

AGE CHANGES IN SKINFOLD MEASUREMENTS OF ADULT SCHEDULED CASTE FEMALES OF PUNJAB

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Abstract: In the present paper an attempt has been made to study the age associated changes in skinfold measurements in a cross-sectional sample of 453 Sikh Harijans and 439 Hindu Harijan females of Punjab ranging in age from 20 to 70 years. In the present sample all the skinfolds increases slightly upto age-group 45-49, followed by a decrease in the subsequent age groups.

Key words: Biceps, triceps, subscapular, suprailiac, calf skinfolds, Sikh Harijans, Hindu Harijans, Punjab.

Introduction

Among the major changes in the skin with aging are thinning of the epithelial and subcutaneous fatty layers. There are multiple factors that determine the amount of fat in the subcutaneous tissue including a genetic potential inherited as type of body build and states of nutrition specifically obesity and under nutrition (Rossman 1977). Changes in the skinfolds a measure of fatty depots, would also be expected to more or less parallel age fluctuations in weight. In general skinfold thickness declines progressively past the third decade (Rossman 1971). In American populations studied by Stoudt et al. (1970) and Damon et al. (1972) the skinfolds thicken progressively from the third decade and fell beyond 70 years of age. However, Lee and Lasker (1958) and Bourliers and Parot (1962) worked on poorly nourished populations and have no evidence of age-related changes in the thickness of skinfolds.

In the present paper an attempt has been made to study the age changes in skinfold measurements among the Scheduled caste females of Punjab. In the constitution of Indian Republic the term Scheduled caste has been accorded to the people who belonged to the lower castes and were considered untouchables. By denominating them as Scheduled castes and Harijans, government is doing a constitutional effort to bring them at par with other higher castes and trying to bring them out of their economic and social backwardness. In the present study both the Sikh and Hindu Harijans have been taken. Most of the Sikh Harijans work as agricultural labourers and industrial workers. The hereditary occupation of Hindu Harijan is scavenging and sweeping. Socio-economic status of Scheduled castes is very low than other populations of Punjab. But Sikh Harijans are slightly better than Hindu Harijans in this respect.

Material and Methods

The sample consists of 483 Sikh Harijan and 439 Hindu Harijan females ranging in age from 20 to 80 years. The data have been collected during 1977-79. All the subjects were drawn from the Harijan settlements in and around Moga, which is a tehsil headquarter of the District Faridkot in the Punjab State of India.

Five skinfolds on different regions of the body, viz. biceps, triceps, subscapular, suprailiac and calf have been studied. These skinfold measurements have been taken with the help of a Harpendan caliper (Tanner & Whitehouse, 1955) by following an standard technique given by Weiner & Lourie (1969).

Table 1. Mean, standard deviation of Biceps, Triceps, Calf, Subscapular and Suprailiac skinfold measurements in Sikh and Hindu Harijan females

Age	N	Biceps (mm)		Triceps (mm)		Calf (mm)		Subscapular (mm)		Suprailiac (mm)	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
<i>SIKH HARIJAN</i>											
20-24	38	8.71	1.64	10.66	2.80	10.61	1.97	12.80	4.11	8.88	3.34
25-29	60	6.97	2.77	10.65	2.19	11.47	4.67	12.83	6.00	9.05	3.56
30-34	41	6.80	1.40	11.13	2.40	11.85	4.01	12.93	4.54	10.05	3.65
35-39	41	7.21	2.75	11.52	4.21	11.86	3.58	13.78	5.61	10.53	4.04
40-44	64	7.25	1.55	13.43	4.18	12.62	3.77	14.43	4.66	10.71	3.30
45-49	80	7.62	2.53	13.62	5.23	12.88	5.01	14.48	5.34	11.61	4.81
50-54	40	7.22	1.70	12.59	4.07	11.73	3.05	13.94	5.61	10.61	3.32
55-59	39	7.38	2.01	11.60	2.44	11.56	3.70	13.68	4.06	10.25	3.11
60-64	37	7.36	2.41	11.50	3.96	11.85	3.61	12.64	4.69	9.79	3.89
65+	43	7.23	2.93	11.00	4.42	11.40	3.69	12.15	5.15	10.64	4.01
20-65+	483	7.19	2.33	11.99	4.37	11.86	4.01	13.70	5.12	10.36	4.18
<i>HINDU HARIJAN</i>											
20-24	39	6.61	1.66	10.32	3.94	10.79	2.25	10.69	3.44	9.15	3.03
25-29	34	6.47	1.50	10.41	2.57	10.98	2.02	10.98	3.60	8.61	2.91
30-34	39	6.81	1.56	10.59	3.53	11.56	3.05	11.46	3.78	8.62	3.39
35-39	52	6.90	2.06	10.98	3.34	11.49	3.91	12.95	5.05	10.00	3.50
40-44	39	7.36	3.33	11.78	5.28	11.78	3.48	13.72	4.53	10.73	3.73
45-49	49	7.49	2.29	12.02	3.74	12.43	3.18	13.97	3.92	10.13	3.52
50-54	44	7.34	1.97	10.69	2.49	11.97	2.56	12.65	3.66	10.10	2.62
55-59	43	7.39	2.20	10.54	2.59	11.54	2.99	10.85	3.90	10.07	3.38
60-64	50	7.31	2.20	10.50	3.25	11.65	2.84	12.60	4.53	9.60	3.46
65+	50	6.78	1.43	9.19	2.37	10.99	1.67	11.27	3.22	9.41	2.81
20-65+	439	7.05	2.12	10.69	3.47	11.61	4.89	12.28	4.17	9.60	3.35

Results and Discussion

The manner in which subcutaneous fat is distributed over the body undergoes significant changes during a life time. All the skinfold measurements of various age groups of Scheduled caste females of Punjab are presented in Table 1.

The mean value of biceps skinfold thickness ranges with narrow limits of 6.70 mm to 7.62 mm in Sikh Harijans and from 6.61 mm to 7.49 mm in Hindu Harijans during the age of 20 to 49 years. After age-group 45–49, there is a general trend of decrease upto age group 65+, where its value becomes 7.23 mm and 6.78 mm among Sikh and Hindu Harijans, respectively. The mean value of triceps skinfold at the age of 20–24 years is 10.66 mm and 10.32 mm among Sikh and Hindu Harijans, respectively, which increases to 13.62 mm among Sikh Harijans and 12.02 mm among Hindu Harijans upto age group 45–49. After age-group 45–49, there is a general trend of decrease upto age-group 65+. The mean value of calf skinfold at age 20–24 years is 10.61 mm and 10.79 mm, which increases to 12.88 mm and 12.43 mm upto age group 45–49 among Sikh and Hindu Harijans, respectively. The value of calf skinfold becomes 11.40 mm among Sikhs and 10.99 mm among Hindu Harijans at age group 65+. Singal (1979) reported an sharp increase in biceps, triceps and calf skinfold upto the age group 40–44 years among Jat Sikh and upto 35–39 years in Bania females of Punjab, followed by a decrease in the subsequent age-groups, however, among Sikh and Hindu Harijan females the increase with age in all skinfolds is relatively small than other populations of Punjab (Table 2).

Table 2. Comparison of Sikh and Hindu Harijan females with other populations as studied from triceps and skinfold (mm)

Age group (yr)	Sikh Harijan	Hindu Harijan	Jat Sikh ¹	Bania ²
20–24	10.66	10.32	13.73	19.32
25–29	10.65	10.41	15.51	18.77
30–34	11.13	10.59	17.05	22.02
35–39	11.52	10.98	18.64	22.99
40–44	13.43	11.78	21.82	23.61
45–49	13.62	12.02	17.24	23.89
50–54	12.59	10.69	17.76	21.54
55–59	11.69	10.54	18.36	18.07
60–64	11.50	10.50	20.34	20.24
65+	11.00	9.19	16.23	15.19

¹ Jat Sikh – Singal, 1979; ² Bania – Singal, 1979.

Average value of subscapular skinfold of adult Sikh and Hindu Harijan females (age 20 to 65+ years) is 13.70 mm and 12.28 mm, respectively. The trend of increase is almost same as in other skinfolds, it rises from age-group 20–24 to 45–49. After age group 45–49 there is decline upto the age group of 65+ years, but in Hindu Harijans the mean value of subscapular skinfold rises at age group 60–64. Maximum increase in subscapular skinfold is observed from age group 30–34 to 35–39 among both caste groups and maximum decline is observed from age group 55–59 to 60–64 among Sikh Harijans and from age group 60–64 to 65+ among Hindu Harijans. Singal (1979) reported continuous increase in subscapular skinfold upto 60–64 years in Jat Sikh and 45–49 years in Banias followed by sudden decrease in subsequent age groups. But Damon et al. (1972) reported that subscapular skinfold rises slightly upto 40 years, remains constant upto 60 years and then falls to its initial value in the 70's.

The mean value of suprailia skinfold of adult (age 20 to 65+ years) Sikh and Hindu Harijan females is 10–36 mm and 9.60 mm, respectively, showing that in Sikh Harijan females the value is 0.70 mm greater than that of Hindu Harijan females (Table 1). In

Table 3. Comparison of some skinfold measurements of Sikh and Hindu Harijan females from the value of 'D' (difference between two means) and students 't' value

Age group (yr)	D	T	D	T	D	T	D	T	D	T
	<i>Biceps</i>		<i>Triceps</i>		<i>Calf</i>		<i>Subscapular</i>		<i>Suprailiac</i>	
20-24	0.10	0.27	0.34	0.44	0.18	-0.38	2.11	2.45*	0.73	1.00
25-29	0.50	1.16	0.24	0.30	0.79	1.19	1.85	1.90	0.44	0.51
30-34	-0.01	0.03	0.54	0.81	0.29	0.37	1.47	1.59	1.43	1.83
35-39	0.31	0.62	0.54	0.69	0.37	0.48	0.83	0.75	0.53	0.67
40-44	0.11	-0.22	1.65	1.73	0.84	0.98	0.71	0.77	-0.02	-0.02
45-49	0.13	0.30	1.60	2.05*	0.83	1.16	0.51	0.62	1.48	2.02*
50-54	0.12	0.30	1.90	2.67*	0.24	0.39	1.29	1.27	0.51	0.78
55-59	-0.01	-0.02	1.06	1.96	0.02	0.27	1.83	2.07*	0.18	0.25
60-64	0.05	0.10	1.00	1.28	0.20	0.28	0.04	0.04	0.19	0.24
65+	0.45	1.00	1.81	2.58*	0.41	0.74	0.88	1.01	1.23	1.73
20-65+	0.14	1.00	1.30	5.20*	0.25	0.89	1.42	4.73	0.76	3.16*

*Significant at 5% level

Sikh Harijans the suprailiac skinfold increases from age group 20–24 to 45–49 and among Hindu Harijans a trend of increase is observed from age-group 20–24 to 40–44. Afterwards there is a trend of decrease. The maximum gain per five years has taken place during age group 25–29 to 30–34 among Sikh Harijans (1.00 mm) and from age group 30–34 to 35–39 (1.38 mm) in Hindu Harijans. Maximum loss per five years is observed from age group 45–49 to 50–54 among Sikh Harijans and from age group 40–44 to 45–49 among Hindu Harijans. But Singal (1979) reported continuous increase in suprailiac skinfold upto 60–64 years age among Jat Sikh females and 45–49 years in Bania females followed by sudden decline in subsequent age groups.

Thus in the present sample all the skinfold measurements increases slightly upto the age group 45–49 years except the subscapular skinfold of Hindu Harijan females which increases only upto 40–44 years of age followed by a decrease in the subsequent age groups. This increase with age in all skinfolds is relatively small than other populations of Punjab. This may be attributed to the availability of limited nutrient intake in the Harijans as compared with othercommunity's women and the energy expenditure in them is more due to hard manual work and physical work which they have to put for earning their livelihood. Similar results have been reported by Lee and Lasker (1958) Bourliere and Parot (1962) and Albrink and Meigs (197). In the typical economic circumstances of western Society, skinfold measurements increases with aging, falling off only in the seventh or eighth decade (Pett and Ogilvie, 1956). The fertility in Scheduled Caste women is also maximum than other populations of Punjab (Sidhu, 1982). The very short interval between successive deliveries can be the cause of less increase inbody fat or skinfold measurements during the fertile period (i.e. from 20 to 45+ years) than that in other populations.

On the average a Sikh Warijan women has slightly higher values of skinfolds than the Hindu Harijan counterpart but differences are statistically significant only in a few age groups (Table 3). Significantly higher values of skinfolds in Sikh Harijan woman than the Hindus may be explained on the basis of better socio-economic conditions of the former.

Summary

Age-associated changes in the skinfold measurements in the adult Scheduled caste females of Punjab have been studied in the present paper. The results are based on a cross-sectional data collected on 483 Sikh Harijan and 439 Hindu Harijan females ranging from 20 to 70 years in age. Most of the Sikh Harijans work as agricultural labourers and industrial workers and the hereditary occupation of Hindu Harijan is scavenging and sweeping. In the present sample all the skinfolds viz. biceps, triceps, calf, subscapular and suprailiac increases slightly upto the age group 45–49 years except the subscapular skinfold of Hindu Harijan females which increases only upto 40–44 years of age followed by a decrease in the subsequent age groups.

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References

- Albrink, M. J., Meigs, J. W. (1971): Serum lipids, skinfolds thickness, body bulk and body weight of native Cape Verdeans and United States factory workers. – *Am. J. Clin. Nutr.*, 24; 344.
- Bourliere, F., Parot, S. (1962): Le vieillissement de deux populations blanches vivant dans des conditions ecologiques tres differentes, etude comparative. – *Rev. France Etudes Clin. Biol.*, 7; 629.
- Damon, A., Seltzer, C. C., Stoudt, H. W., Bell, B. (1972): Age and physique in healthy white veterans at Boston. – *J. Gerontology*, 27; 202.
- Lee, M. M. C., Lasker, G. W. (1958): The thickness of subcutaneous fat in elderly men. – *Am. J. Phy. Anthropol*; 16; 125.
- Pett, L. B., Ogilvie, G. F. (1956): The canadian weight height survey. – *Hum. Biol.* 28; 177.

- Rossmann, I. (1971): *The anatomy of aging. Clinical Geriatrics*. – Lippincott Company, Philadelphia.
- Rossmann, I. (1977): Anatomic and body composition changes with ageing. – In: *Handbook of the biology of ageing*. – Van Nostrand Reinhold Company.
- Sidhu, (1982): A study of fertility and physique in the Scheduled caste women of Punjab with special reference to age changes. – Ph. D. Thesis (unpublished), Punjabi University, Patiala.
- Singal, P. (1979): Morphological age changes in females belonging to two communities of Punjab (India) with special reference to senescence. – Ph. D. thesis (unpublished), Punjabi University, Patiala.
- Stoudt, H. W., Damon, A., McFarland, R. A., Roberts, J. (1970): *Skinfolds, body girths, biacromial breadth and selected anthropometric indices of adults in United States, 1960–1962*. – U. S. Public Health Service, Publication No. 1000, Series 11; No. 35, Govt. Printing Office, Washington, D. C.
- Tanner, J. M., Healy, M. J. R., Whitehouse, R. H. (1959): Fat, muscle and bone in the limbs of youngmen and youngwomen and their quantitative inter-relationships, studied radiographically. – *J. Anat.*, 93; 563.
- Weiner, J. S., Lourie, J. A. (1969): *Human Biology: A guide to field methods*. – Blackwell Scient. Publ., Oxford/Edinburgh.

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