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Analytic study of selected anthropometric characteristics between tribal and non-tribal female players of Himachal Pradesh

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Abstract

The present study has been conducted on 300 female players with an aim to find out the difference in selected anthropometric characteristics between tribal (n=150) and non-tribal (n=150) senior secondary school players of Himachal Pradesh. Tribal sample were taken from the two tribal districts i.e. Lahaul-Spiti and Kinnaur and two tribal tehsil i.e. Bharmour and Pangi of Chamba district in Himachal Pradesh. Non-tribal sample were taken from the three districts i.e. Hamirpur, Bilaspur and Una of Himachal Pradesh. Each player was tested for various anthropometric measurements necessary for estimation of chest circumference, upper arm circumference, forearm circumference, thigh circumference and calf circumference of tribal and non-tribal female players. To analyze the difference in selected anthropometric characteristics of two groups of tribal and non-tribal female players were determined through 't' test. From the findings, it has been found that tribal senior secondary school players possessed significantly in chest circumference, upper arm circumference, forearm circumference, thigh circumference and calf circumference than their counterpart non-tribal senior secondary school female players.

Keyword: Circumference

Introduction

In physical education coaches and scientists have long realized that the performance of an individual is greatly influenced by such factors as height, weight and body structure. The performance diagnosis can only be done through definite knowledge and the understanding of physical characteristics and their relationship of the complex movement mechanism.

The term anthropometry refers to measurement of human body in terms of the dimensions of bone, muscle, and adipose (fat) tissue. Today, anthropometry plays an important role in industrial design, clothing design, ergonomics and architecture where statistical data about the distribution of body dimensions in the population are used to optimize products. Changes in life styles, nutrition and ethnic composition of populations lead to changes in the distribution of body dimensions (e.g., the obesity epidemic), and require regular updating of anthropometric data collections.

Anthropometry is a powerful method for description and analysis of body size, shape, form and proportions. It has been extensively used to quantify and analyze human growth and as such it has become an important specialization not only in anthropology and human biology but also of sports sciences, nutrition, medical sciences, psychology and numerous other sciences

Various researches suggest that suitable physique plays a predominant role for success in sports (Cureton, 1951 and Hirata, 1966 & 1979; De Garay *et al.* 1974; Kemper, 1985; Mathur *et al.* 1985) [3, 1, 4, 5]. The investigator in the underline study would like to compare the certain anthropometric variables i.e. circumferences between tribal and non-tribal senior secondary school players of Himachal Pradesh.

Objectives

The following objectives have been laid down for the present study.

To study and find out the difference in anthropometric characteristics of Senior secondary

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school female players of tribal and non-tribal areas of Himachal Pradesh in respect of their selected anthropometric characteristics i.e. chest circumference, upper arm circumference, forearm Circumference, thigh circumference and calf circumference.

Hypothesis

It is hypothesized that there would be no significant difference between senior secondary school tribal and non-tribal female players in respect of their selected anthropometric characteristics i.e. Circumferences: chest circumference, upper-arm circumference, forearm circumference, thigh circumference and calf circumference.

Methodology

To achieve the purpose of the present study 300 senior

secondary school female players i.e. tribal (n=150) and non-tribal (n=150) were selected randomly from the six district of Himachal Pradesh i.e. tribal (Kinnaur, Lahaul & Spiti and two tribal tehsil i.e. Bharmour & Pangi of Chamba district) and non-tribal (Hamirpur, Bilaspur and Una district) are used as subjects in this study. Each player was tested for certain anthropometric measurements necessary for estimation of chest circumference, upper arm circumference, forearm circumference, thigh and calf circumference. Weighing scale, anthropometric rod and measuring tape were used for the measurements. To test the significance of mean difference between tribal and non-tribal female players, statistical technique of 't' test was applied.

Results and Discussion

Table 1: t-value for tribal and non-tribal female players with respect to their mean score on chest circumference component of anthropometric variable

Group	Variable	N	Mean	S.D	M.D	S.E.M	df	t
Tribal	Chest Circumference	150	83.77	4.520	8.500	.369	298	**13.972
Non-Tribal		150	75.27	5.923		.484		

Significant at 0.01 level of confidence

As per table No.1 the mean value of chest circumference of senior secondary school tribal female players is 83.77, the mean value of senior secondary school non-tribal female players is 75.27. The mean difference is 8.500 and S.D of tribal female players is 4.520 and non-tribal female players is 5.923. The calculated 't'-value came out to be 13.972, which is statistically significant at 0.01 level of significance, (Table value of 't' at 0.01 level =2.59 for df 298.)

This indicated that tribal and non-tribal senior secondary school female players differ significantly in the variable of 'chest circumference'. Hence the formulated hypothesis that "there would be no significant difference between tribal and non-tribal senior secondary school female players in the variable of chest circumference" null hypothesis stand rejected.

Table 2: t-value for tribal and non-tribal female players with respect to their mean score on upper arm circumference component of anthropometric variable

Group	Variable	N	Mean	S.D	M.D	S.E.M	df	t
Tribal	Upper arm Circumference	150	25.23	1.699	3.220	.139	298	**12.129
Non-Tribal		150	22.01	2.772		.226		

Significant at 0.01 level of confidence

As per table No.2 the mean value of upper arm circumference of senior secondary school tribal female players is 25.23, the mean value of senior secondary school non-tribal female players is 22.01. The mean difference is 3.220 and S.D of tribal female players is 1.699 and non-tribal female players is 2.772. The calculated 't'-value came out to be 12.129, which is statistically significant at 0.01 level of significance, (Table value of 't' at 0.01 level =2.59 for df 298.)

This indicated that tribal and non-tribal senior secondary school female players differ significantly in the variable of 'upper arm circumference'. Hence the formulated hypothesis that "there would be no significant difference between tribal and non-tribal senior secondary school female players in the variable of upper arm circumference" null hypothesis stand rejected.

Table 3: t-value for tribal and non-tribal female players with respect to their mean score on forearm circumference component of anthropometric variable

Group	Variable	N	Mean	S.D	M.D	S.E.M	df	t
Tribal	Fore arm Circumference	150	23.43	1.435	2.287	.117	298	**10.226
Non-Tribal		150	21.15	2.333		.190		

Significant at 0.01 level of confidence

As per table No.3 the mean value of fore arm circumference of senior secondary school tribal female players is 23.43, the mean value of senior secondary school non-tribal female players is 21.15. The mean difference is 2.287 and S.D of tribal female players is 1.435 and non-tribal female players is 2.333. The calculated 't'-value came out to be 10.226, which is statistically significant at 0.01 level of significance, (Table value of 't' at 0.01 level =2.59 for df 298.)

This indicated that tribal and non-tribal senior secondary school female players differ significantly in the variable of 'fore arm circumference'. Hence the formulated hypothesis that "there would be no significant difference between tribal and non-tribal senior secondary school female players in the variable of fore arm circumference" null hypothesis stand rejected.

Table 4: t-value for tribal and non-tribal female players with respect to their mean score on thigh circumference component of anthropometric variable

Group	Variable	N	Mean	S.D	M.D	S.E.M	df	t
Tribal	Thigh Circumference	150	48.41	2.901	3.000	.237	298	**5.983
Non-Tribal		150	45.41	5.412		.442		

Significant at 0.01 level of confidence

As per table No.4 the mean value of thigh circumference of senior secondary school tribal female players is 48.41, the mean value of senior secondary school non-tribal female players is 45.41. The mean difference is 3.000 and S.D of tribal female players is 2.901 and non-tribal female players is 5.412. The calculated 't'-value came out to be 5.983, which is statistically significant at 0.01 level of significance, (Table value of 't' at 0.01 level = 2.59 for df 298.)

This indicated that tribal and non-tribal senior secondary school female players differ significantly in the variable of 'thigh circumference'. Hence the formulated hypothesis that "there would be no significant difference between tribal and non-tribal senior secondary school female players in the variable of thigh circumference" null hypothesis stand rejected.

Table 5: t-value for tribal and non-tribal female players with respect to their mean score on calf circumference component of anthropometric variable

Group	Variable	N	Mean	S.D	M.D	S.E.M	df	t
Tribal	Calf Circumference	150	30.03	1.215	.887	.099	298	**3.352
Non-Tribal		150	29.14	3.003		.245		

Significant at 0.01 level of confidence

As per table No.5 the mean value of calf circumference of senior secondary school tribal female players is 30.03, the mean value of senior secondary school non-tribal female players is 29.14. The mean difference is .887 and S.D of tribal female players is 1.215 and non-tribal female players is 3.003. The calculated 't'-value came out to be 3.352, which is statistically significant at 0.01 level of significance, (Table value of 't' at 0.01 level = 2.59 for df 298.)

This indicated that tribal and non-tribal senior secondary school female players differ significantly in the variable of 'calf circumference'. Hence the formulated hypothesis that "there would be no significant difference between tribal and non-tribal senior secondary school female players in the variable of calf circumference" null hypothesis stand rejected.

Discussion

Tribal female players possess greater value for chest circumference, upper-arm, forearm, thigh and calf circumference than non-tribal female players. There was significant difference established between tribal female players and non-tribal female players in chest circumference, upper-arm, forearm, thigh and calf circumference. This indicates that non-tribal female players have lesser circumference in all circumferences measurements than tribal female players.

This indicates that tribal female players showed good development of muscle at chest, upper arm, forearm, thigh and calf than non-tribal players. It may be due to their rough and tough environmental condition and their struggle full life style.

Conclusions

1. Tribal and non-tribal senior secondary school female players differ significantly in the variable of chest circumference.
2. Tribal and non-tribal senior secondary school female players differ significantly in the variable of upper arm circumference.
3. Tribal and non-tribal senior secondary school female players differ significantly in the variable of forearm circumference.
4. Tribal and non-tribal senior secondary school female

players differ significant on the variable of thigh circumference.

5. Tribal and non-tribal senior secondary school female players differ significantly in the variable of calf circumference.

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