

Comparative Study of Chest Muscle Circumference of Anthropometry Characteristics Among Tribal And Non-Tribal Sportsmen of Goa with Reference to Age Groups

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Abstract: Anthropometric characteristics play a vital role in determining physical fitness and sports performance. Among these characteristics, chest muscle circumference reflects upper body muscular development and respiratory efficiency. The present study aimed to compare chest muscle circumference between tribal and non-tribal sportsmen of Goa with reference to two age groups (21–25 years and 26–30 years). A total of 100 male sportsmen were selected for the study, comprising 50 tribal and 50 non-tribal players from different sports disciplines in Goa. The subjects were further categorized into two age groups. Chest muscle circumference was measured using a standard steel measuring tape following accepted anthropometric procedures. The collected data were analyzed using mean, standard deviation, and independent t-test to determine the significance of differences between groups. The findings of the study revealed that non-tribal sportsmen demonstrated slightly higher mean values of chest muscle circumference compared to tribal sportsmen in both age groups; however, the differences were not statistically significant at the 0.05 level of significance. The results suggest that participation in sports activities contributes to similar levels of muscular development among both tribal and non-tribal athletes regardless of age category. The study highlights that sports training and physical activity may minimize anthropometric differences between different ethnic groups.

Keywords: Anthropometry, Tribal athletes, Non-tribal athletes, Chest muscle circumference, Age groups, Sports science

I. INTRODUCTION

Anthropometric measurements are important indicators used in sports science to evaluate body composition, physical structure, and muscular development of athletes. These measurements provide valuable information about the physical characteristics required for success in various sports activities (Malina, Bouchard & Bar-Or, 2004).

Among different anthropometric variables, chest muscle circumference represents upper body muscular development and respiratory efficiency. Athletes participating in sports that require strength, endurance, and power often exhibit greater chest girth due to muscular hypertrophy and improved lung capacity (Baechle & Earle, 2008).

Previous studies have emphasized the relationship between anthropometric characteristics and athletic performance. Singh and Yadav (2010) examined the relationship between anthropometric variables and basketball playing ability and reported that body measurements contribute significantly to sports performance when combined with physical fitness variables.

Anthropometric characteristics may vary across populations due to genetic factors, nutrition, environmental conditions, and lifestyle patterns. Studies comparing rural and urban populations have revealed differences in body composition and cardiovascular efficiency (Patil et al., 2012). Similarly, comparisons between different ethnic groups may reveal variations in body structure and physical fitness.

Tribal populations in India often have different lifestyle patterns compared to non-tribal populations, which may influence their physical characteristics and muscular development. However, limited research has been conducted on the anthropometric comparison of tribal and non-tribal athletes, particularly with respect to age groups.

Therefore, the present study was undertaken to compare chest muscle circumference between tribal and non-tribal sportsmen of Goa with reference to age groups.

II. METHODS

Selection of Subjects

For the purpose of the present study, **100 male sportsmen from Goa** were selected as subjects. The participants were divided into two groups:

1. Tribal sportsmen (n = 50)
2. Non-tribal sportsmen (n = 50)

The subjects were further categorized into two age groups:

1. **21–25 years**
2. **26–30 years**

Variable Selected

The following anthropometric variable was selected:

1. Chest Muscle Circumference

Criterion Measure

Chest muscle circumference was measured using a **steel measuring tape**.

The subjects were asked to stand erect without wearing upper garments. The measuring tape was placed around the chest at the level of the nipples in the front and just below the inferior border of the scapula at the back. The measurement was taken at maximum inspiration and recorded to the nearest **0.1 cm**.

Statistical Technique

The collected data were analyzed using the following statistical techniques:

1. Mean
2. Standard Deviation
3. Independent t-test

The level of significance was set at **0.05**.

III. RESULTS AND DISCUSSION

Table 1

Comparison of Chest Muscle Circumference between Tribal and Non-Tribal Sportsmen (Age Group 21–25 Years)

Anthropometric Characteristics	Sportsman	No.	Mean	Standard Deviation	T-Value	Significant Level
Chest muscle circumference	Tribal	50	88.90	5.54	0.78	Not Significant
	Non-Tribal	50	89.80	5.32		

The table indicates that the mean chest muscle circumference of tribal sportsmen aged 21–25 years was **88.90 cm**, while the mean value of non-tribal sportsmen was **89.80 cm**. The calculated t-value was **0.78**, which was lower than the required table value at the 0.05 level of significance, indicating no significant difference between the groups.

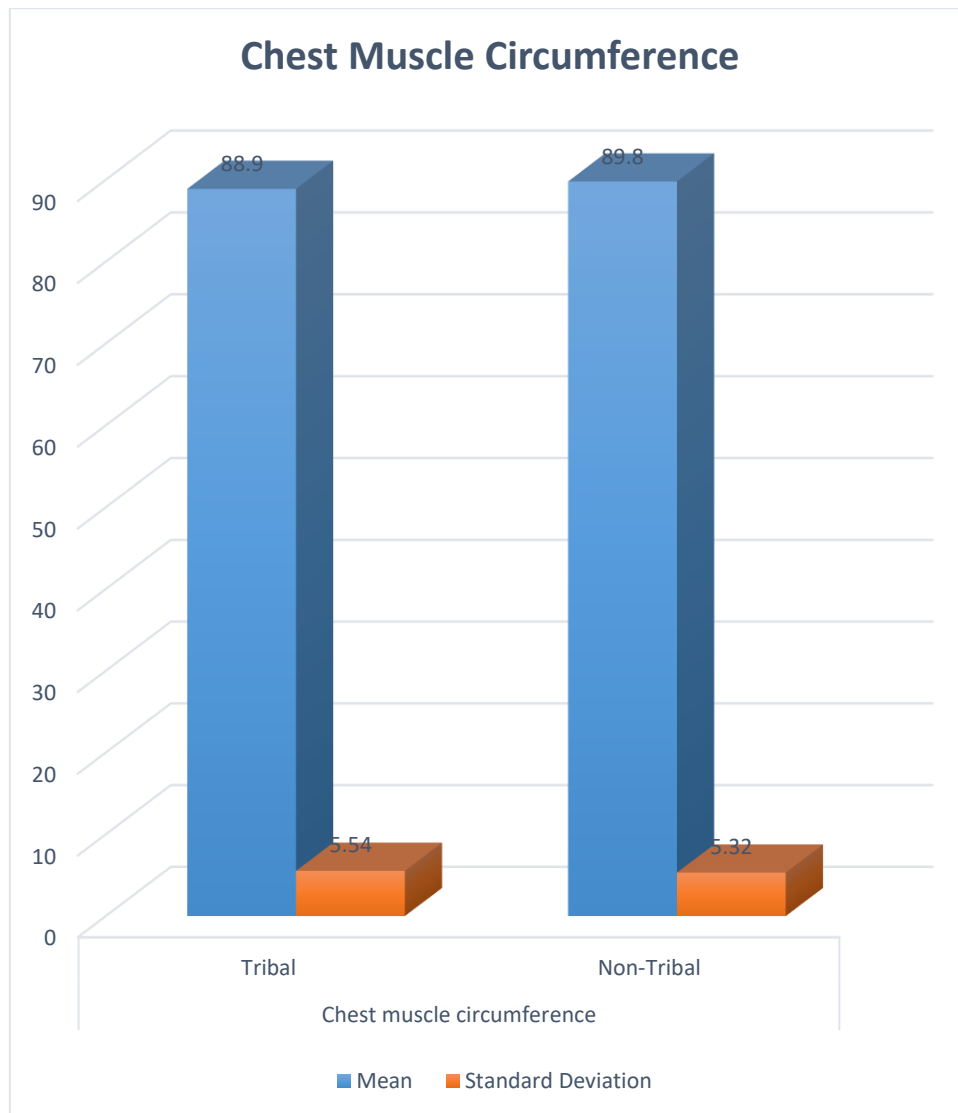


Figure-1 Comparison of Chest Muscle Circumference between Tribal and Non-Tribal Sportsmen (Age Group 21–25 Years)

Table 2

Comparison of Chest Muscle Circumference between Tribal and Non-Tribal Sportsmen (Age Group 26–30 Years)

Anthropometric Characteristics	Sportsman	No.	Mean	Standard Deviation	T-Value	Significant Level
Chest muscle circumference	Tribal	25	87.40	5.10	0.80	Not Significant
	Non-Tribal	25	88.65	5.43		

The table shows that the mean chest muscle circumference of tribal sportsmen aged 26–30 years was **87.40 cm**, whereas the mean value for non-tribal sportsmen was **88.65 cm**. The calculated t-value was **0.80**, which was not significant at the 0.05 level.

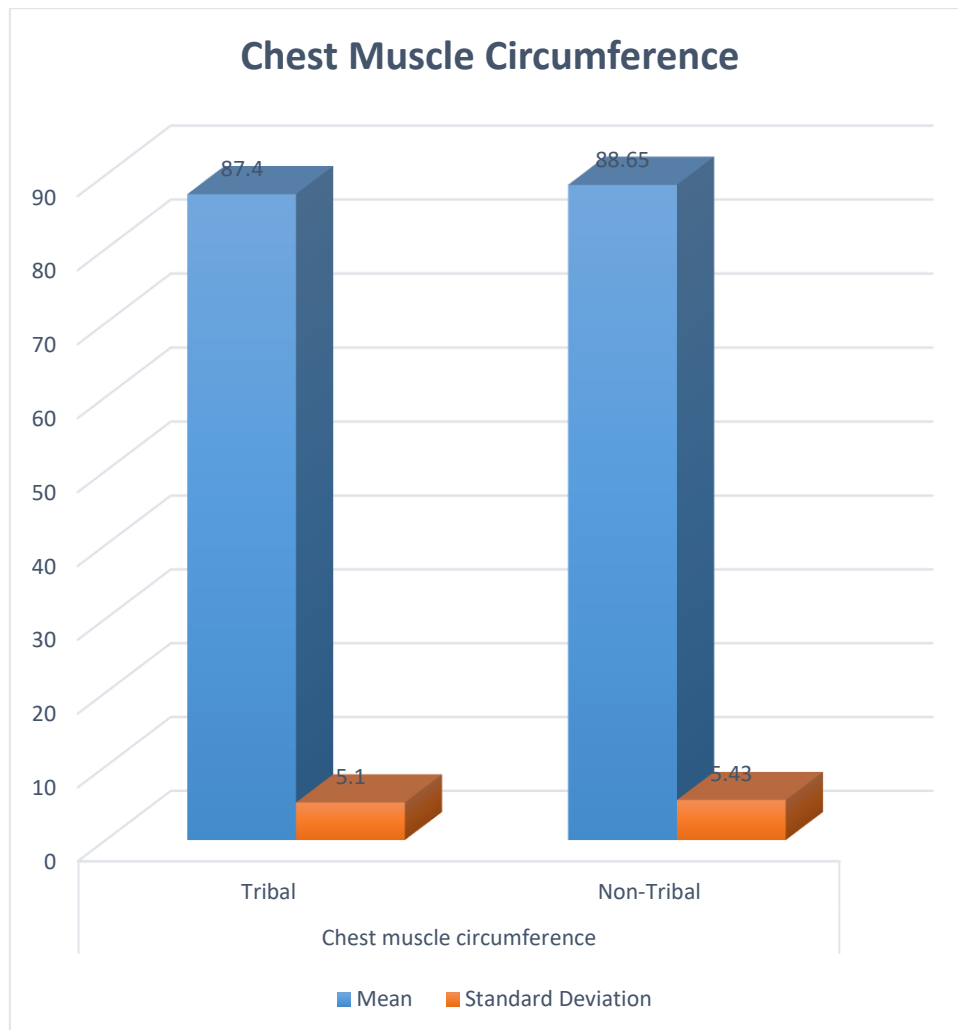


Figure-1 Comparison of Chest Muscle Circumference between Tribal and Non-Tribal Sportsmen (Age Group 26–30 Years)

IV. DISCUSSION

The purpose of the present study was to compare the chest muscle circumference between tribal and non-tribal sportsmen of Goa with reference to two age groups (21–25 years and 26–30 years). The findings of the study revealed that although non-tribal sportsmen showed slightly higher mean values of chest muscle circumference compared to tribal sportsmen, the difference between the two groups was not statistically significant in either age group.

The results of the present study are consistent with the findings of **Malina, Bouchard, and Bar-Or (2004)**, who reported that anthropometric characteristics such as chest circumference and body dimensions are largely influenced by physical activity levels, training status, and environmental conditions rather than ethnicity alone. Since the subjects in the present study were actively involved in sports activities, both tribal and non-tribal players exhibited similar levels of muscular development.

Similarly, the observations of the present study support the findings of **Baechle and Earle (2008)**, who stated that regular participation in sports training leads to significant development of upper body musculature, including chest muscles. According to their research, athletes involved in continuous physical training often develop comparable muscular structures regardless of their background because training stimulus plays a major role in muscle hypertrophy and strength development.

The findings of the present investigation also agree with the study conducted by **Singh and Yadav (2010)**, who examined the relationship between anthropometric variables and sports performance. Their research indicated that body



measurements such as chest girth, limb circumference, and body proportions are influenced by systematic sports participation. They emphasized that athletes participating in organized training programs tend to show similar physical characteristics due to the adaptation of the body to training loads.

Furthermore, the results of the present study are in line with the findings of **Patil et al. (2012)**, who conducted a comparative study on physical fitness parameters between different population groups. Their study revealed that lifestyle and level of physical activity significantly affect body composition and physical fitness variables. In the present investigation, both tribal and non-tribal sportsmen were involved in regular sports activities, which may have minimized anthropometric differences between the two groups.

It is also important to note that tribal populations traditionally engage in physically demanding daily activities, which contribute to their natural physical fitness and muscular endurance. On the other hand, non-tribal athletes often receive structured sports training and coaching. As a result, both groups may develop comparable physical characteristics through different pathways of physical activity and training.

Therefore, the results of the present study suggest that regular sports participation plays a more important role in determining muscular development than ethnic background. The similarity in chest muscle circumference between tribal and non-tribal sportsmen indicates that sports training and physical activity may help reduce physical disparities between different population groups.

V. CONCLUSION

Finally, the results of the present study concluded that regular sports participation plays a more important role in determining muscular development than ethnic background. The similarity in chest muscle circumference between tribal and non-tribal sportsmen indicates that sports training and physical activity may help reduce physical disparities between different population groups.

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