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## A comparative study of anthropometric variables between rhythmic and artistic women gymnasts

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### Abstract

Anthropometry is the science of obtaining systematic measurements of the body. Anthropometry first developed in the 19<sup>th</sup> century as a method employed by physical anthropologist for the study of human variation and evolution in both living and extinct populations. The emergence of a relatively new scientific specialization called Anthropometry provides a convenient frame work for the stud of human body. The present study aimed at comparative study of anthropometric variables between rhythmic and artistic women gymnasts. The sample of study comprised of 40women gymnastic players of Rohtak. Who were selected randomly? This study was delimited on women gymnastic players. Data was collected by using weight machine and still tape. Mean S.D. and 't' ratios were computed to study the difference between anthropometric variables. The findings of the study revealed that there is difference between rhythmic and artistic women gymnasts in anthropometric variables is linear measurement and circumference.

**Keywords:** Anthropometry, rhythmic, artistic, circumference, linear

### Introduction

Anthropometry is the science of obtaining systematic measurements of the body. Anthropometry first developed in the 19<sup>th</sup> century as a method employed by physical anthropologist for the study of human variation and evolution in both living and extinct populations. The study of body types has a significant place in the field of sports. Anthropometric measurement has revealed correlation between body structure physical characteristics and sport capabilities. In all the game, height, weight and other anthropometric variables play a vital role in the players' performance.

Anthropometry is the science of measuring the size and proportions of the human body. Anthropometry means the measurements of man, whether living or dead and consists primarily in the measurements of the dimensions of the body. The physical structure especially the height and arm length, have definite and decisive advantage in many games. It is essential to examine and athlete from every possible aspect. This is in order to win in a sport or event in the Olympics as well as other international competitions to achieve success in this objective one has to examine the best Olympic athletes. They are perhaps the best in the world and the Olympic Games in their most important competition.

The great improvement in performance of sports at the international competition is due to the increased number of competitions improved training method application of scientific principles underlying physiological mechanism and increased Physical fitness components of athletes and sportsmen more men are available with specific Physical characteristics and aptitudes that make for superior performance in a specific event. It has been observed that apart from other factors, the performance of a sportsman and athlete in any event or game depends on the various characteristics of Physiology, morphology and body composition. Various studies have been conducted on anthropometry in other countries which has given positive correlation with the performance. But our country is lacking behind in this field due to lack of sufficient facilities and equipment, which is not present in any research center and in any physical education department in India.

According to mechanical factor the taller Gymnasts in at a disadvantage because he has a smaller strength. Body weight ratio than shorter Gymnasts.

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This is because the shorter and lighter people are better able to control their own body weight. This means strength per pound tends to be higher for smaller individuals- the taller Gymnasts has a center of gravity higher off the ground than the shorter Gymnasts. In modern age Anthropometric and Physiological measurements have been utilized as a basis for evaluating posture and nutritional status in order to determine growth changes in children and their suitability for different sports activities on the basis of the above mentioned facts, it was considered worthwhile to investigate, the comparative study of Anthropometric variables between Rhythmic and Artistic Gymnastics of Rohtak.

**Objectives of the study**

1. To determine the differences in linear measurements between Rhythmic and Artistic women Gymnasts.
2. To find out difference in circumferences measurements between Rhythmic and Artistic women Gymnasts.

**Delimitations of the study**

1. The present study delimited to 20 Rhythmic gymnasts and 20 Artistic gymnasts of the Rohtak.
2. The study is delimited to state level players.
3. Age of the players ranged from 15 to 20 years
4. The study is delimited to women players.
5. The study delimited to the following Anthropometric variables.

1. Weight
2. Linear Measurement
  - (i) Height
  - (ii) Total Leg length
  - (iii) Fore Leg Length
  - (iv) Thigh length.
  - (v) Total Arm Length
  - (vi) Fore Arm Length
  - (vii) Upper Arm Length

3. Circumferences

- (i) Chest
- (ii) Hip
- (iii) Shoulder

**Significance of the study**

The results of the study may contribute to the sports particularly in the competitive field in the following ways:-

1. The results of the study would provide criteria for selecting talented Gymnasts.
2. The Gymnastic Coaches knowing the body characteristics may construct good training schedule for producing outstanding Gymnasts.
3. Through this study people knowing the differences between Rhythmic Gymnasts and Artistic Gymnastics.

**Research design of the study**

**Sample**

40 women Gymnasts were selected from Rohtak. There were 20 Rhythmic Gymnasts women and 20 Artistic Gymnasts women from C.R stadium and Balbhawan Rohtak. Which was selected randomly by the investigator?

**Tools used in the study**

1. For measuring different body (Linear) segments the anthropometry was used,
2. The weight of the subject was measured with the help of portable actuated weighting machine.
3. A flexible still tape was used to measure the circumferences.

**Statistical analysis**

The statistical analyses used were mean S.D. and 't' test to find out significance of comparison between Rhythmic and Artistic women Gymnasts.

**Results and discussion**

The results and analysis of the various tests conducted are given table wise.

**Table 1:** Descriptive Statistics of Linear Measurement between Rhythmic and Artistic women Gymnasts

Sr. no.	Variables	Rhythmic		Artistic		Mean Difference	't' Value
		Mean1	S D1	Mean2	S D2		
1	Height	169.5	2.59	167.8	2.41	1.87	3.23*
2	Total Leg Length	89.3	2.02	87.1	1.56	2.27	5.05*
3	Fore Leg Length	50.4	1.53	47.3	1.13	3.2	9.15*
4	Thigh Length	39.8	2.65	39.5	1.18	0.27	0.51*
5	Total Arm Length	73.3	3.20	68.8	5.47	4.47	3.35*
6	Fore Arm Length	27.3	3.03	30.8	2.31	9.5	13.80*
7	Upper Arm Length	27.6	2.53	22.9	3.06	4.7	6.54*

N=40 Significant at 0.05 level

Table No.1 Reveals the descriptive statistic of Linear measurement of Rhythmic and Artistic women Gymnasts.

**Sr. No. 1:** The mean value of Height of Rhythmic Gymnasts is 169.5 and mean value of Artistic Gymnasts is 167.8 and the mean difference is 1.87. The obtained 't' value is 3.23. The obtained 't' value is statistically significant at 0.05 level of significance, when compared with value of 't'.

**Sr. No 2:** The mean value of Total Leg Length of Rhythmic Gymnasts is 89.3 and mean value of Artistic Gymnasts is 87.1 and the mean difference is 2.27. The obtained 't' value is 5.05. The obtained 't' value is statistically significant at 0.05 level of significance, when compared with value of t.

**Sr. No. 3:** The mean value of Fore Leg Length of Rhythmic Gymnasts is 50.4 and mean value of Artistic Gymnasts is 47.3 and the mean difference is 3.2. The obtained 't' value is 9.15. The obtained 't' value is statistically significant at 0.05 level of significance, when compared with value of 't'.

**Sr. No. 4:** The mean value of Thigh Length of Rhythmic Gymnasts is 39.8 and mean value of Artistic Gymnasts is 39.5 and the mean difference is 0.27. The obtained 't' value is 0.51. The obtained t value is statistically significant at 0.05 level of significance, when compared with value of t.

**Sr. No. 5:** The mean value of Total Arm Length of Rhythmic Gymnasts is 73.3 and mean value of Artistic Gymnasts is 68.8

and the mean difference is 4.47. The obtained t' value is 3.35. The obtained 't' value is statistically significant at 0.05 level of significance, when compared with value of 't'.

**Sr. No.6:** The mean value of Fore Arm Length of Rhythmic Gymnasts is 27.3 and means value of Artistic Gymnasts is 30.8 and the mean difference is 9.5. The obtained 't' value is 13.80. The obtained 't' value is statistically significant at 0.05

level of significance, when compared with value of 't'.

**Sr. No.7:** The mean value of Upper Arm Length of Rhythmic Gymnasts is 27.6 and mean value of Artistic Gymnasts is 22.9 and the mean difference is 4.7. The obtained 't' value is 6.54. The obtained T value is statistically significant at 0.05 level of significance, when compared with value of 't'.

**Table 2:** Descriptive Statistics of Circumference Measurement between Rhythmic and Artistic women Gymnasts

Sr. No.	Variables	Rhythmic		Artistic		Mean Difference	't' Value
		Mean1	S D1	Mean2	S D2		
1	Chest	83.9	1.42	89.6	3.62	5.97	0.84*
2	Hip	84.3	2.06	71.4	2.57	12.9	21.5*
3	Shoulder	100.9	1.57	102.7	1.48	1.77	4.44*

N=40 Significant at 0.05 level

Table No. 2 Reveals the descriptive statistic of Circumference measurement of Rhythmic and Artistic women Gymnasts

**Sr. No. 1:** The mean value of Chest of Rhythmic Gymnasts is 83.9 and mean value of Artistic Gymnasts is 89.6 and the mean difference is 5.97. The obtained 't' value is .84. The obtained 't' value is statistically significant at 0.05 level of significance, when compared with value of 't'.

**Sr. No. 2:** The mean value of Hip of Rhythmic Gymnasts is 84.3 and mean value of Artistic Gymnasts is 71.4 and the mean difference is 12.9. The obtained 't' value is 21.5. The obtained 't' value is statistically significant at 0.05 level of significance, when compared with value of 't'.

**Sr. No. 3:** The mean value of Shoulder of Rhythmic Gymnasts is 100.9 and mean value of Artistic Gymnasts is 102.7 and the mean difference is 1.77. The obtained 't' value is 4.44. The obtained 't' value is statistically significant at 0.05 level of significance, when compared with value of 't'.

### Conclusion

The results of the present study and discussed taking into consideration various Anthropometric variables measurement between Rhythmic and Artistic women Gymnasts.

1. The Rhythmic women Gymnasts are taller in comparison to Artistic women Gymnasts.
2. Total leg length of Rhythmic women Gymnasts is more in comparison to Artistic women Gymnasts.
3. Fore leg length of Rhythmic women Gymnasts is more in comparison to Artistic women Gymnasts.
4. Total arm length of Rhythmic women Gymnasts is more in comparison to Artistic women Gymnasts.
5. Fore arm length of Artistic women Gymnasts is more in comparison to Rhythmic women Gymnasts.
6. Chest Circumferences of Artistic women Gymnasts is more in Comparison to Rhythmic women Gymnasts.
7. Shoulder Circumferences of Artistic women Gymnasts is more comparison to Rhythmic women Gymnasts.

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