

## Comparative study on selected anthropometric measurement of athletes at different level

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### Abstract

The purpose of the study was to compare selected anthropometric measurement of athletes at different level. Forty (40) National level and State level junior athletes of which twenty of each level (age ranging-14-19 y.) was selected from North region of India especially from SAI complex of Patiala. Players were selected from Sprint, Long jump, Shot put, Javelin and Long distance running events where four athletes from each event. Subjects Height, Body weights were measured by 'Stadiometer' and 'Weighing' machine whereas Thigh Girth, Leg length, Hand length were measured by 'Freeman Steel Tape' as an anthropometric measurement. To find out the significant differences of collecting data were calculated by applying students "t" test at 0.05 level of confidence. Result of the study showed that significant difference has been noticed on Height, Leg length and Thigh Girth whereas no significant difference was found in case of Body weight, and hand length.

**Keywords:** Anthropometric measurement, height, weight, thigh girth, leg and hand length

### Introduction

Anthropometry is the branch of Anthropology which is concerned with taking of measurements of human body. This definition has been confined to the kinds of measurements commonly used in associating physical performance with body build (Warren 1974) [12]. Anthropometrical measurement focused on three areas growth measures, body type and body composition. The use of such measures helps to prediction of growth patterns and predictions of success in motor activities as well as assessment of obesity (Correlation 1974) [3]. The major role for physical performance is partly dependent upon the physique and body composition of an individual (Bubrunen 1975) [2]. Measurements of body size include such descriptive information as height weight and surface area while measurements of body proportion describe the comparative of on height and weight and among length of various body segments. It has been found that top athlete in some sports tends to have those proportions that bio mechanically and the particular performance required (Early 1982) [10]. Athletes for superior performance in any is selected on the basis of his physical structure and body size, which has proved to appropriate for high performance in the given sport (Tanner 1964) [7]. Therefore this study has been undertaken with a view to find out the selected anthropometric measurement of national and state level junior athletes.

### Method and Materials

In order to compare selected anthropometric measurement of national and state level junior athletes, Forty (40) National level and State level junior athletes of which twenty of each level (age ranging-14-19 y.) were selected from North region of India Specially from SAI complex of Patiala. Players were selected from sprint, Long jump, shot put, javelin and long distance running events where four athletes of each event. Subjects Height, Body weight, Thigh Girth, Leg length, Hand length (D.K. Kansal 2007) [13] were measured as an anthropometric measurement by using

Stadiometer, Weighing machine and 'Freeman Steel tape'. Corresponding Date were collected in a day shift with the help of Govt. employ PE teachers on the SAI sports ground Patiala.

### Statistical Procedure

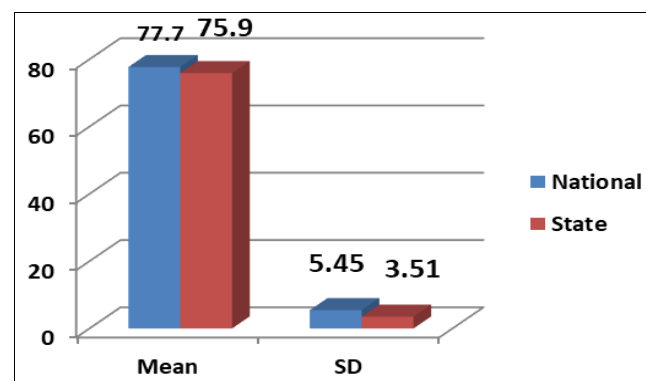
The gathered data were duly analyzed through statistical procedure using Descriptive statistics and 't' test was applied to find out significant differences between selected anthropometric measurement and of national and state level athletes. The level of significant was set at 0.05 level of confidence.

### Result of the study

**Table 1:** Mean, SD and "t" Test on Height of National and State Level Junior Athletes

Level	Mean	SD	Mean Difference	Standard Error	"t"
National	172.03	6.91	4.00	1.86	2.15*
State	168.05	4.67			

\*Significance at 0.05 level, Tabulated  $t_{0.05}(38)$  & 2.024



**Fig 1:** The different of clearly revealed height between national and State level

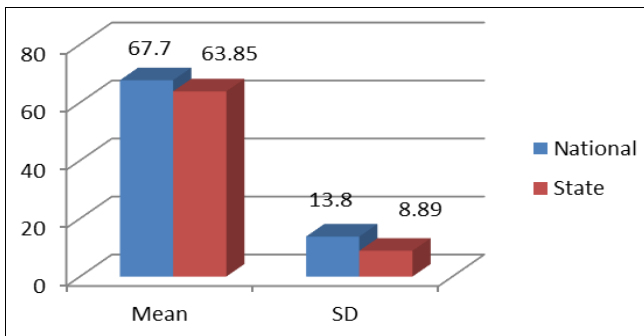
**Findings**

In the Table 1 & Fig. 1, it is clearly revealed that, significant difference exist on Height between national and state level athletes as because Cal “t” value (2.15\*) is higher than Tab t 0.05 (38) value (2.024\*). Mean of performance of national athletes were better than state athletes. Table 2: Mean, SD and “t” Test on Body Weight of National and State Level Junior Athletes.

**Table 2:** Mean, SD and “t” Test on Body Weight of National and State Level Junior Athletes

Level	Mean	SD	Mean Difference	Standard Error	“t”
National	67.7	13.8	1.83	3.67	0.50
State	65.85	8.89			

\*Significance at 0.05 level, Tabulated to.05 (38) &2.024



**Fig 2:** The different of clearly Body weight between national and state level

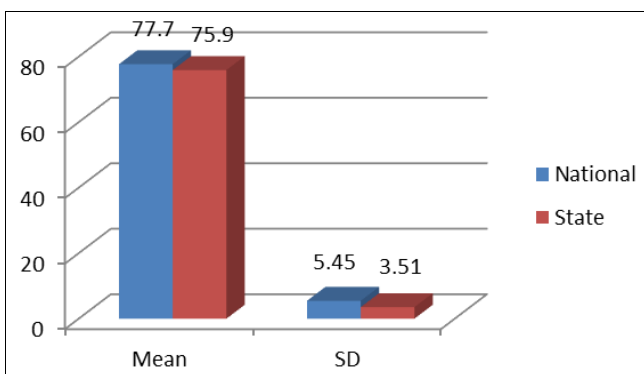
**Findings**

In the Table 2 and Fig. 2, it is clearly revealed that, no significant difference exist on Body weight between national and state level athletes as because Cal “t” value (0.50) is lower than Tab t 0.05 (38) value (2.024\*). Mean of performance of national athletes were better than state athletes.

**Table 3:** Mean, SD and “t” Test on Hand Length of National and State Level Junior Athletes

Level	Mean	SD	Mean Difference	Standard Error	“t”
National	77.7	5.43	1.8	1.45	1.24
State	75.9	3.51			

\*Significance at 0.05 level, Tabulated to.05 (38) &2.024



**Fig 3:** Clearly revealed that, no significant difference exist on Hand length between national and state level athletes

**Findings**

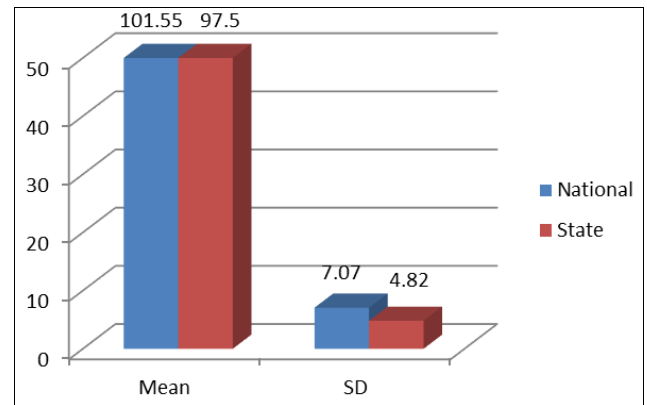
In the Table 3 and Fig. 3, it is clearly revealed that, no significant difference exist on Hand length between national

and state level athletes as because Cal “t” value (1.24) is lower than Tab t 0.05 (38) value (2.024\*). Mean of performance of national athletes were better than state athletes.

**Table 4:** Mean, SD and “t” Test on Leg Length of National and State Level Junior Athletes

Level	Mean	SD	Mean Difference	Standard Error	“t”
National	101.55	7.07	4.05	1.91	2.12*
State	97.5	4.82			

\*Significance at 0.05 level, Tabulated to.05 (38) &2.024



**Fig 4:** it is clearly revealed that, Leg length between national and state level athletes as because Cal “t” value

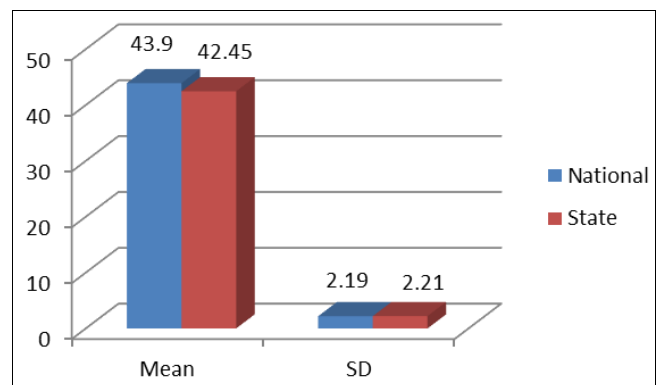
**Findings**

In the Table 4 & Fig. 4, it is clearly revealed that, significant difference exist on Leg length between national and state level athletes as because Cal “t” value (2.12\*) is higher than Tab t 0.05 (38) value (2.024\*). Mean of performance of national athletes were better than state athletes. Table 5: Mean, SD and “t” Test on Thigh Girth of National and State Level Junior Athletes.

**Table 5:** Mean, SD and “t” Test on Thigh Girth of National and State Level Junior Athletes

Level	Mean	SD	Mean Difference	Standard Error	“t”
National	43.9	2.19	1.45	0.68	2.10*
State	42.45	2.21			

\*Significance at 0.05 level, Tabulated to.05 (38) &2.024



**Fig 5:** Shows the difference exist on Thigh Girth between national and state level athletes

**Findings**

In the Table 5 & Fig. 5, it is clearly revealed that, significant difference exist on Thigh Girth between national and state

level athletes as because Cal “t” value (2.10\*) is higher than Tab t 0.05 (38) value (2.024\*). Mean of performance of national athletes were better than state athletes.

### Discussion and Conclusion

The main results of the present study, conducted in 40 junior National and State athletes aged 14-19 years from North region of India, SAI complex of Patiala, are the following:

Result of the study showed that anthropometric characteristics such as-Height, Leg length and Thigh Girth were found to be significant whereas no significant difference was found in case of Body weight, and hand length.

In the present study average height of the national athletes 172.05 cm. was recorded which is better than State athletes (168.05 cm.). Here researcher believed that due to Biological, environmental & Genetic makeup of the athletes may be causes of obtaining grater height (Nudri *et al.* 1996)<sup>[14]</sup>. Rather it can be said that in the adolescence stages (13 to 19 years) height is increase steadily and obtained near top height than other growth stages (Singh A. *et al.* 2007)<sup>[6]</sup>. The average age of both level (N, S) athletes were 17 & 15 years respectively, so they belongs to this stages and achieved more height, but due to greater age national athletes were found better than state athletes because height of the normal peoples is increased proportionally with age (Singh A. *et al.* 2007)<sup>[6]</sup>. Leg lengths of the national athletes were found better than state athletes. Leg length also increases due to increasing overall height of the athletes and development of lower limb is quicker than upper limb (D Gunnell 2001)<sup>[11]</sup>. Thigh circumference of the national athletes were found better, in this case researcher believed that due to strenuous practice, exercise, and nutritional aspect of the athletes thigh muscle hypertrophy is occurred (Hug F 2006) so that overall circumference of the thigh muscles is increase. Although there was age difference between both levels of athletes but due to scientific training, conditioning, dieting, and maintaining physical fitness, body weight of the athletes is on control (Train 2004 reported) therefore we found no significant difference of body weight in this study. In case of hand length there was no differences between them as because development of upper limb is comparatively slower than lower limb in all growth stages (D Gunnell 2001)<sup>[11]</sup>. Important that there was not enough age difference between national and state level athletes so that due to closer age difference upper limb development is same and no difference was found.

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