# Analysis of Selected Anthropometric Measurements and Athletic Performance between Adolescence Boys of Different Age Groups

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**Abstract**

*The purpose of the present study was to analysis of anthropometric variables and physical fitness variables between adolescence boys of different age groups. To achieve the purpose of the study, thirty male students from Government Higher Secondary School,Namakkal. Those subjects divided into two groups (group-I age 15-16 years and group-II age 16-17 years), to compare the selected anthropometrical variables and physical fitness variables. The collected data analysed by independent 't' test were applied to find out the significant different among different age group of adolescences boys. The data were collected on height, weight, arm length, leg length, speed, agility and muscular endurance between adolescence boys of different age groups. The collected data statistically analyzed by 't' test. The statistical analysis was done by used the SPSS package. The values obtained were tested for significant at 0.05 levels. There exist a significant difference on height, leg length, speed and agility between the group – I and group – II adolescence boys also the result showed that group – II adolescence boys higher than the group – I adolescence boys. There was no significant difference on weight, arm length and muscular endurance between the group – I and group – II adolescence boys.*

**Keywords:** Height, Weight, Speed, Agility, Adolescents Boys.

## Introduction

Sport is an organized, competitive, entertaining, and skillful physical activity requiring commitment and fair play, in which a winner can be defined by objective means. It is governed by a set of rules or customs. In sports the key factors are the physical capabilities and skills of the competitor when determining the outcome winning or losing. The physical activity involves the movement of people, animals and or a variety of objects such as balls and machines or equipment. In contrast, games such as card games and board games, though these could be called mind sports and some are recognized as Olympic sports, require primarily mental skills and only mental physical involvement. The oldest definition of sport in English (1300) is of anything humans find amusing or entertaining Douglas, (2008). Other meanings include gambling and events staged for the purpose of gambling; hunting; and games and diversions, including ones that require exercise Webster (1967). Roget's defines the noun sport as an "Activity engaged in for relaxation and amusement" with synonyms including diversion and recreation Roget (1995). An example of a more sharply defined meaning is "an athletic activity where one competitor or a team of

competitors plays against another competitor or group of competitors with a conclusive method of scoring...not determined by a judge" Andrew Goodman (2007). Athletic sports became organized in the late 19th century with the formation of organizations such as the Amateur Athletic Union in the United States and the Union des Sociétés Françaises de Sports Athlétiques in France. The Intercollegiate Athletic Association of the United States (later the NCAA) was established in 1906 to oversee athletic sports at college-level in the United States, known as college athletics. Athletic sports have gained significant importance at educational institutions and many students gain entry into higher education through athletic scholarships as a result of their sporting abilities. Athletic sports are often contested between colleges in the form of an athletic conference.

Anthropometric studies are today conducted for numerous different purposes. Academic anthropologists investigate the evolutionary significance of differences in body proportion between populations whose ancestors lived in different environmental settings. Human populations exhibit similar climatic variation patterns to other large-bodied mammals, following Bergmann's rule, which states that individuals in cold climates will tend to be larger than ones in warm climates, and Allen's rule, which states that individuals in cold climates will tend to have shorter, stubbier limbs than those in warm climates. The measurements of various dimensions of human body have long been used by different researchers all over the

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world for different purposes. In their simplest form these measurements are used to describe the human body and to evaluate the increase in the size of the human body during various stages of post-natal development, i.e., from birth to old age, and also to study the changes during pre-natal period of growth, i.e., from conception to birth. The researchers in the field of human growth and development, Axiological Anthropometry as it is referred to at present, uses these anthropometric measurements to study precisely the age specific changes in the main body segments and the components of these segments. Through these changes the amount and rate of growth can be assessed for a specific child or a group of individuals at community or national level to formulate the respective health standards to assess the growth of children at both the levels. Athletes involved in court and field team sports face a broad range of challenges that involve physical fitness, precision motor skills, team tactics, and individual and group motivation. When an opposing team is then encountered, the difficulties in quantifying any of these challenges are compounded as one team affects the intensity and tactics that the other team must use.

## Methodology

The purpose of the study was to compare the selected anthropometrical variables, physical fitness components of different adolescence groups. Sixty students selected from two types of age groups such as group I age 15-16 years and group II age 16-17 years of adolescence boys. The data an anthropometric variables such as height was measured by stadiometer, weight was measured by weighing machine, arm length and leg length was measured by measuring tape and physical fitness variables such as speed was measured by 50 meters run, agility was measured by shuttle run and muscular endurance was measured by one minute sit-ups. The collection of data will be analyzed by independent 't' test, to determine the difference of means in the scores between adolescence oys of group – I and group - II. I have analysed the difference of means in the scores with the help of SPSS package. Level of significance fixed at 0.05.

## Results

**Table I.** Analysis of 't' test on height of adolescence boys group – I and group - Ii

| Group | N | Mean | SD | DM | 't' - ratio |
|-------|-----|--------|------|------|-------------|
| Group I | 30 | 156.63 | 1.93 | 1.86 | 2.46* |
| Group II | 30 | 158.50 | 3.67 | | |

* Required table value for significance at 0.05 level of confidence for df of 58 is 2.02

Table – I presents the mean and standard deviation values on height $156.63 \pm 1.93$ and $158.50 \pm 3.67$ for group - I and group – II adolescence boys respectively. Since the obtained 't' value of 2.46 on height was greater than the required table value of 2.02 for significant level 0.05 with 58 degrees of freedom. It concluded that, there is significant level of difference in the performance of height between group - I and group – II adolescence boys.

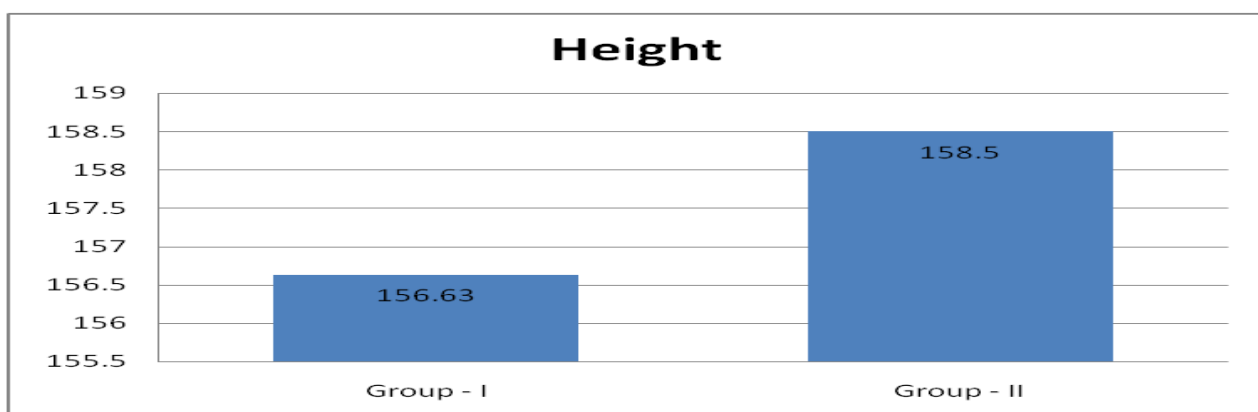**Figure I.** Bar diagram showing the mean value on height of group – I and group – II adolescence boys

**Table II.** Analysis of 't' test on weight of adolescence boys group – I and group - II

| Group | N | Mean | SD | DM | 't' - ratio |
|---|---|---|---|---|---|
| Group I | 30 | 47.17 | 2.71 | 0.50 | 0.65 |
| Group II | 30 | 47.67 | 3.20 | | |

* Required table value for significance at 0.05 level of confidence for df of 58 is 2.02

Table – II presents the mean and standard deviation values on weight 47.17 $\pm$ 2.71 and 47.67$\pm$ 3.20 for group - I and group – II adolescence boys respectively. Since the obtained 't' value of 0.65 on weight was less than the required table value of 2.02 for significant level 0.05 with 58 degrees of freedom. It concluded that, there is no significant level of difference in the performance of weight between group - I and group – II adolescence boys.

**Figure II.** Bar diagram showing the mean value on weight of group – I and group – II adolescence boys
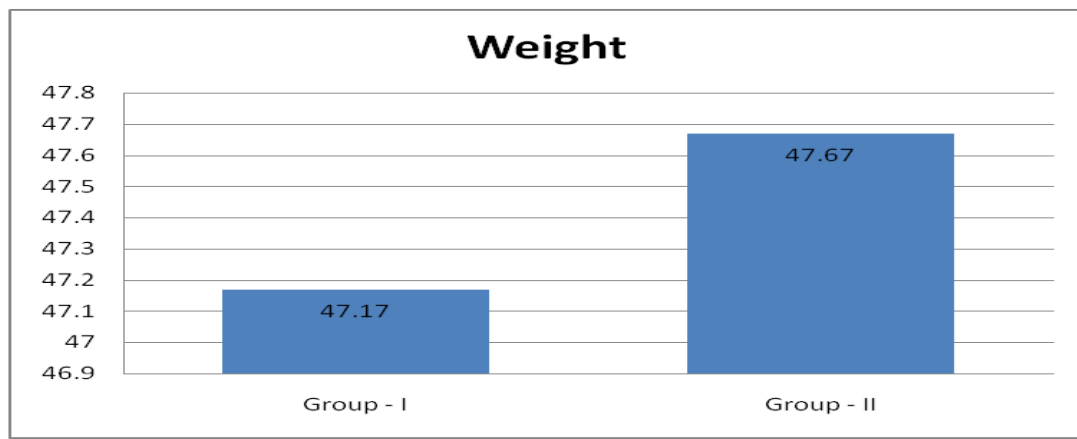


**Table III.** Analysis of 't' test on arm length of adolescence boys group – I and group - II

| Group | N | Mean | SD | DM | 't' - ratio |
|---|---|---|---|---|---|
| Group I | 30 | 63.83 | 1.48 | 0.60 | 1.23 |
| Group II | 30 | 64.43 | 2.22 | | |

* Required table value for significance at 0.05 level of confidence for df of 58 is 2.02

Table – III presents the mean and standard deviation values on arm length 63.83 $\pm$ 1.48 and 64.43$\pm$ 2.22 for group - I and group – II adolescence boys respectively. Since the obtained 't' value of 1.23 on arm length was less than the required table value of 2.02 for significant level 0.05 with 58 degrees of freedom. It concluded that, there is no significant level of difference in the performance of arm length between group - I and group – II adolescence boys.

**Figure III.** Bar diagram showing the mean value on arm length of group – I and group – II adolescence boys
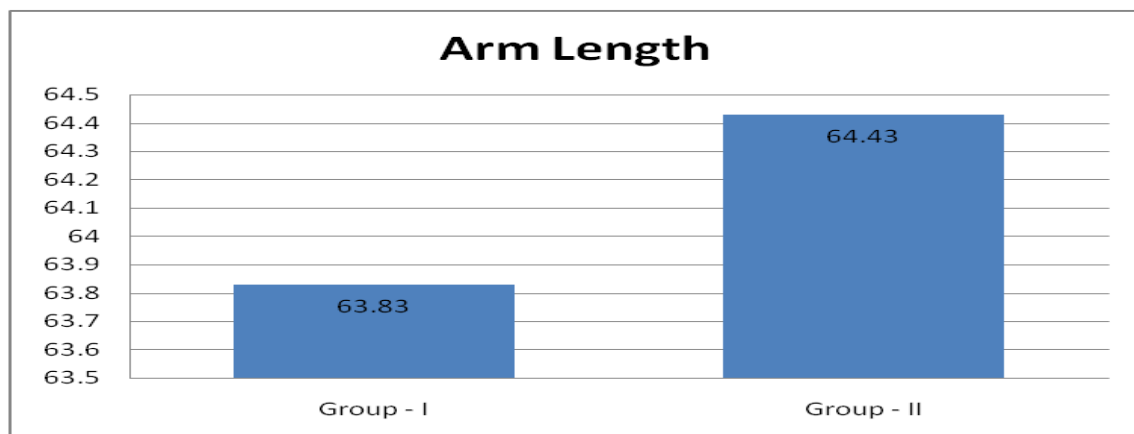
**Table IV.** Analysis of 't' test on leg length of adolescence boys group – I and group - II

| Group | N | Mean | SD | DM | 't' - ratio |
|---|---|---|---|---|---|
| Group I | 30 | 86.60 | 2.19 | 1.20 | 2.34* |
| Group II | 30 | 87.80 | 1.75 | | |

* Required table value for significance at 0.05 level of confidence for df of 58 is 2.02

Table – IV presents the mean and standard deviation values on leg length 86.60 $\pm$ 2.19 and 87.80 $\pm$ 1.75 for group - I and group – II adolescence boys respectively. Since the obtained 't' value of 2.34 on leg length was greater than the required table value of 2.02 for significant level 0.05 with 58 degrees of freedom. It concluded that, there is significant level of difference in the performance of leg length between group - I and group – II adolescence boys.

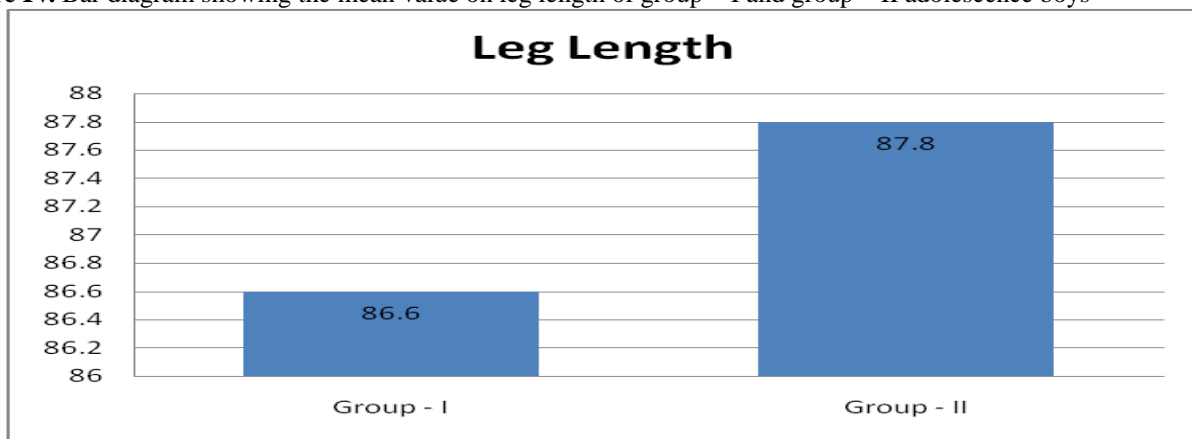**Figure IV.** Bar diagram showing the mean value on leg length of group – I and group – II adolescence boys



**Table V.** Analysis of 't' test on speed of adolescence boys group – I and group - II

| Group | N | Mean | SD | DM | 't' - ratio |
|---|---|---|---|---|---|
| Group I | 30 | 7.81 | 0.20 | 0.16 | 2.51* |
| Group II | 30 | 7.65 | 0.28 | | |

* Required table value for significance at 0.05 level of confidence for df of 58 is 2.02

Table – V presents the mean and standard deviation values on speed 7.81 $\pm$ 0.20 and 7.65 $\pm$ 0.28 for group - I and group – II adolescence boys respectively. Since the obtained 't' value of 2.51 on speed was greater than the required table value of 2.02 for significant level 0.05 with 58 degrees of freedom. It concluded that, there is significant level of difference in the performance of speed between group - I and group – II adolescence boys.

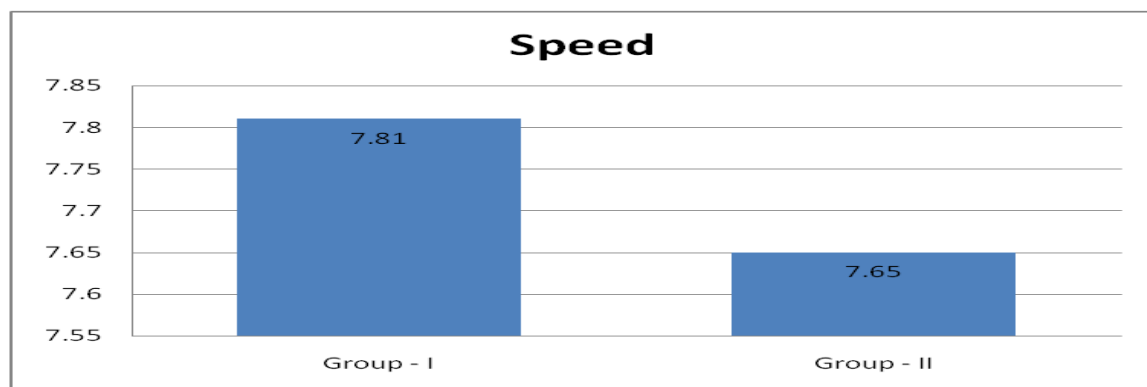**Figure V.** Bar diagram showing the mean value on speed of group – I and group – II adolescence boys



**Table VI.** Analysis of 't' test on agility of adolescence boys group – I and group - II

| Group | N | Mean | SD | DM | 't' - ratio |
|---|---|---|---|---|---|
| Group I | 30 | 9.34 | 0.34 | 0.32 | 2.93* |
| Group II | 30 | 9.02 | 0.49 | | |

\* Required table value for significance at 0.05 level of confidence for df of 58 is 2.02

Table – VI presents the mean and standard deviation values on agility 9.34 $\pm$ 0.34 and 9.02 $\pm$ 0.49 for group - I and group – II adolescence boys respectively. Since the obtained 't' value of 2.93 on agility was greater than the required table value of 2.02 for significant level 0.05 with 58 degrees of freedom. It concluded that, there is significant level of difference in the performance of agility between group - I and group – II adolescence boys.

**Figure VI.** Bar diagram showing the mean value on agility of group – I and group – II adolescence boys
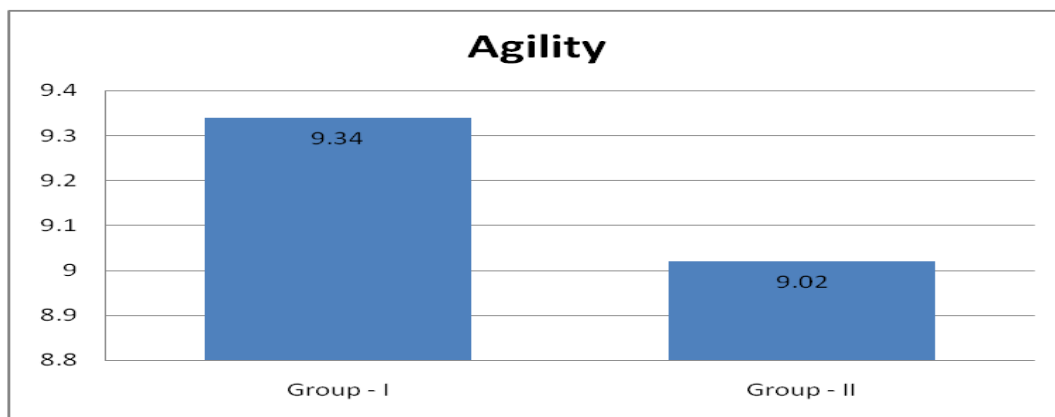


**Table VII.** Analysis of 't' test on muscular endurance of adolescence boys group – I and group - II

| Group | N | Mean | SD | DM | 't' - ratio |
|---|---|---|---|---|---|
| Group I | 30 | 34.90 | 3.22 | .50 | 0.73 |
| Group II | 30 | 35.40 | 1.87 | | |

\* Required table value for significance at 0.05 level of confidence for df of 58 is 2.02

Table – VII presents the mean and standard deviation values on muscular endurance 34.90 $\pm$ 3.22 and 35.40 $\pm$ 1.87 for group - I and group – II adolescence boys respectively. Since the obtained 't' value of 0.73 on muscular endurance was less than the required table value of 2.02 for significant level 0.05 with 58 degrees of freedom. It concluded that, there is no significant level of difference in the performance of muscular endurance between group - I and group – II adolescence boys.

**Figure VII.** Bar diagram showing the mean value on muscular endurance of group – I and group – II adolescence boys
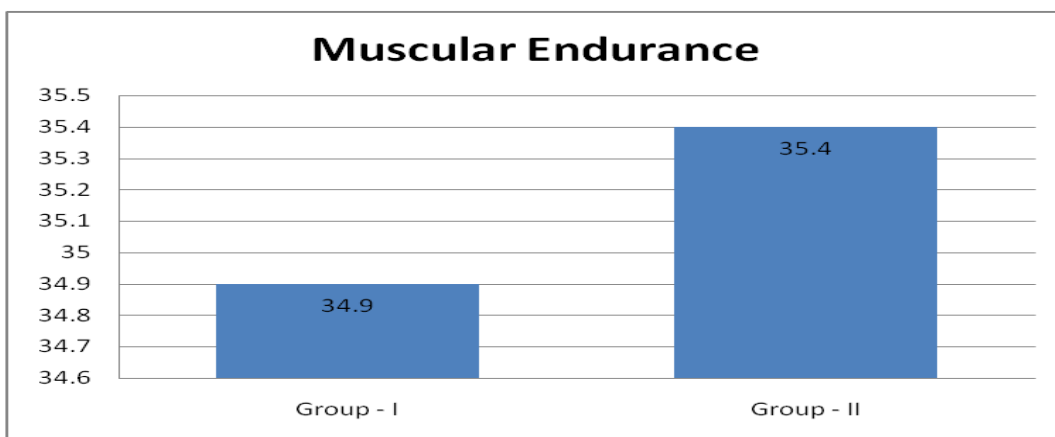
## Conclusions

There exist a significant difference on height, leg length, speed and agility between the group – I and group – II adolescence boys also the result showed that group – II adolescence boys higher than the group – I adolescence boys.

There was no significant difference on weight, arm length and muscular endurance between the group – I and group – II adolescence boys.

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