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## Comparative study of health related physical fitness components among the athletes and non-athletes

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### Abstract

The main purpose of this study was to find out the comparison of health related physical fitness components among the athletes and non-athletes. The data was collected quantitatively on four variables i.e. muscular strength, muscular endurance, cardio-respiratory endurance, and flexibility. Sixty (60) subjects were selected, thirty (30) from athletes and thirty (30) from non-athletes from Annamalai University, Chidambaram by applying random sampling method. The data were collected on health related physical fitness variables, after that collected data was put in Microsoft excel to develop master chart and then 't' test was used for this statistical treatment. To test the hypothesis, the level of significant was set at 0.05 level of confidence which was considered adequate and reliable for the purpose of this study. The finding of the study shows that there is significant difference in health-related physical fitness components between athletes and non-athletes.

**Keywords:** Health related physical fitness components, athletes and non-athletes

### Introduction

Health has been one of the concepts that have been heavily focused on since the beginning of humanity. Health can be considered as a continuum which covers different levels between healthy status at an optimum level and death. According to the World Health Organization, health is more than the status of not having a disease or disability but a status of being well in terms of mental, physical and social aspects. Being healthy, according to the same organization, is defined as "being aware of breathing, being able to meet the needs, being able to change the environment or handle the environment.

Physical fitness is a general state of health and well-being and, more specifically, the ability to perform aspects of sports or occupations. Physical fitness is generally achieved through correct nutrition, moderate-vigorous Physical exercise physical activity, and sufficient rest. Before the industrial revolution, fitness was the capacity to carry out the day's activities without undue fatigue. However, with automation and changes in lifestyles physical fitness is now considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hypo kinetic diseases, and to meet emergency situations.

It is concerned with the development and maintenance of the fitness components that can enhance health through prevention and remediation of disease and illness. Health related fitness enhances one's ability to function efficiently and maintain a healthy lifestyle. Thus health related fitness is important for all individuals throughout life. Health related physical fitness is based on the assumption that an adequate level of body development is required for health. There are five components of health related fitness namely muscular strength, muscular endurance, cardio respiratory endurance, flexibility and body composition.

### Methodology

#### Sources of data

The present researcher has taken the male subjects for the study. The inter-collegiate athletes and non-athletes of Annamalai University, Chidambaram was taken as sources of data.

#### Selection of subjects

Sixty (60) subjects were selected for the collection of data which include thirty (30) as athletes

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and thirty (30) as non-athletes from Annamalai University, Chidambaram Tamil Nadu.

**Sampling method**

The subjects were selected by using purposive sampling method.

**Selection of Variables**

On the basis of the available literature, personal experience, discussion done with research supervisor and consulting with sports experts, the following health related physical fitness variables were selected.

**Health related physical fitness**

1. Muscular Strength
2. Muscular Endurance
3. Cardio-respiratory Endurance
4. Flexibility

**Selection of Tests**

The test items were selected for this study after thorough review of literature as well as consultation with experts, physical education professionals, research supervisor and sports experts which were appropriate and ideal for the variables. The criterion variables are presented in the table 1

**Table 1:** Tests selection

S. No.	Criterion Variables	Test Items	Unit of Measurements
1.	Muscular Strength	Grip dynamometer	Kilograms
2.	Muscular Endurance	Sit ups (Bent knees)	Counts
3.	Cardio Respiratory Endurance	12 - Min run /walk	Meters
4.	Flexibility	Sit and reach box	Centimeters

**Analysis and interpretation of data**

The main purpose of this study was to find out the comparison of health related physical fitness components among the athletes and non-athletes. The data were collected

on health related physical fitness variables, after that collected data was put in Microsoft excel to develop master chart and then 't' test was used for this statistical treatment.

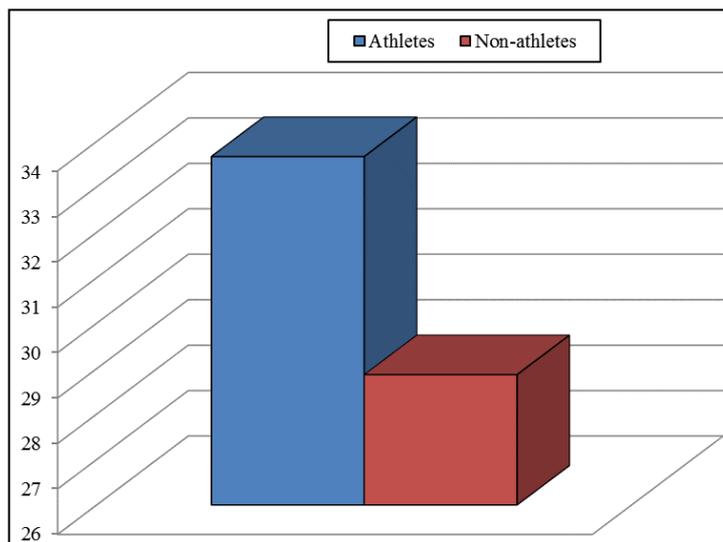
**Table 2:** Showing comparison between athletes and non-athletes in right hand grip strength

Group	Mean	SD	SE	MD	OT	DF	TT
Athletes	33.667	9.083	1.919	4.800	2.501	58	2.00
Non-athletes	28.867	5.290					

\*Level of Significance = 0.05, Tabulated 't' 0.05 (58) = 2.00

Table No.1 reveals that there is difference between means of athletes and non-athletes because mean of athletes is 33.667 which is greater than the mean of non-athletes which is 28.867 and therefore mean difference is 4.800 to check the significant difference between athletes and non-athletes data is again analyzed by applying 't' test. Before applying test, standard deviation is calculated between athletes and non-

athletes which is 9.083 and 5.290 respectively and then the calculated value of 't' is found as 2.501, is greater than tabulated 't' which is 2.00 at 0.05 level of significance. This shows mean of athletes are having more right hand grip strength than non-athletes. Hence the hypothesis which was giving by the researcher is accepted. This is presented graphically in graph No.1.



**Graph 1:** Mean of right hand grip strength between athletes and non-athletes

**Table 3:** Showing comparison between athletes and non-athletes in left hand grip strength

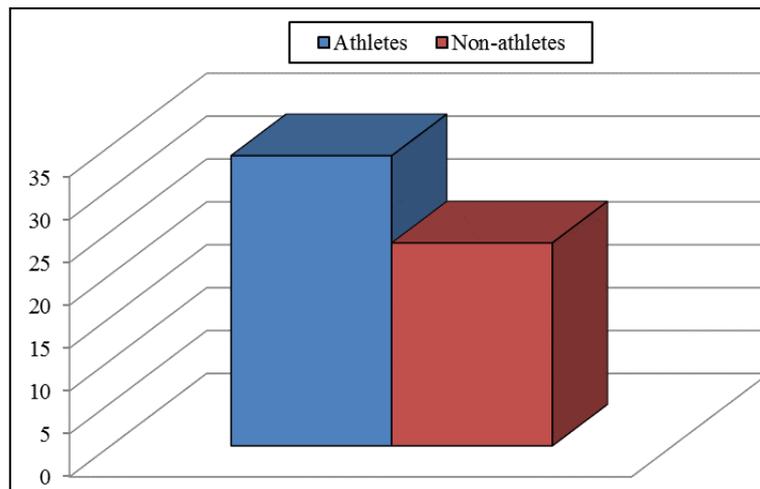
Group	Mean	SD	SE	MD	OT	DF	TT
Athletes	33.833	9.018	1.843	10.167	5.517	58	2.00
Non-athletes	23.667	4.536					

\*Level of Significance = 0.05, Tabulated 't' 0.05 (58) = 2.00

Table No.2 reveals that there is difference between means of athletes and non-athletes because mean of athletes is 33.833 which is greater than the mean of non-athletes which is 23.667 and therefore mean difference is 10.167 to check the significant difference between athletes and non-athletes data is again analyzed by applying 't' test. Before applying test,

standard deviation is calculated between athletes and non-athletes which is 9.018 and 4.536 respectively and then the calculated value of 't' is found as 5.517, is greater than tabulated 't' which is 2.00 at 0.05 level of significance. This

shows mean of athletes are having more left hand grip strength than non-athletes. Hence the hypothesis which was giving by the researcher is accepted. This is presented graphically in graph No.2



**Graph 2:** Mean of left hand grip strength between athletes and non-athletes

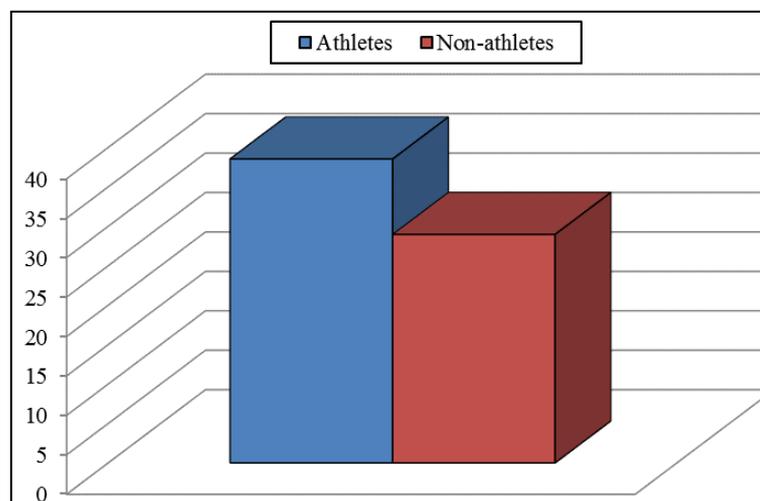
**Table 4:** Showing comparison between athletes and non-athletes in muscular endurance

Group	Mean	SD	SE	MD	OT	DF	TT
Athletes	38.533	7.496	1.474	9.567	6.490	58	2.00
Non-athletes	28.967	3.000					

\*Level of Significance = 0.05, Tabulated 't' 0.05 (58) = 2.00

Table No. 3 reveals that there is difference between means of athletes and non-athletes because mean of athletes is 38.533 which is greater than the mean of non-athletes which is 28.967 and therefore mean difference is 9.567 to check the

significant difference between athletes and non-athletes data is again analyzed by applying 't' test. Before applying test, standard deviation is calculated between athletes and non-athletes which is 7.496 and 3.00 respectively and then the calculated value of 't' is found as 6.490, is greater than tabulated 't' which is 2.00 at 0.05 level of significance. This shows mean of athletes are having more muscular endurance than non-athletes. Hence the hypothesis which was giving by the researcher is accepted. This is presented graphically in graph No.3.



**Graph 3:** Mean of left muscular endurance between athletes and non-athletes

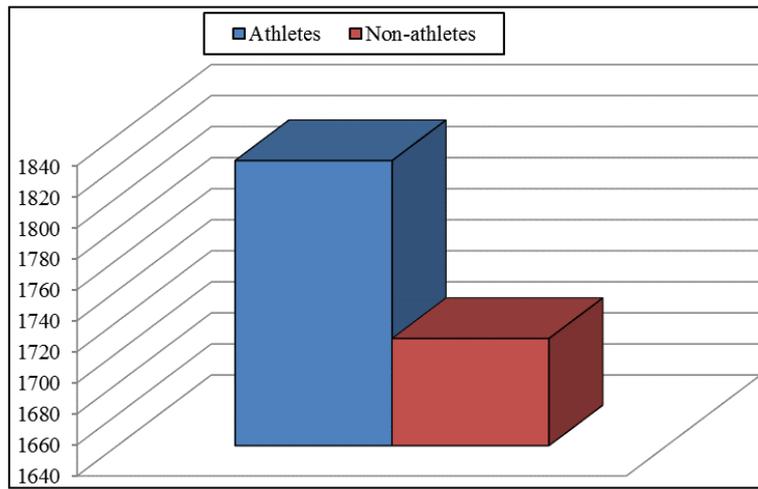
**Table 5:** Showing comparison between athletes and non-athletes in cardio respiratory endurance

Group	Mean	SD	SE	MD	OT	DF	TT
Athletes	1823.600	195.708	37.438	114.567	3.060	58	2.00
Non-athletes	1709.033	61.203					

\*Level of Significance = 0.05, Tabulated 't' 0.05 (58) = 2.00

Table No. 4 reveals that there is difference between means of athletes and non-athletes because mean of athletes is 1823.600 which is greater than the mean of non-athletes which is 1709.033 and therefore mean difference is 114.567 to

check the significant difference between athletes and non-athletes data is again analyzed by applying 't' test. Before applying test, standard deviation is calculated between athletes and non-athletes which is 195.708 and 61.203 respectively and then the calculated value of 't' is found as 3.060, is greater than tabulated 't' which is 2.00 at 0.05 level of significance. This shows mean of athletes are having more cardio respiratory endurance than non-athletes. Hence the hypothesis which was giving by the researcher is accepted. This is presented graphically in graph No.4.



**Graph 4:** Mean of cardio respiratory endurance between athletes and non-athletes

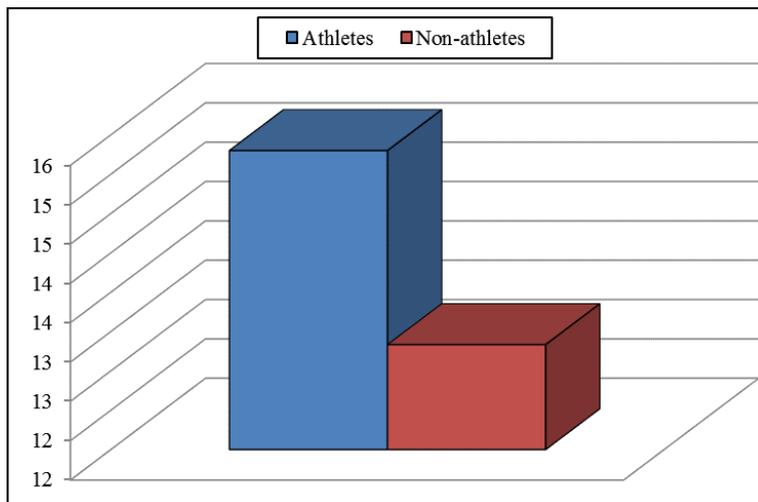
**Table 6:** Showing comparison between athletes and non-athletes in flexibility

Group	Mean	SD	SE	MD	OT	DF	TT
Athletes	15.300	3.967	0.986	2.467	2.501	58	2.00
Non-athletes	12.833	3.668					

\*Level of Significance = 0.05, Tabulated 't' 0.05 (58) = 2.00

Table No. 5 reveals that there is difference between means of athletes and non-athletes because mean of athletes is 15.300 which is greater than the mean of non-athletes which is 12.833 and therefore mean difference is 2.467 to check the

significant difference between athletes and non-athletes data is again analyzed by applying 't' test. Before applying 't' test, standard deviation is calculated between athletes and non-athletes which is 3.967 and 3.668 respectively and then the calculated value of 't' is found as 2.501, is greater than tabulated 't' which is 2.00 at 0.05 level of significance. This shows mean of athletes are having more flexibility than non-athletes. Hence the hypothesis which was giving by the researcher is accepted. This is presented graphically in graph No.5.



**Graph 5:** Mean of flexibility between athletes and non-athletes

**Discussion on findings**

Table No.1 reveals that there is difference between means of athletes and non-athletes because mean of athletes is 33.667 which is greater than the mean of non-athletes which is 28.867 and calculated value of 't' is found as 2.501, is greater than tabulated 't' which is 2.00 at 0.05 level of significance. This shows mean of athletes are having more right hand grip strength than non-athletes.

Table No.2 reveals that there is difference between means of athletes and non-athletes because mean of athletes is 33.833 which is greater than the mean of non-athletes which is 23.667 and calculated value of 't' is found as 5.517, is greater than tabulated 't' which is 2.00 at 0.05 level of significance. This shows mean of athletes are having more left hand grip strength than non-athletes.

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Table No.4 reveals that there is difference between means of athletes and non-athletes because mean of athletes is 1823.600 which is greater than the mean of non-athletes which is 28.967 and calculated value of 't' is found as 3.060, is greater than tabulated 't' which is 2.00 at 0.05 level of significance. This shows mean of athletes are having more cardio respiratory endurance than non-athletes.

Table No.5 reveals that there is difference between means of athletes and non-athletes because mean of athletes is 15.300 which is greater than the mean of non-athletes which is

12.833 and calculated value of 't' is found as 2.501, is greater than tabulated 't' which is 2.00 at 0.05 level of significance. This shows mean of athletes are having more flexibility than non-athletes.

### **Justification of hypothesis**

In the beginning of this study it was hypothesized that there will be significant difference in health-related physical fitness between athletes and non-athletes. In overall numerical and statistical analysis, it was found that there is significant difference in health-related physical fitness components between athletes and non-athletes. Therefore the hypothesis which researcher has given is accepted.

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