

COMPARISON OF CARDIOVASCULAR FITNESS BETWEEN ADOLESCENT ATHLETES AND NON-ATHLETES

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ABSTRACT: The purpose of this study was to compare the cardiovascular fitness between adolescent athletes and non-athletes. The present study was conducted on a sample of sixty (N=60) adolescent, which includes thirty each, athletes ($N_1 = 30$, mean \pm SD: age 18.0 ± 0.79 years, height 177.53 ± 4.68 cm, weight 71.53 ± 5.97 kg, BMI 22.67 ± 1.48) and non-athletes ($N_2 = 30$, mean \pm SD: age 17.70 ± 0.70 years, height 174.80 ± 4.73 cm, weight 73.10 ± 5.12 kg, BMI 23.97 ± 1.29) selected from different schools affiliated to Punjab School Education Board, Punjab, India. Height measurements were taken by using the standard anthropometric rod to the nearest 0.5 cm. The subject's weight was measured with portable weighing machine to the nearest 0.5 kg. The 12 minute run/walk test was used to assess cardiovascular fitness of subjects. The independent samples t-test was applied to assess the differences between athletes and non-athletes. The results of present study indicated that athletes had significantly greater cardiovascular fitness ($p < 0.05$) than non-athletes.

Keywords: Athletes, non-athletes, cardiovascular fitness.

INTRODUCTION

The importance of cardiovascular fitness to health for all individuals has been well documented. Physical fitness is a required element for all the activities in our life [1]. Several factors like heredity, environment, diet, socioeconomic status and training are known to contribute to physical fitness of an individual [2]. Cardiovascular fitness of an individual is mainly dependent on lifestyle related factors such as daily physical activity levels. It was believed that the low cardiovascular fitness level of an individual is associated with higher mortality rate [3]. Cardiovascular fitness reduces the risk of cardiovascular diseases and other diseases like hypertension, Diabetes obesity, and may cure respiratory problems like asthma

[4].Physical inactivity may be responsible for various chronic diseases [5].Low levels of physical activity and cardio-respiratory fitness are both associated with higher risk of all cause and disease specific mortality [6].There is good evidence that regular physical activity reduces the risk for cardiovascular diseases [7-8]. Athletes are commonly associated with a physically active lifestyle as compare to non-athletes, which is beneficial to fitness. Due to regular exercise, athletes tend to have an increase in fitness level when compared to non-exercising individuals. Exercise and physical activity impact on wellness and fitness [9].Therefore, the objective of the study is to compare the cardiovascular fitness between adolescent athletes and non-athletes.

MATERIALS AND METHODS

Subjects:

The present study was conducted on a sample of sixty (N=60) adolescent, which includes thirty each, athletes ($N_1 = 30$, mean \pm SD: age 18.0 ± 0.79 years, height 177.53 ± 4.68 cm, weight 71.53 ± 5.97 kg, BMI 22.67 ± 1.48) and non-athletes ($N_2 = 30$, mean \pm SD: age 17.70 ± 0.70 years, height 174.80 ± 4.73 cm, weight 73.10 ± 5.12 kg, BMI 23.97 ± 1.29) selected from different schools affiliated to Punjab School Education Board, Punjab, India. All the participants were informed about aim and methodology of the study and they volunteered to participate in this study. The purposive sampling method was used to select the subjects for the present study. The age of each subject was calculated from the date of birth as recorded in his school.

Methodology:

Height measurements were taken by using the standard anthropometric rod to the nearest 0.5 cm. Full attention was given to make sure that players' body was fully upright and their mandible was parallel to the ground. Taken values recorded in 'cm'. The subject's weight was measured with portable weighing machine to the nearest 0.5 kg. During measurements players were on bare feet and wearing underwear only. Measurements recorded in 'kg'. BMI was calculated by the formula of; Body Mass Index = Weight/Height².

Cardiovascular Fitness Test:

Cardiovascular fitness was assessed using 12 minute run/walk test. Place markers at set intervals around the track to aid in measuring the completed distance. Subjects were run for 12minutes, and the total distance covered was recorded in meters [10].

Statistical analyses:

Values are presented as mean values and SD. Independent samples t tests were used to test if population means estimated by two independent samples differed significantly. Data was analyzed using SPSS Version 16.0.

RESULTS

Table-1. Demographic Characteristics of adolescent Athletes and Non-Athletes.

Variables	Athletes (N ₁ = 30)		Non-Athletes (N ₂ = 30)		Mean Difference	SEDM	t-value
	Mean	SD	Mean	SD			
Age (yrs)	18.0	0.79	17.70	0.70	0.30	0.19	1.557
Height (cm)	177.53	4.68	174.80	4.73	2.73	1.21	2.25*
Weight(kg)	71.53	5.97	73.10	5.12	1.57	1.44	1.09

*Significant at 0.05 level

Table-2: depicts the demographic characteristics of adolescent athletes and non-athletes. The mean age of athletes was 18 years and non-athletes were 17.70 years. The mean height of athletes was 177.53 cm and non-athletes were 174.80 cm. The mean weight of athletes was 71.53 kg and non-athletes were 73.10 kg.

Table-2. Comparison of Body Mass Index between Athletes and Non Athletes.

Variables	Athletes (N ₁ = 30)		Non-Athletes (N ₂ = 30)		Mean Difference	SEDM	t-value
	Mean	SD	Mean	SD			
Body Mass Index	22.68	1.48	23.97	2.06	1.29	13.87	2.788*

*Significant at 0.05 level

Table-2 compares the mean scores of body mass index between athletes and non-athletes.

The mean BMI value of athletes and non-athletes were 22.68 and 23.97 respectively, the result

reveals a statistically significant difference in body mass index ($p < 0.05$) between adolescent athletes and non-athletes. Non-athletes were found more obese as compared to athletes.

Table-3. Comparison of Cardiovascular Fitness by 12 meter run / walk test of adolescent Athletes and Non-Athletes.

Variables	Athletes (N ₁ = 30)		Non-Athletes (N ₂ = 30)		Mean Difference	SEDM	t-value
	Mean	SD	Mean	SD			
12 min. Run Test (mtr)	1868.9	65.44	1820.2	38.63	48.7	0.46	3.508*

*Significant at 0.05 level

Table 3 presents the cardiovascular fitness of adolescent athletes and non-athletes. The results depict that athletes had significantly greater cardiovascular fitness ($p < 0.05$) than non-athletes.

DISCUSSION

In the present study cardiovascular fitness of the adolescent athletes and non-athletes have been compared with each other. This study indicates the existence of cardiovascular fitness difference among the athletes and non-athletes. The demographic characteristics of athletes and non-athletes show that non-athletes were heavier as compared to the athletes. The results of the present study indicated that athletes had significantly greater fitness than non-athletes. This is because of regular exercise which brings changes on the body. In a previous study significantly higher values of cardiopulmonary efficiency in athletes were observed as compared to non-athletes. The findings of better cardiovascular fitness of athletes in the present study are in agreement with previous study conducted by Singh et al. (2012), they suggested that athletes had better respiratory functions than non-athletes. Due to regular exercise, athletes tend to have an increase in respiratory capacity [11-12]. It was indicated that regular physical activity has beneficial effects on the cardiovascular, respiratory and locomotor systems [13].

CONCLUSION:

The outcome of the study demonstrates the existence of significant difference between athletes and non-athletes on cardiovascular fitness thereby it implies that the sports has a

significant influence on cardiovascular fitness.

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