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## Comparison of aerobic capacity in college sports and non-sports women of Kashmir valley

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### Abstract

Aerobic capacity in athletes should be enthused by training according to the rhythm and direction. The purpose of this study was to compare aerobic capacity of sports and non-sports women of women's college Anantnag, Kashmir valley and to show the importance of sports for physical fitness. The present study was carried out in 50 women were selected randomly as subjects between the age group of 18- 25 yrs. They were divided into two groups, Group-I (25 sports women's) and Group-II (25 non-sports women's). All the participants were assessed for height, weight and body mass index. The aerobic capacity was compared between groups by using cardio-vascular endurance and vital capacity. The Data were collected and tested from each subject statistically analysed by using t-test. The result of our study showed significant difference in aerobic capacity [cardio- vascular endurance ( $T=2.303$ ) and vital capacity ( $T=2.844$ )] among young sports women and non-sports women. The present study showed aerobic capacity was higher in sports women than non-sports women. Now a day, physical inactivity is seen among women than men due to sedentary lifestyle which may lead to many health problems and we suggest that women should get involved in sports.

**Keywords:** Aerobic capacity, sports & non-sports, women

### Introduction

Most of our youth are having sedentary life-style due to extreme exposure to computer, internet and television, etc. in this modern era. Involving exercise and sports is very important in young persons in their busy life. In Olympics female competitors from 1900 onward, though women participated considerably fewer at first in events than men. The physical strength and stamina of women led to the discouragement of female participation in more physically exhaustive sports, and in some cases led to less physically challenging female versions of male sports. Include amateur and professional competitions, women's sports in virtually all sports. One of the most important aspect about women's sports is that women usually do not compete on equal terms against men. The aerobic capacity or functional-capacity describes the cardiorespiratory system, (the heart, lungs and blood vessels) and is an important element of success in sport s achievements. It is the highest rate of oxygen intake as measured during incremental exercise <sup>[1]</sup>. Aerobic exercise includes innumerable forms and it is performed at a moderate level of intensity over a relatively long period of time. It is the best indicator of cardio-respiratory endurance and aerobic fitness <sup>[2]</sup>. Aerobic capacity determines performance of an individual in different sports and in different fields <sup>[2]</sup>.

The present study was initiated to assess the aerobic capacity in women sports. Most of the aerobic capacity studies are in men sports. Very few studies have been taken in women sports. We proposed to compare these levels in women's having sedentary life-style. The main purpose of this study would be to compare Aerobic Capacity of Sports and Non-Sports Women.

### Materials and Methods

The present comparative study was carried out in 50 women's (25 sports women's and 25 non-sports women's) were selected randomly as subjects between the age group of 18-25 yrs. from women's college Anantnag, Kashmir, India.

They were divided into two groups, Group-I (25 sports women's) who participated at district level tournament of any individual and team games and Group-II (25 non-sports women's) of the same age having sedentary life-style were not doing any type of exercise. A detailed history was taken including personal and past history and menstrual history. General and detailed systemic examination was done of all subjects from both groups. The age of each subject was calculated from the date of birth as recorded in his college. The height and weight of the subjects was measured with anthropometric rod and weighing machine. Body mass index was calculated as body weight adjusted for stature. The subjects having cardio-respiratory diseases or having any major systemic illness were excluded from the study. Informed written consent was taken from each subject involved in this study and a brief demonstration was given.

The data was collected after the administrating the test on aerobic capacity of sports and non-sports women's. After following criterion measures were selected for testing the study (1) Cardio-vascular endurance were performed by 600 yard run/walk and measured in seconds and (2) Vital capacity were performed by a computerized Spirometer and measured in litres. Collection of data the statistically analyzed and arranged in the tables. To determine the significant difference in the means of aerobic capacity between sports and non-sports women tests means of both the groups t-test was employed. All the statistical tests were calculated using the statistical package for the social science (SPSS) for MacBook Air (Version 23).

## Results and Discussion

**Table 1:** Mean and standard deviation value of age, weight, height and body mass index in sports and non-sports women's

Group	N	Age [Years]	Weight [kg]	Height [cm]	Body Mass Index (BMI)
Sports Women's	25	22.14 ± 1.99	64.84 ± 5.07	174.69 ± 4.66	22.104 ± 0.887
Non-Sports Women's	25	22.22 ± 1.70	64.97 ± 3.82	175.37 ± 5.08	24.503 ± 1.344

The mean and standard deviation of age, height, weight and body mass index between sports and non-sports women's are shown in table -1. The values presented in table-1 shown the average age value was 22.14 and 22.22, height value was

174.69 and 175.37, weight value was 64.84 and 64.97 and body mass index value was 22.104 and 24.503 of sports and non-sports women's respectively.

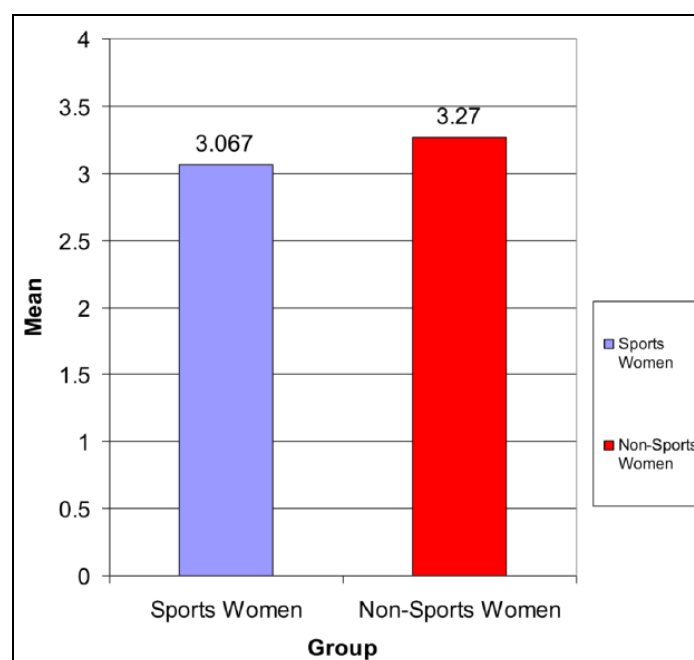
**Table 2:** Mean, standard deviation and t-ratio with statistical significance of cardio-vascular endurance and vital capacity between sports and non-sports women's

	Group	Mean	Standard Deviation	Mean Difference	Standard Error	T-Ratio
<b>Cardio-Vascular Endurance (Seconds)</b>	Sports Women	3.067	0.301	0.202	0.088	2.303*
	Non-Sports Women	3.270	0.320			
<b>Vital Capacity (Liters)</b>	Sports Women	952.80	57.765	46.560	16.374	2.844*
	Non-Sports Women	906.24	58.015			

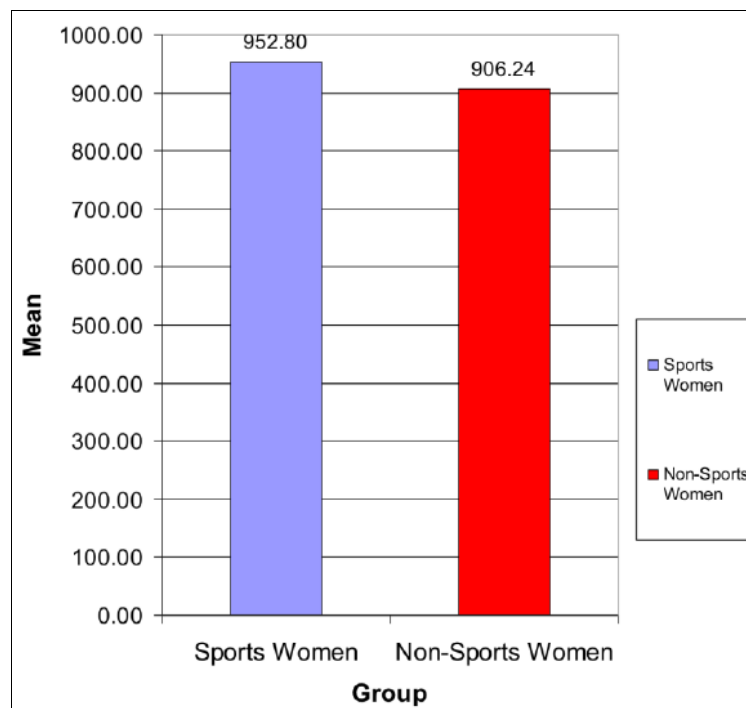
The mean and standard deviation of cardio-vascular endurance and vital capacity between the sports and non-sports women are shown in Table 2. The mean value of cardio-vascular endurance of sports women's and non-sports women's was 3.067 and 3.270 and the mean value of vital capacity of Sports women's and Non-sports women's was 952.80 and 906.24 respectively. The calculated T-Value of

cardio-vascular endurance was 2.303 and vital Capacity was 2.844. Results indicated that sports women's have significantly greater in cardio-vascular endurance and vital capacity than non-sports women's.

Cardio-vascular endurance means between the sports women and non-sports women was graphically shown in Figure-1.



**Fig 1:** Showing mean difference for the data on cardio-vascular endurance between the means of sports women and non-sports women



**Fig 2:** Showing mean difference for the data on vital capacity between the means of sports and non-sports women

Vital Capacity means between the Sports women and Non-sports women was graphically shown in Figure-2.

### Discussion

Results indicated that sports women's have significantly greater values in cardio-vascular endurance and vital capacity than the non-sports women's. Aerobic capacity is the measure of endurance and determined as world-wide standard of physical capacity and it is expressed as liters or ml of body wt/min. Aerobic processes are the main source of energy for muscles. 3, 4, 5 Physical exercise or sports training increases, aerobic capacity by increasing the cardiac output and high stroke volume. The aerobic endurance training can induce countless enlargement of all muscles with a change in cardiac alignment. 6 Training increases density of capillaries in skeletal muscles and increased capacity to the muscles with blood lead to increased vascularization. 7 Training also increases the number of mitochondria with increased capacity to generate ATP aerobically by oxidative phosphorylation. 8 Aerobic capacity increases cardio-respiratory fitness and to lead success in endurance events. 2 Many other previous studies also showed a significantly different and greater vital capacity in sports when compared with non- sports. 9,10 In heart study, physical activity was observed to be positively correlated to changes in forced vital capacity between ages 13-27 years and this is supported by many other previous studies as well. 11, 12, 13, 14.

Our result shows significant difference found in cardio-vascular endurance and vital capacity i.e. calculated t-value of 2.303 is greater than the tabulated t-value of 2.010 at 0.05 level of confidence of 48 degree of freedom. Because practice of running and playing games, the sports women increases the capacity of their lungs.

### Conclusion

The result from our study indicated that there were significant differences in the (cardio-vascular endurance and vital capacity) parameters between sports and non-sports women. Means of Aerobic capacity were significantly higher in sports women than non-sports women. Hence, conclusion made in

this study that, sports women had greater aerobic capacity in comparison with non-sports women. Results of the present study therefore suggest that sports activity, sports training and exercise may cause an increase in the aerobic capacity due to increased development of respiratory musculature to physical training or exercise. We recommend regular physical exercise in different forms of sports.

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