

COMPARATIVE STUDY OF 100 METER PERFORMANCE AND CARDIOVASCULAR ENDURANCE OF UNIVERSITY LEVEL MALE AND FEMALE SPRINTERS

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ABSTRACT

The purpose of this study was to compare the performance and cardiovascular endurance of university level male & female sprinters. The data were collected from twenty five male & twenty five female sprinters who participated in the inter college athletic meets of Panjab University, Chandigarh and Punjabi University, Patiala during the year 2009-2010. Performance was recorded from 100 meter sprint and cardiovascular endurance was measured by Cooper's 12 Minutes Run and Walk test. The 't' test was applied to compare male and female sprinters in performance and cardiovascular endurance. It was evident from the results that male and female sprinters participating in inter college level competition significantly differed at 0.01 level of confidence as the computed 't' value found to be 10.712 was greater than table value of 2.682 required to be significant at 0.01 level of confidence.

Key words: Cardiovascular endurance, Sprinters and Performance.

INTRODUCTION:

Sprint, as the name suggests is the capacity to cover the distance in a single burst in a minimum possible time. The dominating ability in sprints is speed. A fast and purposeful interplay of the muscles involved in a movement is often the result of much training; it is based on the accurate timing of tension and relaxation, excitation and inhibition respectively of the working nerves and muscles. Running speed only becomes fully effective when the athlete masters an economic running technique. Sprinting velocity is characterized by the reactivity acceleration capacity and maximum speed of a sprinter. Fast movements require an excellent motor coordination, the outward sign of which is fluent relaxed movement. The event like sprints, hurdles and jumps needs really good sprinting abilities (Spencer et al 1983). The initial acceleration in all the sprinting events and also during approach run at higher velocities

in the jumping events is the prerequisite to reach at the higher performance. Not only is this maintenance of top speed also one of the major criteria in sprinting performance. It is also called the velocity maintenance phase or the time or distance to which a sprinter can maintain his maximum achieved speed. This phase of maintenance of maximum speed is differing from sprinter to sprinter depending on their cardiovascular endurance. Physiologically, it is impossible to carry out the top sprinting speed throughout the hundred meters races and therefore, a phase of deceleration comes. This deceleration is observed at all levels from those at the top level to the beginners (Johnson and Nelson, 1974). However, the loss of speed in case of top-level sprinters is minimum. It is tested that in the hundred meters race the loss of speed is from 3.5 to 9.5 percent. The decrease in top sprinters amounts only to 0.1 seconds and for beginners it is 0.5 seconds (Schmolinsky 1982). Cardiovascular endurance plays a big role in sprinting. It is the ability of lungs, heart and blood vessels to deliver adequate amounts of oxygen and nutrients to the cells to meet the demands of prolonged physical activity. Cardiovascular endurance is also frequently referred to aerobic exercises. The word "aerobic" means "with oxygen". Whenever, an activity requires the utilization of oxygen to produce energy, it is considered an aerobic exercise. Cardiovascular or aerobic exercises are walking, jogging, swimming, and cycling, cross country, rope skipping, aerobic and dance. Only aerobic activities will enable and individual to develop Cardiovascular endurance (Brar et al. 2005). Nearly all athletes require a basic level of cardiovascular endurance, if for no other reason than recovery between intense bouts of work. Traditionally, coaches have opted for long, slow, distance training at 70-80% maximum heart rate. The problem with this approach is that is not specific to many sports such as the multi-sprint games and can actually be detrimental to strength and power performance. Research shows that long, slow continuous training can actually decrease anaerobic / glycolytic enzyme activity but the continuous running can increase aerobic power and improve cardio- respiratory endurance without the associated detrimental effects on anaerobic power.

SAMPLE & PROCEDURE:

The present status is a survey type and has been designed to find out the difference between 100 meter performance and cardiovascular endurance. Twenty five male sprinters were randomly selected from Punjabi University, Patiala and Panjab University, Chandigarh. Only those sprinters were selected as

sample who had participated in the inter college athletic competition organised by respective universities during the session 2009-2010. The sprinters were between the ages of nineteen to twenty four years. The mean age was 21 years. To measure the performance of the sprinters hundred meter sprint test was given and for the cardiovascular endurance Cooper's (1968) Twelve Minutes Run and Walk test was administered.

STATISTICAL CONSIDERATION:

The 't' test was applied to compare male and female sprinters in performance and cardiovascular endurance.

RESULTS:

To compare the university level male and female sprinters 't' test was applied and the significance of mean differences have been presented in Table 1 through Table 7 respectively.

TABLE-1
COMPARE THE DIFFERENCE OF AGE BETWEEN MALE AND FEMALE SPRINTERS

Gender	N	Mean	Std. Deviation	't'
M	25	21.12	1.5895	1.315
F	25	20.5	1.6361	

Tabulated 't'.05 (48)=2.010

Tabulated 't'.01 (48)=2.682

The above Table 1 showed that the Mean and SD value of male sprinters found to be 21.12, 1.589 respectively where as the Mean and SD value of female sprinters found to be 20.5, 1.636 respectively. When 't' test was applied, it was found that there was non significance difference between male and female sprinters on age variables as computed 't' value 1.315 found to be non significant at 0.05 level of confidence as the 't' value was lower than table value 2.010.

TABLE-2

COMPARE THE DIFFERENCE OF 100 MTS PERFORMANCE BETWEEN MALE AND FEMALE SPRINTERS

Gender	N	Mean	Std. Deviation	't'
M	25	11.29	.5558	10.712
F	25	13.02	.5822	

Tabulated 't'.05 (48)=2.010

Tabulated 't'.01 (48)=2.682

The above Table 2 showed that the Mean and SD value of male sprinters recorded as 11.29, .555 respectively where as the Mean and SD value of female sprinters found to be 13.02, .582 respectively. When 't' test was applied it was found that there was significant difference between male and female sprinters on 100 mts sprint variables as computed 't' value 10.712 found to be significant at 0.05 level of confidence as the 't' value was higher than the table value 2.010.

TABLE-3

COMPARE THE DIFFERENCE OF CARDIOVASCULAR ENDURANCE BETWEEN MALE AND FEMALE SPRINTERS

Gender	N	Mean	Std. Deviation	't'
M	25	2386.6	354.48	.317
F	25	2093.40	305.89	

Tabulated 't'.05 (48) = 2.010

Tabulated 't'.01 (48) = 2.682

Above Table 3 showed that the Mean and SD value of male sprinters was 2386.6, 354.48 respectively where as the Mean and SD value of female sprinters found to be 2093.40, 305.89 respectively on Twelve

Minute Run and Walk test. When 't' test was applied the result found to be non significant at 0.05 level of confidence as the values are lesser than tabulated value 2.010.

TABLE-4

COMPARE THE DIFFERENCE OF MAXIMUM HEART RATE BETWEEN MALE AND FEMALE SPRINTERS

Gender	N	Mean	Std. Deviation	't'
M	25	148.08	21.19	.317
F	25	146.160	21.69	

Tabulated 't'.05 (48) = 2.010,

Tabulated 't'.01 (48) = 2.682

Table 4 indicated that the Mean and SD value of male sprinters was recorded as 148.08, 21.19 respectively where as the Mean and SD value of female sprinters found to be 146.160, 21.69 respectively. When 't' test was applied on the data it was found that there were non significant differences found between male and female sprinters on maximum heart rate variable as computed 't' value .317 found to be non significant at 0.05 level of confidence the value was lower than table value 2.010.

TABLE- 5

COMPARE THE DIFFERENCE OF RECOVERY HEART RATE AFTER 1 MINUTE BETWEEN MALE AND FEMALE SPRINTERS

Gender	N	Mean	Std. Deviation	't'
M	25	123.60	17.41	.612
F	25	120.72	15.81	

Tabulated 't'.05 (48) = 2.010

Tabulated 't'.01 (48) = 2.682

It is evident from Table 5 that there were non significant differences found between male and female sprinters on recovery heart rate after 1 minute. The Mean and SD value of male sprinters was 123.60, 17.41 respectively where as female sprinter's Mean and SD values recorded as 120.72, 15.81 respectively. When 't' test was applied it was found that 't' value was .612 lower than table value 2.010 need to be significant at the 0.05 level of confidence.

TABLE-6

COMPARE THE DIFFERENCE OF RECOVERY HEART RATE AFTER 2 MINUTES BETWEEN MALE AND FEMALE SPRINTERS

Gender	N	Mean	Std. Deviation	't'
M	25	109.92	16.41	.693
F	25	106.80	15.39	

Tabulated 't'.05 (48) = 2.010

Tabulated 't'.01 (48) = 2.682

Table 6 showed that the Mean and SD value of male sprinters on recovery heart rate after 2 minutes was recorded as 109.92, 16.41 respectively where as the Mean values and SD of female sprinters found to be 106.80, 15.39 respectively. When 't' test was applied it was found that there were non significant differences found between male and female sprinters on recovery heart rate after 2 minutes as computed 't' value .693 found to be non significant at 0.05 level of confidence as the 't' value was lower than table value 2.010.

TABLE-7

COMPARE THE DIFFERENCE OF RECOVERY HEART RATE AFTER 3 MINUTES BETWEEN MALE AND FEMALE SPRINTERS

Gender	N	Mean	Std. Deviation	't'
M	25	101.04	18.06	1.465
F	25	94.56	12.76	

Tabulated 't'.05 (48) = 2.010

Tabulated 't'.01 (48) = 2.682

It is evident from Table 7 that there were non significant difference found between male and female sprinters on recovery heart rate after 3 minutes as the Mean and SD value of male sprinters was observed as respectively 101.04, 18.06 where as female sprinters Mean value recorded as 94.56 with SD 12.76 .When't' test was applied it was found that computed 't' value 1.465 was lower than table value 2.010 at the 0.05 level of confidence.

DISCUSSION OF FINDINGS:

The hypothesis of the present study stated that there would be significant differences between University level male and female sprinters.

It was evident from the results that male and female sprinters participating in inter college level competition significantly differed at 0.01 level of confidence as the computed't' value found to be 10.712 was greater than table value of 2.682 required to be significant at 0.01 level of confidence.

It can be strongly inferred from the above results that female sprinters were more serious about participating in 100 mts sprint than male sprinters.

The results also indicate that there was statistically non significance difference found between male and female sprinters on selected variables in present study namely age ($t = 1.315$), cardiovascular endurance ($t = .317$), maximum heart rate ($t = .317$), recovery heart rate after 1 minute ($t = .612$), recovery heart rate after 2 minutes ($t = .693$), and recovery heart rate after 3 minutes ($t = 1.465$). These finding are in line with this finding of Yoest (1973) and, Fox and Foss (1998).

The hypotheses for difference between male and female sprinters on all selected variables taken for the study found to be non significant except at hundred mts performance thus hypotheses was partially rejected and partially accepted.

CONCLUSION:

- There were non significant differences between age of male and female sprinters.
- There were significant differences between 100 mts performance of male and female sprinters.

- There were non significant differences between cardiovascular endurance of male and female sprinters.
- There were non significant differences between maximum heart rate of male and female sprinters.
- There were non significant differences between recovery heart rate after 1 minute, recovery heart rate after 2 minutes, and recovery heart rate after 3 minutes of male and female sprinters.

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