

Comparative Analysis of Selected Health Related Physical Fitness Variables among University Men Triathlon Athletes

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Abstract

The purpose of this study was to compare the selected health related physical fitness variables among university men triathlon athletes, swimmers cyclists and runners. To achieve the purpose each ten university men triathlon athletes, swimmers cyclists and runners were selected as subjects from Chennai. Data were collected on the selected variables namely muscular strength, and muscular endurance. One way analysis of variance (ANOVA) was used for statistical analysis. The result of the study showed that there was significant difference among university men triathlon athletes, swimmers cyclists and runners in muscular strength and muscular endurance.

Key words: Health related physical fitness, Triathlon Athletes Muscular strength, Muscular endurance.

Introduction

A sound body and a sound mind are man's most precious possessions. Man needs to participate in physical activities to develop his mind and body. The child first starts to move and gradually improves to run, throw, jump, climb according to its interest. So physical education is needed for each and every individual for a better growth and development. Physical fitness is the very basis of our daily life and a sick nation cannot produce healthy attitudes and economically productive capacities. (Ajmer Singh et.al. 2006)

Muscular strength is generally as the maximum amount of force that a particular muscle or muscle group can exert against a resistance. It has been pretty well established over the years that the development of muscular strength is the result of an increase in the size (and not the number) of the individual muscle fibers (Hypertrophy), where as the development of local endurance is more closely associated with an increase in the number of capillaries in the trained muscle. (Hardayal singh, 1991)

Muscular endurance is the ability of the muscle to continue to perform without fatigue. To improve your muscle endurance, try cardio-respiratory activities such as walking, jogging, bicycling or dancing. (Dietrach Harre 1982)

Review of Related Literature

Miura (1997) examined the relationship between Olympic distance triathlon (swim over 1.5 km, cycle over 40.0 km, and run over 10.0 km) and economy during a simulated laboratory

test triathlon. Seventeen male triathletes conducted both maximal exercise tests and simulated laboratory triathlon. The latter test consisted of swimming (S), cycling (C) and running (R) stages as a continuous task using a flume-pool, a cycle ergometer and a treadmill, respectively. The exercise intensity and duration were 60% of VO_{2max} during swimming, cycling and running for 30, 75 and 45 min, respectively. The index of economy was determined by the % VO_{2max} at the last min of each stage during a simulated laboratory test triathlon. Results indicated that Olympic distance triathlon (total time) was correlated to swimming- VO_{2max} ($r = -0.621, p < 0.001$), cycling- VO_{2max} ($r = -0.873, p < 0.001$), running- VO_{2max} ($r = -0.891, p < 0.001$), S-Economy ($r = 0.208, ns$), C-Economy ($r = 0.601, p < 0.001$) and R-Economy ($r = 0.769, p < 0.001$). There were also significant correlations between swimming time and swimming- VO_{2max} ($r = -0.648, p < 0.01$), between cycling time and cycling- VO_{2max} ($r = -0.819, p < 0.001$), between running time and running- VO_{2max} ($r = -0.726, p < 0.001$), between swimming time and S-Economy ($r = 0.550, p < 0.05$), between cycling time and C-Economy ($r = 0.613, p < 0.01$), and between running time and R-Economy ($r = 0.548, p < 0.05$). These results demonstrated that the larger VO_{2max} during maximal exercise tests and smaller increment of VO_2 during a simulated laboratory test triathlon indicating good economy were good predictors to determine the Olympic distance triathlon.

Methodology

The purpose of this study was to compare the selected health related physical fitness variables among university men triathlon athletes, swimmers cyclists and runners. To achieve the purpose each ten university men triathlon athletes, swimmers cyclists and runners were selected as subjects from Chennai. Athletes who have regularly participated in competition in the events of triathlon, swimming, cycling and running were selected for this study. The subjects were in the age group of 19 to 23 years. They were well experienced in their athletic events and willingly participated in this study.

Selection of Variables

The following health related physical fitness variables were selected to this study.

- i. Muscular strength
- ii. Muscular endurance

Statistical Analysis

In order to test the differences between the four groups of athletes in their health related physical fitness components, one way analysis of variance (ANOVA) was applied.

When F ratio was found significant, that Scheffe's post hoc test was used to find out the paired mean significant difference. (Thirumalaisamy, 1997).

Result and Discussions

Table-I
One Way Analysis of Variance on Muscular Strength among Triathlon Athletes, Swimmers, Cyclists & Runners
(Scores in Numbers)

Mean values of				Source of variance	Sum of squares	Df	Mean squares	F
Triathlon	Swimmers	Cyclists	Runners					
29.20	36.10	36.30	36.10	Between	364.28	3	121.43	9.39*
				Within	465.50	36	12.93	

Table F-ratio at 0.05 level of confidence for 3 and 36 (df) =2.87 . * Significant at 0.05 level

Table I shows that the F value required to be significant at 0.05 level was 2.87. But the obtained F value 9.39 was greater than the required value to be significant at 0.05 level. Hence, it was found that there was significant differences between triathlon athletes, swimmers, cyclists and runners in health related fitness variable, muscular endurance. Since the obtained F value was significant, Scheffe's post hoc test was applied to find out the significance between the means, which is presented in Table II.

Table-II
Scheffe's Confidence Interval Test Scores on Muscular Strength
(Scores in Numbers)

Means				Mean difference	Required C I
Triathlon	Swimmers	Cyclists	Runners		
29.2	36.10			6.90*	4.72
29.2		36.30		7.10*	4.72
29.2			36.10	6.90*	4.72
	36.10	36.30		0.20	4.72
	36.10		36.10	0.00	4.72
		36.30	36.10	0.20	4.72

* Significant at 0.05 level

The results presented in Table II shows that the required confidence interval at 0.05 level was 4.72. The comparisons between triathlon athletes and swimmers; triathlon athletes and cyclists and triathlon athletes and runners; were significant. The other comparisons were found to be not significant at 0.05 level.

The obtained mean values in muscular strength was presented through bar diagram for better understanding of the results in Figure 1.

Figure-1
Bar Diagram Showing Mean Values of Triathlon Athletes
(Scores in Numbers)

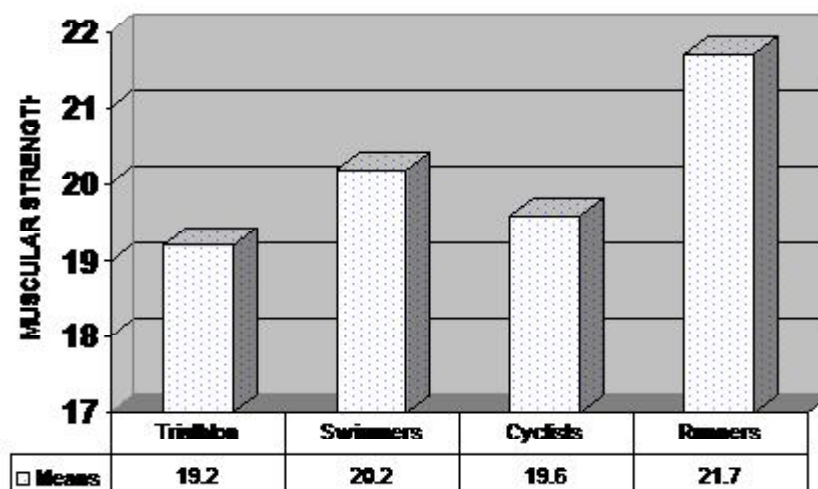


Table-III

One Way Analysis of Variance on Muscular Endurance among Triathlon Athletes
(Scores in numbers)

Mean values of				Source of variance	Sum of squares	Df	Mean squares	F
Triathlon	Swimmers	Cyclists	Runners					
19.20	20.20	19.60	21.70	Between	36.0	37	12.02	5.17*
				Within	83.70	36	2.33	

Table F-ratio at 0.05 level of confidence for 3 and 36 (df) =2.87. * Significant at 0.05 level

Table III shows that the F value required to be significant at 0.05 level was 2.87. But the obtained F value 5.17 was greater than the required value to be significant at 0.05 level. Hence, it was found that there were significant differences between triathlon athletes, swimmers, cyclists and runners in health related fitness variable, muscular strength. Since the obtained F value was significant, Scheffe's post hoc test was applied to find out the significance between the means, which is presented in Table IV.

Table-IV

**Scheffe's Confidence Interval Test Scores on Muscular Endurance
(Scores in Numbers)**

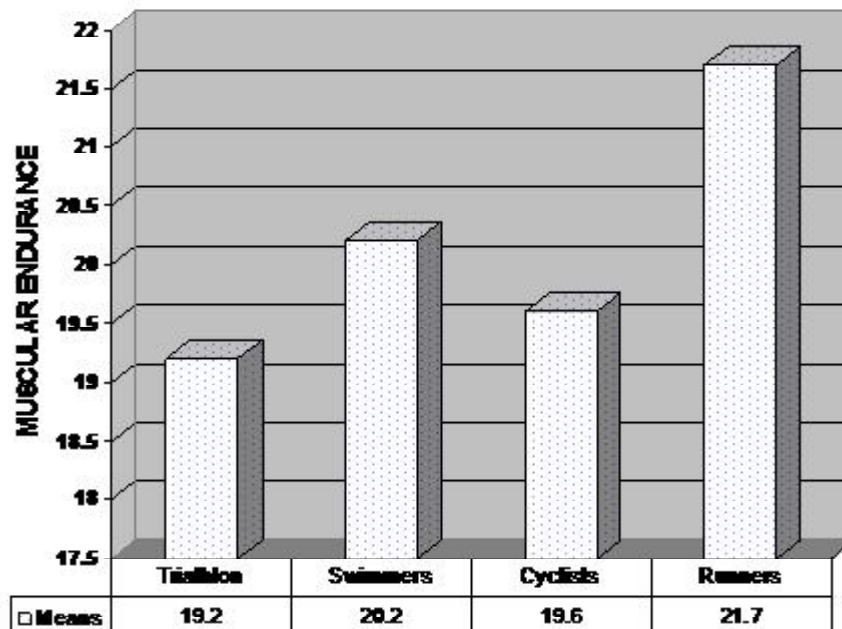
Means				Mean difference	Required C I
Triathlon	Swimmers	Cyclists	Runners		
19.2	20.20			1.00	2.00
19.2		19.60		0.40	2.00
19.2			21.70	2.50*	2.00
	20.20	19.60		0.60	2.00
	20.20		21.70	1.50	2.00
		19.60	21.70	2.10*	2.00

* Significant at 0.05 level

The results presented in Table IV shows that the required confidence interval at 0.05 level was 2.00. The comparisons between triathlon athletes and runners and cyclists and runners were significant, as the obtained values 2.5 and 2.1 respectively were greater than the required values. The other comparisons were found to be no significant at 0.05 level.

The obtained mean value in muscular endurance was presented through bar diagram for better understanding of the results in Figure 2.

**Figure-2
Bar Diagram Showing Mean Values of Triathlon Athletes**



Conclusions

From the above result and discussion the following conclusions were drawn.

1. It was concluded that muscular strength and were significantly differed among triathlon athletes, cyclists, swimmers and runners.
2. It was concluded that muscular endurance, were significantly differed among triathlon athletes, cyclists, swimmers and runners.

References

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