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A study on physiological hematological and physical variables in relation to aerobic capacities among college going students

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Abstract

The purpose of this study was to compare the motor ability variables of college level swimmers, cyclists and athletes. For this purpose fifteen subjects were selected in each discipline with age ranging 18-25 for the comparison of selected motor ability and psychological variables. The variables selected for the study were speed (50 Meter Dash), agility (shuttle run) and leg explosive power (standing broad jump). One-way analysis of variance (ANOVA) was used to find out the significant difference among different disciplines. The Scheffe's post hoc test was used to find the significant difference in paired mean scores. It was concluded that there was significant difference between swimmers, cyclists and athletes in speed, agility and leg explosive power variables. The athletes had better speed, agility and leg explosive power than swimmers and cyclists. The sportsmen must be given good physical conditioning training to enable them to improve the performance in their respective events.

Keywords: Comparison, motor ability, swimmers, cyclists, athletes

1. Introduction

Man is a creation of nature and from ages he lived with the nature, loved and fought against it for existence and survival. Fitness for living, be in the home, on the farm, at the office, in the factory, or in military service implies freedom from disease, enough strength, agility, endurance and skills to meet the demands of daily living, sufficient reserves to withstand ordinary stresses without harmful strain and mental development and emotional adjustment appropriate to the maturity of the individual (Clark and Clark, 1978).

Sports and games in modern times have taken a definite shape in comparison with the immature and unscientific plays of ancient times. Today sports are becoming professional; players are earning a lot through games and sports. Physical Fitness is the ability to carry out daily tasks vigour and alertness, without undue fatigue, and with ample energy to engage in a leisure time pursuits and to meet the above average physical stresses encountered in emergency situations. Physical fitness is the basic foundation of most of the activities sports undertaken by an individual in his daily life. Present high sports performance levels are attributed to the superior motor fitness all over the world at all levels of competition.

The term motor ability was introduced, which referred to the overall proficiency in performing a wide range of sports related tasks. To increase the accuracy of the prediction, test batteries were designed on the premises that certain motor abilities such as agility, balance, co-ordination, endurance, power, speed and strength were the basic of physical performance (Clarke H.H. and Bonesteel, 1935) [2].

Motor fitness is a term that describes an athlete's ability to perform effectively during sports or other physical activity. According to Barrow Motor fitness may be defined as a limited phase of motor ability, giving importance for the capacity to do vigorous work. An athlete's motor fitness is a combination of five different components, each of which is essential for high levels of performance (Davis, 2000) [4].

Speed is very essential in all the sportsperson. Agility is the ability that enables a person to rapidly change body position and direction in a precise manner. Speed, strength and endurance are highly essential in all the team and individual games.

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Speed strength and agility are the important abilities for successful performance of games. The dominant ability is the one from which the sport requires a higher contribution. Most sports require peak performance in at least two abilities. The relationships among speed, strength and agility create crucial physical athletic qualities. In this article the researcher compare speed, leg strength and agility of college level swimmers, cyclists and athletes.

2. Purpose and objective

The purpose of the study is to know the motor ability variables and the objective of the study is to compare the motor ability variables among sportspersons (swimmers, cyclists and athletes).

3. Statement of hypotheses

It was hypothesized that there is no significant difference in the selected motor ability variables of college level swimmers, cyclists and athletes.

4. Methodology

4.1. Selection of Subjects

To achieve the purpose of the study, the researcher randomly

selected the swimmers, cyclists and athletes who were enrolled in the various colleges. Fifty subjects were selected in each discipline who have represented their college in the concerned sport.

4.2 Selection of Variables and criterion measures

The following variables are selected for the purpose of the study:

1. Speed: 50 meters dash (In secs.)
2. Leg Strength: Standing Broad Jump (In Meters.)
3. Agility: Shuttle Run (In secs.)

4.3 Statistical Technique

The One-way Analysis of Variance (ANOVA) was used to find the significant difference among the three groups. The Scheffe’s Post Hoc test was used to find the significant difference in the paired means.

5. Results of the study

The One-way ANOVA (F test) results on selected Motor Ability scores among college level swimmers, cyclists and athletes.

Table 1: Table shows One-Way ANOVA Analysis on selected Motor Ability scores among college level swimmers, cyclists and athletes.

Motor Ability Variables	Groups	Sum of Squares	df	Mean Squares	F Value	Level of Sig.
Speed (In Secs.)	Between Groups	0.840	2	0.420	7.01 (P=0.002)	Significant at 0.01 level
	Within Groups	2.517	42	0.060		
	Total	3.358	44			
Leg Strength (In Meters)	Between Groups	0.394	2	0.197	3.96 P=0.026)	Significant at 0.01 level
	Within Groups	2.085	42	0.050		
	Total	2.479	44			
Agility (In Secs)	Between Groups	2.548	2	1.274	4.70 (P=0.014)	Significant at 0.01 level
	Within Groups	11.384	42	0.271		
	Total	13.932	44			

Groups: Swimmers, Cyclists and Athletes

Table value at 0.05(df-2, 42) =3.23; Table value at 0.01(df-2, 42) =5.18

The table-1 shows that the obtained ‘F’ values 7.01, 3.96 and 4.70 for speed, leg strength and agility are greater than the table value of 3.23 for df ‘2 and 42’ required for significance at 0.05 level of confidence. The results of the study indicated

that “there is significant difference in the speed, leg strength and agility among college level different sportsperson. To determine the significant difference in the said criterion variables among these paired means, the ‘Scheffe’s test was applied as Post hoc analysis and the results are presented in Table-2.

Table 2: Scheffe’s Post Hoc Analysis on Motor Ability scores of among college level different sportsperson.

Motor Fitness Variables	Sportsperson			Mean Difference
	Swimmer	Cyclist	Athletes	
Speed	6.920	7.020		0.100
		7.020	6.693	0.326*
	6.920		6.693	0.226
Leg Strength	2.319	2.144		0.175
		2.144	2.359	0.215*
	2.319		2.359	0.040
Agility	10.580	10.920		0.340
		10.920	10.340	0.580*
	10.580		10.340	0.240

*Significant at 0.05 level of confidence.

Table-2 shows significant paired mean difference on speed between cyclists & athletes and the value is 0.326 which is greater than the critical difference at 0.05 level of confidence. It concludes that there is significant difference in speed between cyclists & athletes. The athletes had better speed than swimmers and cyclists and no different exists in the speed between swimmers & cyclists and swimmers & athletes.

Table-2 shows significant paired mean difference on leg

strength between cyclists & athletes and the value is 0.215 which is greater than the critical difference at 0.05 level of confidence. It concludes that there is significant difference in leg strength between cyclists & athletes. The athletes had better leg strength than swimmers and cyclists and no different exists in the leg strength between swimmers & cyclists and swimmers & athletes.

Table-2 shows significant paired mean difference on agility

between cyclists & athletes and the value is 0.580 which is greater than the critical difference at 0.05 level of confidence. It concludes that there is significant difference in agility between cyclists & athletes. The athletes had better agility

than swimmers and cyclists and no different exists in the agility between swimmers & cyclists and swimmers & athletes.

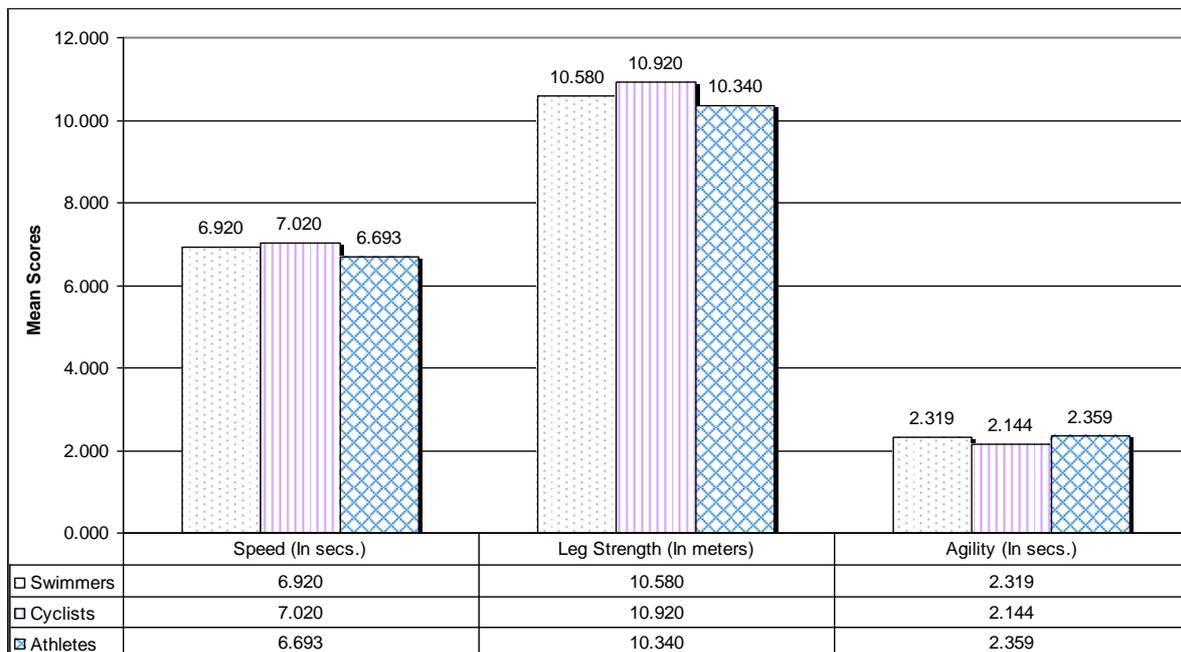


Fig 1: Comparison mean scores of selected Motor Abilities among college level swimmers, cyclists and athlete sportsperson.

6. Findings of the study

The following are the findings of the study:

1. There is a significant difference in the speed among college level swimmers, cyclists and athletes ($F=7.01$ $P<0.01$). The athletes had better speed than swimmers and cyclists.
2. There is a significant difference in the leg strength among college level swimmers, cyclists and athletes ($F=3.96$ $P<0.05$). The athletes had better leg strength than swimmers and cyclists.
3. There is a significant difference in the agility among college level swimmers, cyclists and athletes ($F=4.70$ $P<0.05$). The athletes had better agility than swimmers and cyclists.

7. Conclusion

The result shows that there was a significant difference in the speed, leg strength and agility among college level swimmers, cyclists and athletes. A better understanding of these relationships will help to understand speed, strength and agility and help to plan sport specific strength training at college level sportspersons. The sportsmen must be given good physical conditioning training to enable them to improve the performance in their respective events.

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