

Back Strength and Cardio Respiratory Endurance Differentials among Endomorph Mesomorph and Ectomorph of Female Physical Education Students

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Abstract

The purpose of the study was to compare the selected motor fitness components among endomorph, mesomorph and ectomorph among female physical education students. For this purpose, ninety female physical education students were selected as subjects at random from 205 bachelors' degree students. The selected subjects were classified into three categories such as endomorph, mesomorph and ectomorph by adopting heath – carter rating form. Among them, thirty endomorph, thirty mesomorph and thirty ectomorph female physical education students studying in the Department of Physical Education and Sports Sciences, Annamalai University were selected. Among, the motor fitness components, the following variables such as back strength and cardio respiratory endurance were selected as criterion variables of back lift with dynamometer and coopers' 9 minutes run / walk. The collected data were statistically analysed by using analysis of variance (ANOVA) to find out the significant difference, if any among endomorph, mesomorph and ectomorph female physical education students on each criterion variables such as back strength and cardio respiratory endurance. The results of the study showed that there was a significant difference among three groups on back strength and cardio respiratory endurance. The mesomorph female physical education students were better on selected criterion variables than the endomorph and ectomorph female physical education students.

Key words: Endomorph, Mesomorph, Ectomorph, Back strength, Cardio respiratory endurance.

Introduction

Sport is a human activity that involves specific administrative organization and a historical background at rules which define the objective and limit the pattern of human behaviour". It involves competition non challenge and a definite outcome primarily determined by physical skill.

Body composition is a description of the body in terms of muscle, bone, fat and other elements with respect to health fitness; it refers to the percentage of body weight that is composed of fat as compared with fat free (or) bone tissue. Having a high percentage of body fat is a serious detriment to fitness and health.

The somatotype of the athletes involved in the Olympic Games represent low relative fatness (low endomorph) and high relative fat-free mass mesomorphy.

Methodology

The purpose of the study was to compare the selected motor fitness components among endomorph, mesomorph and ectomorph female physical education students such as back strength and cardio respiratory endurance.

For the purpose of the study, ninety female physical education students from 205 bachelors' degree students studying in the Department of Physical Education and Sports Sciences, Annamalai University in the age group of 18 to 25 years were selected. The selected subjects were classified into three categories such as endomorph, mesomorph and ectomorph by adopting heath – carter rating form. The following criterion variables used to find out such as back strength and cardio respiratory endurance. The subjects were tested on selected criterion variables such as back strength and cardio respiratory endurance by using back lift with dynamometer and Coopers' 9 minutes run / walk test.

Experimental Design and Statistical Procedures

The experimental design used for the present investigation was random group design involving ninety female physical education students as subjects. Analysis of variance (ANOVA) was used to find out the significant differences, if any, among the three groups namely endomorph, mesomorph and ectomorph female physical education students separately for each criterion variables. Since, three groups were compared, wherever they obtained 'F' ratio was found to be significant, the Scheffe's test was applied as a post hoc test to find out the paired mean differences. In all the cases, .05 level of confidence was fixed to the test the significance, which was considered as an appropriate.

Analysis of the Data

The mean, standard deviation and "F" ratio values on selected motor fitness variables of endomorph, mesomorph and ectomorph female physical education students are presented in Table I.

Table-I
Mean, Standard Deviation and 'F' ratio Values on Selected Motor Fitness Components of Endomorph, Mesomorph and Ectomorph Female Physical Education Students

Back Strength

	Endomorph	Mesomorph	Ectomorph	Source of variance	SS	df	MS	F Ratio
Mean	77.87	9 0.50	69.67	Between	11.22	2	5.61	29.74*
SD	12.75	12.61	13.12	Within	16.411	87	0.1886	

Cardio Respiratory Endurance

	Endomorph	Mesomorph	Ectomorph	Source of variance	SS	df	MS	F Ratio
Mean	1476	1772	1400	Between	43.49	2	21.745	864.27*
SD	59.08	57.99	58.66	Within	2.189	87	0.02516	

The obtained “F” ratio value 29.74 on back strength and 864.27 on cardio respiratory endurance among endomorph, mesomorph and ectomorph female physical education students which is higher than the required table value 3.103 with df 2 and 87 at .05 level of confidence. The results of the study showed that there was a significant difference exists among endomorph, mesomorph and ectomorph female physical education students.

Since, the obtained “F” ratio was significant, the Scheffe’s test was applied separately for each variable and presented in Table 2.

Table-II
Scheffe’s Test for the Differences between Paired Mean on Back Strength and Cardio Respiratory Endurance

Back Strength

Endomorph	Mesomorph	Ectomorph	Mean difference	Confidence interval
75.60	115.33	-	39.73*	16.07
75.60	-	69.67	5.93	16.07
-	115.33	69.67	45.66*	16.07

* Significant at .05 level of confidence

The mean difference values of endomorph and mesomorph & mesomorph and ectomorph of female physical education students on back strength 39.73 and 45.66 which were higher than confidence interval value 16.07 for significance. And also the mean difference value of endomorph and ectomorph of female physical education students on back strength 5.93 which was less than confidence interval value 16.07.

Hence, the results of the study showed that there was a significant difference between endomorph and mesomorph & mesomorph and ectomorph of female physical education students on back strength. And there was no significant difference between endomorph and ectomorph of female physical education students on back strength.

Cardio Respiratory Endurance

Endomorph	Mesomorph	Ectomorph	Mean difference	Confidence interval
1476	1772	-	296.00*	105.60
1476	-	1398	78.00	105.60
-	1772	1398	374.00*	105.60

* Significant at .05 level of confidence

The mean difference values of endomorph and mesomorph & mesomorph and ectomorph of female physical education students on cardio respiratory endurance 296.00 and 374.00 which were higher than confidence interval value 105.60 for significance. And also the mean difference value of endomorph and ectomorph of female physical education students on cardio respiratory endurance 78.00 which was less than confidence interval value 105.60.

Hence, the results of the study showed that there was a significant difference between endomorph and mesomorph & mesomorph and ectomorph of female physical education students on cardio respiratory endurance. And there was no significant difference between endomorph and ectomorph of female physical education students on cardio respiratory endurance.

Figure -1

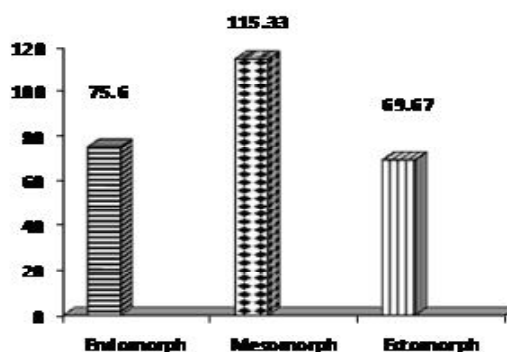
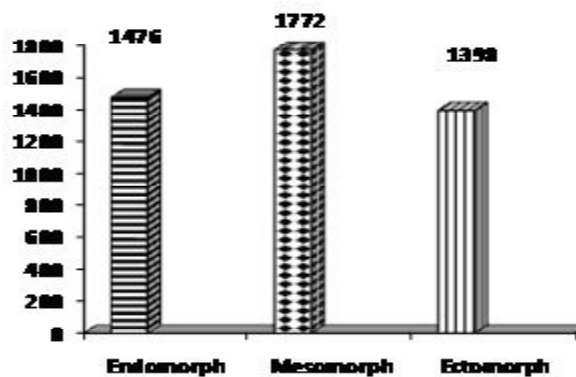
Back Strength

Figure-2**Cardio Respiratory Endurance**

The Mean Values of Endomorph, Mesomorph and Ectomorph Female Physical Education Students on Selected Motor Fitness Components

Conclusions

Based on the analysis of the study, the following conclusions were drawn.

1. There was a significant difference among endomorph, mesomorph and ectomorph female physical education students on back strength and cardio respiratory endurance.
2. Mesomorph female physical education students were better on all the selected criterion variables namely back strength and cardio respiratory endurance than the endomorph and ectomorph female physical education students.

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