Research Paper PHYSICAL EDUCATION

Comparison of Endomorphic Mesomorphic and Ectomorphic Components of College Level Long Distance Runners

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ABSTRACT

The purpose of the study was to find out the somatotypes of college Long distance runners. The subjects for this study were selected from the Engineering College Long distance runners who participated in the Tamilnadu Inter-Engineering sports organized and conducted by Alagappa Chettiar Engineering College, Karaikudi. Fifteen Men College Long distance runners were selected who finished first eight positions in 5000M and 10000M run races. The study was a status study of Long distance runners with purposive sampling. The investigator utilized Heath-Carter measurement system to assess dependent variables endomorph, mesomorph and ectomorph. The obtained scores and the t-test on Long distance runners in endomorphic, mesomorphic and ectomorphic components indicated Long distance runners were predominantly mesomorphic in nature. The Long distance runners are predominantly muscular; the bones are large and covered with thick muscles and heavily muscled throughout.

KEYWORDS Long distance runners, Somatotype, Endomorph, Mesomorph and Ectomorph,

INTRODUCTION

It is a fact that no two human bodies are exactly alike in physical characteristics. In the study of mankind Hippocrates classified the human physique into two fundamental types (Mathews, 1973). Kretschmer frequently referred to as the father of modern somatotyping, revived the Greek term Pyknic, implying a compact body; and Asthenic literally interpreted as without strength. He added a third component, the Athletic type, implying as contender for prize (Sheldon, 1954).

The three components of body build are type, size and composition. A system, developed by Sheldon (1940), uses the terms ectomorph, endomorph, or mesomorph to describe the body build of an individual. People with different body shapes, tend to be good at different sports. Most top level athletes will have a body shape which leans towards the mesomorph end of the scale as most sports require a good deal of strength. They will then have either ectomorph or endomorph features, depending on how lean they are and how weight affects their sport.

Somatotype is a taxonomy developed in the 1940s, by American psychologist William Herbert Sheldon, to categories the human physique according to the relative contribution of three fundamental elements, somatotypes, named after the three germ layers of embryonic development: the endoderm, (develops into the digestive tract), the mesoderm, (becomes muscle, heart and blood vessels), and the ectoderm (forms the skin and nervous system). His initial visual methodology has been discounted as subjective, but later formulaic variations of the methodology, developed by his original research assistant Barbara Heath, and later Lindsay Carter and Rob Rempel (2002) are still in academic use.

Success as an athlete comes from a combination of athletic ability and our body build. The Olympic athletes have comprehensively been studied by various scientists for their somatotyping. Physical education manifests interest in somatotyping on relating body type to success in various sports. This is why "physiognomy" receives primary consideration at the time of selection of sportsmen in different games and sports (Clark, 1975). Appropriate quantification for these aspects of physique can lead to better understanding of the relationships between physique and performance. This knowledge helps the athletes who wish to achieve success in sports at a high level to compare their physique with those of the elite athletes and can consider whether further changes in physique such a lower body fat or increase muscle mass would help or hinder performance (Clark, 1975).In the modern days of competition, coaches are also making all out efforts to select person of particular physique and body composition suitable for various activities.

Hence the trend in the field of games, sports and physical education is to assess the related components as a part of the total body build and size of ach athlete and also to interpret how these components those are helpful to performance in games and sports under competitive. Long-distance running, or endurance running, is a form of continuous running over distances of at least three kilometers (1.86 miles). Physiologically, it is largely aerobic in nature and requires stamina as well as mental strength (Grine, 2006). The three most common types are track running, road running and cross country running, all of which are defined by their terrain – all-weather tracks, roads and natural terrain, respectively. Typical long-distance track races range from 3000 meters to 10,000 meters (6.2 miles), cross country races usually cover 5 to 12 km (3 to 7½ miles). Humans are hot, sweaty, natural-born runners (Phys.org/Harvard University, 2007). Generally, top long distance runners are tall. They have long arms that pump for extra power. Distance runners also have long legs that allow for a bigger stride. Covering more ground with fewer steps gets the distance runner to the finish line in less time. Long distance runners carry as little weight as possible. Running races that cover a mile or more requires strength and endurance. Carrying too much weight is a burden for distance runners and slows speed. Distance runners constantly are burning calories in training and competition, so excessive weight gain is rarely a concern. Long distance runners develop long, lean muscles, particularly in the lower body.

Long distance runners rely on aerobic training to get ready for races. Sprinters also do aerobic training, but they lift weights to add muscle (www.livestrong.com). There were no significant differences between the groups for either bone widths or circumferences but the elite and good runners had significantly higher Ponderal indices (P less than 0.05) than the average runners, indicating that they are more linear. Elite and good runners were also less endomorphic but more ectomorphic than the average runners. The elite runners trained more often, ran more miles per week and had been running longer (P less than 0.05) than good or average runner (Bale, Bradbury & Colley, 1986).

METHODOLOGY

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of college Long distance runners. The subjects for this study were selected from the Engineering College Long distance runners who participated in the Tamilnadu Inter-Engineering sports organized and conducted by Alagappa Chettiar Engineering College, Karaikudi. Fifteen Men College Long distance runners were selected who finished first eight positions in 5000M and 10000M run races. The study was a status study of Long distance runners with purposive sampling.

MEASURING SOMATOTYPE

Somatotype is most commonly measured using the Heath-Carter measurement system (2002), in which ratings for endomorphy, mesomorphy and ectomorphy are calculated using various anthropometrical measurements. In each of the three categories someone is generally classified on a scale from 1 to 7 (though higher ratings are possible), though one cannot score highly on all three. The three numbers together give a somatotype number, with the endomorphy score first, then mesomorphy and finally ectomorphy. The investigator utilized Heath-Carter measurement system.

Endomorphy component of Somatotype was calculated from the sum of sub scapular, triceps and super lilac skin folds using Heath-Carter (2002) anthropometric rating scale.

Mesomorphy component was calculated using Heath-Carter (2002) anthropometric rating scale from humorous breadth, femur breadth, calf circumference and calf circumference in relation to height.

Ectomorphy component was obtained from Heath-Carter (2002) anthropometric rating scale using Ponderal Index. Ponderal index was calculated dividing height by cube root weight.

The collected data were tested for significance using t- ratio.

RESULTS

The descriptive statistics of Long distance runners on endomorph, mesomorph and ectomorph components are resented in table 1

TABLE 1
THE DESCRIPTIVE STATISTICS OF LONG DISTANCE RUNNERS ON ENDOMORPH, MESOMORPH AND ECTOMORPH COMPONENTS

	Endomorph	Mesomorph	Ectomorph
Mean	4.80	4.77	5.3
Standard Deviation	0.36	0.25	0.44

The obtained scores of Long distance runners on endomorph, mesomorph and ectomorph components were 4.80, 4.77 and 5.33 respectively. The obtained score of 5.30 against the possible score of seven in ectomorphic component was higher than the endomorphic and ectomorphic components which were 4.80 and 4.77 respectively. The obtained 4.80 against the possible score of seven in endomorphic component was high. Hence the investigator was interested to find out whether there was any significant difference between the ectomorphic and mesomorphic, ectomorphic and endomorphic component. For this purpose t-test was employed.

The t-ratio between ectomorphic and endomorphic, ectomorphic and mesomorphic components of college Long distance runners are presented in table 2.

TABLE 2
COMPUTATION OF 'T' RATIO BETWEEN EN DOMORPHIC AND MESOMORPHIC, MESO MORPHIC AND ECTOMORPHIC COMPONENTS OF COLLEGE LONG DISTANCE RUNNERS

Component	Mean	Standard deviation	Difference in means	Standard error	't' ratio
Endomorph	4.80	0.36	0.36	0.12	0.25
Mesomorph	4.77	0.25	0.53	0.14	3.79*
Ectomorph	5.30	0.44			

Significant at 0.05 levels (table value 2.05, df, 29)

The obtained t-value between endomorphic and ectomorphic component was less (0.25) than the tabulated value. Hence there was no significant difference between endomorphic and ectomorphic component. The obtained t-value between mesomorphic and ectomorphic component was higher (3.79) than tabulated value. Hence there was significant difference between ectomorphic and mesomorphic component.

DISCUSSION

The obtained scores and the t-test on Long distance runners in endomorphic, mesomorphic and ectomorphic components indicated Long distance runners were predominantly ectomorphic in nature. The score of 4.77 of mesomorphic component may not be ignored, as it is midway between the possible score of seven.

CONCLUSION

Long distance runners were predominantly ectomorphic in nature and had a tendency towards mesomorphic component. They had predominant characteristics in linearity but also had broad square shoulders; the bones were large and covered with moderate muscles throughout with low fat content. Hence it is recommended to select such type players for long distance running event.

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