PHYSICAL CHARACTERISTICS OF ADOLESCENT MALE WRESTLERS IN KERALA

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ABSTRACT

OBJECTIVE: The purpose of the study was to evaluate the anthropometric and somatotype characteristics of adolescent male wrestlers in Kerala. **METHODS:** 32 male adolescent wrestlers were chosen for the investigation. Their mean age was 17.1 (+/-1.3) years, height 158.1 (+/-4.91) cm and weight 66.4 (+/-4.84) kg. Anthropometric measurements included triceps, subscapular, suprailiac, abdomen and calf skinfolds, biceps and calf circumferences and humerus and femur breadths. The body fat percentage was calculated using the formula prescribed by Faulkner. The somatotype of the subjects was calculated by the Health and Carter method. **RESULTS:** The wrestlers under this study have a body fat percentage of 12.7 (+/-1.15) % and mean Lean Body Mass (LBM) of 87.3 (+/-1.35) %. Their Total Weight of Fat was 8.03 (+/- 1.01) kg and Lean Body Weight 58.9 (+/-3.41) kg. . Regarding the somatotype, they fell into the somatotype category of endomorphic mesomorphs with a value of 3.5–4.9–1.6. **CONCLUSION:** The higher value of mesomorphy indicates that they are capable of creating greater force on the opponents and that they are suitable for a power sport like wrestling. Moreover, shorter body stature results in lower level of center of gravity which in turn may facilitate greater stability during the competition.

Key Words: Wrestling, adolescent, body mass, mesomorphy

INTRODUCTION

Physique can be characterized by the interactive sum of its parts, body structure, body size and body composition. Body composition, anthropometric dimensions, and morphological characteristics play a vital role in determining the success of a sportsperson. Proper evaluation of these parameters reflects the quantification of the body''s major structural components, which are required in different proportions for various games to achieve excellence [1].

Somatotyping deals with the body type or physical classification of human body in which the terms endomorphy, mesomorphy and ectomorphy are used to describe a person in terms of his or her somatotype. The first component endomorphy is charectarised by roundness and softness of the body. It denotes fatness of the body. The second component mesomorphy is characterised by square body with hard rugged and prominent musculation. The bones are large and covered with thick muscles. The third component ectomorphy represents the leanness of the body. The limbs are relatively long and trunk short, the bones are small and the muscles thin [2]. Percent body fat (% fat) has been defined as the percentage of total weight that composed of fat [3, 4]. Lean Body Mass (LBM) refers to all the body tissues like muscles, bones etc. excluding the stored deposit fat. That means LBM is the total body weight minus the weight of the stored fat [5].

Studies on somatotype of athletes, elite athletes and Olympic athletes have generally shown that strength dependent athletes tended to be basically mesomorphic while distance dependant athletes were found to be more ectomorphic with limited amount of mesomorphic muscularity. In reference to the male athletes wrestlers were more mesomorphic and endomorphic but less ectomorphic than were boxers and runners [6].

Various studies on high level national and international competitions supported and amplified the fact that most successful athletes have physical structures best suited to those particular sports. Carter hypothesized that somatotype is an important selective factor for success in sports and that there are clear somatotypic differences between some sports and similarities between others [7]. The information about the anthropometric profiles of the athletes may contribute to understanding the suitability of players for that particular sport. Therefore, the present study is an attempt to analyse various anthropometric variables so as to evaluate the morphological characteristics of adolescent male wrestlers from Kerala state, India.

METHODS

Thirty-two male adolescent wrestlers from various districts in Kerala, India, were randomly selected for the purpose of the study. Their average age (SD) was 17.1 (+/-1.30) years, height 158.1 (+/-4.91) cm and weight 66.4 (+/-4.84) kg. The subjects have been practicing regularly and have participated in wither district, state or national championships. Slim guide caliper was used to collect skinfold measurements to the nearest 0.2 mm two seconds after the full pressure of the caliper jaws had been applied; the skinfold value was taken as the average of 3 skinfold measurements separated by at least 1 minute to avoid tissue compression [8]. Skinfold thickness was measured at six anatomical sites – triceps, chest, sub-scapular, supra- iliac, abdomen and calf. Bi-condilar widths of femur and humerus and circumferences of biceps and calf were also measured. The following formulas were used to assess the body composition of the subjects.

% Body Fat or PBF　　　= (triceps + subscapular + suprailiac + abdominal

skinfolds x 0.153) + 5.783   [9]

Total Weight of Fat or TWF (kg)   = (Weight x percent of fat) / 100
Lean Body Weight or LBW (kg)   = (Total Body Weight – Total Weight of Fat)
BMI (Kg/m2) = (Body mass in Kg) / (Stature in Metres) [10]

The method of Heath and Carter, which is based on the Sheldon's somatotype classification, was applied to determine the somatotype characteristics of the subjects [11]

STATISTICAL ANALYSIS

Basic statistical descriptive parameters such as mean and standard deviation were calculated for the analysis of the data.

RESULTS

Table-1: Various physical parameters and anthropometric characteristics of the subjects

	AM	SD	MIN	MAX
Age (yrs)	17.1	1.30	16	19
Height (cm)	158.1	4.91	150	168
Weight (kg)	66.4	4.84	60	74.5
Biceps Girth (cm)	30.4	1.34	28.5	33.0
Calf Girth (cm)	34.9	1.42	32.5	38.0
Humerus Breadth (cm)	6.85	0.31	6.30	7.30
Femur Breadth (cm)	9.64	0.72	8.10	9.93
Triceps Skinfold (mm)	10.8	2.19	8.00	14.3
Sub-scapular Skinfold (mm)	10.7	2.11	7.30	13.9
Supra-iliac Skinfold (mm)	11.9	2.39	8.70	15.9
Abdominal Skinfold (mm)	12.3	2.11	10.1	16.9
Calf Skinfold (mm)	7.37	1.69	5.1	10.1
BMI (wt/h^2)	25.64	1.59	21.2	28.9

Table 1 represents various physical parameters of the subjects. It can be observed that the average height of the wrestlers is 158.1cm and mean weight 66.4 kg with BMI of 25.64. This points out relatively shorter stature and heavier body in these wrestlers.

Regarding skinfold measurements, highest value was observed at abdominal skinfold (12.3) indicating greater adiposity in that area where as lowest value found at calf skinfold (7.37).

Table – 2: Different components of somatotype and body composition of subjects

	AM	SD	MIN	MAX
Endomorphy	3.5	0.68	2.5	4.5
Mesomorphy	4.9	0.47	4.5	5.5
Ectomorphy	1.6	0.50	1.0	2.5
PBF (%)	12.7	1.35	10.9	14.9
Total Weight of Fat (kg)	8.67	1.41	6.50	10.8
Lean Body Mass (%)	87.3	1.35	85.1	89.1
Lean Body Weight (kg)	58.9	3.41	53.4	64.5

Somatotype and body composition of the subjects was presented in table 2. It reveals that the adolescent male wrestlers under this study fall into the somatotype category of endomorphic mesomorphs with a score of 3.5 – 4.9 – 1.6. Mesomorphic component is found to be highly developed in them while endomorphy is greater than ectomorphic component.

Regarding body composition, their average percent body fat (PBF) was 12.7% indicating a slightly higher adiposity in the subjects. Their average total weight of fat (TWF) is 8.67kg while their average percent lean body mass (%LBM) is 87.3%. It was also found that the average lean body weight of the male wrestlers under this investigation was 58.9 kg.

DISCUSSIONS

Tanner (1964) has pointed out that without the required physique an athlete is unlikely to reach a high level of success [12]. In other words somatotype can reveal a lot about one"s capacity to succeed in particular sports. Tanner reported high mesomorphic nature of wrestlers in the Rome Olympic participants with the mean smatoptypes of 2.6-6.2-1.6. The result of the present study is conversant with this finding in which wrestlers are endomorphic mesomorphs. The highly developed mesomorphy in the wrestlers will be helpful for exerting greater force so as either to throw out or to withstand the opponent"s body.

Similarly, the subjects have shorter stature with heavier body as indicated by their BMI value. This shows that their center of gravity is at a lower level which will eventually result in greater stability and equilibrium which is advantageous while considering the technical aspects of the event.

With regard to the body composition it was observed that they possessed slightly higher quantity of fat adiposity than other sports persons. Since force = Mass x Velocity, it can be inferred that this fat deposits add to their body mass which in turn may contribute toward creating greater force on the opponent.

CONCLUSION

The results of this study confirm the fact that those sportspersons involved in strength related events are highly mesomorphic in nature. The shorter stature of the wrestlers in this investigation is advantageous as it provide lower center of gravity resulting in greater stability and equilibrium while their comparatively heavier body helps to exert greater force on the opponent.

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