The Study of The Somatotype Structures and the Performance Characteristics of Turkey's U15 Men's National Basketball Team Players[1]

Türk Yıldız Milli Erkek Basketbol Takım Sporcularının Somatotip Yapılarının ve Performans Özelliklerinin İncelenmesi

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Makalenin Geliş Tarihi: 14.09.2015 ***Yayına Kabul Tarihi: 09.11.2015***

Abstract

In the study it is aimed to assess the somatotypes and performance characteristics of The Turkey's U15 Men's National Basketball Team Players. 19 Turkish U15 National Male Basketballers (mean age 15±1 mean height 191,63±8,14 cm, mean body weight 83,52±11,41 kg) participated in the study as volunteers. In our study were taken 11 anthropometric measurements such as, skinfold thickness, circumference and width measurements. Heath-Carter method was used to determine the somatotype characteristics of the basketball players. Of performance characteristics, standing long jump test, vertical jump test, 20 m. speed run test were applied. To determine the somatotypes of the players Heath-Carter method was used. The mean values and the standart deviations of the measurements taken were calculated. Correlation was made to determine whether there was a relationship between the somatotypes and the performances of the players. The statistical analyses of the measurements were calculated by using SPSS 13.0. The average score of the performance measurement results of The Turkey's U15 Men's National Basketball Team Players was recorded as follows: vertical jump 49,05±6,55 cm; standing long jump 210,63±15,04 cm; 20 m speed run test 3,32±,19 sec. The mean somatotype values of the players that participated were found as 3,0-4,1-3,6. As a result, we think that the data obtained through this study will be beneficial to the selection of basketball players and to the preparation of the training programmes and plans for certain player positions as well as determining the somatotypes and performance characteristics of The Turkey's U19 Men's National Basketball Team Players.

Key Words: *Basketball, Anthropometry, Somatotype, Performance Tests.*

1. The thesis was presented at the 13. International Congress of Sports Sciences.

Özet

*Bu çalışmanın amacı Yıldız Milli Erkek Basketbol Takım sporcularının Somatotip yapılarının ve performans özelliklerinin incelenmesidir. Çalışmaya; Yıldız Milli Erkek Basketbol Takım sporcularından yaş ortalaması 15 yıl, boy ortalaması 191,63±8,14 cm ve vücut ağırlık ortalaması 83,52±11,41 kg olan 19 sporcusu gönüllü olarak katılmıştır. Sporcuların Somatotip özelliklerini belirlemek amacıyla Heath-Carter yöntemi kullanılmıştır. Alınan bütün ölçümlerin aritmetik ortalamaları, standart sapmaları hesaplanmıştır. Sporcuların s*omatotip yapıları ile performansları arasında ilişkinin olup olmadığını belirlemek için Correlate *yapılmıştır. İstatistiki analiz için SPSS 13.0 istatistik paket program kullanılmıştır. Yıldız Milli Erkek Basketbol Takımı sporcularının performans ölçümlerinden dikey sıçrama ortalaması 49,05±6,55 cm, durarak uzun atlama ortalaması 210,63±15,04 cm, 20 m koşu ortalaması 3,32±,19 sn olarak bulunmuştur. Yıldız Milli Erkek Basketbol Takım sporcularının somatotip ortalama değerleri ise 3,0-4,1-3,6 olarak bulunmuştur. Sonuç olarak Yıldız Milli Erkek Basketbol Takım sporcularının Somatotip yapılarını ve performans özelliklerini belirlemekle birlikte elde edilen verilerin basketbol oyuncularının seçiminde ve belirli oyuncu pozisyonlarına yönelik antrenman programlarının ve planlarının oluşturulmasında faydalı olacağı kanaatindeyiz.*

Anahtar Kelimeler: *Basketbol, Antropometri, Somatotip, Performans Testleri.*

1. Introduction

The relationship between body structure and physical activity, on which many studies have been carried out from the ancient times to our day, has been the primary aim of the several studies as it has always been sport scientists' primary concern in terms of reaching conclusions, comparisons and its association with performance (Bilge and Tuncel, 2003). For these reasons, sport scientists have intensively studied the athletes' body composition and physical profiles as well as their physiological profile (Gökdemir, Cicioğlu and Günay, 1999).

When the results of the elite level performance sports are studied, it might be seen that both victory and defeat are related to various factors (Gündüz, Sevim and Hazır, 2002).

With the help of the studies on anthropometric characteristics, it has been aimed to determine what body profile fits what sport branch and in addition to this, the athletes that fit the profiles have been selected during the talent selection period (Söğüt, Müniroğlu and Deliceoğlu, 2004).

In order to get a good level of performance in a sport, firstly, a suitable body type for that sport is considered to be essential. It is known that one's natural body structure has a significant influence on the physical activity level and on the athlete's aptness to a specific sport; yet there might be sport specific changes in the physical structure of the body as a result of regular physical activities (Gualdi-Russo and Zaccagni, 2001).

In Turkey, there are few studies associating somatotype with athletes' performance components. In our study, we aimed to study somatotypes and performance characteristics of U15 Male Basketballers.

2. Material and Method

19 Turkish U15 National Male Basketballers (mean age 15, mean height 191,63±8,14 cm, mean body weight 83,52±11,41 kg) participated in the study as volunteers while they were at a training camp in Ankara. All the measurements were taken in the sports hall of Gazi College of Physical Education and Sports.

The anthropometric measurements of the sample group were taken using the techniques of the International Biological Programme (IBP) (Lohman, Roche, and Martorel, 1988) and International Society for the Advancement of Kinanthropometry (ISAK) (Ross and Marfell-Jones, 1991).

In our study, the Heath-Carter anthropometric somatotype method was used to determine the somatotype characteristics of the basketball players (Carter and Heath, 1990). This method uses the following anthropometric measurements: height, weight, elbow and knee width, biceps and calf circumferences (Carter, and Heath, 1990).

Measurement Parameters

Vertical Jump Test: The participants were required to jump using both legs to reach as high as possible on a wall mounted tape. Before the test, standing height measurement was taken and after the test, net height was determined by subtracting the standing reach height from the jump height and recorded in centimeter. The tests were taken twice and the better scores were used (Tamer, 1995).

Standing Long Jump Test: Long jump was performed from the standing position with two feet take off. The distance between take off point and the players back heel mark on the pit was measured in centimeters. The participants were allowed two trials and the better scores were recorded (Sevim, 1997).

20 m Speed Run Test: The participants ran a 20 m distance at their maximum running speed. Their scores were recorded with a stopwatch in seconds. The participants were allowed two trials and the better scores were recorded (Sevim, 1997).

In the study Heath-Carter method was used to determine the somatotypes of the basketballers (Carter and Heath, 1990).

Statistical Analysis

The means and standard deviations of all the measurements taken were calculated. Correlation coefficient was used to determine the relationship between the players' somatotypes and their physical performance measures**.**

3. Results

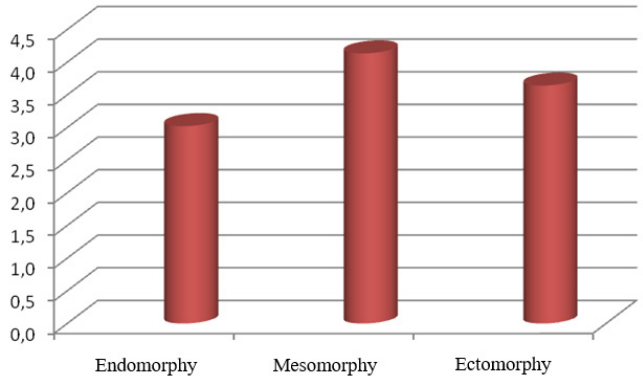
Table 1: The Mean and Standard Deviation Values of Anthropometric, Somatotype and Performance Measurements of U15 Male Basketballers.

	N	Mean	Standard Deviation
Weight (kg)	19	83,5	11,4
Height (cm)	19	191,6	8,1
Triceps (mm)	19	11,4	4,0
Subscapula skinfold (mm)	19	11,3	4,0
Suprailiac skinfold (mm)	19	11,1	4,6
Calf Skinfold (mm)	19	15,4	4,6
Biceps Skinfold (cm)	19	29,8	2,3
Calf circumference (cm)	19	38,7	2,7
Elbow width (cm)	19	8,3	0,55
Knee width (cm)	19	10,3	0,68
Vertical jump (cm)	19	49,0	6,5
Standing long jump (cm)	19	210,6	15,04
20 m run (sec)	19	3,3	0,19
Endomorphy	19	3,0	1,0
Mesomorphy	19	4,1	1,4
Ectomorphy	19	3,6	1,2

Table 2: The Correlation of the Somatotype and Performance Values of U15 Male Basketballers.

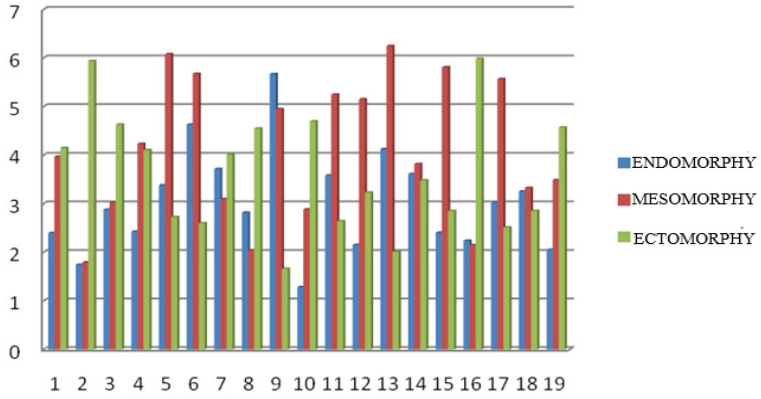
	Vertical jump	Standing long jump	20 m run
Endomorphy	-,287(*)	-,303(*)	0,19
Mesomorphy	,056	,146	-0,30(*)
Ectomorphy	,050	-,032	0,26(*)

The mean somatotype values of the partcipants -U15 Male Basketballers -in our study are shown in bar charts in Graphic 1.



Graphic 1. The mean endomorphy, mesomorphy and ectomorphy values of the U15 Male Basketballers

The mean endomorphy, mesomorphy and ectomorphy values of the U15 Male Basketballers that participated in our study ares hown in graphics in Graphic 2.



Graphic 2: The demonstration of the endomorphy, mesomorphy and ectomorphy values of U15 Male Basketballers.

With the help of the data obtained in our study, the dispersion of the mean somatotype of the U15 Male Basketballers on somatochart is shown in Figure 1.

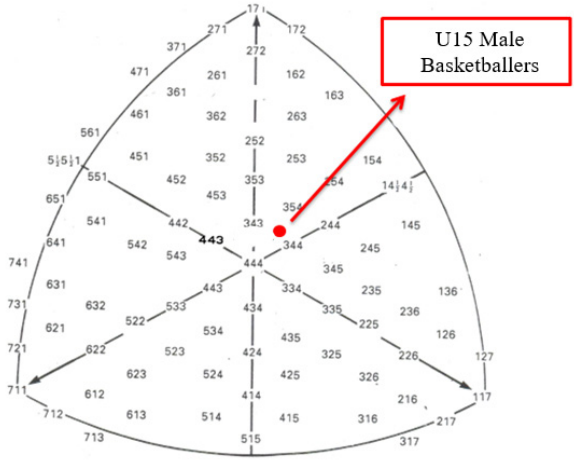


Figure 1: The dispersion of the mean somatotype of the U15 Male Basketballers on somatochart.

With the help of the data obtained in our study, the dispersion of the individual somatotypes of the U15 Male Basketballers on somatochart is shown in Figure 2.

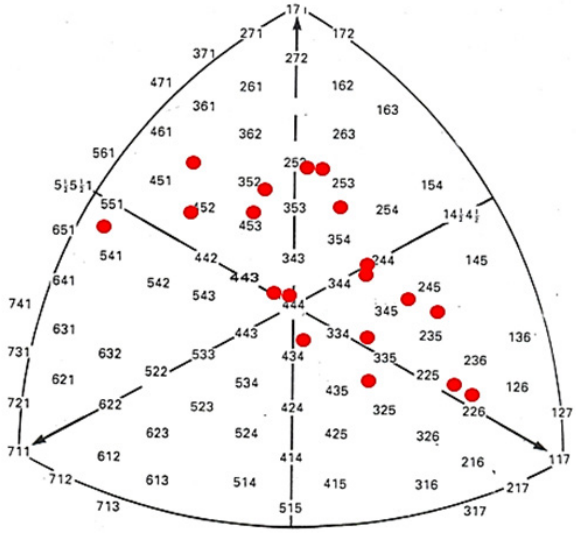


Figure 2: The dispersion of the individual somatotypes of the U15 Male Basketballers on somatochart.

4. Discussion and Conclusions

The human body formed by the interaction of the genetic and environmental factors has a significantly high adaptation ability. The exercises related to the sport branch in practise help the body to get the desired form, which improves the performance and makes the body structure more advantageous (Özer, 1993; Tamer, 1995).

Success is the main concern in all sports. Scientific sports studies that have been carried out increasingly in Turkey have a positive effect on success in sports. In the studies, it has been demonstrated that the structural characteristics of the body are different depending on sports or the branches of a sport. The data collected is considered to be crucial in guiding and educating the young players as well as improving elite athletes' training and performance. Therefore, the determination of the morphological structures of the players is important (Carter and Heath, 1990; Heyward and Stolarczyk, 1996; Ross and Marfell-Jones, 1991; Zorba and Ziyagil, 1995).

In our study the mean somatotype values of the U15 Men's National Basketball Team Players were found as 3,0-4,1-3,6 and the basketballers' somatotype structures were determined as mesomorphic-ectomorph.

Carter and Heath, (1990) and his friends in their study determined the somatotype values of the 10 basketball players (mean age 19.6 years old) as 2,7-4,9-3,0 In another study including 10 basketball players (mean age 20 years old) by Carter and Heath, (1990) and his friends, somatotype values were determined as 2,4-4,9-3,3. These findings are in parallel with the those in our study.

Perez (1981) and his friends determined the somatotype values of the basketballers as 1,9-4,4-3,7 in their study with 21 basketball players at the age of 20 years old (cited Carter and Heath,1990). In the study (including 10 basketballers at the age of 14,9 years old) by Haley and his friends. (1974) they determined the somatotype values of the basketballers as 2,2-4,4-4,1(cited Carter and Heath,1990). In the study by Kalkavan, and his friends. (1996) including 36 basketballers, 32 volleyball players and 46 footballers at a varying mean age between 12 and 15 years old and 19 sedentaries at same age group, they determined somatotype values as 1,7-5,2-3,4 for basketballers In the study by Mathur, and his friends. (1985) including 121 athletes (mean age 24,2 years old) from different branches of sports (30 basketball players, 16 handball players, 18 badminton players, 24 hockey players, 8 judo fighters, 25 footballers), they determined the somatotype values of the basketballers as 1,9-5,3-3,4. These findings are in parallel with the those in our study.

In the study by Zapletalova, and his friends. (1980) including 29 basketballers (mean age 13,14 years old), they found the somatotype values of the basketballers as 3,0-3,5-4,0 and in their another study including 54 basketballers with 15,16 -year-old mean age, they determined the somatotype values as 2,5-3,5-4,0 and finally, Zapletalova, and his friends. (1980) determined somatotype values as 2,0-4,0-4,5 in their

study including 37 basketball players (mean age 17,18 years old) (cited Carter and Heath, 1990). In the study by Alonso, and his friends. (1986) including 25 basketballers with 12,5 year-old mean age, they found the somatotype values of the basketballers as 2,3-4,0-4,1 (Carter and Heath, 1990). These findings are not in parallel with the those in our study.

The differences between the somatotype structures in our study and the those in literature are thought to stem from the differences of the structural characteristics related to the growth and development period of athletes in developmental age and being effected by the environmental factors.

When somatotype and performance values of the The Turkey's U15 Men's National Basketball Team Players compared, low negative relationship between endomorphy and vertical jump and standing long jump and low positive relationship between endomorphy and 20m run ; low positive relationship between mesomorphy and vertical jump and standing long jump, low negative relationship between mesomorphy and 20m run; low positive relationship between ectomorphy and vertical jump and 20m run, low negative relationship between ectomorphy and standing long jump were dedected.

Despite a number of different methodologies used in the studies on determining the relationship between physical performance measures and somatotype characteristics , generally, positive effects of the mesomorphic and negative effects of the endomorphic components on physical performance variables are pronounced. These studies have indicated that the mesomorphy has positive association with physical performance variables such as endurance, explosive power, strength, and speed, whereas endomorphic component has negative association with the performance measures (Gürses and Olgun, 1991).

In Raudsepp and Jurimae, (1996). study the relationship between somatotype and physical fitness were not significant. Generally, endomorphy has low negative and mesomorphy positive relationships with physical fitness tests, whereas ectomorphy correlates significantly with physical fitness measures. Physical fitness elements had low positive correlation with mesomorphy and low negative correlation with endomorphy. The negative association between physical fitness and endomorphy was obvious especially in the activities requiring the whole body movement. Ectomorphy had no or slight correlation with physical fitness scores. These findings have smilaraties with the those in our study.

In conclusion, high level physical fitness capacity and a good motoric characteristic are needed to be successfull at elite level as well as skills related to sport branches. We think that the data obtained through this study will be beneficial to the selection of the basketball players and to the preparation of the training programmes and plans for certain player positions as well as determining the somatotypes and performance

characteristics of The Turkey's U15 Men's National Basketball Team Players, and it will also contribute to the studies on this field in our country.

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