Full Length Research Paper

Physical profiles of Turkish young Greco-Roman wrestlers

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The aim of this study is to evaluate some physical properties of Turkish National Greco-Roman wrestlers and reveal the profile of Turkish Young National Greco-Roman athlete. A total of 48 male athletes who were from Turkish Young National Greco-Roman Wrestling Team participated in this study. This study was carried out at Wrestling Federation National Team Camp Centre on May, 2011. Before the research, all the required permissions were taken and voluntary forms were filled in by the wrestlers. Respectively the age, height, weight and training years of the ones who participated in the study are 18,61±1,01 years old, 173,00±8,79 cm, 77,88±18,84 kg and 8,09±2,7 years. Resting heart rate, flexibility, vertical jump, 10m-20m-30m speeds, aerobic power (VO_{2Max}), strength (hand, back and leg), visual and auditory reaction time and body fat percentage were determined. Data were analysed by the descriptive statistics (mean, standard deviation, minimum and maximum) of SPSS 18 Programme. The flexibility; 10m-20m-30m speeds; VO_{2Max}; right-left handgrip, leg and back strength; visual right, visual left, auditory right and auditory left reaction times and body fat percentage values of elite young Greco-Roman wrestlers were respectively determined as; 35,15 cm; 1,637 s, 3,001 s, 4,315 s 56,45 (ml/kg/min); 52,68 kg-f, 50,89 kg-f, 179,48 kg-f and 153,98 kg-f; 214,18 msn, 208,68 msn, 178,89 msn, 188,02 msn and 11,04%. As a result of the fact that, in Greco-Roman wrestling, wrestlers using only their tops affects their physical structures. Accordingly, it is seen that Turkish Young National Greco-Roman wrestlers and others from different countries have several characteristics in common in terms of physical structure and performance.

Key words: Greco-Roman, wrestling, profile, performance.

INTRODUCTION

Wrestling is the one of the oldest sport in all disciplines. A wrestling bout is a physical competition, between two competitors, who attempt to gain and maintain a superior position. There are two basic styles of international wrestling, Freestyle and Greco-Roman. The Greco-Roman Style and Freestyle basically differ from each other. In Greco-Roman wrestling, it is strictly forbidden to grasp the opponent below the belt line or to trip him or to use the legs actively to perform any action (International Rule Book, 2014). In Freestyle both men and women can compete, but in Greco-Roman style, only men can compete (Çankaya, 2012).

The latest rule changes in wrestling have made anaerobic energy metabolism more important than aerobic performance because of the shortening of the wrestling match duration and the reduction of the tournament to one day (Çankaya, 2012). Wrestling is an intermittent sport characterized by short duration, high intensity bursts of activity. It requires significant anaerobic fitness, and operates within a moderato-level of aerobic system. Percent contribution of energy systems in wrestling is estimated to be 30% alactic anaerobic, 30% lactic anaerobic and 40% aerobic (Yamaner et al, 2010). The studies carried out show that in order to provide for the circulatory, respiratory and muscular systems of the wrestlers, several training methods and basic motoric features, aerobic and anaerobic capacities have to be developed (Yoon, 2002; Mirzaei et al., 2010).

The physical and physiological developments of elite athletes are followed with interest by scientists all over the world and athlete profile created particular to branch. Correspondingly with the developing the Greco-Roman style wrestling, athlete necessity and athlete interest increase day by day. In this study, the exposure of physical profiles of elite wrestlers who are a part of Young Greco-Roman National Team and the comparison between other athletes in literature are aimed.

MATERIAL AND METHOD

Subjects

A total of 48 male athletes who were form Turkish Young National Greco-Roman Wrestling Team participated in this study. Respectively the age, height, weight and training years of the ones who participated in the study are 18,61±1,01 years old, 173,00±8,79 cm, 77,88±18,84 kg and 8,09±2,7 years. Before the research, all the required permissions were taken from Wrestling Federation and voluntary forms indicating there are no health problems or any injuries and personal information forms were filled in by the athletes. This study was carried out at Turkish Wrestling Federation's Preparation Camp which took place in 2011 activity programme (27/04-12/05/2011) (Table 1).

Data collection

Measuring of height and weight: Their height was measured with a 0.1 cm sensitive stadiometer made of metal and stable on the weighbridge, and their weight was measured with a 0.1 kg sensitive bascule (SECA electronic scale) with bare foot and light dresses.
Resting heart rate: After they rested in supine position for 15 min, they were auscultated at the same position. The resting heart rate was measured for 15 s by the palpation method and the results were multiplied by four.
Flexibility measuring: Sit and reach test was used. For this measure, Lafayette brand Sit and Rich test were used. This is the commonly used test for measuring lower back and hamstring flexibility.
Reaction time measuring: Wrestlers' auditory and visual reaction

Table 1. Physical properties of wrestlers who participated in the study.

Variables	(n=48)
Age (year)	18,61±1,01
Height (cm)	173,00±8,79
Weight (kg)	77,88±18,84
Training years (year)	8,09±2,7

times were measured by a New-Test 1000 brand reaction timer in terms of 1/1000 s.
Aerobic power measuring: Aerobic power was measured with 20m shuttle runs. They run this 20m as a round trip. According to their laps, their VO$_{2Max}$ levels were determined by indirect methods (Leger, 1982).
Vertical jump: It was done with the help of 1 cm spaced scales marked on the wall. The difference between the highest point the athlete touched without jumping and with jumping creates the measurement value.
10-20-30m speed test: The tests were started after 20 min warm-up session. New Test 2000 Powertimer gates are used as the measurement device. The subjects made their start on foot from one meter distance to the photocell. When they are ready, they run with a maximum speed.
Handgrip strength: Takei A5401 digital hand grip dynamometer was used to measure hand grip strength. It was made real by Takei brand back-leg and hand dynamometers.
Back and leg strength: Back and leg strength was measured with Takei 5402 back and leg muscle digital dynamometer.
Body fat percentage: Holtain skin fold calliper was used. When the wrestler was in the upright position, it was taken from the right side and determined according to the Durnin-Womersley formulae (Durnin and Womersley, 1974). The calculation of body fat % involves measuring four skinfold sites, triceps, biceps, subscapular and suprailiac.
Data analysis: It was evaluated in SPSS 17 programme by using descriptive statistics and 95 % confidence interval was calculated (mean, standard deviation, and minimum and maximum).

RESULTS

The results are expressed in Tables 2-4.

DISCUSSION

In this part, comments based on the findings gathered in our study and the findings in other studies take place.
Resting heart rate: In our study, the resting heart rate of the wrestlers was found as 63.2 bpm. When we think of the average human pulse, 60 - 100 bpm (Target Heart Rates, 2015), the researchers state that in many sports branches, the resting pulse of the athletes is lower and this is due to the effects of long term and tough trainings on the increase of heart's volume (Guyton and Hall, 2006). In a study where national team athletes and

Table 2. Physical parameters of wrestlers.

Variables	Mean	Minimum	Maximum	SD
Resting heart rate (bpm)	63,2	52	71	6,20
Flexibility (cm)	35,15	16	52	8,23
Vertical jump (cm)	49,43	35	65	6,4
VO $_{Max2}$ (ml/kg/min)	56,45	43,08	68,16	8,24
Body fat (%)	11,04	8,56	15,24	3,42

bpm=beats per minute.

Table 3. 10-20-30 m sprint parameters of wrestlers.

Variables	Mean	Minimum	Maximum	SD
10m speed (s)	1,637	1,431	1,923	0,098
20m speed (s)	3,001	2,627	3,515	0,189
30m speed (s)	4,315	3,784	5,075	0,259

Table 4. Other physical parameters of Greco-Roman wrestlers.

Variables	Mean	Minimum	Maximum	SD
Right hand (kg-f)	52,68	33,80	77,00	9,87
Left hand (kg-f)	50,89	32,70	70,30	10,17
Leg strength (kg-f)	179,48	116,50	284	35,36
Back strength (kg-f)	153,98	107,50	207,50	25,92
Right visual reaction (s)	214,18	173	315	29,61
Left visual reaction (s)	208,68	167	294	25,66
Right auditory reaction (s)	178,89	123	258	25,60
Left auditory reaction (s)	188,02	122	301	36,63

university athletes are compared, the average pulse of the national wrestlers and the university athletes is respectively identified as 59.55 bpm. and 75.40 bpm (Alpay and Hazar, 2006). In a study carried out in 2012, the physiological profiles of the Egyptian young wrestlers were observed and their resting pulse average was 68.67 bpm (Saad, 2012). In our study, the average heart rate of the wrestlers at the same age group was 63,2 bpm.

Flexibility: In wrestling, flexibility has importance on the reduction of injuries, and the moves unique to the branches done properly and right. In our study, the flexibility values of the wrestlers are determined as 35.15 cm. Mirzaei et al. (2011) found out in a study that the flexibility value of the wrestlers was approximately 45 cm. In other study where 39 freestyle and 53 Greco-Roman wrestlers, whose ages change between 18-20, partici-pated, the average measuring flexibility values (< 24,1 cm) of all the athletes were below 35.15 cm (Gullon et al, 2011).

Vertical jump: The average vertical jump value of the elite Greco-Roman wrestlers was 49.43. Athletes must have a good anaerobic capacity due to characteristic of wrestling. In a study carried out on elite freestyle wrestlers, the average vertical jump was 60 cm (Callan et al., 2000). In a study where the vertical jump perfor-mances of the volleyball players and the wrestlers are compared, the average value of the wrestlers was 34.60 cm lower than that of volleyball players. This result is lower than the ones in our study (Atan et al., 2012).

10m-20m-30m speed: When their speed was observed in 10, 20 and 30m, the results were respectively 1.62, 3.00 and 4.31 s. In Gullon et al. study, physical properties of freestyle and Greco-Roman wrestlers were compared and no significant difference was found in 10m speed values. The lowest average 10m speed value was determined as 1.74 s (Gullon et al., 2011). Bayraktar et al. found out in a study conducted on wrestlers whose ages change between 15-17 that 30m speed values are 4.58 s and 4.59 s (Bayraktar et al., 2012).

Aerobic capacity: MaxVO2 value in elite Greco-Roman

wrestlers is found out as approximately 56.45 (ml/kg/min). When Colombia National Wrestling Team's average MaxVO2 was 45.9 (ml/kg/min) (Velez et al., 2014), in other studies state athletes' average value was 49 (ml/kg/min) (Çankaya, 2012; Hakkinen et al., 1984). In another study performed on wrestlers preparing for the Olympics, 3 measurements were done in 7 months. The highest of these was found in the middle of 7 month period as 57.1 (ml/kg/min). This value is higher than the one in our study (Utter et al., 2002). While Mirzaei presented the MaxVO2 in Persian Young Freestyle Wrestlers as 50.5±4.7 ml/kg/min, Rahmani-Nia presented the values in Persian Young Greco-Roman Wrestlers as 50.0±4.75 ml/kg/min (Mirzaei et al., 2009; Rahmani-Nia et al., 2007). The reason why aerobic capacity values vary can be explained by training status, weight and different environmental factors where the measuring takes place.

Strength measuring: In wrestling both upper and lower extremity strength is important and attracts the attention as a basic quality in finding out the sportive performance. The average values of elite wrestlers' right-left hand grip, leg and back strength are respectively 52.68, 50.89, 179.48 and 153.98 kg. In a study where Greco-Roman and Freestyle wrestlers are observed, Greco-Roman wrestlers presented more right and left handgrip strength value (Bayraktar et al., 2012). In study carried out in 2012 where top wrestlers are compared, in all values (right-left hand, leg and back strength), Greco-Roman wrestlers' values were higher than those of Freestyle wrestlers' (Demirkan et al., 2014).

Reaction time measuring: When the reaction times of the wrestlers are compared, right-left visual and right-left auditory reaction times are respectively found as 214.18, 208.68, 178.89 and 188.02 ms. In a study where elite top wrestlers' reaction times are observed in two styles, it is found out that freestyle wrestlers' reaction times, except right visual reaction, are lower than those of Greco-Roman wrestlers' (Koç, 2013). When it is thought that sudden moves affect the result of the bout in wrestling branches, performing the right move at a right time has a close link with fast reaction time.

Body fat percentage: In study, the body fat percentage of elite wrestlers is determined as 11.04%. In literatures we come across studies related to body composition of the wrestlers. From these, Demirkan et al. (2014) determined the percentage in freestyle wrestlers as 9% and in Greco-Roman style wrestlers as 8.7%. Vardar et al. (2007) found the body fat percentage of elite wrestlers whose average age is 17.3, as 9.7%. In a study where freestyle and Greco-Roman wrestlers are observed in 3 different divisions, in overweight group the average body fat percentage was equal but in middleweight and heavyweight body fat percentage of Greco-Roman

wrestlers is much more lower (Gullon et al., 2011). In another study where 11 Greco-Roman wrestlers were chosen for the national team, the average body fat percentage was presented as 9.6% (Demirkan et al., 2012). Akyuz et al. (2010) determined the body fat percentage for national wrestlers whose average age is 19, as 9.8%. In another study carried out in 2009, segmental analysis of body compositions of freestyle and Greco-Roman wrestlers was done and total fat percentage in freestyle was 11.5% and in Greco-Roman style, it was 11% (Demirkan et al., 2011). Looking at the studies concerning body composition and this study, close results can be observed.

The athlete reaching sufficient physical maturity in elite level depends on how early he starts wrestling and the suitability of the conditions put forward by the basic motoric features during development process. Besides, we can say that wrestlers using only their tops will have their physical profiles affected. It is seen that Turkish Young National Greco-Roman wrestlers and others from different countries have several characteristics in common in terms of physical structure and performance.

Conflict of Interests

The author has not declared any conflict of interests.

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