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ELITE TURKISH GRECO-ROMAN WRESTLERS ANAEROBIK AND AEROBIC POWER PROFILES

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Abstract

Aim. The aim of the study is to determine the aerobic and anaerobic strength parameters of elite level Turkish Greco-Roman wrestlers.

Methods. The study examined the wrestlers' physical attributes (height, body weight), anaerobic power (maximum anaerobic force), and aerobic capacity (maximum oxygen consumption). The Bruce protocol was used to test aerobic capacity and determine VO2 max.

Results. These results demonstrate that Turkish Greco-Roman wrestlers' physiological and physical characteristics are comparable to those of wrestlers from other nations.

Conclusions. Training regimens can be designed in a more individualized and efficient manner by carefully examining the wrestlers' anaerobic and aerobic capacity. In turn, this improves wrestlers' performance and boosts their level of competitive success.

Keywords: greco-roman wrestlers, anaerobik power, aerobic power, turkish wrestlers.

Introduction

The examination of various physical and physiological attributes is crucial for enhancing and maximizing the performance of elite athletes (Astrand & Rodahl, 1977). Greco-Roman wrestling, being a sport that demands a high level of both aerobic and anaerobic capacity, calls for a comprehensive understanding of the aerobic and anaerobic force profiles of elite-level wrestlers (Bloomfield, Ackland & Elliott, 1994). By analyzing the detailed physical and physiological characteristics of elite Greco-Roman wrestlers in Turkey, this study aims to improve the effectiveness of training programs and optimize the performance of these athletes (Baykuş, 1989).

The main purpose of the study is to determine the aerobic and anaerobic strength parameters of elite level Turkish Greco-Roman wrestlers and to reveal how these parameters can be used in the preparation of training programs. The research covers various physical and physiological measurements of wrestlers, such as age, height, body weight, body mass index, body fat percentage, maximal oxygen consumption (VO2 max), maximal heart rate, maximal minute ventilation, maximal respiratory rate (RER), and maximal anaerobic force. A detailed analysis of these parameters will allow wrestlers' training programs to be optimized according to their individual needs.

The hypothesis of this research is that the aerobic and anaerobic strength profiles of elite Greco-Roman wrestlers are an important determinant for their success in national and international competitions. Additionally, it is envisaged that these profiles will help wrestlers to plan their individual training programs more effectively. This hypothesis is based on the assumption that the physical and physiological characteristics of wrestlers directly affect their performance in competitions. In particular factors such as aerobic capacity and anaerobic power are thought to be decisive on the endurance and power bursts displayed by wrestlers during the competition.

The research organization:

Subjects. Twenty professional Greco-Roman wrestlers volunteered to take part in the study. Based on their body mass, the participants were split into three groups: Lightweight (52–68 kg), Middleweight (72–78 kg), and Heavyweight (82-132 kg). These wrestlers, who are exceptional athletes between the ages of 18 and 26, place in the top three in both national and international competitions. Each of these athletes have a specific degree of training history and competition experience, making them eligible to perform the physiological and physical examinations needed for the study

Methods

The study examined the wrestlers' physical attributes (height, body weight), anaerobic power (maximum anaerobic force), and aerobic capacity (maximum oxygen consumption). The Bruce protocol was used to test aerobic capacity and determine VO2 max. Through the Wingate test, anaerobic power was assessed. These tests show wrestlers' ability to maintain maximal power for brief intervals of time as well as their long-term endurance abilities.

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Results

Physical properties

The average age, training experience, height, body weight, and body mass index of the wrestlers were as follows: 21.6 ± 2.5 years, 10.5 ± 2.9 years, 80.4 ± 17.5 kg, 27 ± 4.4 kg/m², and 11.6% ± 3.7 for the wrestlers, according to the study's results. These physical attributes reveal vital details about the wrestlers' overall health and level of training ability. Wrestlers are very strong and durable due to their high body mass index and low body fat percentages.

Table 1. Subject descriptive data (mean ± SD and range: min-max).

	Light Weight	**Middle Weight**	**Heavy Weight**	**Total group**
	n=6	n=7	n=7	n=20
Age (years)	21.7±1.5 20 – 23	21.9±2.7 18 – 26	21.4±2.9 18 – 26	21.6±2.5 18 – 26
Height (cm)	162.8±4.5 160 – 168	170.7±4.3 165 – 178	177.2±4.0 172 – 183	172±6.6 160 – 183
Weight (kg)	21.7±1.5 20 – 23	75.3±1.9 72 – 78	95.0±16.8 82 – 132	80.4±17.5 52 – 132
Training (years	58.4±5.3 52 – 62	11.0±3.1 6 – 16	10.1±3.5 7 – 16	10.5±2.9 6 – 16
Body Fat (%)	10±0,9 9 – 11	10.2±1.8 8 – 12	13.8±4.9 8 – 22	11.6±3.7 8 – 22
Body mass index (kg/m2)	21.7±1.5 20 – 23	25.9±1.2 24 – 28	30.2±4.7 27 – 40	27±4.4 20 – 40

Aerobic capacity

The Bruce technique was used to calculate the wrestlers' maximum oxygen consumption (VO2 max) and assess their aerobic capacity. The wrestlers' aerobic endurance levels are indicated by their VO2 max numbers. The study's findings showed that the maximum oxygen consumption was 56.6 ± 7.7 ml·kg-1·min-1. The highest heart rate measured was 189.7 ± 10.1 bpm, the highest minute ventilation was 153.1 ± 24.6 l/min, and the highest respiratory rate (RER) was 1.1 ± 0.0. The results indicate that the aerobic capacity of wrestlers is high.

Table 2. Values of maximum oxygen uptake, heart rate, maximum ventilation and respiratory exchange ratio (mean ± SD and range: min-max)

	Light Weight	**Middle Weight**	**Heavy Weight**	**Total group**
	n=6	n=7	n=7	n=20
MaxVO2 (ml/kg/min)	61.5±5.7 57 – 68	60.8±5.5 54 – 68	50.4±6.3 41 – 58	56.6±7.7 41 – 68

HRmax	192.7±5.0	192.7±7.0	185.4±13.3	189.7±10.1
(pulse/min)	188 – 198	180 – 202	169 – 202	169 – 202
VEmakx	135.8±7.3	152.5±16.3	161.2±33.1	153.1±24.6
(lt/dk)	129 – 177	134 – 177	103 – 200	103 – 200
RER	1.1±0.0 1–1	1.1±0.0 1–1	1.1±0.0 1–1	1.1±0.0 1–1

MaxVO2 = maximal oxygen uptake; *HRmax* = maximum heart rate; *VEmax* =maximum minute ventilation; *RER*= respiratory exchange ratio

Anaerobic power

The Wingate test was utilized to measure the values of anaerobic power. The Wingate test determines a wrestler's ability to exert maximum force for brief intervals of time. The test findings showed that the minimum force was 233.9 ± 65.2 W·s-1, the average force (W·kg-1) was 7.5 ± 0.7, and the maximum anaerobic force was 592.4 ± 111.2 W. These findings demonstrate that wrestlers possess a high anaerobic power and a strong capacity to generate maximum power for brief intervals.

Table 3. Values of anaerobic power parameters (mean ± SD and range: min-max)

	Light Weight	**Middle Weight**	**Heavy Weight**	**Total group**
	n=6	n=7	n=7	n=20
Mean power	443.2±76.3	567.7±41.6	681.1±90.9	592.4±111.2
(W)	375 – 525	499 – 627	583 – 837	375 – 837
Peak Power/kg	13.2±2.4	13.3±1.7	13.7±1.9	13.5±1.8
(W/kg)	11 – 16	11 – 16	11 – 16	11 – 16
Peak Power	772.8±170.4	1003.5±134.2	1270.5±2003.5	1072.7±249
(W)	651– 968	825 – 1191	926 – 1532	651 – 1532
MeanPower	7.6±0.9	7.5±0.6	7.3±0.7	7.5±0.7
(W/kg)	7 – 9	7 – 8	6 – 8	6 – 9
Minimum	172.4±54	241.7±54.1	252.4±71.1	233.9±65.2
Power (W)	111 – 212	132-287	133 – 348	111 – 348
Minimum	2.9±0.7	3.2±0.7	2.7±0.7	3±0.7
Power(W/kg)	2 – 3	2 – 4	1 – 3	1 – 4

Discussions

These findings demonstrate that Turkish Greco-Roman wrestlers' physiological and physical characteristics are comparable to those of wrestlers from other nations. To boost success, it is stressed that more rigorous and structured training regimens should be used. Wrestlers will be able to maximize their performance and have more success if their specific training plans take these aerobic and anaerobic characteristics into consideration. Other researchers, Bahman et al. (2009), Gökdemir (2000) have reached the same conclusions as our study.

Conclusions

Finally, a thorough examination of the anaerobic and aerobic force profiles of top Turkish Greco-Roman wrestlers is presented in this study. The research findings offer valuable information for tailoring wrestlers' training regimens to their specific needs. By using this knowledge, coaches can create training plans that are more efficient in maximizing the physical and physiological potential of wrestlers. Higher success rates in regional, national, and worldwide competitions will result from this.

Also, this study offers valuable insights into how training regimens for wrestlers might be developed in a more methodical, data-driven way. Training regimens can be designed in a more individualized and efficient manner by carefully examining the wrestlers' anaerobic and aerobic capacity. In turn, this improves wrestlers' performance and boosts their level of competitive success.

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