Investigation of Physical and Some Motoric Characteristics of Kyrgyz Junior and Cadet Women National Wrestling Team

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Abstract

The research was conducted on 17 wrestlers wrestling in the Kyrgyz national women's national team (n: 9 / age: 15.44 ± 1.13 years) and Junior (n: 8 / age: 20.38 ± 1.99 years). Wrestlers' body weight, height, body mass index (BMI), claw strength, back-leg strength, sprint levels of 10-30 meters, body fat percentages, flexibility levels, anaerobic power and circumference were measured and recorded according to the procedure. Analyzes of the data obtained were made in the SPSS-20 package program, T-test was used for independent sample groups for statistical analysis, and the differences at the level of P<0.05 were considered significant. The BMI average of young female wrestlers was significantly higher than cadet national women wrestlers (p<0.05). A difference at the level of (p<0.05) was found in the sports age of junior women compared to cadet women. Back and leg strengths of junior women 10 and 30 meters sprint times of junior women wrestlers were found to be significantly lower than cadet women wrestlers (p<0.05). Chest and right arm biceps (flexion and extension) circumference measurements of junior women wrestlers were found to be significantly higher than cadet women wrestlers (p<0.05). As a result, the back-leg strength of junior women wrestlers, BMI, reflected higher averages than cadet women wrestlers. As a result, the back-leg strength of junior women wrestlers, BMI, reflected higher averages than cadet women wrestlers. These results were evaluated as a natural reflection of age and sports age.

Keywords: Women wrestling, Body composition, Physical measurements

Introduction

Wrestling is one of the oldest known sports in the world and is held in two styles in the Olympic category, freestyle and Greco-Roman. United World Wrestling has determined different weight categories for Greco-Roman and freestyle wrestling since 2018. Besides, it has decided that the competitions will be held in 10 weights in the Continental and World Championships, while in 6 in the Olympic Games. These decisions increased the competition for medals in the Olympics in wrestling. Women's wrestling is performed in different weight categories, subject to the competition rules of freestyle wrestling.

The superior performance demonstrated in wrestling sport is possible with the biomotor competencies that the branch needs, as well as the predisposition of the body composition to the branch. Wrestling is the struggle of two wrestlers to gain superiority over each other by integrating technical, tactical intelligence and biomotor features with strategies within the rules determined by the United World Wrestling(UWW).

Wrestling is a regular sporting activity that continues in both the old and modern Olympic Games. The ongoing international wrestling tournaments cover gender and weight sections and various age categories (Arakawa et al., 2020). The importance of body composition for achieving success in wrestling athletes has been emphasized in many studies (Arakawa, at al 2015; Sharratt, et al., 1986; Yaşar & Sağır 2019; İmamoğlu, et al., 1999; Demirel, 2015). In addition, in many studies, the importance and necessity of motoric features such as strength, speed, and flexibility in wrestlers' superiority to the opponent have been stated in many studies. (Cicioğlu et al., 2007; Günaydın et al., 2002; Arakawa, at al 2020; Sharratt, et al., 1986).

Although many studies have been conducted on elite male wrestlers, there are limited number of studies examining elite female wrestlers representing their country and competing in international arenas. In this context, the findings of our research are thought to contribute to future studies.

In our research conducted in the light of this information, the physical and some biomotor characteristics of the Kyrgyz national cadet and junior woman wrestlers were determined and their differences according to the age factor were examined.

Material and Method

Participants

The research was carried out on 17 wrestlers wrestling in the Kyrgyz national women's team (n: 9 / age: 15.44 ± 1.13 years) and Junior (n: 8 / age: 20.38 ± 1.99 years). The research data were collected at the end of the national team camp work, which lasted 20 days during the 2018 competition period.

Measurements and Tests

Body Weight and Height Measurements: Bodyweight (VA) measurements were made with an electronic scale with an accuracy of ± 0.1 kg and wrestling jersey. Length measurements were made with an accuracy of ± 0.01mm (Gordon et al., 1988).

Body circumference Measurements: Body circumference measurements were made using Gulick anthropometric tape measure with proper methods (Harrison et al., 1988; Heyward and Stolarczyk, 1996).

Body fat measurements: Body Fat Percentage was determined by measuring skinfold thickness at 6 sites (biceps, triceps, pectoralis, subscapula, suprailic, and Quadriceps) and percentage fat calculated using the Lange formula (Açıkada et al., 1991)

Flexibility Test: This test of individual trunk and lower extremities was applied to measure flexibility. Athletes to the test stand bare feet propped in a way that is straight. Athletes body forward, taking care not to bend the knee and extend forward as far as it goes. In this way, the athletes tried to stop at the farthest point. The test was repeated three times and the higher value was recorded. (Tamer, 2000).

Strength measurements: Back and leg strengths were measured with Back and leg dynamometer (Takei-Back &Lift). Claw strengths were measured using isometric dynamometer (Takei-Hand Grip). Claw strengths were taken measurements from the dominant arm. (Heyward, 2002).

Sprint test (10–30 Meters): The athletes were subjected to the 10 and 30 m maximal running test in the gym. The scores were taken with a photocell (Sport Expert MPS 501 Model). The scores were recorded in terms of the best 10 meters and 30 meters of the athlete: 1/1000 (sec) after two repetitions.

Strength measurements: Back and leg strengths were measured with Back and leg dynamometer (Takei-Back &Lift). Claw strengths were measured using an isometric dynamometer (Takei-Hand Grip). (Heyward, 2002).

BMI (Body Mass Index): Body mass index values were calculated using the formula of body weight and height [BMI (kg/m2) = Body weight (kg)/ Height (m²)], (Heyward and Stolarczyk, 1996).

Anaerobic Power: The peak and average anaerobic power of the volunteers were calculated with Johnson & Bahamonde formula using data from jump distance, body weight and height. (Johnson and Bahamonde, 1996).

Peak power (W)=[78.6 x VJ (cm)]+[60.3 x BW (kg)]-[15.3 x Height(cm)]-1308
Average power (W) = [43.8 x VJ(cm)]+[32.7 x BW (kg)]-[16.8 x Height(cm)]+431
 VJ, (Vertical jump); BW, (bodyweight)

Body density calculation: The formula given below was used to calculate the body density (Jackson et al.,1980)
Body Density = 1.0994921 – (0.0009929 x sum of tricep, suprailiac and thigh skinfolds in mm) + (0.0000023 x square of the sum of tricep, suprailiac and thigh) – (0.0001392 x age)

Statistical evaluation: Data were analyzed by using SPSS version 20.00 software computer package program. The suitability of variables to parametric tests was evaluated according to the Shapiro-Wilk test, considering the number of subjects. It was determined that the data showed normal distribution. Independent sample t-test was applied to test whether there is a difference between the two women wrestler groups. A p-value < 0.05 was considered statistically significant.

Findings

The results determined from cadet and junior women wrestlers competing in the Kyrgyz national team and their comparisons are given in the tables below.

Table 1. Results on the demographic characteristics of women wrestlers (n=17)

Variable	Junior (n=8)	Cadet (n=9)	t	p
Age (year)	20.38±1,99	15.44±1.13	6.367	.000
Height (cm)	160.00±8.33	160.28±7.56	-0.072	.943
Weight (kg)	59.88±9.97	52.73±8.83	1.566	.138
Sport age	5.50±1.19	3.22±2.16	2.633	.019
BMI- (kg/m**2**)	23.23±1.73	20.37±1.74	3.394	.004
Body fat (%)	7.46±0.29	7.25±0.56	0.947	.359
Body density (g/ml)	1.0764±0.002	1.0781±0.003	-1.285	.218

p<0.05 BMI (body mass index)

As seen in table 1, the average age and sports age of junior women wrestlers were found to be significantly higher than cadet women wrestlers as expected. (p<0.05). In addition, BMI averages of junior women wrestlers also reflected statistically high averages (p<0.05).

Table 2. Body circumference and flexibility results of women wrestlers (n=17)

Variable	Junior (n=8)	Cadet (n=9)	t	p
Neck cir. (cm)	34.83±1.88	33.19±2.07	1.695	.111
Shoulder c. (cm)	103.44±7.47	97.22±6.64	1.816	.089
Chest c. (cm)	88.75±4.33	82.78±4.75	2.693	.017
Biceps- flx right c. (cm)	30.77±3.10	27.80±2.08	2.343	.033
Biceps-flx left c. (cm)	30.36±2.58	28.13±2.28	1.888	.079
Biceps -ex right c. (cm)	28.18±2.50	25.52±2.52	2.182	.045
Biceps-ex left c. (cm)	27.62±2.62	25.77±2.35	1.588	.147
Waist c. (cm)	76.71±5.94	73.83±5.07	1.078	.298
Hip c. (cm)	92.75±5.80	87.11±7.11	1.776	.096
Femur c. (cm)	53.26±3.93	49.55±3.94	1.935	.072
Flexibility (cm)	34.55±3.84	31.72±3.71	1.541	.144

p<0.05 ex: extantion, flx :flexion: c:Circumference

Chest of junior women wrestlers, Biceps - flx (right) and Biceps -ex (right). mean deaths in the environment were statistically significantly higher than cadet women wrestlers (p <0.05).

Table 3. Results of strength, anaerobic power and sprint and flexibility measurement results of female wrestlers (n=17).

Variable	Junior (n=8)	Cadet (n=9)	t	p
Average power (watt)	976.58±348.32	659.91±291.95	2.040	.059
peak power (watt)	2143.68±729.99	1567.97±601.31	1.783	.095
Vertical jump (cm)	29.13±5.35	27.33±7.05	0.584	.568
Sprint 10 meter	2.27±0.26	3.11±0.57	-3.769	.002
Sprint 30 meter	6.44±0.28	7.65±0.71	-4.460	.000
Back strength (kg)	88.13±9.61	73.33±8.29	3.408	.004
Leg strength (kg)	100.00±10.69	83.33±9.01	3.489	.003
Hand claw -right (kg)	33.00±14.68	25.44±5.79	1.428	.174
Hand claw -left (kg)	29.13±14.33	23.11±6.93	1.122	.279

p<0.05

As seen in table 3, the average Back-Leg strengths of junior women wrestlers are significantly higher than the cadet women wrestlers (p <0.05.) The sprint 10 and 30 meters scores reflected lower p <0.05 scores compared to the cadet women wrestlers.

Discussion and Conclusion

Physical fitness is one of the important criteria for sportive performance. Unless the physical structures of athletes reveal the requirements for sports branches, it is very difficult to demonstrate successful performance in sports (Hakkinen, 1991). In addition, physical fitness includes elements of cardio-circulatory system endurance, strength, endurance, agility, balance, coordination, flexibility and body composition, strength and speed related to health and skills (Gökmen et al. 1995).

In our study, the average age and sports age of young female wrestlers were found to be significantly higher than star female wrestlers, as expected. (p<0.05). In addition, BMI averages of young female wrestlers reflected statistically higher results (p<0.05). Body fat%, Height, Weight and Body density measurement values of women wrestlers were found to be statistically similar (p <0.05), (Table 1). Arakawa et al. (2020) found BMI values of 15-year-old athletes as 19.5 ± 1.6 kg / m2, and 20-year-old female wrestlers as 21.6 ± 1.0 kg / m2 in their study on elite Japanese wrestlers from different age categories. These scores were found to be higher than the scores we determined. This may be because Japanese women wrestlers are the most successful wrestlers worldwide. From another point of view, the fact that Japanese women wrestlers are more elite athletes than the wrestlers in our research group may be the reason for different results in BKI profiles. In another study conducted on female wrestlers, the results of height and body weight measurements showed similar results with the findings of our cadets' women athletes (Günaydin et al., 2002). In our study, the average fat of women wrestlers was found to be quite low. Referring to a study conducted by Mc Ardle et al. (2005), the ideal body fat ratio of wrestlers was generally between 5-9%. In the same study, it was stated that the most ideal among wrestlers was reported as 7% averages (Bağcı, 2016). This literature information presented is important in supporting the body fat percentage results obtained from female athletes in our research.

In research, young women wrestlers' chest, biceps-flx (right) and biceps-ex (right). circumference measurement values were found statistically significantly higher than star female wrestlers (p<0.05). Other body circumference and flexibility measurement results did not differ (p> 0.05), (Table 2). As can be seen, body circumference measurements generally reflected close results. In a study conducted in Japan, it was stated that physical development in Japanese women stops around the age of 15 (Isojima et al., 2016). The report of these researchers made us think that the Kyrgyz and the Japanese live in the same continent and similar geography and therefore may have similar physical characteristics. For this reason, Isojima and his friends results are important in terms of supporting the similarity of many-body circumference measurements obtained from cadet and junior Kyrgyz women wrestlers with a mean age of 15.44 ± 1.13 and 20.38 ± 1.99 in our research group. In the research, the average Back-Leg strengths determined from young female wrestlers were found to be significantly higher than the star wrestlers (p<0.05). In addition, the 10-meter and 30-meter sprint values of the junior women wrestlers reflected lower scores than cadet wrestlers (p<0.05). The determined Anaerobic power parameters, vertical jump and claw strength averages did not differ between junior and cadet women wrestlers (p>0.05). Back and leg strengths determined from young female wrestlers are thought to be related to age and sports age. As a matter of fact, there are many physiological changes with the rapid growth and development in childhood. During the period from childhood to early youth, muscle strength begins to increase; While this increase is gaining momentum for boys, the situation for girls is more stable (Malina, et al.,, 2004). It has been stated that the increase in strength depends on many factors such as age, height, weight and the increase in the mass of the muscles in the

body (Muratlı, 2007). In another study, it was concluded that the increase in body environmental measurements with the effect of training may be effective in the increase of anaerobic power and muscle strength properties with the increase of muscle volumes (Demirhan, 2020).

In our study 10 and 30 meters sprint scores of the junior women wrestlers reflected better scores than cadet wrestlers (Table 3). A study revealed that by improving muscle strength, speed and strength will be gained quickly. Stating that the muscles will work in the form of short-term but excessive contractions in this development (Muratlı, 1976). Our research results suggest that there is clear evidence that junior women wrestlers reflect better scores due to leg and back strength. According to the findings obtained from our study; The back-leg strength of junior women wrestlers, BMI, reflected higher averages than cadet women wrestlers. In addition, it has been observed that sprint scores are better in young wrestlers.

These results were evaluated as a natural reflection of age and sports age. The physical characteristics of junior and cadet women wrestlers, except for waist and bicep circumference measurements, generally reflect similar results, suggesting that the body profiles of Asian women do not change much after the age of 15. There is a need for multi-participatory studies to examine the physical characteristics of women athletes from different continents and ages.

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