Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XXI, ISSUE 2, 2021, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST,
DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

Science, Movement and Health, Vol. XXI, ISSUE 2, 2021
June 2021, 21 (2): 135 - 139
Original article

BODY COMPOSITION OF ELITE SAMBO ATHLETES SEASONAL CHANGES

KALYS TOKTOSARTOV[1], KANAT DZHANUZAKOV[1], BİLAL DEMİRHAN[2], DCİPARKUL ABDYRAKHMANOVA[1], EMİRHAN DEMİRHAN[2]

Abstract

Objective; The study was carried out on five elite sambo athletes who train regularly with a mean age of 20 ± 1.64 and a height of 167.6 ± 6.88.

Methods: Two measurements were made to the athletes, first during the beginning of the season followed by the beginning of the competition period. Body circumference measurements, skin fold thickness, claw strength, waist and back strength were measured, body mass indexes (BMI) were calculated using the height and body weights obtained from the athletes. In addition, anaerobic powers were determined with the lewis formula from the values obtained from the vertical jump distances of the athletes. SPSS 20.0 package program was used in the analysis of the data obtained. The level of significance was taken as $p < 0.05$.

Results: According to the results obtained, leg strengths and anaerobic strengths of sambo athletes measured at the beginning of the season were found to be significantly lower than the values measured at the end of the season ($p < 0.05$). From the circumference measurements, the mean measurements of neck, chest, biceps (ex-flx), hip and femur circumference were significantly higher in the second measurement ($p < 0.05$). Other measurements made at the beginning and end of the season and the averages of skinfold thickness did not reflect a statistically significant difference ($p > 0.05$).

Conclusions: It was concluded that during the trainings performed during the preparation period, the athletes increased their other regional strengths, which is important in anaerobic power and leg strength, depending on the muscular development, the environmental measurements and the muscle development.

Key words: Sambo, regular training, body composition, BMI.

Introduction

The term "SAMBO" is an abbreviation of a Russian-based expression that means "self-defense without weapons" (Drid et al. 2018). Sambo is a relatively young international martial art (combat sport) that originated in the USSR in the 1930s. This type of martial arts is characterized by the performance of various throwing, holding, holding and painful techniques. Successful activities depend on technical base, tactical skills and optimal physical condition of in the sports of sambo (Drid et al. 2018; Osipov et al. 2019).

However, the training process of qualified sambists (sambo athlete) is quite long and depends on many different factors. From a fighting method, Sambo became a combat sport officially recognized by the Sports Union Committee of the Soviet Socialist Republics in the 1940s. After later growth and development, sambo was recognized worldwide and was recently provisionally accepted by the International Olympic Committee (Trivic et al. 2020). As in other combat sports, specific weight categories based on sports, gender and age have also been adopted in sambo to ensure a more equal participation (Reale et al. 2017). Nowadays, sambo has age classes ranging from cadet (14–15–16), youth (16–17– 18 years old) and juniors (18–19–20 years old) to seniors (over 18 years old) (Figlioli et al. 2021).

Among the physiological effects of sports on individuals, the motor characteristics (endurance, strength, speed, mobility and skill) of individuals show a better development (Sahan, 2007). In sambo sport, anthropometric properties and maximum strength represent the basic elements of physical performance. Also, one of the goals of sambo training is to increase muscle strength, maximize lean tissue, and minimize body fat (Trivic et al. 2020). It has been stated that there are a limited number of studies evaluating the body structure and somatotypes of elite sambo athletes (Drid et al. 2018).

In our study, which we designed in the light of this information, the physical characteristics of elite level competitor Kyrgyz sambo athletes were measured and their changes were observed during the preparation period and the competition period. In addition, it is hoped that the data obtained will

[1] Kyrgyz Turkish Manas University, School of Physical Education and Sport, Bishkek, Kyrgyzstan
[1] Bartın University, Faculty of Sport Sciences, Bartın, Turkey
Email: bilaldemirhan55@gmail.com
Received 11.03.2021 / Accepted 13.05. 2021

contribute to the research to be conducted on sambo athletes, for which a limited number of studies have been conducted.

Methods

The research was conducted on five Sambo athletes with an average age of 20 ± 1.64, who are elite competitors and represent Kyrgyzstan in international competitions. Measurements were made twice, at the beginning of the season and at the end of the season, with 4-month intervals. The athletes were told that since the research is a scientific purpose, it is extremely important for them to perform the desired movements properly, correctly and willingly in the measurements, and a voluntary consent form was obtained from the participants.

Measurement Methods

Body weight of the participants was measured in a sensitive (Angel brand) scale up to 20 grams. Length measurements of the participants were measured with a Holtain sliding caliper with 1mm measuring range. Body circumference measurements were made with an anthropometric tape measure (Gulick Meter) with ± 1mm precision. Skinfold thickness were made with a Holtain brand caliper from the thigh measurements, Triceps, Abdominal, subscapula, Suprailiac chest regions with a precision of 0.2 mm (Heyward, 1991; Morrow et al., 1995). (male) = 1.28x (BKI-10.13) (Black et all., 1983). BMI values were calculated with the following formula using body weight and height- BMI Formula: BMI (kg / m2) = Body weight (kg) Length (m^2). Flexibility values were determined by the Sit and Reach test with bare feet (Savaş, 2004). The standing and long jump scores were recorded on two legs, with the feet together, and the distance he jumped without falling back. A hand dynamometer was used to measure hand grip strength (Koç, 2010). The following formula is used in determining the anaerobic capacity of the athletes. [P = Anaerobic Power (kg / m / sec), W = Body weight (kg), D = Leap Distance (m)] (Tamer, 2000).

Statistical analysis

The SPSS 20.0 package program was used in the analysis of the data obtained in the study. As a statistical method, the significance level was taken as p <0.05 using the Paired Samples T-test (pre-test-post-test), one of the parametric tests, since the distribution of the groups is homogeneous.

Results

The changes that occurred in the measurements of Sambo athletes at the beginning of the preparation period before training and during the competition period are given in the tables below.

Table 1. Age and height values of athletes (n = 5)

Variable	mean ± ss	min	max
Age (years)	20 ± 1.64	19	23
Height (cm)	167.6 ± 6,88	163	178

Table 2. Physical characteristics seasonal changes (n = 5)

Variable	1st Measurement mean ± sd	2nd Measurement mean ± sd	t	p
Body weight (kg)	62.02 ± 4.59	63.96 ± 5.44	2.50	0.07
BMI (kg / m2)	22.06 ± 0.56	22.74 ± 0.74	2.52	0.06
body fat (%)	16.15 ±,94	15.28, ± ,71	2, 53	0.07

* differences between two measurements, p<0.05.

As seen in Table 2, the body fat percentages, BMI and body weight averages measured at the beginning of the season did not reflect a statistically significant difference from the averages obtained at the end of the season (p <0.05).

Table 3. Strength - power long jump values of athletes seasonal change (n = 5)

Variable	1st Measurement mean ± sd	2nd Measurement mean ± sd	t	p
Claw strength (kg)	43.8 ± 5 76	46.22 ± 5.34	1.59	0.19
Back strength (kg)	97 ± 21.68	103 ± 23.61	2.44	0.92
Leg strength (kg)	115.2 ± 22.42	124, 6 ± 22.71	23.50	**0.00**
Anaerobic power (kgm / s)	678.31 ± 43.74	788.60 ± 34.66	7.06	**0.00**
Vertical jump (cm)	25 ± 5.92	31, 8 ± 7.33	3.66	**0.02**
Long jump	197.2 ± 44.48	204.4 ± 43.37	1.87	**0.01**
Elasticity	29 ± 7.58	31 ± 8.28	1.45	0.22

* differences between two measurements, p<0.05.

According to the results obtained, the leg strength, anaerobic power, vertical jump and long jump averages of the sambo athletes at the end of the season were found to be significantly higher than the values measured at the beginning of the season (p <0.05).

Table 4. Body Circumference and skinfold thickness Measurement Values of Athletes (n = 5)

Variable	1st Measurement mean ± sd	2nd Measurement mean ± sd	t	p
Neck circumference (cm)	37,4 ± 0 89	38.3 ± 0.84	9.00	**0.01**
Shoulder circumference (cm)	107.00 ± 3.74	110.5 ± 1.80	2.25	0.09
Chest circumference (cm)	87.4 ± 3 , 36	91.00 ± 4.69	4.43	**0.02**
Biceps circumference (ex) (cm)	26.6 ± 1.67	28.4 ± 1.95	4.81	**0.01**
Biceps circumference (flx) (cm)	29.1 ± 1.64	30.5 ± 2.06	5.71	**0.01**
Waist circumference (cm)	72.5 ± 2.18	75.2 ± 3.49	2.33	0.08
Hip circumference (cm)	88.4 ± 2.51	90.9 ± 2.07	3.95	**0.02**
Upper leg circumference (cm)	33.4 ± 1.29	34.4 ± 1.56	3.65	**0.03**
sup-capula (dkk) (mm)	9.10 ± 1.24	9.20 ± 2.28	0.10	0.92
Triceps (dkk) (mm)	7.60 ± 0.74	7.62 ± 0.69	0.05	0.96
Biceps (dkk) (mm)	4.30 ± 0.57	4.40 ± 0.89	0.53	0.62
Chest (dkk) (mm)	8.10 ± 1.78	8.00 ± 1, 90	0.40	0.70
Supra-iliac (dkk) (mm)	6.30 ± 1.64	6.40 ± 1.52	0.25	0.82
Abdomen (dkk) (mm)	11.40 ± 3.80	11.00 ± 2.74	0.54	0.61

* differences between two measurements, p<0.05.

As seen in Table 4, measurements of neck, chest, biceps (ex-flx), hip and femur circumference are the second measurements. It was found at a significantly high level in dew (p <0.05). Average skin fold thickness did not reflect a significant difference between measurement times (p> 0.05).

Discussion and Conclusion

Anthropometric properties and characteristics such as strength and strength represent the basic elements of physical performance in order to be successful in Sambo, as in all sports branches. Some of the main goals of training in sambo sport are to increase muscle strength and minimize body fat (Trivic et all., 2020).

According to the results obtained in the research, the athletes weighed 115.2 ± 22.42 kg at the beginning of the season. Leg strength values measured in the averages after four months 124.6 ± 22.71 kg. It was observed a significant increase by measuring (p <0.05). Parallel to this, the average of Anaerobic power at the beginning of the season was measured as 678.31 ± 43.74 (kgm / sec), averages of vertical jump as 25 ± 5.92 (cm), and long jump scores as 197.2 ± 44.48 (cm). In repeated measurements after four months, Anaerobic power averages were 788.60 ± 34.66 (kgm / sec), vertical jump averages 31.8 ± 7.33 (cm), and long jump scores at 204.4 ± 43.37 (cm). found (table 3), it showed a statistically significant increase (p <0.05).

Besides this, BMI and body weights of athletes increased numerically and body fat percentages decreased. However, the comparison between the results was not found to be statistically significant ($p > 0.05$).

In my study findings, the strength and anaerobic power determined from sambo athletes and parallel to this, the improvement in the averages of vertical jump and standing long jump were interpreted as the natural reflection of regular training. Supporting our findings, there are many studies reporting the positive effects of regular training on regional strength and anaerobic power values in combat sports, which are similar to the principle of competition with sambo sport. (Şanslı, 2017; Cicioğlu, et al.2007; Gökdemir et al.1999; Kürkçü, 2009; Song and Cıprıano 1984; Arabacı, 2003).

Among the body circumference measurements determined in our study, the mean measurements of neck, chest, biceps (ex-flx), hip and femur circumference increased significantly at the second measurement ($p<0.05$). Although the average skinfold thickness and the percentage of body fat, which is the parameter it affects, showed a decreasing trend in the second measurements, it did not reflect a statistically significant difference ($p > 0.05$).

The results of the study conducted by James et al. in which the changes in the physical characteristics of wrestlers before and after the season were examined (James et al. 1997). These are important in terms of supporting our research findings. The results of many studies, in which regular training causes an increase in some body circumference measurements due to developing muscle mass, support our findings. (Şanslı, 201; Cicioğlu et al.2007; Stupar et al. 2017)

As a result; The training of Sambo athletes during the preparation period causes a numerical increase in the environmental measurements of the athletes depending on the muscular development and, accordingly, the anaerobic power and leg strength, especially in other regional strengths.

Acknowledgments

*This research manufactured from Kyrgyzstan Turkey Manas University, Physical Education and Sports School undergraduate graduation project (2019).

References

Arabacı R, 2003, Güreşçilere Uygulanan Antrenman Programının Bazı Fiziksel ve Fizyolojik Özellikler Üzerine Etkisi. Uludağ Üniversitesi, Spor Araştırmaları Dergisi, 2003 Jan; 7(1): 81-93.

Black D, James WPT, Besser GM, et al., 1983, Obesity. A repon of the Royal College of Physicians. JR Coll Physicians Lond 1983: 17; 5-65.

Cicioğlu İ, Kürkçü R, Eroğlu H, Yüksek S, 2007, Seasonal change of physical and physiological characteristics of 15-17 age group wrestlers. Spormeter physical education and sports science journal, 2007 Dec:5 (4); 151-156.

Drid P, Tabakov S, Eliseev S, Selimovic N, Jaksic, D., Trivic, T., Ostojic, S., 2018, Somatotypes of elite male and female junior sambo athletes. Arch. Budo 2018 Jun: 14; 189-195.

Figlioli F, Bianco A, Thomas E, Stajer V, Korovljev, D., Trivic, T., Drid, P., 2021, Rapid Weight Loss Habits before a Competition in Sambo Athletes. Nutrients, 2021 April :13 (4); 1063.

Gökdemir K, Çeker B, Cicioğlu İ, 1999, The Effects of Quick Strength Training on Some Physical and Physiological Parameters of 16-17 Age Group Wrestlers, Selçuk University Journal of Physical Education and Sports Sciences, 1999 Feb.: 1 (1); 36-43.

Heyward VH, 1991, Advanced Fitness Assessment and Exercise Prescription, 2nd Ed., Champaign, IL, Human Kinetics Books, 1991: 142-183.

James N, Wayne E, 1997, Weight Loss and Wrestling Training: Effects Onnutrition, Growth, Maturation, Body Composition, And Strength. Journal Ofapplied Physiology. 1997: 6 (82): 1751-1759.

Koç H, Aslan CS, 2010, Comparison of selected physical and motoric characteristics of male handball and volleyball athletes. Selcuk University Journal of Physical Education and Sports Science, 2010 Jun.: 12 (3); 227-231.

Kürkçü R, 2009, The Effect of 12-Week Training Program Applied to Wrestlers on Some Physical and Physiological Properties. Sport Sciences, 2009 Sept; 4 (4): 313-321.

Morrow JR, Jackson AW, Disch JG, Mood DP, 1995, Measurement and Evaluation in Human Performance, Champaign, IL, Human Kinetics.

Osipov A, Kudryavtsev M, Iermakov S, & Jagiello W, 2019, The overall knowledge characterising the training process of young sambo athletes. 2019 Jan.; 15 (1) :1-10.

Reale R, Slater G, Burke LM, 2017, Acute-Weight-Loss Strategies for Combat Sports and Applications to Olympic Success. Int. J. Sports Physiol. Perform. 2017 Feb.; 12 (2); 142--151.

Sahan H, 2007, The Role of Sports Activities in the Socialization Process of University

Students. Master Thesis, Selcuk University Institute of Social Sciences, Konya.

Savaş S, Uğraş A., 2004, The effects of an eight-week pre-season training program on the physical and physiological characteristics of college male boxing, taekwondo and karate athletes. Gazi University Journal of Gazi Education Faculty, 2004 Dec: 24 (3); 257-274.

Song TMK, Cipriano, N., 1984, Effects of seasonal training on physical and physiological function on elite varsity wrestlers. Journal of Sports Medicine, 1984: 24; 123 – 130.

Stupar D, Popovic B, Romanov R, Jankovic M, Jezdimirovic T, Medjedovic B, 2017 The Effects of Specific Exercise Program on Anthropometric Characteristics and Motor Abilities of Preschool Children. International Journal of Morphology, 2017 Aug:35 (3);1050-1057.

Tamer K, 2000, Measurement and Evaluation of Physical Performance, Ankara: Bağırgan Yayınevi,

Trivic T, Eliseev S, Tabakov S, Raonic V, Casals, C, Jahic D, Jaksic D, Drid P, 2020, Somatotypes and hand-grip strength analysis of elite cadet sambo athletes. Medicine, 2020 Jan: 99 (3) 1-7.