



RESEARCH ARTICLE

Comparison of Some Physical Characteristics of Young Judoka and Wrestlers

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Abstract

Purpose: This research sought to assess and contrast the physical attributes of adolescent wrestlers and judo practitioners aged 13 to 16, aiming to identify key physical and motor skills that contribute to performance excellence in these sports. **Method:** A total of 30 athletes were randomly assigned to the wrestling (n=15) and judo (n=15) groups. These athletes train 4 to 6 days a week. In this study, body composition, horizontal jump test, hand grip strength, flamingo balance test, sit and reach test and shuttle run of combat athletes were evaluated. Statistical analysis was conducted utilizing the SPSS 20.0 program. **Findings:** Based on the results, the average age of the participants was calculated to be (13.7±1.2) for judo and (14.8±1.7) for wrestling, with their respective sports ages being (5.3±1.3) for judo and (5.6±1.2) for wrestling, and their heights being (161.1±10.7) for judo and (169.4±9.4) for wrestling. Although a significant difference was noted in the lean body mass percentage, the results of the horizontal jump, hand grip strength tests, sit and reach test, flamingo balance test and shuttle run showed no significant variance. **Conclusion:** The lack of a significant difference in the outcomes observed between judo participants and wrestlers in this age category can be attributed to the similarity of these sports disciplines. The follow-up of the process will provide detailed information about the physical characteristics and performances of combative athletes and will provide scientific contribution to the training and development processes of athletes in this age group.

Keywords

Wrestling, Judo, Horizontal Jump, Combat Sports, Hand Grip

INTRODUCTION

Contemporary research in sport sciences shows a great interest in understanding the physical development of young athletes and the effects of this development on sport performance. In this context, sports requiring intense physical competition such as wrestling and judo offer an excellent field for the evaluation of physical and athletic abilities of young combat athletes (Çakıroğlu et al., 2012). Male athletes in particular go through a rapid period of growth and development between the ages of 13 and 16, and assessing physical characteristics during this time is crucial to understanding their future performance potential. Judo is a sport branch that incorporates

concepts such as balance, strength, endurance, flexibility, speed, quickness, coordination (Yüksek et al., 2004), and in terms of its technical characteristics, it is a level defense art that best overcomes the opponent with the methods of not resisting the opponent's force and even taking advantage of the opponent's force. Wrestling, on the other hand, is a historical combat sport practiced worldwide and at the Olympic level (Cicioğlu et al., 2007) and the most important physical characteristics required to achieve successful results in wrestling competitions are; Having good anaerobic and aerobic capacity, upper and lower body strength, power, agility and flexibility (Bloomfield et al., 1994).

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Wrestling and judo are sports that require different technical and tactical skills, but both require combat and high levels of physical strength, agility and endurance. These sports promote the development of motor skills, physical strength and psychological resilience of young athletes. However, Wrestling and Judo sports are defined as the struggle of two opponents to establish superiority over each other through technical tactical practices, requiring similar physical physiological characteristics (Jäggi et al., 2015).

Claw strength is a vital factor in wrestling in terms of controlling the opponent and in judo in terms of providing an effective grip due to clothing. The long jump stands out as an indicator of general athletic ability, explosive power and lower body strength (Aydos et al., 2004).

Within the realm of sports science research, there exists a scant volume of investigations exploring the varied impacts and demands associated with these two martial arts disciplines (Aydos et al., 2004; Çakıroğlu et al., 2013; Franchini et al., 2011; Fry et al., 2006; Lakicevic et al., 2020; McDonald et al., 2019). This deficiency suggests that comprehensive information is needed to design more effective education and training programs for young athletes.

This study aimed to evaluate the physical and certain motor characteristics of wrestling and judo athletes aged (13 – 16), to identify factors influencing success in these sports, and to aid in the development of more efficient training programs for young athletes.

MATERIALS AND METHODS

Research Group

A total of 30 male athletes aged 13-16 years from licensed sports clubs in the province of Çorum who voluntarily practiced wrestling (n=15) and judo (n=15) took part in the study. Every athlete involved in the study was chosen from those who compete and train between 4 to 6 days per week. This study complies with ethical standards and was approved by Hitit University Non-Interventional Ethics Committee with reference number (2024-0018). The participant provided informed consent with a consent form covering study details, risks, benefits, confidentiality and participant rights. The study strictly adhered to the ethical principles of the Declaration of Helsinki and prioritized the rights

and welfare of the participant in the design, procedures and confidentiality measures.

Working Procedure

The body composition of the participants was analyzed before the study. After filling out a demographic information form for each participant, horizontal jump test, hand grip strength, flamingo balance test, sit and reach test, and shuttle run measurements were performed.

Data Collection Tools

Weight: body weight, length: height, body composition analysis; body mass index, fat mass and lean body mass, horizontal jump test, hand grip strength, flamingo balance test, sit and reach test, and shuttle run were measured.

Body Composition Analysis

Data on the body composition of the participants were obtained with the Tanita 418 BC instrument using bioelectrical impedance as the method.

Horizontal Jump Test

The starting point is determined on a flat ground with a strip of adhesive tape. The subjects are asked to jump as far as possible with their toes on the starting line, arms at the side and simultaneously swinging back and forth. The jump distance is measured from the starting line to the back point where the heels touch the ground. In this way, the test is repeated twice and the best value is recorded in cm (Maulder & Cronin 2005).

Hand Grip Strength Test

Hand grip strength (hand claw) was measured using a Takei digital hand dynamometer. The subject stood upright and the dynamometer was adjusted to the size of the subject's hand. The subject's arm was extended and started with the right hand. The maximum grip force was measured from the side at an angle of 10-15 degrees to the shoulder. The subject had to perform 2 repetitions with both hands and the best result was recorded in kg (Günay et al., 2013).

Flamingo Balance Test

Flamingo balance test can be used to determine the static balance abilities of athletes. The balance material used for the test is a wooden beam with a length of 50 cm, a height of 5 cm and a width of 3 cm. The athlete steps on the balance material with the selected foot and receives support from the test administrator in order to maintain his/her balance and take the correct position before the test. The athlete then bends his/her free foot from the knee towards the back and holds it with the

hand in the same direction. When the athlete is ready, he releases the assistant's hand and the stopwatch is started at the same time. The stopwatch is stopped every time the athlete loses balance and is started again when the athlete is ready 60 sec. The total number of balance losses during the period is recorded.

Sit and Reach (flexibility)

The Sit and Reach Test is measured using a tripod. The subject is seated on the floor and the bare foot rests flat on the test table, the torso (waist and hips) is bent forward and the knees are asked to reach as far forward as possible without bending the knees, with the hands in front of the body. The subject tried to reach the farthest point in this way, and at the last point, he/she was kept waiting for 2 seconds and the value was recorded. The tester stands next to the subject and prevents the subject's knees from bending, the test is repeated twice and the higher value is recorded (Miller, 2006).

Shuttle Run (agility)

A 4X9m shuttle run was performed to measure the agility of the athletes. In the shuttle run,

the athletes started from behind the line and were observed to step on the line at the end of every 9m. The results were recorded in seconds and split-seconds.

Statistical analysis

The data were statistically analyzed using SPSS 20.0 (Statistical Package for the Social Sciences, Version 22.0, SPSS Inc., Chicago, IL, USA). The choice between parametric and non-parametric tests was based on the evaluation of the normal distribution using the Shapiro-Wilk test. Depending on the distribution of the data, the numerical variables were expressed either as mean \pm standard deviation or as median (range from minimum to maximum). For data conforming to a normal distribution, the independent samples test was used to analyze numerical comparisons between two different groups, while the Mann-Whitney U test was used for data not conforming to a normal distribution. The significance level was set at $p < 0.05$ for all tests.

RESULTS

Table 1. Physical traits of the athletes taking part in the study.

	Group	Judo (n:15)	t	p
	Wrestling (n:15)			
	X \pm Sd	X \pm Sd		
	Min – Max	Min – Max		
Age	14,66 \pm 1,17 (13 – 16)	13,73 \pm 1,22 (13-15)	2,19	0.037^a*
Sports Age	5,60 \pm 1,23 (4-8)	5,33 \pm 1,23 (4-7)	0.664	0.539 ^a
Height	169,40 \pm 9,40 (148-184)	161,13 \pm 10,70 (141-178)	-2.247	0.033^b*
Body Weight	64,24 \pm 17,80 (33-108)	53,13 \pm 14,78 (28-79)	-1.859	0.074 ^b
Bmi	22,08 \pm 4,89 (15-35)	20,07 \pm 3,51 (14-25)	0.913	0.367 ^a
Fat percentage	14,90 \pm 4,57 (9-27)	16,87 \pm 5,37 (10-28)	-1.203	0.233 ^a
Ffm	54,06 \pm 12,38 (29-78)	43,80 \pm 11,28 (25-62)	-2.371	0.025^b*

X : Average; Sd: Standard deviation a: Mann-Whitney U Test; b: Independent Samples Test

Judo (13.7 \pm 1.2), wrestling (14.8 \pm 1.7), sports age (wrestling: 5.6 \pm 1.2), (judo: 5.3 \pm 1.3) age of the participants in the study height wrestling 169.4 \pm 9.4 (148 – 184), judo (161.1 \pm 10.7) (141-178), average body weight wrestling 64.2 \pm 17.8 (33-108), judo

(53.1 \pm 14.7) BMI wrestling (22.08 \pm 4), judo (16.8 \pm 5.3), fat percentages wrestling (14.9 \pm 4.5), judo (16.8 \pm 5.3), Fat free mass (ffm) wrestling, (54.0 \pm 12.3), judo (43.8 \pm 11.2) (Table 1).

Table 2. Data regarding the horizontal jump and hand grip motor characteristics of the athletes are presented in (Table 2)

Parameter	Group	X±Sd	t	p
Horizontal Jump (m)	Wrestling	2.33±0.29	- 0,842	0,407 ^a
	Judo	2.23±0.31		
Hand Grip Left	Wrestling	34.53±8.88	- 1,556	0,131 ^a
	Judo	29.26±9.63		
Hand Grip Right	Wrestling	34.73±8.18	0.748	0.461 ^b
	Judo	31.53±10.65		
Flamingo balance test(n)	Wrestling	9.66±4.09	-0.188	0.870 ^b
	Judo	10.20±4.34		
Sit and reach (cm) (flexibility)	Wrestling	24.26±7.15	-0.645	0.539 ^b
	Judo	25.66±6.30		
Shutte run(s)(agility)	Wrestling	10.76±1.30	2.573	0.009^b
	Judo	9.74±0.74		

X : Average; Sd: Standard deviation a: Mann-Whitney U Test; b: Independent Samples Test

The research indicated that there was no substantial disparity observed in horizontal jumping, right-hand grip strength, left-hand grip strength, flamingo balance test, sit and reach test and shuttle run between both groups. ($p > 0.050$).

DISCUSSION

In both wrestling and judo, which are combat sports, one of the main problems encountered by coaches and athletes is what physical characteristics will lead to success. For this reason, our study aimed to determine some important physical characteristics of male wrestling and judo athletes between the ages of 13-16 and compare them. Firstly, significant differences were found between wrestling and judo athletes in terms of age, height and lean body mass. In judo sport, both in training and in championships, athletes frequently and intensively apply movements such as pulling, pushing and throwing by grasping the judo suit of their opponents. During such movements, the forearm flexor muscles in the forearm, which have a great effect on grip strength, are actively used. Therefore, although statistically significant results were expected in the hand grip strength parameters of athletes who only practiced judo compared to wrestling, no significant difference was observed in the right and left hand grip strength values compared to wrestling. These findings may reflect the effect of different physical demands of sports branches and training methods on athletes' body composition. For example, judo athletes generally

have a higher lean body mass, which may be attributed to the strength and explosive power demanding characteristics of this sport (Franchini et al., 2011). Results revealed significant variations in age, height, and lean body mass among athletes participating in wrestling and judo. These findings are consistent with the outcomes of prior research. For example, a study by Fry et al. revealed that the anthropometric profiles of athletes in different martial arts differed significantly (Fry et al., 2006). (8) The effect of anthropometric differences such as age, height and lean body mass on sport performance has been widely studied in the sport science literature. It has been shown that these differences can be determinants for success in specific sports, especially in young athletes (Lakicevic et al., 2020). It has been observed that wrestlers are generally shorter and more compact, while judoka are taller and have a lean body mass (McDonald et al., 2019). In terms of hand grip strength and long jump performance, our study showed that there was no significant difference between the two sports. This finding may indicate that both sports require similar levels of strength and agility. In the literature, it has been reported that hand grip strength is a good indicator of overall strength level (Wind et al., 2010). Similarly, long jump performance is an important measure of agility and explosive power (Özdemir, 2009). Tural et al., (2021) examined the effects of 8-week core exercises on maximal strength, (leg, back and grip strength) vertical jump and flexibility in freestyle competitive wrestlers aged 15-17 years, and at the

end of the study, no significant difference was found in body weight, right and left grip and core strength before and after core strength training ($p>0.05$). It is in parallel with our study. Tortum (2018), in his study investigating the effects of eight-week judo training on strength, flexibility and balance performances of 12-13 year-old children, explained that judo training applied to athletes provided a significant increase in the hand grip strength of individuals. Aydos et al., (2004) In their study with the participation of 77 male athletes in basketball, volleyball, boxing, wrestling, judo and weightlifting, it was stated that individual athletes had higher leg strength and back-lumbar strength than team athletes, and right and left hand grip strengths were similar. Saygın et al., (2017) compared the aerobic capacity values of 14-15 years old Greco-Roman style wrestlers according to weight classes and found significant differences in vertical jump, anaerobic power, and hand grip strength. Çakıroğlu et al., (2014) examined the effects of judo and game training on the physical development of children in 8-10 years old boys and observed a significant increase in body weight, height, vertical jump, standing long jump, claw strength (right hand-left hand), sit-ups and flexibility values. The fact that the wrestlers were significantly one year older and taller is thought to be effective in the results ($P<0.05$). (Gencay et al., 2018) in their study 54 adolescent wrestlers and judoists were evaluated using static and dynamic balance, flamingo balance test and when static balance performance scores were compared between groups, it was determined that judoists had higher static balance performance than wrestlers ($P<0.05$). In a similar study; 51 boys aged 14-15 years, 26 of whom had been practicing judo for at least 2 years and 25 of whom did not practice any sport ('inactive') participated in the study. In the study, static balance was measured with a modified version of the Flamingo Test. As a result of the study; it was observed that boys who practiced judo had a higher level of dynamic balance than those who did not (Witkowski et al., 2014). In another study conducted on the Shuttle Run Test; In a study conducted by (Raj, 2016) on 30 boxers, 30 wrestlers and 30 judo players aged between 18 and 23, a significant difference was observed in the results of the shuttle run test, is in line with our research. (Demirkan, 2015) No significant difference was found in the physical and physiological flexibility

parameters of one hundred and twenty-six wrestlers aged 15-17 years. Therefore is in line with our study. In a similar study; In the research conducted on 12 male wrestlers and 12 male judoists between the ages of 9-21, no significant difference was observed in the 20 m Shuttle Run Tests (Koyunlu et al., 2020). It is not in line with this research. In addition, it is thought that the fact that the sports age is similar, both sports are combat sports and include similar physical physiological requirements may be effective in not creating significant differences. In conclusion, this study illuminated the physical differences and similarities between wrestling and judo athletes.

These findings provide information for coaches and sport science professionals to better understand the training programs and specific needs of young athletes. Additionally, this research indicates the necessity for more in-depth investigations to fully comprehend the physical progression and performance capabilities of young athletes.

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Conflict of interest

The authors declare no conflict of interest.

Ethics Statement

The non- interventional study was approved by the Hitit University Non-Interventional Ethics Committee numbered (2024-0018) were obtained.

Author Contributions

Study Design, EÇÇ, MK and CT; Data Collection, EÇÇ; Statistical Analysis, MK; Data Interpretation, CT and EÇÇ; Article Preparation, CT and MK; Literature Search, EÇÇ, MK and CT. All authors read and accepted the published version of the manuscript.

REFERENCES

- Aydos, L., Taş, M., Akyüz, M., & Uzun, A. (2010). Investigation of the relationship between strength and some anthropometric parameters in young elite wrestlers. *Journal of Physical Education and Sports Sciences*, 11(4), 1-10. [CrossRef]
- Bloomfield, J. Ackland, T.R. & Elliott, B.C. (1994). *Applied Anatomy and Biomechanics in Sport (4th ed.)*, Blackwell Scientific Publications.
- Cicioğlu, İ., Kürkçü, R., Eroğlu, H., & Yüksek, S. (2007). Seasonal change in physical and physiological characteristics of wrestlers in the 15-17 age group. *Journal of Physical Education and Sports Sciences Spormetre*, 5(4), 151-156. [CrossRef]
- Çakıroğlu, T., Sökmen, T., & Arslanoğlu, E. (2013). The effect of judo technique training and games on the physical development levels of boys aged 8–10 years. *SPORMETRE Journal of Physical Education and Sports Sciences*, 11(2), 73-79. [CrossRef]
- Demirkan, E. (2015). Age-related patterns of physical and physiological characteristics in adolescent wrestlers. *Montenegrin Journal of Sports Science and Medicine*, 4(1), 13-18. [CrossRef]
- Franchini, E., Del Vecchio, F.B., Matsushigue, K.A., & Artioli, G.G. (2011). Physiological profiles of elite judo athletes. *Sports Medicine*, 41, 147-166. [CrossRef]
- Fry, L.W., & Matherly, L.L. (2006). *Spiritual leadership and organizational performance: An exploratory study* [Master's thesis]. Tarleton State University–Central Texas.
- Gencay, O. A., Gencay, S., & Gencay, E. (2020). A comparison of static and dynamic balance performance in adolescent male wrestlers and judoists. *Science & Sports*, 35(3), e57-e63. [CrossRef]
- Günay, M., Tamer, K., & Cicioğlu, H. (2013). *Sports Physiology and Performance Measurement*, Gazi Kitabevi.
- Koyunlu, A., Dağlıoğlu, Ö., & Özdal, M. (2020). Comparison of physical fitness and respiratory parameters of Elite Wrestlers and Judokas. *Turkish Journal of Sport and Exercise*, 22(3), 360-365. [CrossRef]
- Lakicevic, N., Roklicer, R., Bianco, A., Mani, D., Paoli, A., Trivic, T., & Drid, P. (2020). Effects of rapid weight loss on judo athletes: A systematic review. *Nutrients*, 12(5), 1220. [CrossRef]
- Maulder, P., & Cronin, J. (2005). Horizontal and vertical jump assessment: reliability, symmetry, discriminative and predictive ability. *Physical Therapy in Sport*, 6(2), 74-82. 8(11). [CrossRef]
- McDonald, C., Deitch, J., & Bush, C. (2019). Early sports specialization in elite wrestlers. *Sports Health*, 11(5), 397-401. [CrossRef]
- Özdemir, S. (2009). The effect of a complex training program on the development of explosive power, strength, speed and agility in male football players in the 14-16 age group. (Doctoral dissertation, Marmara Üniversitesi, İstanbul (in Turkey)).
- Raj, X. M. (2016). Comparative study of selected physical components of male boxers, wrestlers and judokas. *Power*, 20(15.3), 16-7666. [CrossRef]
- Saygın, Ö., Gürsoy, R., Tekin, A., Ceylan, H. İ., & Babayiğit İrez, G. (2017). Comparison of vertical jump, anaerobic power, hand grip strength, 30m sprint and aerobic capacity values of 14-15 year old Greco-Roman style wrestlers according to their weights. *ATABESBD*, 19(3), 36-50. [CrossRef]
- Tortum, A. (2018). *The effect of eight-week judo training applied to the 12-13 age group on some physical parameters* [Master's thesis, Ankara Yıldırım Beyazıt University].
- Tural, E., Kahya, S., Tiryaki, A., Mehmet, Ç., & Ceylan, L. (2021). Examination of the effects of 8-week core exercises on maximal strength, vertical jump and flexibility in freestyle wrestlers. *OPUS International Journal of Society Researches*, 17(37), 4563-4580. [CrossRef]
- Wind, A. E., Takken, T., Helders, P. J., & Engelbert, R. H. (2010). Is grip strength a predictor for total muscle strength in healthy children, adolescents, and young adults?. *European Journal of Pediatrics*, 169, 281-287. [CrossRef]
- WitkowskiAbcde, K., MaślińskiAbcd, J., & RemiarzAbd, A. (2014) Static and dynamic balance in 14-15 year old boys training judo and in their non-active peers. [CrossRef]

