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A comparative study of selected strength parameters of university and national level male wrestlers and judokas

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Abstract
The purpose of this study was to find out the difference between selected strength parameters such as grip strength, shoulder strength, back strength, core strength and leg strength of university and national level male wrestlers and judokas. To accomplish this study 30 male university and national level players (15 from wrestling and 15 from judo) were selected from Kerala. The selected strength variables such as grip strength, shoulder strength, back strength, core strength and leg strength taken for this study were measured using hand-grip strength dynamo meter, pull up test, back-leg strength dynamometer and sit up test respectively. Independent t-test was computed to compare the variables. To test the hypothesis the significance level was set at 0.05 percent. The outcome reveals that there is a statistical significant difference between grip strength, shoulder strength, core strength, leg strength and there is no statistical significant difference between back strength of university and national level male wrestlers and judokas.

Keywords: Wrestlers, judokas, strength parameters, national and male

Introduction
In the world of combat sports, an athlete's success is heavily influenced by their combination of technique, strategy, and physical strength. Judo and wrestling, two sports with long and storied traditions, highlight the critical role that strength plays in their training. Athletes require a specific mix of muscle power to outmaneuver, control, and ultimately emerge victorious over their opponents on the mat. Wrestling and judo branches are complex sports branches. Wrestle; the courage, which requires all body parts to work together, is an activity and sports branch that requires movement time, reflex, skill, endurance and strength (Koyunlu *et al*., 2020) [13]. Judo, one of the most popular sports in the world, is an exciting grappling sport which includes various techniques and throws similar to wrestling, but unlike wrestling, the competitors wear thick jackets called judogis or GIS (John and A Cotton, 2005) [1]. Wrestling is one of the oldest combat sports which requires skill, power, strength and endurance disputed since the ancient Greek Olympic Games (Chaabene *et al*., 2017) [5]. The short quick bursts of maximal power activities during the match are maintained by the anaerobic system, whereas the aerobic system manages the wrestler's ability to maintain effort throughout the duration of the match and accelerates the recovery process within and between successive matches (Callan *et al*., 2000) [4]. The main objective of each wrestler is to physically dominate an opponent and to establish clear physical control over him/her. Wrestlers compete in a challenging environment involving repetitive bouts of high-intensity actions (e.g., attacks and counterattacks) alternated by submaximal work of low-intensity activity or pause (Horswill, C. A. 1992) [10]. The technical-tactical training provides support for the adequate development of aerobic endurance, power, anaerobic capacity, strength, speed and flexibility (Franchini *et al*., 2013) [7]. It is important to ensure that the athletes' aerobic system is sufficiently developed for training and competition, since aerobic power enables the maintenance of high intensity activities during the fight, which might allow individuals to maintain high performance for a longer period (Franchini *et al*., 2014) [8]. Competitive judo demands high-intensity intermittent actions, in which optimal physical attributes are necessary in order to achieve technical-tactical development and success in combat.

(Ohta *et al*., 2002) [15]. Fitness enhances general wellbeing and it is fundamental for full and lively living. (Kumar and Chaudhary, 2014) [11]. Physical wellness of a player relies upon the idea of his amusement and furthermore outer conditions. There are various wellness components that should be produced. For example, speed, perseverance, deftness and quality to right and Main tenure of body weight (Chetan Sharma, 2017) [6]. As wrestlers, the ability to control your opponents' wrists with a strong and powerful grip is an incredible wrestling advantage. A strong grip is important in just about every sport, but wrestling and judo are greatly depends on the grip. A strong grip will increase your chances at reaching the top of the podium (As wrestlers, the ability to control your opponents' wrists with a strong and powerful grip is an incredible wrestling advantage. A strong grip is important in just about every sport, but wrestling and judo are greatly depends on the grip. A strong grip will increase your chances at reaching the top of the podium (Anil Chokhoba Patil 2019) [2]. Success in sport is possible through scientific methods. With the long-term training program to achieve success, the athlete is expected to achieve higher levels of physical and psychological performance (Günay *et al*., 2006) [9]. Wrestling and judo branches are complex sports branches. Wrestle; the courage, which requires all body parts to work together, is an activity and sports branch that requires movement time, reflex, skill, endurance and strength (Avcuoğulları *et al*., 1993) [3]. This article delves deep into the world of competition to explore the fascinating topic of strength in sports. We closely examine grip, shoulder, back, core, and leg strength. In close-quarters combat sports, like wrestling, every bit of strength can mean the difference between victory and defeat. Wrestlers are often praised for their dedication and strong ground game. On the other hand, judokas are known for their throws and grappling, using explosive power and technique to defeat opponents. Through this comparison, we aim to highlight the subtle differences in how these top athletes develop their strength and how it impacts their performance.

Methodology

Sample: For the purpose of the study 30 (15 wrestlers and 15 judokas) male players national and inter university players were selected from Kerala.

Tools: For measuring grip strength, shoulder strength, back strength, core strength and leg strength, the methods and equipment's such as hand-grip strength dynamometer, pull up test, sit up test and back-leg strength dynamometer were used.

Data collection: The data was collected from various academies and standard clubs from Kerala.

Data analysis: The collected data were put to statistical treatment by computing to find out the comparison between the wrestler and judokas on their strength parameters. The result has been presented in the following table.

Results

Table 1: Showing the mean difference between wrestlers and judokas on right-hand grip strength

Group	N	Mean	Std. Deviation	T (DF=28)	Sig.
Wrestling	15	54.3	4.79	3.805	.001*
Judo	15	46.2	6.71		

*Significant at 0.05 level of Significance with 28 DF, Tabulated, T-Value = 2.04

An examination of table 1 revealed that there was significant difference found between wresters and judokas on right-hand grip strength at 0.05 level of significance with 28 degree of freedom because calculated t-value (3.805) is higher than tabulated t-value (2.04).

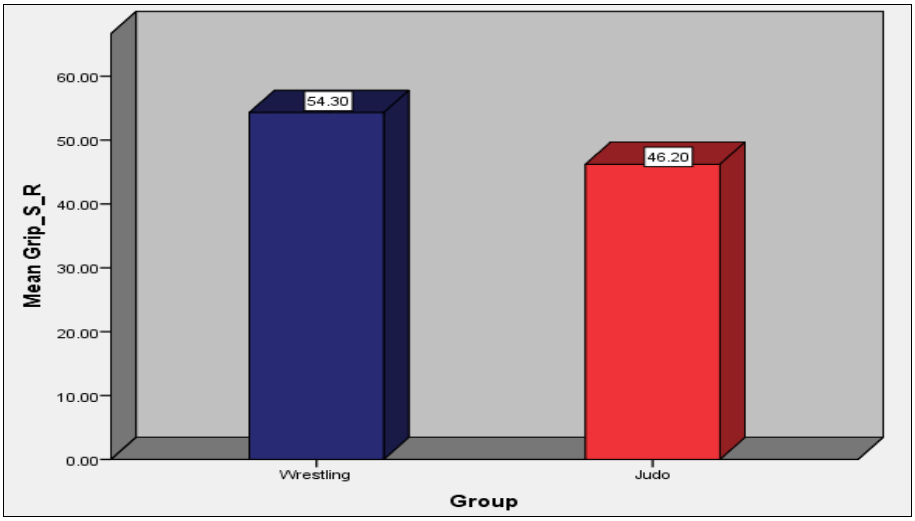

Fig 1: Mean values on right-hand grip strength of wrestlers and judoka

Table 2: Showing the mean difference between wrestlers and judokas on left-hand grip strength

Group		N	Mean	Std. Deviation	T (DF=28)	Sig.
	Wrestling	15	52.2000	5.12821	2.230	.034*
	Judo	15	47.1667	7.07770		

*Significant at 0.05 level of Significance with 28 DF, Tabulated, t-value = 2.04

An examination of table 2 revealed that there was significant difference found between wresters and judokas on left-hand grip strength at 0.05 level of significance with 28 degree of freedom because calculated t-value (2.23) is higher than tabulated t-value (2.04).

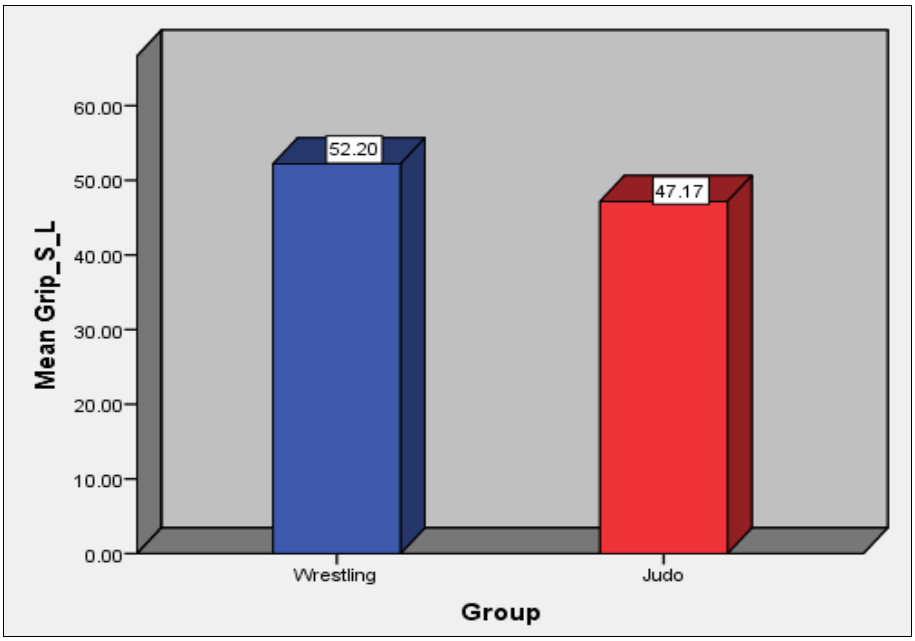

Fig 2: Mean values on left-hand grip strength of wrestlers and judokas

Table 3: Showing the mean difference between wrestlers and judokas on shoulder strength

Group		N	Mean	Std. Deviation	T (DF=28)	Sig.
	Wrestling	15	11.80	4.82	-3.067	.005*
	Judo	15	16.26	2.91		

*Significant at 0.05 level of Significance with 28 DF, Tabulated, t-value = 2.04

An examination of table 3 revealed that there was significant difference found between wresters and judokas on shoulder strength at 0.05 level of significance with 28 degree of freedom because calculated t-value (-3.067) is higher than tabulated t-value (2.04).

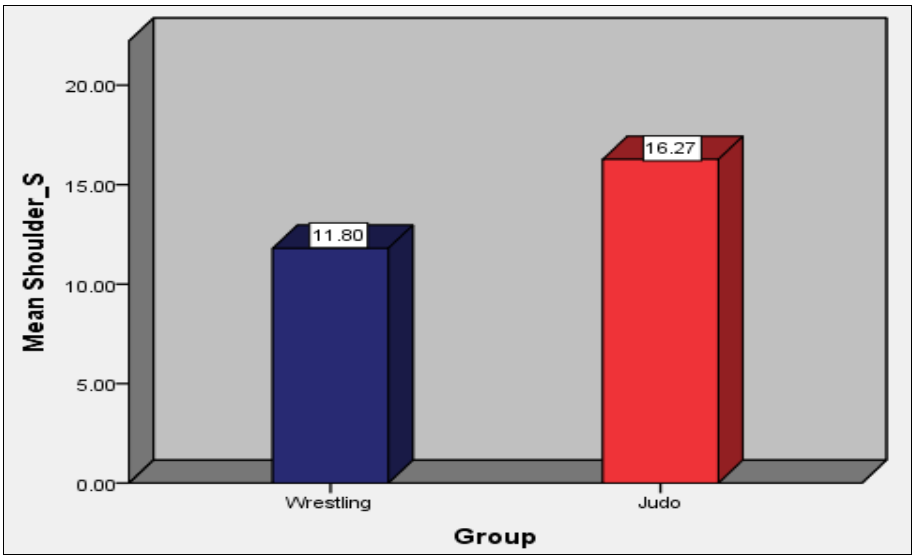

Fig 3: Mean values on shoulder strength of wrestlers and judokas

Table 4: Showing the mean difference between wrestlers and judokas on back strength

Group		N	Mean	Std. Deviation	T (DF=28)	Sig.
	Wrestling	15	141.0	18.68	1.289	.208
	Judo	15	131.03	23.40		

*Significant at 0.05 level of Significance with 28 DF, Tabulated, t-value = 2.04

An examination of table 4 revealed that there was no significant difference found between wresters and judokas on back strength at 0.05 level of significance with 28 degree of freedom because calculated t-value (1.289) is lesser than tabulated t-value (2.04).

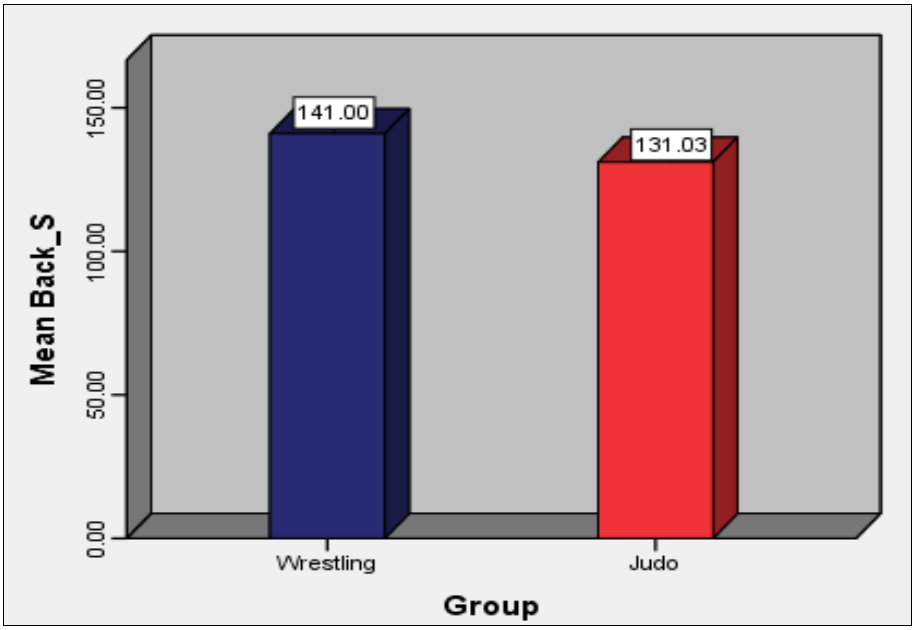

Fig 4: Mean values on back strength of wrestlers and judokas

Table 5: Showing the mean difference between wrestlers and judokas on core strength

Group		N	Mean	Std. Deviation	T (DF=28)	Sig.
	Wrestling	15	41.73	9.24	-5.750	.000*
	Judo	15	61.86	9.92		

*Significant at 0.05 level of Significance with 28 DF, Tabulated, t-value = 2.04

An examination of table 5 revealed that there was a significant difference found between wresters and judokas on core strength at 0.05 level of significance with 28 degree of freedom because calculated t-value (-5.75) is greater than tabulated t-value (2.04).

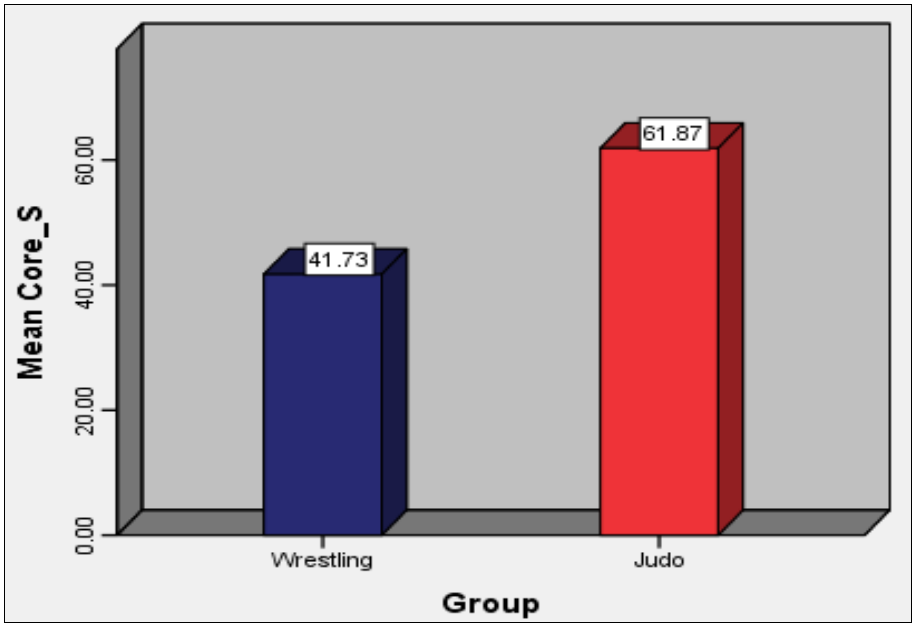

Fig 5: Mean values on Core Strength of wrestlers and judokas

Table 6: Showing the mean difference between wrestlers and judokas on leg strength

Group		N	Mean	Std. Deviation	T (DF=28)	Sig.
	Wrestling	15	152.53	19.04	4.747	.000*
	Judo	15	121.16	17.10		

*Significant at 0.05 level of Significance with 28 DF, Tabulated, t-value = 2.04

An examination of table 6 revealed that there was a significant difference found between wresters and judokas on leg strength at 0.05 level of significance with 28 degree of freedom because calculated t-value (4.747) is greater than tabulated t-value (2.04).

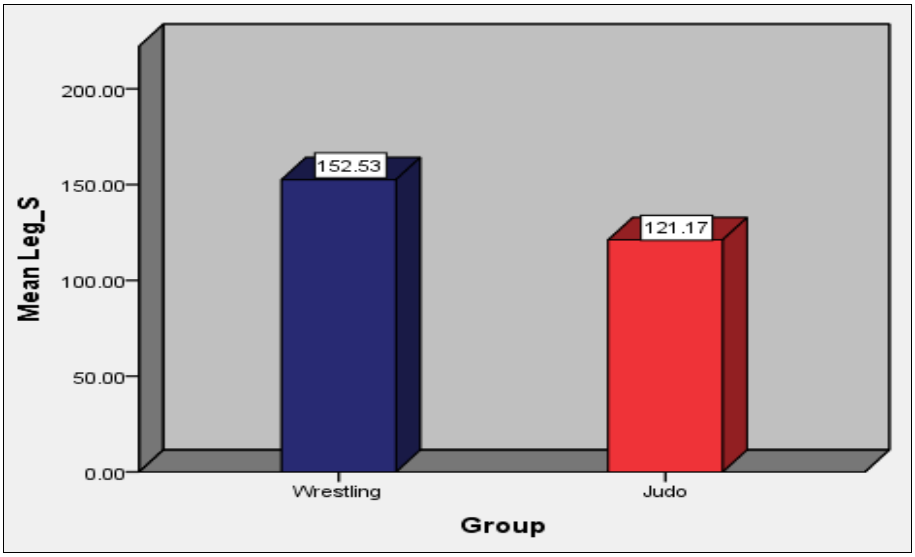

Fig 6: Mean values on leg strength of wrestlers and judokas

Discussions on findings

The results clearly indicate statistical significant difference between right hand grip strength, left-hand grip strength, shoulder strength, core strength and leg strength of wrestlers and judokas. This study also shows that there is no statistical difference between the back strength values of wrestlers and judokas. Results of the present study indicate that wrestlers have higher grip strength, leg strength and judokas have higher shoulder strength and core strength.

Conclusion

There is a statistical significant difference found between wrestlers and judokas in grip strength, shoulder strength, core strength, leg strength and there was no significant difference in back strength.

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