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Influence of Different Intensities of Resistance Training on Selected Strength Parameters Among Judo Players

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ABSTRACT

The purpose of the study was to find out the impact of different intensities of resistance training on selected strength among male judo players such as leg strength, back strength and abdominal strength. Since the purpose of the study forty-five male judo players selected from Christian Educational Society, Ottanchathiram, Tamil Nadu, India and their age ranged between 17-25 years was selected as subjects. The selected subjects were divided into three equal groups, in which, group – I (n = 15) underwent medium intensity resistance training, group – II (n = 15) underwent high intensity resistance training, group – III (n = 15) acted as control which do not participate in any special training. The training programme was carried out for this study is three days per week for twelve weeks. The data collected from the three groups before and after the experimental training period were statistically examined to find out the significant improvement if any using the analysis of covariance (ANCOVA). The level of significance confidence was fixed at 0.05. Whenever, the obtained 'F' ratio value for adjusted post-test means was found to be significant, the Scheffe's post hoc test was applied to determine the paired mean differences. The results of the study showed that effects of the medium and high intensity resistance training on strength such as leg strength, back strength and abdominal strength has shown improvement for the medium and high intensity resistance training groups when compared with the control groups.

Keywords: Resistance Training, Leg Strength, Back Strength and Abdominal Strength.

INTRODUCTION:

Resistance training follows the fundamental principle that involves repeatedly overloading a muscle group. This is typically done by contracting the muscles against heavy resistance and then returning to the starting position. This process is repeated for several repetitions until the muscles reach the point of failure. (Schoenfeld BJ et al, 2017)

Resistance training typically follows the principle of progressive overload, in which muscles are subjected to gradually increasing resistance over time to stimulate adaptation and growth. They respond by growing larger and stronger. Beginning strength-trainers are in the process of training the neurological aspects of strength, the ability of the brain to generate a rate of neuronal action potentials that will produce a muscular contraction that is close to the maximum of the muscles potential. (Ida A, Sasaki K 2024)

The sport of judo entails throwing the opponents onto their backs using different techniques. This combat sport involves great neuromuscular demand, suggesting that a good level of physical fitness in strength and flexibility seems crucial to its competitors (Fukuda et al., 2011). For instance, competitors are matched by weight; hence, higher overall body strength is an important advantage.(Blais and Trilles, 2006)

Today, judo is one of the most popular martial arts, where physical performance and body composition are crucial elements that significantly impact an athlete's success (Franchini, E et al, 2005). High levels of strength, endurance, and agility, coupled with optimal body composition, characterized by a favorable balance of muscle mass and minimal body fat, are essential for executing techniques with precision and power, allowing judokas to gain an advantage over their opponents (Franchini, E et al, 2011). Moreover, top-elite judokas are significantly superior in all upper-body neuromuscular attributes compared to lower-level judokas (Monteiro, L et al, 2024). This superiority is critical as it enables elite judokas to perform more powerful and effective throws, maintain superior grip strength, and exhibit greater overall endurance and resilience during matches, which are essential qualities for success at the highest levels of competition.

METHODOLOGY:

The purpose of the study was to find out the impact of different intensities of resistance training on selected strength parameters among male judo players such as leg strength, back strength and abdominal strength. Since the purpose of the study forty-five male judo players selected from Christian Educational Society, Ottanchathiram, Tamil Nadu, India and their age ranged between 17-25 years was selected as subjects. The selected subjects were divided into three equal groups, in which, group – I (n = 15) underwent medium intensity resistance training, group – II (n = 15) underwent high intensity resistance training, group – III (n = 15) acted as control which do not participate in any special training. The training programme was carried out for this study is three days per week for twelve weeks.

The study was formulated as a random group design consisting of pre and post-tests. Pre-test was conducted for all the subjects on selected criterion variables. Post-test was conducted after the experimental treatment of twelve weeks and the scores were recorded. The normality of the data was found through mean, standard deviation and F ratio. The analysis of covariance (ANCOVA) was applied to find out the significant difference in each criterion variables among the groups. Whenever, the obtained 'F' ratio value for adjusted post-test means was found to be significant, the Scheffe's post hoc test was applied to determine the paired mean differences

STATISTICAL ANALYSES:

The mean values of leg strength of medium, high resistance training group and control group at different stages of tests have been analyzed and submitted in table -1.

Table –1

Test	MRT Group	HRT Group	Control Group	SOV	SS	df	MS	'F'
Pre-test mean	86.28	89.96	89.15	**B**	112.52	2	56.26	0.6
S.D	10.32	9.51	9.17	**W**	3933.35	42	93.65	
Post-test mean	91.63	100.86	85.57	**B**	1778.15	2	889.08	

S.D	13.57	11.36	10.38	**W**	5895.38	42	140.37	6.33*
Adj. Post-Test mean	92.05	100.58	85.44	**B**	1723.33	2	861.66	6.14*
				W	5753.22	41	140.32	

* Significant at 0.05 level of confidence.

*(*The table value required for significance at 0.05 level of significance with df 2 and 42 and 2 and 41 were 3.22 and 3.23 respectively*)*

The post test scores analysis proves that there is significant difference among the groups, as obtained 'F' value 6.33 was greater than the required 'F' value of 3.22. That proves that there was significant difference among the post-test means of the subjects. There was significant difference existed among the adjusted means due to twelve weeks of medium and high resistance training on leg strength. Since the significant improvements were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence interval test. The results were presented in table -2.

Table-2

Adjusted Post-Test Means			**Mean Difference**	**Confidence Interval Value**
MRT Group	**HRT Group**	**Control Group**		
92.05	100.58		8.53*	2.01
92.05		85.44	6.61*	
	100.58	85.44	15.14*	

As the confidence interval required being significant at 0.05 levels was 2.01 and the obtained values are greater than the required value. It was observed that the significant difference was found to be existed. The mean values of back strength of medium, high resistance training group and control group at different stages of tests have been analyzed and submitted in table – 3.

Table –3

Test	**MRT Group**	**HRT Group**	**Control Group**	**SOV**	**SS**	**df**	**MS**	**'F'**
Pre-test mean	78.36	79.74	79.08	**B**	14.46	2	7.23	0.41
S.D	5.04	3.59	3.88	**W**	746.64	42	17.78	
Post-test mean	84.17	86.79	79.17	**B**	448.86	2	224.43	11.87*
S.D	5.48	3.57	3.73	**W**	794.23	42	18.91	
Adj. Post-Test mean	84.13	86.83	79.18	**B**	450.98	2	225.49	11.68*
				W	791.68	41	19.31	

Table-3 shows that the post test scores analysis proves that there was significant difference among the groups, as obtained 'F' value 11.87 is greater than the required 'F' value of 3.22. This proves that there was significant difference among the post-test means of the subjects. Since the significant improvements are recorded, the results are subjected to post hoc analysis using Scheffe's Confidence interval test. The results are presented in table -4.

Table-4

Adjusted Post-Test Means			MeanDifference	Confidence Interval Value
MRT Group	**HRT Group**	**Control Group**		
84.13	86.83		2.699*	0.74
84.13		79.18	4.954*	
	86.83	79.18	7.653*	

As the confidence interval required being significant at 0.05 level was 0.74 and the obtained values were greater than the required value. The mean values of abdominal strength of medium, high resistance training group and control group at different stages of tests have been analyzed and submitted in table – 5.

Table –5

Test	MRT Group	HRT Group	Control Group	SOV	SS	df	MS	'F'
Pre-test mean	29.31	30.44	29.90	**B**	9.62	2	4.81	1.08
S.D	2.22	1.73	2.33	**W**	186.91	42	4.45	
Post-test mean	36.28	32.79	29.19	**B**	376.44	2	188.22	36.64*
S.D	2.34	1.92	2.49	**W**	215.77	42	5.14	
Adj. Post- Test mean	36.33	32.75	29.19	**B**	376.49	2	188.25	35.98*
				W	214.49	41	5.23	

Table-5 shows that the post test scores analysis proves that there was significant difference among the groups, as obtained 'F' value 36.64 was greater than the required 'F' value of 3.22. This proves that there was significant difference among the post-test means of the subjects. This proves that there was significant difference existed among the adjusted means due to twelve weeks of medium and high resistance training on abdominal strength. Since the significant improvements were recorded, the results are subjected to post hoc analysis using Scheffe's Confidence interval test. The results are presented in table -6.

Table-6

Adjusted Post-Test Means			Mean Difference	Confidence Interval Value
MRT Group	**HRT Group**	**Control Group**		
36.33	32.75		3.58*	0.387*
36.33		29.19	7.14*	
	32.75	29.19	3.56*	

As the confidence interval required being significant at 0.05 level was 0.387 and the obtained values are greater than the required value. It was observed that the significant difference was found to be existed.

RESULTS:

The results of the study showed that effects of the medium and high intensity resistance training on strength such as leg strength, back strength and abdominal strength has shown improvement for the medium and high intensity resistance training groups when compared with the control groups. In addition, the result of the tests shows that High intensity resistance training group was better in leg strength, back strength and abdominal strength compared with medium intensity resistance training

DISCUSSION:

Based on the result of the study the following findings were drawn: It was found from the effects of the medium and high intensity resistance training on strength parameters such as leg strength, back strength and abdominal strength has shown improvement for the medium and high intensity resistance training groups when compared with the control groups. **Orange et al., (2022)** estimated the effectiveness of using velocity feedback to regulate resistance training load on changes in muscle strength, power, and linear sprint speed in apparently healthy participants. **Dowse, McGuigan and Harrison (2020)** idea was to decide whether a nine-week resistance training program could have significant effect maximum lower-body strength and power, dynamic balance and dance performance in adolescent dancers.

Both medium and high intensity resistance training groups have improved their leg strength, back strength and elastic power when compared with the control groups**.** In addition, the result of the tests shows that there was a significant difference between experimental groups. High intensity resistance training group was better in leg strength, back strength and elastic power compared with medium intensity resistance training and control groups. **Sabag et al., (2018)** inspected the result of concurrent high intensity interval training and resistance training on strength and hypertrophy it recommends concurrent high intensity interval training and resistance training doesn't contrarily affect hypertrophy or upper body strength.

Medium and high intensity resistance training groups have improved their abdominal strength, strength endurance, anaerobic power and explosive power in the terms of horizontal and vertical distances when compared with the control group**.** In addition, the results of the tests show that there was a significant difference between experimental groups. Medium intensity resistance training group was better in abdominal strength, strength endurance, anaerobic power and explosive power in the terms of horizontal and vertical distances compared with high intensity resistance training and control groups. **Fernandez-**

Lezaun (2017) investigated the effects of resistance training performed with different frequencies, including a follow-up period, on cardio respiratory fitness in healthy older individuals.

CONCLUSIONS:

Hence, it was concluded from the results that both medium and high intensity resistance training practice were improved leg strength, back strength and abdominal strength. Among the experimental groups, the increase was higher for high intensity resistance training than medium intensity resistance training.

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