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Evaluation of Difference in Strength Levels of Major Muscle Groups of Light Weight Judokas

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Abstract - The present study was directed to figure out the difference in level of strength of major group of muscles concerned with Judokas of light weight category. Switching to next weight category has always been considered a challenging task for any combative sports. To know whether switching to -66kg from -60kg weight category requires significant improvements in selected strength parameters. A total of 34 Judokas were recruited to achieve the objectives of this study. 19 Judokas from -60kg weight category, and 15 Judokas of -66kg weight category took part in this study voluntarily. For statistical analysis Independent sample t-test was applied, level of significance was set at 0.05 during whole statistical analysis. Their performance were tested on grip strength, bench press, back strength, leg strength. Results of the study suggests that except back strength the strength levels of Judokas of two selected weight categories varies significantly from each other.

Keywords - Judoka, Grip strength, Back strength, Leg strength, Weight category.

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INTRODUCTION

The search of excellence paves the way of hard work and ensures finest use of human intellect. In today's science era human potential have been excelled in extraordinary way. With modern inventions we have been facilitated with so many useful inventions who helped us leading our lives in an easy manner.

Anything that is moving in the planet is propelled by either internal or external forces. With reference to human body the internal force that cause motion is produced by skeletal muscles. These skeletal muscles works under voluntary control of human brain. Different types of Games imposes specific type of strength for each sports.

Strength plays a dominant role in determining performance in most of the combative sports. In the sports of Judo it requires explosive strength as prime motor quality in a Judoka. For a Judoka to excel in Judo he/she needs considerable amount of strength in following terms: grip strength, chest strength, back strength, and leg strength. A Judoka should also possess good level of endurance, agility, and flexibility along with above mentioned qualities. In present study a comparison have been made of above mentioned motor qualities between Judokas of -60kg and -66kg weight categories. The study caries the aim of determining whether a Judoka of concerned lower weight category really requires to improve his strength levels before switching to next higher weight category.

To avoid taking part in next higher weight category so many Judokas prefer to lose their body weight. Their major concern for taking part in lower weight category lies in question "whether their body possess required level of muscular strength to take part in next higher weight category"? The author believes that the present study will serve as reliable baseline for Judokas competing in -60kg, and -66kg weight category. It may provide them with necessary help in making their decision.

METHODOLOGY

34 Judokas (19+15 from -60kg and -66kg weight category respectively) were tested on 4 strength parameters namely grip strength, bench press, back strength, and leg strength. All these tests were conducted inside Judo hall of TT Nagar Stadium of Bhopal District. The subjects were provided with 15 minutes of warming up period. Grip strength test was measured using grip strength dynamometer equipment. Bench press exercise was performed by subjects on a flat bench, they were asked to perform 1RM. For measurement of back strength, back strength dynamometer was made utilised. Leg strength of all the subjects was measured using leg strength dynamometer. Digital dynamometers were

used for the purpose of analysis. Performance on each independent variable was measured in Kilograms.

ANALYSIS OF DATA

Table-1: Descriptive Statistics of each independent variable

	Weight category	N	Mean	Std. Deviation	Std. Error Mean
Grip strength	60 KG	19	40.58	1.71	0.39
	66 KG	15	46.53	3.36	0.87
Bench press	60 KG	19	78.68	16.4	3.76
	66 KG	15	88.67	10.93	2.82
Back strength	60 KG	19	126.79	10.75	2.47
	66 KG	15	131.07	10.39	2.68
Leg strength	60 KG	19	134	4.89	1.12
	66 KG	15	145.53	3.78	0.98

Table 1 consists of 6 columns and 5 rows, the most basic information related to selected independent variables have been displayed in above table. The group mean, sample size, standard deviation and standard error of mean of two weight categories namely -60kg and -66kg have been presented in above table. The above table clearly states the status of low and high performance of each group.

Things to be noted down from table 1 can be observed in column 4, where mean scores of all the independent variables have been presented. In nut shell it is clearly visible that observable difference exist in all the concerned weight groups. Whether the observable difference in group means is statistically significant too can be figured out with the findings of table 2. By looking at the group means presented in column 4 it can be clearly observed that bigger muscle groups has higher group means. The study observed highest group mean for independent variable leg strength 134kg for -60kg, and 145.53 kg for Judokas belonging to -66kg weight category.

Table-2: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Leg strength	Equal variances assumed	1.66	0.21	-7.53	32.00	**0.00**	-11.53	1.53	-14.65	-8.41
	Equal variances not assumed			-7.76	31.99	**0.00**	-11.53	1.49	-14.56	-8.51
Grip strength	Equal variances assumed	13.28	0.00	-6.72	32.00	**0.00**	-5.95	0.89	-7.76	-4.15
	Equal variances not assumed			-6.26	19.68	**0.00**	-5.95	0.95	-7.94	-3.97
Bench press	Equal variances assumed	3.77	0.06	-2.03	32.00	**0.05**	-9.98	4.93	-20.02	0.06
	Equal variances not assumed			-2.12	31.24	**0.04**	-9.98	4.70	-19.57	-0.39
Back strength	Equal variances assumed	0.06	0.81	-1.17	32.00	0.25	-4.28	3.66	-11.73	3.18
	Equal variances not assumed			-1.17	30.65	0.25	-4.28	3.64	-11.71	3.16

Table-2 states the categories where statistical significant differences were observed. Most of the statistics texts suggests that p-value ≤ selected level of significance defines that significant difference exists between the two. According to table-2 the independent variables corresponding to column 7 has significantly different mean for both weight categories.

CONCLUSIONS

On the basis of statistical analysis, the present research study proposes following conclusions:

Findings presented below are based on assumption that both datasets (-60kg, & -66kg) has equal variance.

- The levels of grip strength were found significantly different for both groups. Higher mean value were recorded for heavier weight group.
- The levels of chest strengths were found significantly different for both groups. Higher mean value were recorded for heavier weight group.
- The levels of leg strength were found significantly different for both groups. Higher mean value were recorded for heavier weight group.
- It was noticed that in case of back strength both groups has more or less similar level of strengths.
- The mean score of grip strength was noted as 40.58kg, and 46.53kg for -60kg, and -66kg respectively .
- The mean score of chest strength (bench press) was noted as 78.68kg, and 88.67kg for -60kg, and -66kg respectively.
- The mean score of back strength was noted as 126.79kg, and 131.07kg for -60kg, and -66kg respectively.
- The mean score of leg strength was noted as 134kg, and 145.53kg for -60kg, and -66kg respectively.

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