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AN ANALYSIS OF SELECTED CARDIAC AND STRENGTH PARAMETERS AMONG NOVICE, ELITE AND NON-ELITE MALE JUDO PLAYERS

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ABSTRACT

The objective of this study was to verify the differences among novice (the beginners), Elite (School National or Inter-university medalists) and Non-elite (non-medalists in School National or Inter-university Tournaments) school and college level male judo players. For this purpose, the following tests and measurements were conducted: (a) Blood pressure (Diastolic & Systolic); (b) Pulse Rate; (c) Isometric hand grip strength (Right & Left) and (d) shoulder-girdle strength. The groups were compared by means of an ANOVA statistic followed by a post-hoc Scheffe test (significance level=5%). Elite group presented better results than Non-elite and Novice group in the following variables ($p < 0.05$): Diastolic blood pressure. It can be concluded that elite and non-elite had significantly better blood pressure (Diastolic & Systolic) and Isometric hand grip strength (Right & Left) than novice

Keywords: Blood Pressure, Pulse Rate, Isometric, Strength and Judoka.

INTRODUCTION

Judo is a high-intensity activity; a judoka tries to throw the opponent on the back or to control the opponent during fighting on the floor or during groundwork combat. For these reasons, judokas are required to have excellent physical and physiological conditioned body. Both attempts depend on specific techniques and tactical skills with the support of good physical fitness (Thomas et al, 1989). Judo is an Olympic sport, which requires technique, tactics and a high level of physical fitness (Little N.G.). Some physical fitness and anthropometrical variables are considered requisites for high performance in judo competition (Sikorski et al, 1987). Being especially focus on strengths' parameters and physiological characteristics of an elite judoka will pave the way for his success. Judo is a combative game, in this game to dominant the opponent and to protect oneself high level strengths' parameters are essentially required. To work against resistance and to impress the opponent for maximum time, a player needs high level of endurance also. From the physical fitness viewpoint; few studies (Borkowsky et al., 2001; Fagerlund and Häkkinen, 1991; Franchini et al., 2003; Franchini et al., 2005a) compared high level with lower level judo players concerning physical fitness variables. The physical and physiological capacities of various sports disciplines have been extensively studied in India. In the field of combat sports several works on taekwondo, karate kumite, nunchaku exercise, and judo have been reported (Beneke et al., 2004; Callister et al., 1991; Heller, 2000; Toskovic et al., 2002; Thompson et al., 1991). From the physiological point of view, anaerobic power and capacity, strength and aerobic capacity have been pointed as the main characteristics to be developed by judo players (Thomas et al, 1989). These variables also are different according to weight categories. The evaluation of judokas is difficult because there are few specific tests and the laboratories tests do not simulate the match movements. Similar to athletes in other sports, those in combat sports have also been profiled. However, only limited information is available on them. For instance, Pieter and Taaffe, 1990 tested the isokinetic strength of elite American taekwondo athletes and found their hamstrings to quadriceps (H/Q) ratios to be lower than expected. Indeed, judo players have been evaluated in non-specific tasks. In nutshell we can say that physical and physiological

fitness plays an important role in Judo. Furthermore, little is known about the differences between elite and non-elite judo players. Thus, the objective of this study was to verify the differences among novice, elite and non-elite male judo player's with refer specific tests.

MATERIALS AND METHOD

Sixty purposively selected male Judo players of Punjab region (India) aged 16–26 years volunteered to participate in the study. The subjects were highly motivated to participate in this study. They were randomly assigned into three groups: Novice (The Beginners N1=20), Elite (School National or Inter-University medalists: N2=20) and Non-Elite (Non-Medalists in School National or Inter-University Tournaments: N3=20) male judokas.

Selection of Variable and Their Criterion

Measures: Table-1 presents the variables in respect to cardio and strengths' parameters which were selected for the present study and were measured by standardized tests.

Table 1: Selected variables and their criterion measures

Sr. No.	Variable	Criterion Measures
1	Blood Pressure (Diastolic & Systolic)	Wrist Monitor
2	Pulse Rate	Wrist Monitor
3	Isometric hand grip strength	Grip Dynamometer
4	Shoulder Girdle Strength	Medicine Ball Throw

STATISTICAL TECHNIQUE

The data analyzed and compared with the help of statistical procedure in which arithmetic mean, standard deviation, ANOVA followed by a post-hoc Scheffe test (significance level=5%) used to determine the group differences. The IBM SPSS Statistics 20 was used to analyze the collected data.

RESULTS

The tests were selected keeping in mind the administrative feasibility, availability and suitability with regard to the subjects to be employed for this study. Mean and standard deviation of the selected dimensions of novice, elite and non-elite were computed. The results have been depicted in table 2. Table 2 depicts that the mean and standard deviation values of novice, elite and non-elite male judo players. It was hypothesized that there were no significant differences with regard to selected variables among novice, elite and non-elite male judokas.

Table 2: Results of One-Way Analysis of Variance (ANOVA) among Novice, Elite and Non-Elite Male Judo Players

		Sum of Squares	df	Mean Square	F
Diastolic Blood Pressure	Between Groups	2211.300	2	1105.650	18.301*
	Within Groups	3443.550	57	60.413	
	Total	5654.850	59		
Systolic Blood Pressure	Between Groups	3266.433	2	1633.217	18.462*
	Within Groups	5042.300	57	88.461	
	Total	8308.733	59		
Pulse Rate	Between Groups	612.300	2	306.150	6.602*
	Within Groups	2643.350	57	46.375	
	Total	3255.650	59		
Right Hand Grip Strength	Between Groups	1624.233	2	812.117	22.084*
	Within Groups	2096.109	57	36.774	
	Total	3720.342	59		
Left Hand Grip Strength	Between Groups	1456.800	2	728.400	20.221*
	Within Groups	2053.290	57	36.023	
	Total	3510.090	59		
Shoulder Girdle Strength	Between Groups	1145.655	2	572.828	2.136
	Within Groups	15285.213	57	268.162	
	Total	16430.868	59		

(*) Significant at 0.05 level, Tabulated F Value = 3.16

Table-2 showed significant difference on Diastolic & Systolic Blood Pressure among Novice, Elite and Non-Elite judo players as the F-value=18.301 & 18.462 respectively were found greater than the tabulated value=3.16. The results with regards to Pulse rate was found significant difference among different level of judo players as the F-value=6.602 was higher than the table value=3.16. The results revealed that Right- and Left-hand grip strength were also found significant as the F-value=22.084 & 20.221 respectively, found higher than the tabulated value=3.16 which was required to be significant at 0.05 level of significance. The F-value=2.136 Shoulder Girdle Strength was found statistically lower than the tabulated value among all the three groups of judo players.

Table 3: Comparison of Mean Values of Scheffe's Post Hoc Test among Novice, Elite and Non-Elite Male Judo Players

Dependent Variable	(I)VAR00001	(J)VAR00001	Mean Difference (I-J)	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Diastolic Blood Pressure	Novice	Elite	14.85000*	.000	8.6720	21.0280
		Non- Elite	8.10000*	.007	1.9220	14.2780
	Elite	Novice	-14.85000*	.000	-21.0280	-8.6720
		Non- Elite	-6.75000*	.029	-12.9280	-.5720
	Non- Elite	Novice	-8.10000*	.007	-14.2780	-1.9220
		Elite	6.75000*	.029	.5720	12.9280
Systolic Blood Pressure	Novice	Elite	17.95000*	.000	10.4742	25.4258
		Non- Elite	10.80000*	.003	3.3242	18.2758
	Elite	Novice	-17.95000*	.000	-25.4258	-10.4742
		Non- Elite	-7.15000	.064	-14.6258	.3258
	Non- Elite	Novice	-10.80000*	.003	-18.2758	-3.3242
		Elite	7.15000	.064	-.3258	14.6258
Pulse Rate	Novice	Elite	6.00000*	.026	.5872	11.4128
		Non- Elite	7.35000*	.005	1.9372	12.7628
	Elite	Novice	-6.00000*	.026	-11.4128	-.5872
		Non- Elite	1.35000	.822	-4.0628	6.7628
	Non- Elite	Novice	-7.35000*	.005	-12.7628	-1.9372
		Elite	-1.35000	.822	-6.7628	4.0628
Right Hand Grip Strength	Novice	Elite	-12.35000*	.000	-17.1700	-7.5300
		Non- Elite	-8.90000*	.000	-13.7200	-4.0800
	Elite	Novice	12.35000*	.000	7.5300	17.1700
		Non- Elite	3.45000	.207	-1.3700	8.2700
	Non- Elite	Novice	8.90000*	.000	4.0800	13.7200
		Elite	-3.45000	.207	-8.2700	1.3700
Left Hand Grip Strength	Novice	Elite	-11.68000*	.000	-16.4505	-6.9095
		Non- Elite	-8.47500*	.000	-13.2455	-3.7045
	Elite	Novice	11.68000*	.000	6.9095	16.4505
		Non- Elite	3.20500	.249	-1.5655	7.9755
	Non- Elite	Novice	8.47500*	.000	3.7045	13.2455
		Elite	-3.20500	.249	-7.9755	1.5655
Shoulder Girdle Strength	Novice	Elite	-10.44500	.140	-23.4610	2.5710
		Non- Elite	-3.19750	.827	-16.2135	9.8185
	Elite	Novice	10.44500	.140	-2.5710	23.4610
		Non- Elite	7.24750	.382	-5.7685	20.2635
	Non- Elite	Novice	3.19750	.827	-9.8185	16.2135
		Elite	-7.24750	.382	-20.2635	5.7685

(*) The mean difference is significant at the 0.05 level.

Table-3 result shows significant differences on the account of diastolic blood pressure within three groups. However, elite and non-elite had significant lower systolic blood pressure than novice, but elite had not significant lower systolic blood pressure than non-elite. Elite and non-elite again recorded lower pulse rate than novice, but not significant difference within themselves. The isometric hand grip strength of both hands was found higher in the elite and non-elite group than novice and insignificant difference found within elite and non-elite. The shoulder girdle strength was recorded as not significant difference in the all three groups.

DISCUSSION

The results show that significant differences were found among novice, elite and non-elite judo players on diastolic Blood Pressure. Systolic blood pressure of elite and non-elite was significant lower than novice, but the elite and non-elite had almost same systolic blood pressure. The pulse rate of elite and non-elite judokas was recorded lower than novice players. The results of this study was in line with the Pradeep Kumar et al. (2013), who reported significant differences on the basis of physiological variables of all India intervarsity level batsmen's, pace bowlers, spin bowlers, wicketkeepers and all-rounders men cricketers of India. The results revealed that isometric strength of both hands did not differ between the elite and non-elite judo players, but both group had significant higher grip strength than novice players. Present study also is going in line with the results of E. Franchini et al. (2005). However, the values presented by the elite judo athletes in the present study was lower than that reported by Claessens et al. (1984) in high level Belgian judo players (right hand grip=64.908.9 kg; left hand grip=59.708.8 kg). The results on the account of shoulder girdle strength concluded that there was not a significant difference among three groups i.e. novice, elite and non-elite male judo players.

CONCLUSIONS

It is concluded from the above findings that elite had significantly better Diastolic blood pressure than their counterparts. However, elite and non-elite had significantly better blood pressure (Diastolic & Systolic) and Isometric hand grip strength (Right & Left) than novice.

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