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A comparison between male judo-kas and karate-kas within body composition and physical fitness

Satpal YADAV

Lakshmibai National Institute of Physical Education, NERC, Guwahati, Assam, India.
Address correspondence to Satpal Yadav, satpalresearch@gmail.com.

Abstract
The purpose of the study was to compare the body composition and physical fitness between male judo-kas and karate-kas. The subjects were selected from the male Judokas and Karatekas of different colleges and training centers, who had participated last 2 years at Punjab state level competitions for this study. Ten (10) male Judokas and Karatekas from three different weight categories namely light weight, middle weight and heavy weight were selected as the subject for the study. Selected body composition such as Standing Height, Weight, Humerus Biepicondylar, Wrist Diameter, Femur Biepicondylar, Ankle Diameter, Upper arm Circumference, Forearm Circumference, Thigh Circumference, Calf Circumference, Bicep Skinfold, Forearm Skinfold, Suprailiac Skinfold, Subscapular Skinfold, Thigh Skinfold, Calf Skinfold and Physical fitness variables such as 50 meter Dash, Shuttle Run, Shot Put, 600 yards Run or Walk and Bend and Reach Test were presented to compare the male Judokas and Karatekas from three different weight categories namely light weight, middle weight and heavy weight. To see the significant difference of selected body composition and physical fitness variables among the male Judokas and Karatekas from three different weight categories namely light weight, middle weight and heavy weight, the analysis of "mean, standard deviation and t test" was applied at .05 level of significance. The judokas are found to be taller and having greater diameters and circumferences and leaner in all skinfolds except suprailiac skinfold. The karatekas found to be heavier and having greater upper arm and forearm circumferences and leaner in suprailiac skinfold than judokas. However, the Judokas have greater bone mass, muscle mass and less fat percentage than Karatekas. Further Judokas have more speed, coordinative ability and endurance than Karatekas.
Keywords: Body composition, physical fitness, judo-kas, karate-kas.

INTRODUCTION

The scientifically proved that the body composition of two persons is never alike. It may differ in many ways like body size, structure, shape, weight, fat etc. The term Judo breaks down into 'Ju' means 'Gentle' and 'Do' means 'Way or Path' so 'Judo' means 'Gentle Way' Judo became an official event in the Olympic game of 1964. In India Judo was started by 'Dr. Ravindernath Tagore'; he started Judo in Shanti Nikatan University. Judo is a rigorous and demanding physical activity. The practice of judo techniques helps people develop basic and fundamental physical fitness in a number of ways, such as the development of strength, flexibility, agility, speed, dynamic and static balance, explosive power, and endurance. Karate origins live on the battle fields of ancient Japan, but today this martial art is more than just a system of combat. For Karate participants, it is way of life that encourages mental, physical and moral development. Gichin Funakoshi was established Karate in Japan in 1921. "Karate" means 'Empty handed art of self-defense' in which the arms and legs are systematically trained and an enemy attacking by surprise can controlled by a demonstration of strength like that of using actual weapons. Karate is exercise through which the Karatekas masters all body movements, such as bending, jumping and balancing, by learning to move, limbs and body backward and forward, left and right, up and down. This difference influences their performance in some different sports events. The human body consists of several levels of structural organization. Considering the increasing stages of complexity, five levels of body composition can be envisioned (10). The human body is characterized by size, shape and its various dimensions (8,9). Body composition is used to describe the percentages of fat, bone and muscular in human body. Physical fitness is the ability to carry out daily tasks with vigor and alertness without undue fatigue and with ample energy to enjoy leisure time pursuit and meet unforeseen emergencies with components of strength, endurance ability and speed- endurance. Judokas' and Karatekas' performance can predict on the basis of physical fitness (1). Body composition has become a major field of interest, for the sport scientists and proper assessment of body composition can help in profiling and counseling sportsperson (12). Body composition makes an

important contribution to an individual's level of physical fitness for performance (1) describes it as a state which characterizes the degree to which a person is able to function efficiently through these physical, mental, emotional, moral and spiritual components. The physical fitness totally depends upon the body composition. So investigator tried to such hidden factors which help to increase the level of performance of judokas and karatekas.

MATERIALS AND METHODS

Participants

Sixty male subjects which were divided into two groups 30 judokas and 30 karatekas and both groups having equally sample according to their three categories i.e. light weight (66-73kg) middle weight (81-90kg) and heavy weight (100+kg). They were ranging in age from 18.5+6.5 years old. The sample had participated last 2 years at state level competitions. The sixty (60) judokas and Karatekas were selected from different colleges and training centers. The investigator firstly divided the Judokas and Karatekas to their weight category, random sampling technique was used.

Instruments

The following instruments used for collection of data were anthropometric rod, Weighing machine, Sliding caliper, Steel tape, Skinfold caliper, Stopwatch, Measuring tape and Shot Put.

The following standardized anthropometric measurements used (11) method for data collection were Standing Height (cms), Weight (kg), Humerus Biepicondylar (cms), Wrist Diameter (cms), Femur Biepicondylar (cms), Ankle Diameter (cms), Upper arm Circumference (cms), Forearm Circumference (cms), Thigh Circumference (cms), Calf Circumference (cms), Bicep Skinfold (mm) Forearm Skinfold (mm), Suprailiac Skinfold (mm), Subscapular Skinfold (mm), Thigh Skinfold (mm), Calf Skinfold (mm).

The following selected physical fitness test items used for data collection were 50 meter Dash (sec.) (5), Shuttle Run (6x10m) (sec.) (4), Shot Put (mts.) (1), 600 yards. Run or Walk (mins.)(1), Bend and Reach Test (cms) (5).

Body composition components i.e. bone mass and muscle mass (2), percentage of body fat (3) and body density (7) were calculated using the formula.

Statistical Analysis

To analysis the significant difference of selected body composition and physical fitness variables among the male Judokas and Karatekas from three different weight categories namely light weight, middle weight and heavy weight, the analysis of "mean, standard deviation and 't' test was applied at.05 level of significance (6).

RESULTS

The results pertaining to body composition, if any, between judokas and Karatekas were assessed using the Student's t test and the results are shown in tables 1.

The comparison of their Standing Height, Weight, Humerus Biepicondylar, Wrist Diameter, Femur Biepicondylar, Ankle Diameter, Upper arm Circumference, Forearm Circumference, Thigh Circumference, Calf Circumference, Bicep Skinfold, Forearm Skinfold, Suprailiac Skinfold, Subscapular Skinfold, Thigh Skinfold, Calf Skinfold of male judokas and karatekas were shown in table 1. The mean values of Humerus Biepicondylar, Wrist Diameter, Femur Biepicondylar, Ankle Diameter, Upper arm Circumference, Thigh Circumference, Calf Circumference, Bicep Skinfold, Bone mass and Fat percentage of judokas and karatekas were (7.01 and 5.97)cms, (5.99 and 5.54)cms, (8.64 and 8.31)cms, (6.83 and 6.51)cms, (25.53 and 26.90)cms, (48.57 and 47.27)cms, (35.10 and 33.92)cms, (9.72 and 11.23)mm, (10.28 and 8.73) and (23.71 and 30.24) respectively. In statistically term cal. t (=6.70, 3.24, 2.40, 2.78, 2.13, 2.01, 2.03, 2.05, 4.56 and 6.86)> tab t .05 (59) (=2.01), Ho (null hypothesis) is rejected at .05 level of significance.

The comparison of their height, body weight, forarm circumference, forarm skinfold, suprailiac skinfold, subscapular skinfold, thigh skinfold, calf skinfold and muscle mass of judokas and karatekas were (168.2 and 1.66.8)cms, (61.20 and 62.25)kg, (24.80 and 25.47)cms, (7.68 and 8.93)mm, (16.37 and 15.60)mm, (12.23 and 13.03)mm, (12.13 and 13.03)mm, (13.53 and 14.57)mm and (25.25 and 24.29) respectively. The cal "t" value (=0.68, 0.41, 1.20, 1.77, 0.42, 0.58, 1.19, 1.38 and 1.07)< tab t.o5 (59)(=2.01), Ho (null hypothesis) is accepted at .05 level of significance.

Table 1. Mean value (SD) of body composition in the judokas and karatekas.

Dimensions	Mean		SD		t-value
	Judo-kas	Karate-kas	Judo-kas	Karate-kas	
Height (cms)	168.2	166.8	166.8	166.87	0.68
Body weight (Kg)	61.20	62.25	9.37	10.54	0.41
Humerus biepicondylar (cms)	7.01	5.97	0.60	0.60	6.70*
Wrist diameter (cms)	5.99	5.54	0.53	0.54	3.24*
Femer biepicondylar (cms)	8.64	8.31	0.45	0.59	2.40*
Ankle diameter (cms)	6.83	6.51	0.44	0.45	2.78*
Upper arm circumference (cms)	25.53	26.90	2.59	2.38	2.13*
Forarm circumference (cms)	24.80	25.47	2.31	1.98	1.20
Thigh circumference (cms)	48.57	47.27	1.82	3.05	2.01*
Calf circumference (cms)	35.10	33.92	1.93	2.55	2.03*
Biceps skinfold (mm)	9.72	11.23	2.31	3.32	2.05*
Forearm skinfold (mm)	7.68	8.93	2.27	3.14	1.77
Suprailiac skinfold	16.37	15.60	7.35	6.64	0.42
Subscapular skinfold (mm)	12.23	13.03	5.18	5.81	0.58
Thigh skinfold (mm)	12.13	13.03	2.86	3.00	1.19
Calf skinfold (mm)	13.53	14.57	2.49	2.19	1.38
Bone mass	10.28	8.73	1.41	1.22	4.56*
Muscle mass	25.25	24.29	3.42	3.51	1.07
Fat percentage	23.71	30.24	3.99	3.36	6.86*

* p <0.05

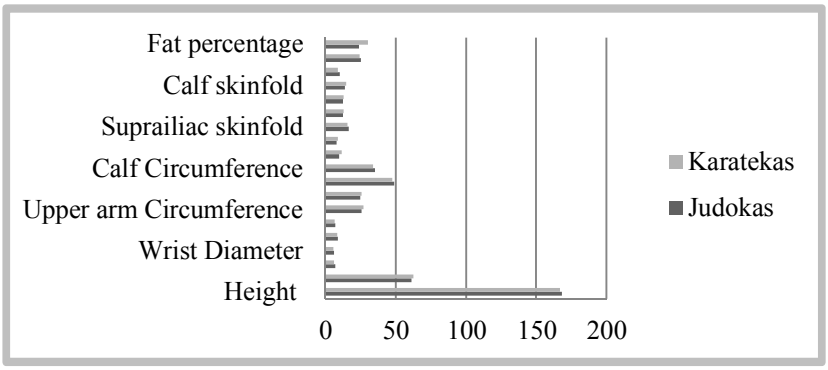

Figure 1. Body composition in the judokas and karatekas.

Result indicates that male judokas were found to be taller than karatekas, male karatekas were found to be heavier than judokas, male judokas has greater humerus biepicondylar diameter, wrist diameter, femur biepicondylar, ankle diameter, upper arm circumference, thigh circumference, calf circumference than judokas, leaner biceps skinfold than karatekas, greater bone mass and lesser fat percentage than karatekas.

It may also concluded that no significant change was noted in the height, body weight, forarm circumference, forarm skinfold, suprailiac skinfold, subscapular skinfold, thigh skinfold, calf skinfold and muscle mass. As per the study the above remark can be given at 95% confidence.

The results pertaining to physical fitness, if any, between Judokas and Karatekas were assessed using the Student's t test and the results are presented in tables 2.

The comparison of their speed, coordinative ability, and endurance of male judokas and karatekas were shown in Table 2. The mean values of speed, coordinative ability and endurance of judokas and karatekas were (8.74 and 7.98) sec., (15.76 and 14.72) sec. and (12.65 and 11.98) cms respectively. In statistically term cal. t (=4.35, 4.80 and 2.67)> tab t .05 (59) (=2.01), Ho (null hypothesis) is rejected at .05 level of significance.

Table 2. Mean values (SD) of physical fitness in the judokas and karatekas.

Dimensions	Mean		SD		t-value
	Judo-kas	Karate-kas	Judo-kas	Karate-kas	
Speed (sec)	8.74	7.98	0.79	0.54	4.35*
Coordinative ability (sec)	15.76	14.72	0.75	0.92	4.80*
Shoulder strength (mts)	8.28	7.66	1.12	1.37	1.91
Endurance (mins)	2.41	2.27	0.24	0.13	2.67*
Flexibility (cms)	12.65	11.98	2.57	2.81	0.96

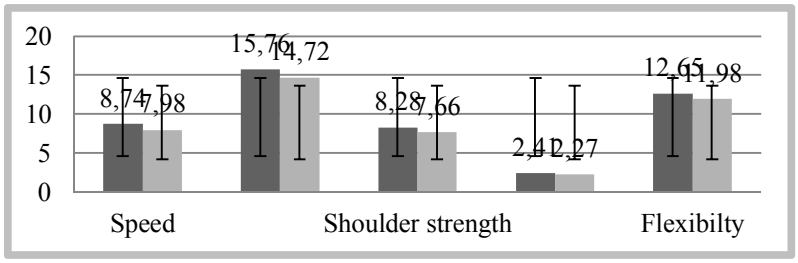

Figure 2. Physical fitness in the judokas and karatekas.

The comparison of their shoulder strength and flexibility of judokas and karatekas were (8.28 and 7.66) mts and (12.65 and 11.98) cms respectively. The cal. "t" value (=1.91 and 0.96) < tab t .05 (59) (=2.01), Ho (null hypothesis) is accepted at .05 level of significance.

Result indicates that male karatekas were found to be speediest than judokas, judokas more coordinative ability and more endurance than karatekas, lesser shoulder strength and flexibility of karate-kas than judokas. It may also conclude that no significant change was noted in the shoulder strength and flexibility. As per the study the above remark can be given at 95% confidence.

DISCUSSION

Body composition

Results of the present study revealed that male judokas have taller, greater diameters, circumferences except upper-arm and fore-arm circumferences and leaner in skinfolds except suprailiac skinfold. Karatekas have greater upper-arm and forearm circumferences and leaner in suprailiac skinfold. These finding substantiate the assertion that the several study have shown that comparison to other sports using body power, the judokas in the present study has greater bone mass, more muscle mass and lesser fat percentage may be due to wider bone diameters, more developed girths; this may be effect of strenuous training, different skills movements, genetics factors and different diet pattern as compare to karatekas.

Physical Fitness

It may be concluded from the results that judokas have more shoulder strength, endurance and flexibility. Karatekas have more speed and coordinative ability. Results indicate that statistically exist significant difference between male judokas and karatekas related to their speed, coordinative ability and endurance. The findings of the study more shoulder strength, flexibility in judokas may be due to their skill requirements, different training schedule and their forward backward bending movement's, quickly counter movements change the position throwing and defending. Thus karatekas have more speed and coordinative ability comparative to judokas may be due to effects of different skill i.e. Punching, kicking, and blocking of counter attacks.

In conclusion; keeping the results and discussion in view the conclusions drawn that in comparison with Karatekas, Judokas are found to be taller and having greater diameters and circumferences. Judokas are further found to be leaner in all skinfolds except suprailiac skinfold. Karatekas are found to be heavier and having greater upper arm and forearm circumferences than Judokas. Karatekas are further found to be leaner in suprailiac skinfold. Judokas have greater bone mass, muscle mass and less fat percentage than Karatekas. Judokas have more speed, coordinative ability and endurance than Karatekas. With reference to the physical fitness among Karatekas and Judokas, significant difference is noted in all diameters including circumferences except forearm circumference, biceps skinfold; bone mass, fat

percentage, speed, coordinative ability and endurance. Results pertaining to significant differences exist related to physical fitness in favors of Judokas.

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