17 - LEVELS OF STRENGTH AND BODY COMPOSITION IN ATHLETES OF KARATE

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INTRODUCTION

Karate is a martial art of Japanese origin. Currently he is a combat sport of percussion and semi contact. The blows are usually trained in karate and applied so intense in a short duration with call for rapid execution of movements of the upper and lower its practitioners, especially during the fights, which tend to be high intensity and short duration, characterized them as an anaerobic activity (ROSS and TIRAPEGUI, 2007; VOLTARELLI and MONTREZOL, 2009).

Within this perspective, it is believed that the variable force - power can be a determining factor in the acquisition of sports performance (ROCHEL et al, 2009). In sports that involve categories of weight, body composition can help in the acquisition process results (AIWA and PIETER, 2007).

Strength - strength and body composition are components of physical fitness and health. Physical fitness can be defined as the capacity or ability to perform a task body without excessive wear occurs. Composed of several components such as body composition, strength, flexibility, endurance and others (BÖHME, 2003), key components for the practice of karate (URBINATI et al, 2011).

Controlling the level of physical fitness can contribute to achieving better results in sports performance (ARRUDA and SILVA, 2011). Body composition variables, such as fat levels may be associated with decreased levels of force (UGARKOVIC et al, 2002).

The objective of this study was to determine the levels of body composition and strength endurance and power athletes in karate, as well as verify that influences the adiposity levels of muscular strength.

METHODS

We evaluated nine karate athletes, seven men and two women in the middle, advanced to at least two years of practice. We measured anthropometric variables: body mass (kg), height (m), wingspan (m), resistance / abdominal strength Sit ups (abdominal in a minute), strength testing power of the lower limbs (horizontal jump) proposed by PROESP- BR, (2007) and skinfolds (triceps, chest, subscapular, supra iliac, measured axillary, abdominal and thigh). Were calculated lean body mass (kg), fat mass (kg), body mass index (BMI), fat percentage (Men = 1.11200000 - [0.00043499 (ST) + 0.00000055 (TS) ²] - [0.0002882 (age)]; Women = 1.0970 - [0.00046971 (ST) + 0.00000056 (TS) ²] - [0.00012828 (age)]). ST is the sum of all the folds (JACKSON and POLLOCK, 1978 and 1980). The athletes also underwent a medical interview.

We used a skinfold caliper brand WCS and tape measure. The evaluation protocol was followed as seven folds of Pollock et al. (1978 and 1980) (triceps, chest, subscapular, supra iliac, measured axillary, abdominal and thigh).

After we measured the body mass measured was conducted to scale with an accuracy of up to 500 grams, where he was instructed to go barefoot, the evaluator noted in the record demonstrated the value assessed by the scale, the measurement was recorded in kilograms to the use of one decimal place.

In height was used with a stadiometer accurate to two mm. The individual stood with his back to the device and the assessor allocated as the ruler of the stadiometer in parallel to the skull of the student, noted the measure of the height in centimeters to one decimal place. This measurement was made with the athlete without shoes and after a deep breath.

BMI was calculated based on body weight and height, measured previously, each athlete is determined by calculating the ratio between the measure of total body mass in kilograms by height in meters squared: BMI = weight (kg) / height (m) 2. As has been noted to one decimal place.

Scale was used in the tape measure with an accuracy of 2mm. On a plain wall, without footnotes, set up the tape measure parallel to the ground at a height of 1.50 m. The athlete is positioned upright, facing the wall, with arms in abduction at 90 degrees to the trunk. The elbows were extended and the forearm supinated. Athletes positioned the tip of the left middle finger at the zero point of the measuring tape and measured the distance to the edge of the right middle finger. The measurement was recorded in centimeters to one decimal place.

In the test of strength / abdominal strength were used gymnastics mats and a stopwatch. The subject evaluated was positioned supine with knees flexed at 45 degrees and with his arms crossed over his chest. The evaluator, with his hands, grabbed the ankles of athletes fixing them to the ground. At the signal the individual initiating the movements of flexion of the trunk to play with his elbows on his thighs, returning to the starting position (it was not necessary to touch the mat with his head at each execution). The evaluator performed the counting aloud. The result is expressed by the number of full-motion performed in one minute.

In the test power output of the lower limbs (horizontal jump) was used a banner metric glued to the floor. The individual is placed immediately behind the starting line, the zero point of the banner metric, with the feet parallel and slightly apart, knees slightly bent, body slightly projected forward. At the signal the athlete jumped as far as possible landing with both feet simultaneously. There were two attempts, registering the best result. The distance of the jump was recorded in centimeters with one decimal place, from the line on the ground until the heel closest to this.

We conducted descriptive statistical analysis and descriptive percentage (mean, standard deviation) and Spearman's test ($p < 0.05$) for variables of strength and body composition. We used the statistical package SPSS 17.0.

RESULTS AND DISCUSSION

Table 1 shows that our sample is composed mostly male 77.7% and 22.2% female, mean age of the athletes is 27.8 years and train on average 255 minutes per week. As the stress level of training the majority claims to be moderate and only 88.8% said to be a stressful 11.1. 33.3% say they take some medication and the other 66.6% do not. Joint pain feel pain 33.3%, not 66.6. Back pain 11.1% say they feel pain in the lumbar region, 22.2% in the cervical and 66.6% said they felt no pain. 100% of the sample reported not only an individual smoker and 11.1% of the individuals exposed drinking alcohol. Only one, 11.1% have

some disease have been treated. But the history of family diseases shows that 44.4% have relatives with diabetes, hypertension 11.1% family, 11.1% and 44.4% with heart disease said to have neither a case of these diseases in the family.

Table 1 - Characteristics of the athletes

Características	n (%)			
Sex	Female	Male		
	2 (22,2)	8 (77,7)		
Age (years)	27,8 ± 13,9			
Weekly trainig time (min)	255 ± 130,8			
Everiday stress	Moderate	Stressful		
	8 (88,8)	1 (11,1)		
Use of medicines	Yes	No		
	3 (33,3)	6 (66,6)		
Joint pain	Yes	No		
	3 (33,3)	6 (66,6)		
Back pain	Lumbar	Cervical	No	
	1 (11,1)	2 (22,2)	6 (66,6)	
Smokers	Yes	No		
	0	9 (100)		
Ingestion of alcohol	Yes	No		
	1 (11,1)	8 (88,8)		
Treated illness	Yes	No		
	1 (11,1)	8 (88,8)		
Family storie of desease	Diabetes	Hipertensyon	Cardiovascular	No
	4 (44,4)	1 (11,1)	1 (11,1)	4 (44,4)

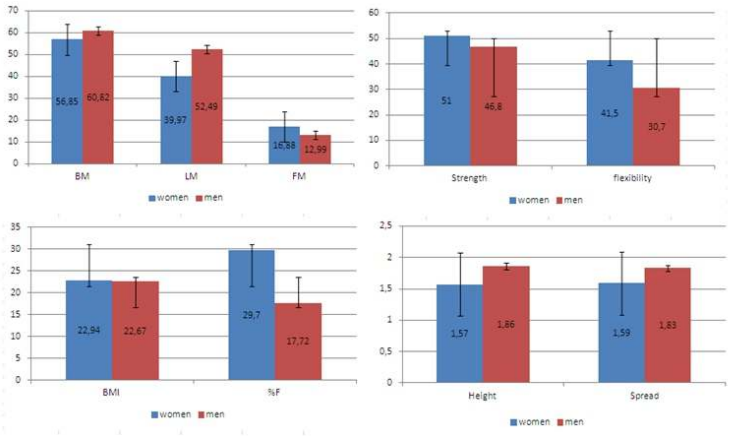
The Table 2 presents the results on some components of physical fitness of our evaluated. They exhibit an average body mass of 66.9 which proves to be a little higher than in the study of ARRUDA and SILVA, 2011 with an average of 64.99, but with high-performance athletes with males, however if you look at the study GIAMPIETRO, (2003) with the same level practitioners in our study we detected a lower body mass for both the high / medium or amateurs. Comparing with the same study found that GIAMPIETRO, (2003) our athletes have a disadvantage in height and have more body fat, which can be a disadvantage (ARRUDA and SILVA, 2011). In a similar study DEL VECCHIO (2005) compares the same performance variables of our study and show our athletes have better average performance in the test of abdominal strength against 39.7 51.44. In the strength of our results were lower limbs well below the average for the study of DEL VECCHIO (2005) which was 2.29 meters.

Table 2 – Variables of fitness.

	mean	standart deviation	min.	max.
Antropometria				
Body mass (kg)	66,9	11,7	49,7	83,9
Heigth (m)	1,72	0,1	1,51	1,86
Envergadura (m)	1,78	0,1	1,52	1,93
Strength and power				
Strength	51,44	8,1	46	63
Power – horizontal jump (m)	1,66	0,4	1,23	2,29
Composição Corporal				
Lean boby mass (kg)	49,7	12,4	27,06	65,79
Body fat (kg)	13,85	6,50	5,22	21,34
F%	20,38	8,6	8,99	29,91
BMI	22,73	3,6	17,59	28,45

The association between adiposity variables (% BF, BMI, and MM) with the strength and power (abdominal strength and drive horizontal) found that BMI has inversely proportional to the levels of abdominal strength (r =- 0.73 p = 0.023), reflecting the fact that the accumulation of fat can be detrimental to the strength levels (KING et al, 2011).

Figure 1 - Description for gender as physical fitness variables.



Where: BM (body mass), Lean body mass (LBM), BF (body fat), BMI (body mass index), G% (fat percentage), Strength (test of strength endurance).

CONCLUSION

The levels of strength and body composition are as expected for the population. However, they could be decreased levels of% BF and fat mass. Levels of adiposity were related inversely with the strength.

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LEVELS OF STRENGTH AND BODY COMPOSITION IN ATHLETES OF KARATE

ABSTRACT

The aim of this study was to determine the levels of body composition, strength and power in athletes of karate, and verify that inflences the adiposity levels in muscular streght. Nine athletes of karate (intermediate ans advanced) participated in this stydy, with 27,8 ± 13,9 years old. We evaluated anthropometric variables: body composition, strength, flexibility and Power. We conducted percetage and descriptive (mean, standart deviation) statistical analysis and Spearman test (p<0,05). The levels of strehgth and are composition are as expected for the population. However, they could be decreased levels of % fat and fat mass. Levels of adiosity were related inversely with the strength.

KEYWORDS: karate, strength, Power and body composition.

NIVEAUX DE FORCE ET LA COMPOSITION CORPORELLE DES ATHLETES DE KARATE

RÉSUMÉ

L'objectif de cette étude était de déterminer les niveaux de la composition corporelle et l'endurance et la puissance des athlètes de karaté, ainsi que de vérifier que les niveaux de l'adiposité des influences de la force musculaire. Neuf athlètes ont participé à l'étude du karaté, intermédiaire - avancé, avec 27,8 ± 13,9 ans. Nous avons évalué les variables anthropométriques, de composition corporelle, la force, l'endurance, la force et la flexibilité de pouvoir. Nous avons effectué une analyse statistique descriptive et le pourcentage descriptives (moyenne, écart-type) et le testde Spearman (p <0,05). Les niveaux de force et de la composition corporelle sont aussi attendus pour la population. Cependant, ils pourraient être diminué les niveaux de BF% et la masse grasse. Niveaux de l'adiposité sont liés inversement proportionnelle à la force de résistance.

MOTS-CLÉS: karaté, force, endurance, puissance de la composition corporelle.

NIVELES DE FUERZA Y COMPOSICIÓN CORPORAL EN ATLETAS DE KARATE

RESUMEN

El objetivo de este estudio fue determinar los niveles de la composición corporal y laresistencia de la fuerza y los atletas de potencia en karate, así como verificar que influye en los niveles de adiposidad de la fuerza muscular. Nueve atletas participaron en el estudio del karate, intermedio - avanzado, con 27,8 ± 13,9 años. Se evaluaronlas variables antropométricas, composición corporal, fuerza, resistencia, fuerza y flexibilidad de poder. Se realizó un análisis estadístico descriptivo y el porcentajedescriptiva (media, desviación estándar) y de Spearman (p <0,05). Los niveles defuerza y composición corporal son los esperados para la población. Sin embargo,se podrían reducir los niveles de% GC y la masa grasa. Los niveles de adiposidadse relacionan inversamente con la fuerza de resistencia.

PALABRAS CLAVE: karate, fuerza, resistencia, potencia, composición corporal.

NÍVEIS DE FORÇA E COMPOSIÇÃO CORPORAL EM ATLETAS DE KARATE

RESUMO

O objetivo do presente estudo foi verificar os níveis de composição corporal e força de resistência e potência em atletas de karate, bem como verificar se a adiposidade influencia nos níveis de força muscular. Participaram do estudo nove atletas de karate, nível intermediário – avançado, com 27,8 ± 13,9 anos de idade. Foram avaliadas variáveis antropométricas, composição corporal, força de resistência, força de potencia e flexibilidade. Realizou-se analise estatística descritiva percentual e descritiva (média, desvio padrão) e teste de spearman (p<0,05). Os níveis de força e composição corporal encontram-se dentro do esperado para a população. No entanto, poderiam ser diminuídos os níveis de %G e massa gorda. Níveis de adiposidade estiveram relacionados inversamente com força de resistência.

PALAVRAS CHAVE: karate, força resistência, força potência, composição corporal.