

90 - DESCRIPTION AND ANTHROPOMETRIC COMPARISON APPLIED TO MOTION IN TAEKWONDOINES

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INTRODUCTION:

Taekwondo is an Olympic sport, where its participants compete for weight, body composition and fat percentage categories, whose anthropometric characteristics are favorable to them, could have sporting success.

Kinanthropometry is the study of the size, shape, composition, structure, and proportionality of the human body, with the aim of understanding man's evolution in relation to growth, nutritional status, physical activity, and physical and sports training (Ross & Marfell-Jones, 1991).

As indicated (Acero J, 2016), when these measurements assume the meaning of projection and analysis of the kinematic and kinetic factors of human movement, it is called Biomechanical Anthropometry. In the order of ideas above, this study can be static or structural, functional or biomechanical.

It can be said that anthropometry has several applications, so that it can characterize human groups, assess nutritional status, monitor physical growth and even serve as a parameter to verify changes in somatotype, proportionality and body composition at various stages of human growth and development. (Ross and Marfell-Jones, 1991).

On the other hand, reactive manifestation is the force generated by the muscle in response to an external force that modifies or alters its own structure. It occurs after a stretch-shortening cycle (CEA). (Verkhoshansky and Siff, 2000). The author Verkhoshansky calls it reactive muscle capacity in different situations of muscle contraction; Two forms of manifestation can be distinguished: Elastic - Explosive: It is the manifestation of the reactive force that occurs when the eccentric phase occurs at high velocity. The kinetic energy that generates the damping (in the tendons and the myosin head) is stored, which is then used in the concentric phase as mechanical energy, since the coupling time (time between eccentric and concentric contraction) is shorter. (Mesón & Ramos, 2001).

Reflection - Elastic - Explosive: This is the manifestation of the reactive force that occurs when the eccentric phase is of limited amplitude and the velocity of execution is high. It favors the recruitment by stimulation of the myotactic reflex of larger number of motor units to develop a great tension in a short period of time (McNeely, 2007). In this order of ideas, neuromuscular processes and viscoelastic properties of the extensor muscles of the legs are involved.

Neuromuscular processes include adaptations that have occurred at the level of nerve proprioceptors, inhibitory and excitatory functions in both the elongation reflex and Golgi tendon organs, as well as in morphological and structural cross-bridges and / or collagen tendon structure. (Garcia, 2007). Stretching - Shortening Cycle: Movements rarely include pure isometric, concentric or eccentric contractions. All of this happens because body segments are constantly subjected to forces of varying magnitude, such as jumps, direction changes, running and even gravity, which stretch the muscles (Floody, Poblete, & Fuentes, 2012).

During the vertical jump, the elevation of the center of gravity can be measured by observing the time spent in the flight phase (Asmussen & Bonde-Petersen, 1974), from which the formula is derived in which: $H = TV * TV$ Where H: Height. TV: flight time.

With the Bosco test, there is one more tool to evaluate individual characteristics and specific quality selection of each athlete or person, with a simple conceptual instrumentation, but performed with a scientific definition (Salazar, 2009), running the whole battery of the test. jumping, it is possible to profile the capacity or manifestations of strength.

MATERIALS AND METHODS:

The research corresponds to a descriptive correlation design, through which 54 athletes from the Taekwondo Atlantic League were evaluated in categories open to the 2019 national games, with a minimum of 3 years of training. The protocol used was the ISAK (International Measurement Association).) anthropometric), with the participation of a certified representative in the observation of anthropometric.

The complete Rosscraf anthropometric set of the Argentine brand was used, in addition to the anthropometric biomechanical protocol based on the Anthropobio 16SC model (Acero J, 2016), and the contact platform used was the Biosaltus, developed at the Institute for Research and Biomechanical Solutions (Acero J., 2013), for the measurement of the lower muscular train power variable, the Bosco protocol was considered, considering jumps such as SJ, CMJ and ABK. In addition, a classroom was prepared for the evaluation of the Bosco test: countermovement jump (SJ), countermovement vertical jump (CMJ) and Abalakov test (ABK).

The jump assessment for this sample consists of three tests performed on the Biosaltus platform: The Squat jump (SJ) test: which examines the explosive strength of the lower train without the use of countermovement, so the muscle activation mode is concentric (Bosco 1996). The subject should perform a vertical jump from the squat position (knee flexed at 90°), with the trunk straight and hands on the hips. After three attempts with a 40 second pause, the best attempt is recorded.

Countermovement Vertical Jump Test (CMJ): Evaluates the explosive force of the lower train from a countermovement vertical jump in which concentric activation is preceded by eccentric activity (counter movement), the use of

the myotactic reflex It has an important role that is reflected in better performance compared to the previous test.

Bosco's recommendations (1996) are followed. After three attempts with a 40 second pause, the best achieved value is recorded. Abalakov Test (ABK): This test is the same as the counter-movement vertical jump test, the difference being that this test allows the free use of weapons, so it evaluates its influence on vertical jump (Vittori, 1990). retries after an interval between each of them, the best performance is recorded. After the above considerations, the elasticity index (IE) is performed: it is an indicator in percentage terms of the magnitude of the accumulated elastic energy considering the SJ and CMJ tests that from the following equation; $(CMJ - SJ) \times 100 / SJ$, proposed by (Bosco, 1992). In the same vein, the weapon use index (IUB): is an indicator that allows us to know in percentage terms the extent to which weapons contribute to the vertical jump. The proposed equation is $(ABK-CMJ) \times 100 / CMJ$. The evaluations were performed in the afternoon from 14:00 to 17:00, coinciding with the training schedule of the Taekwondo Atlantic League athletes. For descriptive statistics, a database was developed using the Excel program and the SPSS version 21 software was used. Information is presented using descriptive statistics, mean and standard deviation, and Pearson correlation was used. RESULTS: The sample analyzed consisted of 54 taekwondoines during the Camp of Sciences Applied to Sport and Health (40 men (73%) and 15 women (27%).

n=54	Media	D.E.
Peso (kg)	66,4	16,8
Talla (cm)	167,7	25,1
IMC (%)	22,6	3,9
Adiposo (%)	28,1	0,1
Muscular (%)	37,8	0,2
Ósea (%)	11,6	0,0
Piel (%)	5,4	0,1
Sj (cm)	23,5	10,5
Cmj (cm)	25,2	11,4
Abk (cm)	30,9	12,6
Potencia (wattios)	712,6	323,1

Table I. Mean and standard deviation of the five components. (Kerr and Ross, 1988)

Table I shows the mean values and standard deviation of the analyzes that were performed. Mean fat mass (MA) was 28 ± 10 , HIGH in sports with weight category, mean muscle mass (MM) was 38 ± 11.0 LOW in CTD, residual mass and bone sports. the average was 12 ± 3.0 , the average skin mass was 5.0 ± 2.0 , the $\sum 6$ folds the average was 78.1 ± 48.4 , in relation to the wattage was 7126 ± 323.1 .

Significant negative correlation (higher fat lower jump).

Significant positive correlation (higher muscle mass, higher jump).

Then, the correlation between the different variables, percentage of muscle mass, with the results of the expressed power in the jumps is expressed, values that indicate that there is no correlation between the different variables, ranging between -0.17 and -0.20, not reaching the correlation limit of -0.5.

CORRELATION:

Among the variables, it was possible to show that the MA presented a positive correlation with the residual mass ($r = 0.505$), bone mass ($r = 0.392$), skin mass ($r = 0.542$), the MM had a positive correlation with the residual mass ($r = 0.864$), bone mass ($r = 847$), skin mass ($r = 698$).

The proportion of power output affects the CMJ jump; as its correlation is 0.17, detecting that the higher the fat percentage, the smaller this type of jump will be. Significant negative correlation is present in ABK, where the higher the fat percentage, the lower this type of jump, casting the correlation -0.07 or negative correlation. Also in the SJ jump, I have a significant negative correlation -0.05, so this jump has no incidence in the correlation with the fat percentage.

See table II.

n= 54		PESO	TALLA	IMC	SJ	CMJ	ABK
PESO	Correlación de Pearson Sig. (bilateral)	1					
TALLA	Correlación de Pearson Sig. (bilateral)	.362**	1				
IMC	Correlación de Pearson Sig. (bilateral)	.908**	.409**	1			
SJ	Correlación de Pearson Sig. (bilateral)				1		
CMJ	Correlación de Pearson Sig. (bilateral)				.871**	1	
ABK	Correlación de Pearson Sig. (bilateral)				.918**	.933**	1
POTENCIA	Correlación de Pearson Sig. (bilateral)	.451**	0.108	.433**	.789**	.898**	.761**
		0.001	0.439	0.001	0.000	0.000	0.000

** La correlación es significativa en el nivel 0.01 (bilateral).

Chart II Statistical correlations in the study subjects.

DISCUSSION:

The study results show that the average age was 20.5 ± 5.8 and the average weight was 66.1 ± 16.2 .

Regarding height, the average was 161 ± 5.8 , LOW compared to other studies, such as athletes with a height of 177 cm and a weight of 62 kg, although it has similarity with the weight and age of the study that varies between 18,6 and 22 years.

BMI, within the parameters established as normal, values between 21.9 ± 4.8 , for both women and men, are normal ranges within the WHO health parameters, in this order of calculation the BMI is the most used for the diagnosis of weight problems due to its ease. The BMI problem is derived from nothing more than a statistical-mathematical manipulation of two variables of different dimensions: weight (volume) and height (height).

Its main limitation is that it is based on the assumption that any weight exceeding the values determined by the size-weight tables will correspond to the fat mass. It is evident that overweight may correspond to increased muscle and / or bone mass (Kweitel, 2007).

From the point of view of descriptive statistics regarding the vertical jump strength tests, it can be noted that the average values found are low compared to other investigations in taekwondoines.

These results may be due to the fact that the action on which the test is based (vertical jump) has a technical component, which may slightly reduce the subject's potential in the measurement, however, in the study conducted in Brazil (Loch, Konrad, Dos Santos and Naha, 2006), the jump test in young athletes, obtained normal values, while the tests that presented contractile deficit results in this study were the (IE)

CONCLUSIONS:

The results obtained in the muscle power and kinanthropometry evaluation indicate that the results were not adjusted to the taekwondoines reference values; As the percentages of MA were high, the values of muscle mass and power were low compared to international teams.

The relationship in this investigation of lower train muscle strength with the percentage of MA was "direct", because the lower the percentage of adiposity, the higher the study subjects obtained, however, the relationship between the lower train muscle power and the MM it was indirect; This means that in a higher percentage of MM, there is no greater power in the subjects.

This indicates that their explosive strength level is not good for taekwondo sports, which means that without an explosive strength program they will not be able to succeed in any weight category.

Finally, to improve anthropometric aspects, a restricted profile assessment should be performed according to the ISAK protocol and the conditional performance regarding the jumping strength of this sample. After conducting this assessment, it is necessary to study more carefully the sports training process, as well as integrate other factors that may alter sports performance, such as nutritional and medical aspects.

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DESCRIPTION AND COMPARISON ANTHROPOMETRIC APPLIED TO MOVEMENT IN TAEKWONDOINES.

Objective: To determine in analysis, the description and comparison of anthropometry applied to movement in taekwondo practitioners.

Materials and methods: It is a descriptive correlational study, within a quantitative framework, where the sample was

intended with a number of variables evaluated were obtained through anthropometric criteria and physical muscular power of the lower train. The study was carried out during the first half of 2019-1

Results: With reference to the levels of explosive force 89.7%, it presents a range in average power, in the same way the elastic index (IE), shows that 48.3%, shows contractile muscular deficit, only 44, 8%, shows the use of accumulated elastic energy, followed by the rate of use of arms (IUB), 72.4, uses the use of arms, while 13.8% has a contractile deficit.

Conclusions: According to the conclusion of the objectives, the correlation was verified under statistical analysis, through systematic work, consequently the results yielded a significant negative correlation (higher fat less jump) and a significant positive Correlation (greater muscle mass jump). Consequently, the limits of this research are of a particular order, however, its methodology can be extrapolated in other similar study groups in quantitative work.

Keywords: anthropometry, body composition, adipose tissue.

DESCRIPTION ET COMPARAISON ANTHROPOMETRIQUE APPLIQUE AU MOUVEMENT EN TAEKWONDOINES

Objectif: déterminer en analyse la description et la comparaison de l'anthropométrie appliquée au mouvement chez les praticiens du taekwondo.

Matériels et méthodes: Il s'agit d'une étude de corrélation descriptive, dans un cadre quantitatif, où l'échantillon était destiné à un certain nombre de variables évaluées obtenues à l'aide de critères anthropométriques et du pouvoir musculaire physique du train inférieur. L'étude a été réalisée au cours du premier semestre 2019-1.

Résultats: En ce qui concerne les niveaux de force explosive de 89,7%, il présente une plage de puissance moyenne, de la même manière que l'indice élastique (IE) montre que 48,3%, montre un déficit musculaire contractile, seulement 44, 8%, montre l'utilisation de l'énergie élastique accumulée, suivie du taux d'utilisation des armes (IUB), 72,4%, utilise les armes, tandis que 13,8% ont un déficit contractile.

Conclusions: Selon la conclusion des objectifs, la corrélation a été vérifiée par analyse statistique. Grâce à un travail systématique, les résultats ont donné une corrélation négative significative (plus de graisse et moins de saut) et une corrélation positive significative (plus de masse musculaire). sauter). Par conséquent, les limites de cette recherche sont d'un ordre particulier. Cependant, sa méthodologie peut être extrapolée à d'autres groupes d'étude similaires dans le cadre de travaux quantitatifs.

Mots-clés: anthropométrie, composition corporelle, tissu adipeux.

RESUMEN

Objetivo: Determinar en análisis, la descripción y comparación de la antropometría aplicada al movimiento en practicantes de taekwondo.

Materiales y métodos: Es un estudio descriptivo correlacional, dentro de un marco cuantitativo, donde la muestra fue intencionada con una cantidad de variables evaluadas se obtuvieron a través de criterios antropométricos y de potencia física muscular del tren inferior. El estudio se llevó a cabo durante el primer semestre de 2019-1

Resultados: Con referencia a los niveles de fuerza explosiva el 89,7%, presenta rango en promedio de potencia, de igual manera el índice elástico (IE), muestra que el 48,3%, presenta déficit contráctil muscular, solo el 44,8%, presenta aprovechamiento de la energía elástica acumulada, seguidamente el índice de utilización de brazos (IUB), el 72,4, utiliza el aprovechamiento de brazos, mientras que el 13,8%, presenta déficit contráctil.

Conclusiones: Acorde a la conclusión de los objetivos, se verificó la correlación bajo análisis estadístico, a través de un trabajo sistemático, consecuentemente los resultados arrojaron una correlación significativa negativa (mayor grasa menor salto) y una Correlación significativa positiva (mayor masa muscular mayor salto). Consecuentemente los límites de esta investigación son de orden particular, sin embargo, su metodología puede ser extrapolada en otros grupos de estudio similares en el trabajo cuantitativo.

Palabras claves: antropometría, composición corporal, tejido adiposo.

DESCRIÇÃO E COMPARAÇÃO ANTRÓPOMÉTRICA APLICADA AO MOVIMENTO EM TAEKWONDOINES.

Objetivo: Determinar a análise, descrição e comparação da antropometria aplicada ao movimento em praticantes de taekwondo.

Materiais e métodos: Trata-se de um estudo descritivo correlacional, dentro de um arcabouço quantitativo, em que a amostra pretendida com diversas variáveis avaliadas foi obtida por meio de critérios antropométricos e potência muscular física do trem inferior. O estudo foi realizado durante o primeiro semestre de 2019-1

Resultados: Com referência aos níveis de força explosiva 89,7%, apresenta variação na potência média, da mesma forma que o índice elástico (IE) mostra que 48,3% mostra déficit muscular contrátil, apenas 44, 8%, mostra o uso de energia elástica acumulada, seguida pela taxa de uso de armas (IUB), 72,4, usa o uso de armas, enquanto 13,8% apresenta déficit contrátil.

Conclusões: De acordo com a conclusão dos objetivos, a correlação foi verificada sob análise estatística, através de trabalho sistemático, consecuentemente os resultados geraram uma correlação negativa significativa (maior gordura menos salto) e uma correlação positiva significativa (maior massa muscular pular). Conseqüentemente, os limites desta pesquisa são de uma ordem específica, no entanto, sua metodologia pode ser extrapolada em outros grupos de estudo semelhantes em trabalho quantitativo.

Palavras-chave: antropometria, composição corporal, tecido adiposo.

