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THE RELATIONSHIP OF MORPHOLOGICAL CHARACTERISTICS WITH THE PERFORMANCE OF THE TECHNIQUE OF THROWING WITH THE STANDING LEG LEFT FROM THE BACK

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Abstract
The aim of the work was to determine the connection between morphological characteristics and the effectiveness of the throwing technique by kicking the legs from behind from the program of Special Physical Education (SPE). The sample of respondents consisted of 84 students (male), first year of the Faculty of Security Sciences from Banja Luka. The variable sample was composed of 17 tests for the evaluation of morphological characteristics, which were the independent variables and the dependent variable OSOTOG, which was the average grade of the performance of the kicking technique from the SPE program. The regression analysis did not establish a statistically significant connection between the efficiency of performing the throwing technique by striking the landing leg from behind and the selected set of predictor variables for the assessment of morphological characteristics. Only the elbow diameter variable (ADIJLA) gave a statistically significant contribution to the explanation of the criteria variable OSOTOG. Based on the value of the Beta coefficients, we can see that the variables: body weight (ATETJ) and leg length (ADUZNO) have significant positive partial correlations with the criterion variable, while negative correlations were achieved by the variables: elbow diameter (ADIJLA), body height (AVISTJ) and length hands (ADUZRU). The obtained results could be used in terms of improving the quality of the performance of certain program contents of the SPE, when choosing the appropriate technique within the motor program when solving certain problem situations from the SPE program.

Keywords: students, interconnection, morphological characteristics, throwing by kicking out the leg from behind

INTRODUCTION

Security and police officers who exercise authority are the most important bearers of security and police affairs, where they are given the authority to directly apply police measures and use means of force (coercion) when conducting security and police affairs. As part of the performance of security and police work, martial arts should be understood as a tool in the function of developing certain knowledge, skills and habits, which are necessary for the successful implementation of daily jobs, tasks and obligations, when there is no other way to overcome the resistance of a person who threatens the safety of authorized persons, other people and protected property with physical attacks. Given that the work of security and police agency workers carries the most risks, it is very important that they are able to survive life-threating situations and successfully complete the assigned tasks with full control.

When it comes to the immediate execution of tasks under the conditions of the use of means of force (coercion), security and police workers must be able to implement a large number of basic and situational motor programs, with the aim of intercepting various types of attacks, defenses and counterattacks, for the sake of overcoming the resistance, establishing control, arresting, bringing and arresting persons prone to illegal behavior. Future security and criminology lawyers at the Faculty of Security Sciences (hereinafter referred to as FSS) are educated according to special plans and programs, within which, in addition to other subjects, they also take classes in Special Physical Education (hereinafter referred to SPE), which is characterized by a large number of technical elements, their variations and combinations, which are performed in unpredictable and variable situations with different opponents. In order for education and training to meaningfully and comprehensively influence the student, as a future holder of security and police affairs, with educational training programs and content, in addition to the need to know its structure, its adaptive characteristics, the way it functions, of course, it is necessary to know the impact of education and training on transformation of its system. Therefore, SPE is the field of Kinesiology, without knowledge of which there is no possibility to form appropriate characteristics or to influence them in the form of certain changes aligned with the requirements of police work.

Due to the fact that when applying physical strength as an adequate and appropriate means of force, certain techniques as a part of their algorithms

include throwing techniques, within the curriculum of SPE subjects, up to the level of utilitarianism, in addition to other techniques, hand, foot and side throwing techniques are taught from judo, which from the aspect of the biomechanical way of execution can be divided into: throwing techniques by clearing, throwing techniques by breaking out, throwing techniques by grasping and lifting, and throwing techniques by blocking the protruding leg. In SPE, throwing techniques are complex movement structures intended primarily to destabilize and inflict pain on the „opponent" on the way of establishing total control over him, and are characterized by a large number of technical elements and different variants (in which they can be performed), as well as an inexhaustible the number of movement structures that are performed in order to implement certain tactical ideas. They are most often performed in self-defense as counterattack techniques after grabbing and capturing parts of the opponent's body, by transferring ones own movement to the opponents body (Arlov, 2001), wherby the effectivness of their implementation depends on the timeliness of initiation, duration of performance and control before and after their application. Due to the fact that throwing techniques are based on the principle of imbalance and the principle of communicating rotational movement to the body, and that they are performed at high speed, it is possible to separate the phase of breaking the opponents balance, the phase of establishing contact with the opponent and the phase of realizing the throw itself. Violation of the opponents balance aims to create suitable conditions for performing the imagined technique, which is why it is very important that the projection of the center of gravity of opponents body is as far as possible from the surface of the center of support, which is most often performed in movement using the intertial force and weight of the opponent (pulling or pushing), and it depends on the reaction and movement of the opponent. A set of movements when establishing contact with the opponent has the task of keeping the opponent in a position of imbalance and providing contact with the opponent's body that enables more efficient performance of the final phase of the throw (Popović, 1985). The final part of the throwing technique consists in separating the opponent's body from the surface and throwing it to the ground, communicating to it the rotational movement through the coupling of forces, which implies that the movements involved in the execution of the throw should be performed in such a way that the opponent's body is under control until the end of the throw, which makes impossible the possibility of avoiding the opponents fall (ibidem). Each of these phases is characterized by specific (trajectories of individual body segments) with maximum mutual dependence, which is why all these phases are interconnected into one whole, and the effectivness of their implementation depends on the precise and fast performance of all phases (Milošević, 1989). From the mentioned it follows that the throwing technique will be performed effectively if the opponent is placed in a position of pronounced imbalance and if appropriate relations are established between the partners and the opponent's body (Kuleš, 2008). Like other throwing and the throwing technique by kicking out the leg from behind, they are characterized by mentioned stages in the execution of the throwing technique. The throw is performed from the basic stance and right guard at the moment when the opponent takes a step back with the right leg and pulls the performer towards him, disrupting his balance forward. At the moment of breaking the balance, the performer tries to maintain a stable balance with a reflex movement, by steppin forward with the left leg to the left side by about 15 to 20 cm from the opponent's right foot, thus fully transferring the weight to the left leg and stabilizing the balance position. In the continuation of the activity, the performer simultaneously pulls the opponents right arm towards the waist with his left hand and pushes the opponent's left shoulder and left side of the body to the left with his right hand, disrupting the opponent's balance. Furthermore, the performer, by strongly twisting the body to the outside at an angle of 45 degrees (continious contact with the opponent), puts the opponent in an unbalanced, reducing his support surface (making him stand on the outside of the foot of the right leg). Continuing the action by rotating the pelvis to the left, the performer swings the right leg forward (behind the opponent's right leg, so that the head and toes of the right leg are in the same plane), after which, by simultaneously bending the body forward and downward, a strong swing with the same (semi-bent) leg backwards, makes contact in the knee bend of the opponent's right leg, kicking his leg back and up. After the contact is made, the performer throws the opponent in front of him by pulling the left hand towards him and pushing down with the right hand (directing him to fall on the left side of the body on the ground). It is very important that the performer maintains a stable balance when kicking out the opponent's leg, which requires him to transfer the entire body weight to the front part of the foot of the landing leg, which allows him to fully control the opponent's fall to the ground. The reason why this technique has its proper application in the SFE program is that the initial phase of the

throw is performed by pushing the opponent backwards, where the direct and quick entry into this throw allows the weight of the performer's body to be transferred to the opponent, due to which he he loses his balance backwards, because he has no visual contact with the direction in which he is moving, and for this reason it is more difficult for him to re-establish a position of stable balance and organize a defense. The opponent should be acted upon with the force of the whole body and not only with the hands (because the body relies on the lower extremities), which is why the lower extremities should be used in synchronization with the upper extremities and the abdominal part of the body. These movements can be performed in all directions, while the method of their execution requires quick application, so that the opponent does not return to the equilibrium position. For the effectiveness of performing throwing techniques by kicking out the landing leg from behind, it is important that the projection of the opponent's center of gravity falls in the point of support, which reduces the possibility of his resistance to passive static resistance only (ibidem).

In some previous works (Mudrić & Jovanović, 2000a, Mudrić & Jovanović, 2000b), it was stated that the effectiveness of the adoption of the content of SFE depends on the motor skills and morphological characteristics of students, but also that the teaching of SFE significantly affects the transformation psychomotor status, as well as some motor abilities and morphological characteristics of students. Morphological space means the area that defines the structure of the body and the basic dimensions that describe the given structure, where the morphological characteristics include parameters of skeletal and soft tissues measured by anthropometric techniques, but also latent measures that are evaluated and are responsible for individual changes in these parameters in people. Previous research conducted on the student population: Kurelić (1957), Viskić, (1972), Stojanović et al. (1975), Szirovica et al. (1980), Hošek & Jeričević (1982), Momirović et al. (1987), Božić (1994), Mudrić & Jovanović (2000b), point to the existence of four latent morphological dimensions that are considered responsible for explaining individual changes registered in the domain of manifest morphological indicators identified as: the factor of longitudinal dimensionality (responsible for individual changes in the length dimensions of bones in humans), the factor of transferal dimensionality (responsible for individual changes in the transferal parameters of human skeleton), the body voluminous factor (responsible for individual changes in total body mass and girth) and the physical body composition factor (responsible for individual differences in muscle mass and subcutaneous fat tissue).

Morphological characteristics can certainly represent a very important success factor in the performance of certain motor tasks, due to the fact that the specification equation of an activity, in addition to other characteristics and abilities, is also defined by a certain constellation of anthropometric characteristics, to the extent and in the manner in which the characteristics of biomechanically limited movement structures are defined for a specific activity. As in all sports activities and skills, so in martial sports in this case in SFE, the success in learning and practical application of the provided martial techniques largely depends on anthropological characteristics and their compatibility with the respective sport or skill. Therefore, based on experiences and research related to motor learning, improvement and efficiency of motor pattern application, it is rightly believed that each of these factors can be of great help when planning teaching programs in SFE. This is precisely why morphological features are one of the bases for choosing a kinesiological activity based on the compatibility between the biomechanical requirements of the activity and the characteristics of the anthropometric dimensions of each individual. Morphological characteristics emit several groups of information on which the planning of SFE activities depends, and the effectiveness of regulatory mechanisms responsible for quick, precise and timely application of means of force (coercion). When structuring and reprogramming the motor algorithm, the structures of the central nervous system must decode, analyze and transform information on the parameters of morphological characteristics, information on the relationship between morphological structures and the structures of force means, information on the relationship of situational response and transform them into an adequate output (application of physical force or another suitable means of force or coercion), where there is often a discrepancy between the morphological characteristics and the structure of the technique, to the multiple choice of movement trajectories in a very short time imposed by the situation and other disturbances. This relationship between morphological characteristics and regulatory mechanisms calls for work on the development of regulatory devices in terms of better identification and absorption of information emitted by the morphological characteristics of the locomotor subsystem, as data that needs to be integrated into an adequate kinetic output. Namely, practical experiences and research indicate advantages, but also disadvantages of certain

morphological characteristics that can influence learning, improvement and implementation of specific motor programs. Research conducted by Milošević et al. (1985); (1987), Božić (1989) and Blagojević (1996), point to the positive relationship of longitudinal dimensionality and mechanisms for structuring and reprogramming the motor algorithm, transferal dimensionality and body volume with the same mechanisms, but also to the negative relationship of subcutaneous fat tissue and the mechanism for motor reprogramming algorithm and mechanism for selective control and regulation of facilitation and inhibition of efferent motor pathways.

Given that, based on the research published so far, it has been established that morphological characteristics influence the effectiveness of the adoption and application of the program content of the SFE (Blagojević, 1996, Mudrić & Jovanović, 2000b), the subject of the research was to determine the relationship between the level of adoption and the efficiency of performing the throwing technique by kicking the leg from behind from the program of SFE and the morphological characteristics of students of FBN, University of Banja Luka. The main goal of the research was to determine the size and direction of the association of morphological characteristics with the throwing technique by kicking the leg from behind from the SFE program, i.e. to identify the morphological characteristics that are significant for the performance of the throwing technique by kicking the leg from behind, that is, to determine whether the success of the performance of the throwing technique by kicking the leg from behind can be predicted on the basis of certain morphological characteristics of FBN students.

RESEARCH METHODOLOGY

Sample of respondents

The sample of respondents consisted of 84 male students, first year at the Faculty of Security Sciences from Banja Luka, aged 19 ± 0.6 years. All the entities that made up the sample were clinically healthy and without visible morphological defects. The basic anthropomorphological indicators of the tested sample were: TV = 181.85 ± 6.13 cm, BMI 78.43 ± 9.83 kg and BMI 23.71 ± 2.43 kg/m2.

Sample of variables

The variables of the predictor system consisted of variables for assessing and defining the morphological status, while the criterion variable consisted of the throwing technique by kicking out the leg from behind, which evaluates the technical knowledge of judo from the SFE program. To assess the morphological status of students, 17 variables were applied, selected to cover a four-dimensional space defined as longitudinal dimensionality of the skeleton, transferal dimensionality of the skeleton, subcutaneous fat tissue, and body volume and mass: Body height (AVISTJ), Leg length (ADUZNO), Arm length (ADUZRU), Shoulder width (ASIRAM), Pelvic width (ASIKAR), Elbow diameter (ADIJLA), Knee diameter (ADIJKO), Wrist diameter (ADIJRZ), Diameter ankle (ADIJSZ), Body weight (ATEZTJ), Upper arm circumference (AOBNAD), Forearm circumference (AOBPOD), Upper leg circumference (AOBNAT), Calf circumference (AOBPOT), Upper arm skinfold (AKNNAD), Abdominal skinfold (AKNTRB) and Lower leg skin fold (AKNPOT). Measurements of variables for the assessment of morphological characteristics were carried out in the morning according to the methodology recommended by the International Biological Program (IBP). The evaluation of the technical level of judo students' knowledge was determined based on the execution of the throwing technique with the landing leg from behind (OSOTOG) from the SFE program. The total education of the throwing technique by kicking the leg out from behind lasted a total of six classes over three weeks, and was carried out during regular classes with first-year students of the Faculty of Security Sciences during the second semester in the martial arts office of the Faculty of Physical Education and Sports in Banja Luka. The efficiency of performing the throwing technique by kicking out the leg from behind was determined by an expert evaluation by five examiners (experts for SFEs). During the assessment, special attention is paid to certain phases of technique performance, which are related to taking the opponent off balance, establishing contact with the opponent, achieving the appropriate position for throwing and throwing with control and restraint of the opponent.

Data processing methods

Statistical data processing was performed on a Pentium 4 PC, using the applied statistical program SPSS (version 20.00). Basic measures of central tendency and dispersion of results are defined using: arithmetic mean (Mean) and standard deviation (Std. Deviation). In order to test the regularity of data distribution, the Kolmogorov-Smirnov test was used, while regression analysis was used to determine how well a set of predictor variables predicts or explains the dependent variable.

RESULTS

According to the presented results, it was established that for most variables the results are well grouped. The results of the Kolmogorov-Smirnov test showed a deviation from the normal distribution of the following variables: shoulder width (ASIRAM), pelvis width (ASIKAR), elbow diameter (ADIJLA), wrist diameter (ADIJRZ), knee diameter (ADIJKO), ankle diameter (ADIJSZ), skin fold on the upper arm (AKNNAD) and skin fold on the abdomen (AKNTRB). According to the results of the regression analysis shown in Table 2, we see that between the set of predictor variables for the assessment of morphological characteristics and the criterion variable OSOTOG, there is a significant multiple correlation (R = 0.516), however, based on the achieved level of significance (p = 0.161), it is evident that between of the set of predictor variables for the assessment of morphological characteristics and the variable (OSOTOG), there is no statistically significant qualitative connection, which results in the impossibility of predicting the results of performing the technique of throwing from behind, based on the applied system of variables for the assessment of morphological characteristics.

Table 1. Descriptive indicators of variables for the assessment of morphological characteristics and kicking technique from the special physical education program

Variable	N	Mean	Std. Deviation	KS p
AVISTJ	84	181.85	6.13	0.93
ADUZNO	84	94.97	4.40	0.51
ADUZRU	84	78.03	3.37	0.16
ASIRAM	84	40.61	2.05	0.03
ASIKAR	84	27.32	1.56	0.00
ADIJLA	84	6.57	0.47	0.00
ADIJRZ	84	5.34	0.41	0.00
ADIJKO	84	8.93	0.72	0.00
ADIJSZ	84	7.04	0.53	0.00
ATEZTJ	84	78.25	9.19	0.74
AOBNAD	84	29.53	3.00	0.20
AOBPOD	84	26.41	1.81	0.38
AOBNAT	84	56.77	4.32	0.52
AOBPOT	84	37.13	2.39	0.61
AKNNAD	84	7.64	2.71	0.00
AKNTRB	84	11.10	4.72	0.00
AKNPOT	84	9.68	2.91	0.15
OSOTOG	84	6.45	1.17	0.00

Legend: **Variable** – variable names; **N** – number of respondents; **Mean** – arithmetic mean; **Std. Deviation** – standard deviation; **KSp** – the probability value of the Kolmogorov-Smirnov; **AVISTJ** – body height, **ADUZNO** – leg lenght, **ADUZRU** – arm lenght, **ASIRAM** – shoulder width, **ASIRKAR** – pelvis width, **ADIJLA** – elbow diameter, **ADIJKO** – knee diameter, **ADIJRZ** – wrist diameter, **ADIJSZ** – ankle diameter, **ATEZTJ** – body weight (mass), **AOBNAD** – upper arm circumference, **AOBPOD** – forearm circumference, **AOBNAT** – thight circumference, **AOBPOT** – lower leg circumference, **AKNNAD** – a skin fold on the upper arm, **AKNTRB** – a fold of skin on the abdomen, **AKNPOT** – skin fold on the lower leg, **OSOTOG** – throwing techique by kicking the landing leg from behind from the program of Special Physical Education

The measure of the strength of association, represented by the coefficient of multiple determination, shows that 26.6% of the common variability of the dependent variable (OSOTOG) can be explained by the influence of the combined independent variables for the assessment of

morphological characteristics, while the remaining 73.4% of the variability can be attributed to other abilities and characteristics of the examinees, which were not the subject of this research.

Analyzing the partial influence of individual anthropometric variables shown in table 3, we can see that the variable elbow diameter (ADIJLA) has a statistically significant influence on the explanation of the structuring of the motor program of the throwing technique by kicking the leg from behind (OSOTOG), at this level of education.

Table 2. Multiple regression parameters of morphological characteristics and kicking technique

R	R^2	SE	F	p
0.516	0.266	1.130	1.409	0.161

Legenda: R – Canonical correlation coefficient, **R^2 –** Coefficient of determination, **SE** – Standard error, **F** – F test, **p** – probability

Table 3. Regression coefficients of morphological characteristics and kicking technique

Model	Unstandardized coefficients		Standardized coefficients	t	Significance
	B	Standard error	Beta		
(Constant)	17.73	6.52		2.71	0.00
AKNNAD	-0.03	0.09	-0.07	-0.37	0.70
AKNTRB	-0.03	0.05	-0.14	-0.63	0.52
AKNPOT	0.05	0.07	0.13	0.70	0.48
AOBNAT	0.05	0.06	0.19	0.86	0.39
AOBPOT	-0.06	0.10	-0.14	-0.67	0.50
AOBPOD	-0.06	0.11	-0.10	-0.54	0.58
AOBNAD	0.03	0.07	0.09	0.44	0.66
AVISTJ	-0.05	0.04	-0.27	-1.16	0.24
ATEZTJ	0.05	0.03	0.40	1.35	0.18
ADUZNO	0.05	0.06	0.21	0.85	0.39
ADUZRU	-0.08	0.08	-0.24	-1.05	0.29
ASIRAM	-0.02	0.08	-0.03	-0.23	0.81
ASIRKA	-0.07	0.08	-0.09	-0.80	0.42
ADIJLA	-0.94	0.31	-0.38	-3.03	0.00
ADIJRZ	0.41	0.38	0.14	1.07	0.28
ADIJKOL	0.12	0.22	0.07	0.54	0.58
ADIJSZ	0.17	0.36	0.07	0.47	0.63

Dependend variable: OSOTOG

A more detailed analysis of the numerical values of the regression Beta coefficients clearly shows that the importance of the connection between anthropometric parameters and the throwing technique by striking the landing leg from behind (OSOTOG) is defined above all by body weight (ATEZTJ), elbow diameter (ADIJLA), body height (AVISTJ), arm length (ADUZRU) and leg length

(ADUZNO), which leads to the conclusion that the mentioned variables contribute the most to the explanation of the dependent variable, when the variance explained by the other independent variables in the model is subtracted. From the table we can see that the variables elbow diameter (ADIJLA), body height (AVISTJ) and arm length (ADUZRU) have negative partial correlations with

DISCUSSION

For the results obtained by regression analysis, the explanation can be sought in the kinematics and dynamics of the performance of the observed throwing technique. Namely, the throwing technique by kicking out the leg from behind is performed in accordance with biomechanical principles, maximum speed and optimal force level, whereby the relationships of the segments of individual parts of the body change. The mentioned technique is obviously a complex structure, in the performance of which the muscle mass of various topological regions participates, along with activities in the joints of the shoulder, elbow, hand, hip, knee and ankle joint, whereby different mechanisms at various levels inhibit, time synchronously or successively, individual muscles or groups of muscles, which with more or less success, perform the technique program, depending on the adoption of the skill. The technique, as it is already known, is included in the complex structure of movement by the very fact that it consists of different, but fluid movements and movements combined into a whole. In the throwing technique by kicking out the leg from behind, the performer approaches the opponent by moving his left leg forward while simultaneously pulling him out of balance, which enables him to use a combination of forces, by rotating the opponent's body in the hip joint around the horizontal axis in the sagittal plane, to kick out the opponent's right leg with his right leg legs from behind and throw the opponent (backwards) in front of you onto his back. The performance of the technique is based on the biomechanical principle with the action of two forces, where one vector represents the force created by the performer's hands, while the other vector represents the force created by the kicking action of the attacker's leg (Sacripanti, 1989). The most favorable moment for performing the technique is the position of the opponent's body, when most of his weight is on the heel or should just land on the heel of the kicking foot, i.e. that the projection of the opponent's center of gravity falls in the point of support, which reduces the possibility of his resistance exclusively to passive static resistance. For the throwing technique by kicking the leg from behind, it is characteristic that the criterion variable, while body weight (ATEZTJ) and leg length (ADUZNO) have positive ones, based on which it could be concluded that those students who have a higher body weight and longer legs more efficiently perform the throwing technique by breaking the landing leg from behind from the SFE program.

the opponent's body kicks out in the direction of the longitudinal axis from the heel to the toes, whereby the performer kicks out the opponent's right leg with his right leg after establishing contact in the area of the knee bend, where it is very important that in the final phase of the performance throws, he pulls to the left and down with his left hand (thereby preventing the opponent from transferring his weight to his left foot), while with his right hand he pushes towards the heel of the opponent's right foot, simultaneously performing forward bending of the torso and stepping in a large arc with the right leg with a movement from the hip joint. It should be noted that straining the plantar flexors of the ankle joint during movement and increasing the rotation of the whole body, by tightening the knee extensors in the shaft, was a key factor in accelerating the leg when making contact and realizing swing. Also, it is important to emphasize that the swing of the right leg will not be transferred to the opponent's body if the performer has not previously established contact with the right side of the chest with the right side of the opponent's upper chest, that when the opponent's right foot kicks out, the opponent's left foot also separates from the ground at the same time. Bearing in mind the fact that for the effectiveness of the execution of throwing techniques by striking the landing leg from behind, it is important that the projection of the opponent's center of gravity falls in the point of support, the proportion of body mass and leg length in its execution seems justified due to the existing biomechanical laws, because the performer with his swinging leg (shin) , knocks out the shin of the opponent's landing leg, and therefore the greater mass during the collision of two bodies enables greater force to be exerted. In addition to the internal forces created by the action of the large skeletal muscles, the realization is also influenced by the impulse of the ground force, the moment of inertia, the force of action and reaction, the coupling of forces, the lever arm, the reactive transfer of momentum and the centrifugal and centripetal force. Also, after finishing the throw, it is necessary to maintain one's own balance, which is why it is necessary for the muscles of the lower leg and upper leg to act with eccentric contraction, which also explains the participation of these variables in the prediction of the execution of the

throwing technique by kicking out the landing leg from behind.

From the obtained results, it can be seen that the average rating of the effectiveness of the execution of the throwing technique by kicking out the leg from behind is 6.45. The reason for such an achievement in performing the technique can be found in the relatively small number of training hours, where the respondents were not able to perform the optimal number of repetitions in a limited time of three weeks, which is why they failed to adopt or automate the taught elements of the technique. The available number of classes not only did not provide them with the acquisition of the external form of performing the technique, but also the acquisition of the internal form that implies optimal dynamics and kinematics provided by the given criteria of its execution. It was observed that the most common mistakes were related to the initial failure to get the opponent off balance, incorrect foot position when transferring weight to the landing leg, inadequate contact of the upper body with the upper body of the opponent, insufficient swing of the right leg without full extension of the leg and ankle when executing a kick after making contact with the opponent's right leg, insufficient bending of the trunk and insufficient pulling force with the hands or incorrect pulling direction when executing the final part of the throw.

There are several reasons why the leg kick technique is suitable for use in higher weight classes. One of the reasons for its application is the biomechanical characteristics of its performance, while the second reason is the possibility of using one's own weight to throw the opponent. As mentioned, the technique of throwing by kicking the landing leg from behind is performed by acting on the opponent's supporting leg (foot), the performer's swinging leg (kicking), while using the mass of the body to throw the opponent. It can be assumed that with performers who have a larger body mass, speed does not come to the fore (Drapšin et al., 2009), because the realization of the technique itself does not require a large range of movement of the performer's body or a high speed (Sato, 1992), which favors the level speed in performers who have a higher body weight, because due to their constitution they "weight" much more rational and shorter movements, which can still achieve a relatively high speed of entry into the throwing technique. When performing the technique, the anthropometric characteristics of the performer come to the fore, because the weight of the performer's body is transferred to the opponent, in such a way that the performer leans almost completely on the opponent, and in this way performs the throwing technique more efficiently, which is why the movement of the performer is not crucial for the realization of the throw itself. In support of this claim is the research conducted by Sertić, Segedi & Žvan (2007), on a sample of 122 second-year students of the Faculty of Kinesiology in Zagreb, with the application of 18 anthropometric variables as part of the predictor set of variables, with the aim of determining the magnitude and direction of relations of some anthropometric variables with the quality of execution of throwing techniques in judo. The analysis of the relationship between latent anthropometric dimensions and the quality of performance of throwing techniques showed that there is a statistically significant relationship between latent anthropometric dimensions and the performance of throwing techniques, where body volume and mass, as well as longitudinal and transverse dimensions of the body, made an individual statistically significant contribution to the realization of the connection between latent anthropometric variables with the quality of execution of throwing techniques. A similar study was conducted by Božić (1989), investigating the relationship between anthropometric dimensions and the effectiveness of execution of judo throwing techniques. Based on the obtained results, it was established that the factors of motor intelligence, body volume and motor educability have a dominant influence on the structuring of motor algorithms in the first phase of training, which retain their influence in the second phase, while in the third phase motor educability loses its importance, and voluminousness bodies and motor intelligence increase their influence. Kasum (2001) and Popović (2010) studied the influence of morphological characteristics and motor skills of students on the success of mastering martial arts programs. Using a sample of 45 students from the Faculty of Physical Culture in Belgrade, Kasum looked at the connection between their morphological characteristics and motor skills and success in mastering the wrestling program. The results showed that certain morphological characteristics and motor abilities significantly influenced the successful mastering of wrestling techniques, while Popović, based on a sample of 58 students of the Faculty of Physical Education, determined that there is no relationship between most morphological and motor variables and success in mastering the judo teaching program statistically significant correlation. The main reason for this is the fact that we are talking about the population of students of the Faculty of Physical Education, who, in accordance with the judo curriculum, are required to respect the standard

form of school technique, and not the characteristics of speed and strength that accompany this technique in a sports judo fight.

CONCLUSION

On a sample of 84 first-year students of the Faculty of Security Sciences, University of Banja Luka, the influence of morphological characteristics on the effectiveness of performing the technique of kicking the leg from behind from the SFE program was examined. The regression analysis did not establish a statistically significant connection between the efficiency of performing the throwing technique by kicking the landing leg from behind from the SFE program, with the selected set of predictor variables for the assessment of morphological characteristics.

Analyzing the partial influence of certain anthropometric variables, we can see that the variable elbow diameter (ADIJLA) has a statistically significant influence on the explanation of the structuring of the motor program of the throwing technique by kicking the leg from behind (OSOTOG), at this level of education. A more detailed analysis of the numerical values of the regression Beta coefficients shows that negative partial correlations with the criterion variable have variables: elbow diameter (ADIJLA), body height (AVISTJ) and arm length (ADUZRU), while positive ones have body weight (ATEZTJ) and leg length (ADUZNO), on the basis of which it could be concluded that the subjects with higher values of body weight and longer leg length performed better the throwing technique by breaking the landing leg from behind from the SFE program. Bearing in mind the fact that the kinematics and dynamics of the performance of motor programs in the SFE depends on: the level of adoption of the basic elements of techniques and their combinations, and the latent motor abilities and morphological characteristics of the individual, it is very important that the orientation of the students is directed in the direction of complete adoption elements of technique, but also in the direction of developing and perfecting certain motor abilities and morphological characteristics, as a prerequisite for the effective adoption and application of motor programs from the SFE program.

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