

FACTORIAL STRUCTURE OF KARATE ELEMENTS IN SPORT FIGHT ON KARATE SPORTSMEN FROM R.MACEDONIA

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Zarko Kostovski¹, Elena Soklevska - Ilievski, Zorica Kostovska

¹*Ss. Cyril and Methodius University in Skopje, Faculty of Physical Culture, Skopje, Macedonia*

Abstract

The research has been done on 48 participants - top male karate competitors, juniors, from 20 karate clubs from Macedonia. Subject of this research are karate elements which are most frequently used in karate fight, and the basic aim is to establish the structure of the same karate elements that are used in karate fight. In the research, 36 variables were applied: 4 anthropometric variables, 4 variables for estimation on the explosive strength, 4 variables for estimation on the segmented velocity (frequency of movements), 12 variables of the karate elements used in the karate fighting and 12 variables for estimation of the specific karate abilities in 3 motor spaces: 4 variables for estimation of the specific karate coordination, 4 variables for estimation of the specific karate precision and 4 variables for estimation of the specific karate balance. This research examines the factors of used karate elements in sports fighting. The results obtained show existing of grouping by space of the variables being used in the research.

Key Words: *karate elements, sports fight, segmented velocity, specic karate abilities, specic karate coordination, specic karate precision, specic karate balance.*

INTRODUCTION

Genesis of karate as a martial art presents means for self-defense based on some principles, rules and laws. Its practice demands enormous physical and mental discipline. Practicing karate helps in developing strong character and personality and builds the feeling of the obvious. With development and improvement of the conditions for training, the karate sport has developed from the karate - an ancient martial art. The tendency for achieving better results leads to introduction of new tools and methods to preservation and improvement of higher existing kite. The process of achieving results to leading sports results is more based on scientific research and method, on determining the factor which had influence on achieving succes and peak sports performance. The value of these researches in the field of sports, karate consisting in find and determining the most economical and efficient-term factors that are significant for the achieving of results represents the

peak, with the discovery of the structure of their personality and find of the appropriate measuring instruments. Rapid development of karate sport will be realized by improving the material conditions for training, development of technical aids, training process led by experts, planning and programming of the appropriate training process and timely selecting the young categories for this sport.

Karate represents an acyclic polistructyral sport which in part, in its functioning includes stances, punches, blocks, ranges, movements, all grouped in synhronization of acting. Punch in karate sport are dominant techniques. Therefore, in mastering the karate techniques, special emphasis is given to the improvement of the technique of strikes which are unique point technique in sport fight. Because of the various and numerous unforeseen situations that occur in sport fight, there should be completeness of all parts involved in it. Therefore, in the beginning of training process, same are channeled towards establishing, developing and keeping the

anthropological, motor dimension, as well as situational karate techniques and specific elements of karate. The attention to achieve the goal, a great number of information is required that will be properly incorporated and used in the process of building the personality of the karate athlete. For the purpose of successfulness of the process, range term patterns should be based on real examples, practical and scientific achievements which will enable objective evaluation at the elements that are important for transformation of the mentioned dimensions. Because of all, should create uninterrupted link between the theory and practice of that, can karate athletes increase their opportunities and achievements. For that purpose, this effort will be directed toward the discovery and obtain information on the new elements, which i hope that will be used in theoretical knowledge in this problem and will be put in function of the science and practice and will contribute to future development of top results of karate athletes.

SAMPLE AND METHODS

Sample of participants

The research has been done on 48 participants - top male karate competitors, juniors, from 20 karate clubs from Macedonia.

Methods

Measurement techniques

In the first phase the participants were recorded in the performance of the specific karate elements at the state and official competitions, the composition the electoral national representation. The participants were divided according to the age and weight categories (determined according to the rules of WKF) in sport fighting (kumite). In the second phase, the same participants were covered individually by anthropometrical measurements and tests for assessment of specific karate skills, and the same was performed in their clubs. Also, it were needed certain criteria on the date of the measurements:

- to be healthy psychophysical on the day of check up
- regularly be attended trainings in their clubs and to be in the appropriate categories
- for the measuringtime up to them and conscientiously doingthe tasks whichwould be arealistic situation

Sample of variables

In the research, there were used 36 variables: 4 anthropometric variables, 4 variables for the estimate on the explosive strength, 4 variables for the estimate on the segmented velocity (frequency of movements), 12 variables of the karate elements used in the karate ghting and 12 variables for the estimate on the specific karate abilities in 3 motor spaces: 4 variables for the estimate on the specific karate coordination, 4 variables for the estimate on the specific karate precision and 4 variables for the estimate on the specific karate balance.

The way of measuring the conduction

Making of karate elements applied in the fight were realized in the hall in which was the competition, which was with satisfactory conditions and appropriate foundation. The respondents were not previously acquainted for the making of which is used by the method of systematic observation of side to karate people who know the sport and the Physical Education teachers who have previous experience and knowledge of that problem which is subject of this research which would enable the proper and fair enforcement the same. While, on the anthropometrical measurements and motor variables as well as other tests to assess the specific skills of karate, was carried out in the clubs in which competitors make their daily training. Also they were in the appropriate equipment and familiar with the conditions of measuring.

Statistical methods for data processing

The data that is obtained from this research according to the characteristics and size of the elected sample is processed in several programs. Original data of the measurements was primarily put in a matrix of data in Excel program, and then the statistical parameters are calculated with program Statistics for windows 6.0. as well as the statistical package SPSS. For the purposes of the survey is calculated the following measures:

Basic descriptive statistical parameters: Mean - the arithmetic mean, SD - standard deviation, which should be at least 1/3 of the value of the arithmetic mean, Min. - Minimum score, Max. - Maximum result, Skew - symmetric distribution on the accuracy with which outcome is assessed whether a certain test is easy or heavy for the performance among a sample, Kurt - according distribution to the results is determine the homogeneity

Descriptive Statistics (Matrica juniori) (Table 1)

	N	Mean	Minimum	Maximum	Std.Dev.	Skewness	Kurtosis	K-S
ATT	48	69,68	51,00	100,00	9,58	0,55	1,19	0,11
ATV	48	177,50	162,00	192,00	6,71	-0,12	0,24	0,10
ADRAKA	48	87,01	77,00	97,50	4,73	0,17	-0,01	0,10
ADNOGA	48	103,30	95,50	115,00	4,29	0,33	0,13	0,10
MSMD	48	220,33	175,00	270,00	20,07	0,09	0,53	0,10
MSMV	48	48,10	37,00	70,00	7,04	1,18	1,30	0,22
MTVS20	48	3,09	2,79	3,44	0,14	0,52	0,18	0,12
MUNMG	48	10,13	8,00	12,00	0,76	-0,22	0,51	0,27
MTRSR	48	72,69	48,00	90,00	11,71	-0,56	-0,67	0,15
MTNSR	48	50,65	38,00	62,00	6,02	-0,24	-0,68	0,10
MTRFR10	48	59,04	36,00	76,00	8,68	-0,60	-0,09	0,13
MTNFR10	48	41,38	34,00	50,00	4,54	0,28	-0,62	0,15
KNUR	48	11,29	1,00	38,00	8,97*	1,48	1,88	0,18
KN2UR	48	5,98	0,00	25,00	4,63*	1,74	4,97	0,14
KKNRNNR	48	1,56	0,00	6,00	1,35*	0,91	1,10	0,18
KNUNT	48	5,44	0,00	16,00	4,26*	0,67	-0,57	0,17
KNUNG	48	3,38	0,00	18,00	3,44*	2,23	6,86	0,23
KKNPU	48	1,96	0,00	9,00	2,50*	1,30	0,70	0,25
KOB	48	4,83	0,00	15,00	3,65*	0,71	-0,01	0,15
KOI	48	4,69	0,00	13,00	3,67*	0,73	-0,54	0,20
KOBKN	48	1,44	0,00	13,00	2,19*	3,64	16,78	0,27
KPGC	48	3,48	0,00	9,00	2,58*	0,57	-0,60	0,14
KPKC	48	0,85	0,00	5,00	1,09*	1,63	3,30	0,26
KKAZNA	48	0,79	0,00	3,00	0,97*	1,03	0,05	0,29
SHC	48	1,42	1,00	2,62	0,31	1,78	4,25	0,14
SHMG	48	4,03	2,98	5,22	0,50	0,33	-0,09	0,09
TSHUSHC	48	2,32	1,37	3,34	0,54	0,39	-1,00	0,14
TSHUSHMG	48	3,92	2,92	5,47	0,57	0,60	0,20	0,10
URMSR	48	6,77	6,00	7,00	0,42	-1,33	-0,24	0,48
URMFR	48	6,63	6,00	7,00	0,49	-0,53	-1,79	0,40
UNMSR	48	6,10	3,00	7,00	0,95	-1,15	1,38	0,25
UNMFR	48	5,75	4,00	7,00	0,96	-0,23	-0,87	0,21
SOHMG	48	8,49	2,02	45,44	9,70*	2,62	6,52	0,29
SZHMG	48	2,33	0,85	5,75	0,96*	1,41	2,93	0,15
SOHMAG	48	8,09	1,47	132,00	19,61*	5,78	35,75	0,37
SZHMAG	48	2,15	1,13	5,01	0,74	1,42	3,47	0,13

of the results in a given test, KS - Kolmogorov-Smirnov which is determined by the normal distribution of results.

Factor analysis- the aim is, from the number of the interconnected manifest variables, reduce the smaller number of each relatively independent latent variables which can explain the mutual relation of the analyzed manifest variables. H - the first principal component - explains most of the total

variance, Lambda - characteristic roots which explains the common variance of each major isolated component, h² - communality - size of the explain part of the total variance of each variable.

RESULTS AND DISCUSION

Basic descriptive statistical parameters

From the data provided in Table 1, it can be concluded that the distribution of the anthropomet-

rical variables, motor variables and variables specific to karate skills is moving within the limits of the normal distribution of results, while even among the variables applied in karate fight there is deviation from the normal distribution the results. The results show that the values of standard deviation (Std.Dev) among these variables (KNUR = 8.97, KN2UR= 4.63, KKNRNNR = 1.35, KNUNT= 4.26, KNUNG = 3.44, KKNPU = 2.50, KOB = 3.65, KOI = 3.67, KOBKN= 2:19, KPGC = 2.58, KPKC= 1.09, KKAZNA = 0.97) is higher than a third compared to the values of the arithmetic middle. Such deviation is evident among the three variables for the estimation of particular karate balance (SOHMG = 9.70 SZHMG = 0.96 and SOHMAG = 19.61) The remaining results of the values of standard deviations (Std.Dev) amount to one third compared to the arithmetical mean to indicates that the main grouping of the results is moving around its own mean. The values of the Gaus curve (Skewness) are in the range of moderate symmetry (+1 -1) among variables, with the exception of variables MSMV= 1.18 KNUR = 1.48, KN2UR= 1.74, KKNPU = 1.30, KPKC= 1.63, SHC = 1.78, UNMSR = -1.15, SOHMG = 2.62, SZHMG = 1.41, SOHMAG= 5.78, SZHMAG = 1.42) which emphasizes the concentration of the results towards smaller values. The values ??of the Gaus curve (Kurtosis) is platicurtical which emphasizes the greater discrimination of the results, while the exception make variables (KN2UR = 4.97, KNUNG= 6.86 KOBKN = 16.78, KPKC = 4.25, SHC= 4.25, SOHMG = 6.52, SOHMAG = 35.75, SZHMAG = 3.47) where as it is evident leptokurtical of the curve, or the higher concentration of results around their mean. The distribution of the results of the variables, obtained by the method of Kolmogorov - Smirnov shows that the values of all variables does not derogate of the normal distribution of results.

Factor analysis applied to variables

In Table 2 are presented the results of factor analysis applied to variables, in the unrotated matrix.

The characteristic roots and the explained variance of the motor manifest variables by the significant principal components in the space of first order are given in Table. 3. The applied Guttman-Kaiser criterion extracted 5 significant latent dimensions that appears to be sufficient for the

Factor Loadings (Unrotated) (Matrica juniori)
Extraction: Maximum likelihood factors
(Marked loadings are > ,500000)
 (Table 2)

	F 1	F 2	F3	F 4	F5	h ²
ATT	-,81	-,13	-,08	,06	,15	,88
ATV	-,97	,08	-,03	-,03	,03	,92
ADRAKA	-,77	-,14	-,07	,14	-,23	,85
ADNOGA	-,82	,06	-,07	-,12	-,10	,81
MSMD	-,27	-,38	,33	,55	,26	,69
MSMV	-,23	-,45	,03	,52	-,18	,78
MTVS20	-,07	,22	-,20	-,58	-,18	,68
MUNMG	,26	-,51	,06	,40	-,05	,75
TRSR	-,05	-,46	-,79	,05	-,09	,85
TNSR	,08	-,74	-,23	,04	,21	,85
TRFR10	,07	-,47	-,56	,05	,03	,65
TNFR10	,01	-,45	,03	-,23	,31	,66
SHC	,15	,63	-,28	,16	-,14	,75
SHMG	,08	,73	-,21	,25	,33	,80
TSHUSHC	,30	,57	-,55	,12	-,17	,90
TSHUSHMG	,15	,79	-,19	,08	,27	,85
URMSR	-,15	,12	,09	-,17	-,14	,44
URMFR	,07	-,13	-,13	-,05	,19	,62
UNMSR	,40	-,42	,13	-,38	,00	,74
UNMFR	,06	-,05	-,30	,20	,04	,61
SOHMG	,11	-,28	-,33	-,22	,47	,72
SZHMG	,01	-,32	-,13	-,27	,44	,44
SOHMAG	,22	-,17	-,25	-,21	,48	,61
SZHMAG	,15	-,49	,09	-,06	,19	,58
Expl.Var	3,49	4,44	1,95	1,65	1,34	
Prp.Totl	0,15	0,19	0,08	0,07	0,06	

explication of variability and covariability of the manifest variables applied to the sample karate competitors (Table 2). From the heights of the projections of the manifest variables of the first principal component of unrotated factor matrix can be concluded that most of variables have significant, but the medium to medium high projections, it may be that the principle means that the received factors in a relatively significant correlation and that izolating the factors of high order would be justified. The value of communality is high, this means that the system of factors go relatively well defined variability and covariability of the manifest variables Orthogonal varimax solution (Table

Eigenvalues (Matrica juniori)
Extraction: Maximum likelihood factors
 (Table 3)

	Eigenvalue	% Total	Cumulative
1	3,49	14,53	14,53
2	4,44	18,51	33,05
3	1,95	8,13	41,18
4	1,65	6,88	48,07
5	1,34	5,59	53,66*

4) lead to the creation of a structure, which satisfy the conditions of the simplicity of the structure, only two of the manifest variables have values close to the projection at more than one latent dimension.

The first latent dimension (F1) shall be composed of the significant and high projections of the measures of the dimensionality of the body. The structure of this latent dimension consists of the variables on body weight, body height, length of the arm, length of the leg and the same we can define as a factor of the longitudinal dimension of the skeleton (FLDS).

The second latent factor (F2) shall consist of medium to high values of variables at specific karate coordination in whose structure is included variables: shihon cuki, shihon mae geri, tate shuto uke shihon cuki, tate shuto uke shihon mae geri. Also here is included the variable impact of the foot in the target in the sagittal plain that belongs to another area and because of that reason here we not to interpret. Received factor shall define as a factor in the specific karate coordination (FSKK).

The third latent dimension (F3) is defined by high and medium projections of variables taping with arm in the sagittal plain, taping the foot in the sagittal plain and taping by hand in the frontal plain and can be defined as a factor of the segmentary speed or frequency of movements (FSB).

The fourth latent factor (F4) is defined by moderately high and medium projections of the variables: jump by place of the distance, jump by place in a height, running of the high start 20 meters, and the punch with leg mae geri for 10 seconds. Received factor can be defined as a factor in the explosive force of the lower limbs (FESD).

Fifth latent dimension (F5) can be defined as a factor of specific karate balance (FSKR), in whose structure is included variables standing with open eye hikijashii mae geri, standing with closed eye

hikijashi mae geri and standing with open eye hikijashi mavashi geri, represented with medium projections of the same. Here is included the variable taping the foot in the frontal plain for 10 seconds who belongs to another space and here we does not interpreted it.

Extraction: Maximum likelihood factors
 (Marked loadings are > ,500000)
 (Table 4)

	F 1	F 2	F 3	F 4	F 5
ATT	-0,82*	0,05	0,03	-0,12	0,10
ATV	-0,97*	-0,02	-0,10	0,05	-0,05
ADRAKA	-0,76*	0,16	0,15	-0,08	-0,25
ADNOGA	-0,81*	0,04	-0,02	0,17	-0,11
MSMD	-0,26	0,19	-0,10	-0,77*	0,04
MSMV	-0,22	0,29	0,30	-0,54*	-0,21
MTVS20	-0,08	-0,01	0,00	0,67*	0,02
MUNMG	0,26	0,32	0,26	-0,50*	-0,02
TRSR	-0,13	0,12	0,87*	0,06	0,24
TNSR	0,04	0,45	0,42*	-0,28	0,45
TRFR10	0,00	0,16	0,65*	-0,05	0,30
TNFR10	0,00	0,36	-0,01	-0,05	0,47*
SHC	0,13	-0,63*	0,10	0,19	-0,28
SHMG	0,04	-0,86*	-0,11	-0,02	0,03
TSHUSHC	0,25	-0,67*	0,37	0,29	-0,19
TSHUSHMG	0,11	-0,84*	-0,16	0,16	0,03
URMSR	-0,13	0,04	-0,13	0,20	-0,13
URMFR	0,04	0,01	0,10	-0,02	0,26
UNMSR	0,40	0,50	-0,03	0,16	0,25
UNMFR	0,03	-0,14	0,32	-0,11	0,06
SOHMG	0,04	0,04	0,20	0,04	0,65*
SZHMG	-0,04	0,17	0,04	0,03	0,60*
SOHMAG	0,16	-0,04	0,10	0,04	0,61*
SZHMAG	0,14	0,39	0,04	-0,19	0,32
Expl.Var	3,39	3,36	1,92	1,98	2,23
Prp.Totl	0,14	0,14	0,08	0,08	0,09

CONCLUSION

The research has been done on 48 participants - top male karate competitors, juniors from the 20 clubs of Macedonia. Subject of this research are karate elements which are most frequently used in karate fight, and the basic aim is to establish the structure of the same karate elements who are used in karate fight.

From the received results of this research, we can conclude that from the variables which are most frequently used in karate fight, for the age categories juniors, we can define 5 latent factors:

1. factor of the longitudinal dimension of the skeleton

2. factor of the specific karate coordination

3. factor of the segmentary speed or frequency of movements

4. factor of explosive strenght of the lower limbs

5. factor of specific karate balance

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Correspondence:

Zarko Kostovski

Ss. Cyril and Methodius University in Skopje

Faculty of Physical Culture,

Zeleznicka b.b.

1000, Skopje, Macedonia

e-mail:zarkokostovski@hotmail.com

ФАКТОРСКА СТРУКТУРА НА КАРАТЕ ЕЛЕМЕНТИ ПРИМЕНЕТИ ВО СПОРТСКА БОРБА КАЈ КАРАТЕ СПОРТИСТИ ОД Р.МАКЕДОНИЈА

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Жарко Костовски¹, Елена Соклевска - Илиевски, Зорица Костовска

*Универзитет „Св. Кирил и Методиј“ во Скопје, Факултет за физичка култура,
Скопје, Македонија*

Абстракт

Испитувањето беше спроведено на 48 испитаници, врвни карате спортисти, од машки пол, јуниори од 20 клубови од Р. Македонија. Предмет на ова испитување се карате елементите. Предмет на ова испитување претставуваат карате елементите кои најчесто се применуваат за време на изведување на карате борба, а како основна цел е утврдување на структурата на карате елементите кои се изведуваат за време на спортската борба. Во испитувањето беа применети вкупно 36 варијабли од кои: 4 антропометриски варијабли, 4 варијабли за проценка на експлозивната сила, 4 варијабли за проценка на сегментарната брзина (фреквенција на движења), 12 варијабли на карате елементи кои се применуваат во спортската карате борба и 12 варијабли за проценка на специфичните карате способности групирани во 3 маторички проспекти претставени со: 4 варијабли за проценка на специфичната карате координација, 4 варијабли за проценка на специфичната карате прецизност и 4 варијабли за проценка на специфичната карате рамношежа. Во ова испитување проучувани се факторите на карате елементите во спортската борба. Резултатите кои се добиени од ова испитување покажуваат дека постои групирање по проспекти на истражуваниите варијабли кои се користени во испитувањето.

Клучни зборови: карате елементи, спортска борба, специфични карате способности: специфичната карате координација, специфичната карате прецизност и специфичната карате рамношежа.

