

# DIFFERENCES IN SOME MORPHOLOGICAL CHARACTERISTICS AND SELECTED MOTOR ABILITIES BETWEEN KYOKUSHINKAI AND SHOTOKAN FIGHTERS

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# INTRODUCTION

- Karate as sport has many styles. The most significant are: SHOTOKAN, KYOKUSHIN - Oyama-Ryu, SHITO-Ryu, GOJU-Ryu and WADO-Ryu.
- The most attention by Serbian sport persons, recreationalists and lovers in Japan martial were attracted by two styles: **SHOTOKAN** and **KYOKUSHIN - Oyama-Ryu**
- It is important to add that the both styles have two competing disciplines - **kata** and **kumite**. Kyokushin kumite in training process require more aggressive and more strength.

# THEORETICAL FRAMEWORK OF RESEARCH

- Defining basic concepts
- Characteristics of karate and karatekas through styles
- Previous research
- Characteristics for the development of motor skills

# DEFINITION OF BASIC CONCEPTS

- Based on a lot of research and allegations (Zatciorski 1961; Matveev 1964; Ter - Ovensajn 1967; Kurelić et al. 1975; Platonov 1984; Gajić 1985; Đorđević 1989; Kukolj 1996; Nićin & Kalajdžić 1966), the following structure is accepted basic motor skills:
  - coordination;
  - power;
  - velocity;
  - durability;
  - flexibility;
  - balance;
  - precision.

# Characteristics of karate and karatekas through styles

- Characteristics of karate;
- Characteristics of karatekas through styles;
- Motor skills and morphological characteristics of karatekas.

# Previous research

To win top results in sports, it depends on a number of components, and the role of science is gaining in importance (Željaskov, 2004).

Zulić (1985) found significant connections between the impact impulse of force and the velocity of impact with anthropometric and motor characteristics in top karatekas.

Success in kumite depends to a large extent on the time of reaction and adaptation (Mori, 2002; Donovan, 2006).

Beneke (2004) in a study talks about the characteristics of karate fighters who indicate that the participation of the aerobic component in competitors in combat is about 70%, aerobic lactate component about 20% and lactate component about 10%.

# SUBJECT AND OBJECTIVE OF THE RESEARCH

- **The subject** of this research is a comparative analysis of morphological characteristics (body height and body weight) and motor abilities (strength, power, flexibility and velocity) of Shotokan (Shotokan Karate Federation of Serbia) and Kyokushinkai (Shinkyokushin Federation of Serbia) style.
- **The aim** of this research is to determine, compare and analyze the level of anthropometric characteristics and motor abilities of shotokan and kyokushin karate fighters.

# Research hypotheses

- Based on the defined subject, and the goals and objectives of this research, the following hypotheses were set:
- **H<sub>1</sub>** - Statistically significant information is expected to be obtained in some morphological characteristics between shotokan and kyokushin karatekas.
- **H<sub>2</sub>** - Statistically significant information is expected in selected motor skills between shotokan and kyokushin karatekas.



# RESEARCH METHODS

- **Subject sample:**
  - Group I - Kyokushin fighters (N = 11);
  - Group II - Shotokan fighters (N = 11).
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- **Variables:**
  - Independent variable: Karate style

# RESEARCH METHODS

- Dependent variables:
- Variables of morphological characteristics:
  - 1) Body height (BH)
  - 2) Body mass(BM)
- Variables of motor skills:
  - 1) Throwing the medic out of the chair (BMED);
  - 2) long jump (SDALJ);
  - 3) Taping by hand (TAR);
  - 4) Taping by foot (TAN);
  - 5) Raising the leg in a supine position (PSP);
  - 6) Hip abduction test (TBK);
  - 7) Sit and reach (SID);
  - 8) One repetition maximum (1RM);
  - 9) maximum hand grip force (FORCE)

# RESEARCH METHODS

- **Data analysis:**
- All dependent variables were processed by descriptive statistics: mean value - **MEAN**; standard deviation - **SD**; minimum value - **MIN**; maximum value - **MAX**; coefficient of variability-**cV%**
- The independent **t-test** (T-test) was used to determine the differences between karate styles, for all morphological and motor variables.

# RESEARCH RESULTS

**Tabel 1.** Results of basic descriptive indicators of some morphological characteristics of Kyokushin and Shotokan kumite

		N	MEAN	SD	MIN	MAX	cV%
<b>Kyokushin</b>	<b>BH (cm)</b>	11	180.73	8.36	168	194	4.62
	<b>BM (kg)</b>	11	82.45	9.17	62	92	11.12
<b>Shotokan</b>	<b>BH (cm)</b>	11	180.64	8.81	162	193	4.88
	<b>BM (kg)</b>	11	85.45	11.31	60	103	13.23

N - number, MEAN - mean value, SD - standard deviation, MIN - min, MAX - maximum, cV% - coefficient of variability, BH - body height, BM - body weight

# RESEARCH RESULTS

**Tabel 2.** Results of basic descriptive indicators of selected motor skills of Kyokushin and Shotokan kumite

	N	MEAN	SD	MIN	MAC	cV%
<b>Kyokushin</b>						
<b>BMED (m)</b>	11	3.56	0.37	3	4.05	10.42
<b>SDALJ (m)</b>	11	1.87	0.17	1.65	2.07	9.00
<b>TAR (rep)</b>	11	37.45	5.26	29	45	14.04
<b>TAN (rep)</b>	11	27.18	3.12	22	31	11.50
<b>PSP (deg)</b>	11	135.09	27.92	100	175	20.66
<b>TBK (deg)</b>	11	105.00	9.75	90	120	9.28
<b>SID (cm)</b>	11	12.73	2.37	9	16	18.62
<b>1RM (kg)</b>	11	85.91	18.14	60	120	21.12
<b>FORCE (N)</b>	11	651.36	27.83	596	701	4.27
<b>Shotokan</b>						
<b>BMED (m)</b>	11	2.97	0.76	1.9	3.9	25.67
<b>SDALJ (m)</b>	11	1.82	0.14	1.6	2.05	7.56
<b>TAR (rep)</b>	11	42.64	5.85	36	52	13.73
<b>TAN (rep)</b>	11	30.73	3.58	26	37	11.65
<b>PSP (deg)</b>	11	134.36	26.86	100	173	19.99
<b>TBK (deg)</b>	11	115.00	13.60	90	135	11.83
<b>CID (cm)</b>	11	13.27	2.15	10	16	16.19
<b>1RM (kg)</b>	11	81.18	16.71	55	104	20.58
<b>FORCE (N)</b>	11	612.36	47.80	539	687	7.81

N - number, MEAN - mean value, SD - standard deviation, MIN - min, MAX - maximum, cV% - coefficient of variability, BMED - throwing medicine, SDALJ - long jump, TAR - hand tapping, TAN - foot tapping, PSP - raising the legs to the bed. pol., TBK - hip abduction, SID - sit and reach, 1PM - one recurring maximum, FORCE - hand grip

# RESEARCH RESULTS

**Table 3.** Results of differences in some morphological characteristics and selected motor skills between Kyokushin and Shotokan kumite (T-test)

	MEAN Kyokushin	MEAN Shotokan	MEAN Difference	t value	Significance
<b>BH (cm)</b>	180.73	180.64	0.09	0.025	0.980
<b>BM (kg)</b>	82.45	85.45	-3.00	-0.683	0.502
<b>BMED (m)</b>	3.56	2.97	0.58	2.290	<b>0.033*</b>
<b>СДАЉ (m)</b>	1.87	1.82	0.47	0.722	0.479
<b>TAR (rep)</b>	37.45	42.64	-5.18	-2.184	<b>0.041*</b>
<b>TAN (rep)</b>	27.18	30.73	-3.55	-2.475	<b>0.022*</b>
<b>PSP (deg)</b>	135.09	134.36	0.73	0.062	0.951
<b>TBK (deg)</b>	105.00	115.00	-10.00	-1.982	0.061
<b>SID (cm)</b>	12.73	13.27	-5.55	-0.565	0.578
<b>1RM (kg)</b>	85.91	81.18	4.73	0.636	0.532
<b>FORCE (N)</b>	651.36	612.36	39.00	2.338	<b>0.03*</b>

MEAN - mean value, BH - body height, BM - body weight, BMED - throwing medicine, SDALJ - long jump, TAR - taping with the hand, TAN - taping with the foot, PSP - lifting the leg to the bed. pol., TBK - hip abduction, SID - sit and reach, 1PM - one recurring maximum, STŠ - hand grip

# DISCUSSION

By applying statistical analysis of the t-test, we obtained results in which statistical differences were obtained for certain variables, which means that no differences between styles in morphological were found, while for selected motor abilities significance was determined for variable BMED ( $p = 0.033$ ), TAR ( $p = 0.041$ ) and TAN ( $p = 0.022$ ). No significant differences were found between styles in other variables of selected motor abilities.

Regarding the selected motor skills, the Explosive Strength Test (BMED) - arms and shoulder girdle showed that Kyokushin subjects have better this ability and are stronger in the region than Shotokan subjects. On the other hand, the results of tests that determine the velocity of the frequency of movement of the arms and legs (TAR and TAN), showed that Shotokan fighters have better developed abilities of the velocity of the frequency of movement of the arms and legs. In the end, in the hand grip test (FORCE), Kyokushin karate athletes achieved significantly better maximum strength, which means they were stronger than Shotokan karatekas, because that style certainly requires it.



Thank you for your attention!  
Questions?