EMPIRICAL BASIS FOR PREDICTING SUCCESS IN COMBAT SPORTS AND SELF-DEFENCE*

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Abstract:

The aim of the study was to find out whether being superior to the opponent with respect to physical fitness would be a prerequisite for success in a hand-to-hand struggle, and whether it would apply to those who had no experience in such contests, as well as to those who had been trained for at least a year. The so-called International Fitness Test was used to assess the level of fitness, and the combat performance was determined by using two types of contests: according to a modified sumo formula (in a vertical position) or according to the judo formula (in a horizontal position). All contests were conducted in the round-robin system. It was found that physical fitness superiority over an opponent was no prerequisite for success in a hand-to-hand struggle. Owing to the methodological and organisational simplicity of the test contests in sumo, as well as to a very high correlation between the results of sumo and judo (*ne waza*, in a horizontal position) contests (r = 0.892), the sumo contests may serve as a specific tool for measuring competence in hand-to-hand struggles.

Key words: *combat sports, self-defence, fitness, hand-to-hand struggle*

EMPIRISCHE BASIS ZUM VORAUSSAGEN DES ERFOLGS IN KAMPFSPORTARTEN UND IN DER SELBSTVERTEIDIGUNG

Zusammenfassung:

Das Ziel dieser Forschungsstudie war festzustellen, ob eine bessere körperliche Leistungsfähigkeit im Vergleich zum Gegner eine Voraussetzung für den Erfolg in einem modifizierten Sumo-Wettkampf ist, und ob das auch für die ohne jegliche Erfahrung in Wettkämpfen gilt, sowie für diejenigen, die mindestens ein Jahr trainierten. Der Internationale Fitness Test wurde angewandt, um den Fitnessgrad zu bestimmen, während die Kampfleistung mittels zwei Wettkampftypen bewertet wurde: nach der modifizierten Sumo-Formel (in senkrechter Position) oder nach der Judo-Formel (in waagerechter Position). Alle Kämpfer traten mit jedem Gegner zum Kampf an. Es wurde gezeigt, dass eine bessere körperliche Leistungsfähigkeit keine Voraussetzung für den Erfolg in einem modifizierten Sumo-Wettkampf darstellt. Da die Sumo-Wettkampf-Tests in methodologischer und organisatorischer Hinsicht einfacher sind und da eine sehr hohe Korrelation zwischen den Sumo- und Judo- (*ne waza*, in waagerechter Position) Wettkampfergebnissen (r = 0,892) besteht, können Sumo-Wettkämpfe als ein spezifisches Mittel zur Kompetenzbewertungen in allen Kampfsportarten und Selbstverteidigung dienen.

Schlüsselwörter: *Kampfsportarten, Selbstverteidigung, Fitness, modifizierte Sumo-Wettkampf*

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Introduction

Establishing reliable criteria for selecting potential sport elite is one of the principal issues in sport science. The fact that the motor competences of combat (or martial arts) athletes are transferred directly to the field of self-defence makes combat sports specific. Those motor competences may, obviously, be misused by some individuals in aggression and violence but those who are guided by ethics would not associate combat sports with aggression, only with self-defence (Tokarski, 1996; Kalina, 2000). Nevertheless, only some people do combat sport for safety reasons (Kruszewski, 2003), others engage in a sports career or combine the latter with mastering self-defence. Such dilemmas usually are not associated with other sports, like tennis, cycling, team games, etc.

Most published reports in the field of combat sports, including self-defence, pertain to sporting performance. When approaching a selection of talented individuals, various methodological criteria were applied. It was established that starting training in judo at an early age was not a prerequisite for top achievements, R. Kubacki, A. Parisi, S.W. Ruska, S. Nowikow or H. Saito serving as examples (Jagiełło, 2000). Among many motor tests and abilities, those reflecting best the subject's predispositions were identified for judo (Sulisz, Tkaczyk, 1982, Pilis, Cerazy, Smaczyńska, Stania, & Langfort, 1983; Dąbrowska, Sikorski, & Wit, 1986; Jagiełło, 2000, 2002), wrestling (Starosta & Głaz, 1993), taekwon-do (Bujak, 2004), and other combat sports (Sterkowicz & Ambroży, 1992). A number of reports pertained to the assessment of the so-called specific fitness (Żara & Vachun, 1981; Nowikow, Petrunev, Akopyan, Topolan, Petrunev, Akopyan, & Topolan, 1988; Sterkowicz 1992; Lerczak, Rzepkiewicz, Borowiak, & Lerczak, 1996) as well as to the relations between psychological indices or intellectual level and competitive performance (Jaworski & Radochański, 1974; Żukowski, 1974, 1995; Gorący, 1981). Other reports discussed the relations between competitive experience (numbers of sport events an athlete participated in) and world-class sport achievements (Matwiejew & Jagiełło, 1997; Jagiełło, 2000), or withdrawals of talented juniors from combat sports due to excessive training and competitive loads (Timakowa, 1985; Jagiełło, 2000). Still other reports presented the effects of specific contest exertions on an athlete's organism (Horswill, Miller, Scott, Smith, Welk, & Van-Handel, 1992; Hübner-Woźniak, 2002), on the biological development and physical fitness of children and the young (Jagiełło, Kalina, & Tkachuk, 2001), etc. Another line of research includes a search for the most efficient methods of teaching principles of a given combat sport (Sertić, Milanović, & Vuleta, 2003; Kalina, Kruszewski, Jagiełło, & Włoch, 2003) or self-defence (Ashkinazi, 1998; Sterkowicz, 1998).

In view of the vast literature focusing on improving the efficacy of training systems in combat sports and self-defence, information on a precise selection of talents for sports or jobs (e.g. police, army, security guards, prison guards – where competence in self-defence is vital) is clearly deficient. Commercialisation of sports makes many coaches (and probably scientists as well) reluctant to disclose any details on such issues. It may be inferred (as supported by our own observations) that many a coach, having no access to reliable information, makes use of the simplest selection criteria, mostly based on the recommended motor tests. Such an approach seems to result from restricted or even false knowledge concerning performing contests, for combat sport top athletes have an extreme motor proficiency. Appropriate norms were designed for diverse weight categories (Kaplin, 1986). Thus, combat sport coaches and those responsible for the selection of candidates for diverse defence (preventive) squads pick predominantly those who are strong, enduring, agile and flexible, while the principal skill in any combat encounter, not only judo, is, roughly speaking, the ability to make use of the opponent's energy.

The aim of the study was to verify the following statement: superiority in physical fitness is not an absolute prerequisite for beating opponents in direct combat, either in vertical or in horizontal positions. Furthermore, that rule applies to those who have no experience in direct combat as well as to those who had been trained for at least a year.

Methods

Subjects

Four experiments were conducted, each of them designed to answer detailed questions, the methods and research techniques used being in all the experiments alike.

Experiment 1 was aimed at finding out how general physical fitness correlated with the outcomes of judo test contests in a vertical position performed by 11-year old boys (n = 22), their body mass ranging from 20.5 to 39.5 kg. The boys formed 6 competing teams: A (n = 5) 20.5 – 22 kg; B (n = 3) 23.5 – 24 kg; C (n = 4) 24.5 – 25 kg; D (n = 4) 25.5 – 26 kg; E (n = 3) 32 – 33.5 kg; F (n = 3) 37.5 – 39.5 kg. Their physical fitness was determined just before the test contests during the first week of training.

Experiment 2 was aimed at finding out how general physical fitness, age and body mass correlated with the outcomes of judo test contests performed in a vertical position by children volunteering to start learning judo. Twenty-one boys, aged 7 – 13 years, their body mass ranging from 22 to 44.6 kg, formed 6 competing teams: A (n = 4) 22 – 28.1 kg, age 8 – 10 years; B (n = 5) 24.6 – 33.8 kg, age

7 – 10 years; C (n = 5) 26 – 29 kg, age 7 – 9 years; D (n = 4) 34 – 38 kg, age 10 – 12 years; E (n = 3) 40 – 44.6 kg, age 9 – 13 years. Their physical fitness was determined just before the test contests during the first two weeks of training.

Experiment 3 was aimed at finding out how general physical fitness, age and body mass correlated with the outcomes of judo test contests performed in a vertical position by men, professional security guards or candidates. A group of 113 male security guards from Lithuania were studied. Their age ranged from 19 to 43 years and body mass from 67 to 125 kg. They formed 23 competing teams, 5 subjects each. Within the teams, the age difference ranged from 3 to 23 years and the body mass difference ranged from 8 to 35 kg. Their physical fitness was determined just before the test contests.

Experiment 4 was aimed at finding out how general physical fitness and body mass correlated with the outcomes of judo test contests performed in either a vertical or a horizontal position by men undergoing military training, and whether the outcomes in both positions correlated with one another. A group of 33 male military cadets, students of the Military Technical University in Warsaw, were studied. They formed two teams (platoons), counting 15 and 18 subjects. Their age ranged from 19 to 21 years and body mass from 58 to 96 kg. Maximum in-team differences in body mass were 26 and 29 kg. Physical fitness was determined in the second and in the last weeks of the academic year, i.e. 9 months apart. Every cadet had 14 (Team 1) or 17 (Team 2) contests in either a vertical or a horizontal position with each team-mate, during the first or second semester, respectively. The last contest was always performed by the lightest and heaviest subjects in any given team. Thus, every cadet had 2 – 3 contests during PE classes every week of the first academic year.

Methods

Physical fitness. A battery of 8 fitness tests, developed by the International Committee on the Standardisation of Physical Fitness Test (Pilicz, Przewęda, Dobosz, & Nowacka-Dobosz, 2002) was used. The battery included: standing broad jump (SBJ), bent-arm hang (BAH), sit-ups (SUP), pull-ups on a bar (PUP), handgrip (HGR), 4×10 m shuttle run (SHR), 50-m dash (50 m), 1,000-m run (1000 m). In experiments 1 and 2, SBJ, BAH, SUP and SHR tests were applied, as it was possible to conduct them in a judo sports hall. In experiment 3 – SBJ, SUP and pull-ups (as an alternative to BAH) were applied, and in experiment 4 – all 8 tests were conducted.

The results of the tests were expressed in point scores according to Pilicz and associates (2002), established for the Polish population aged 7 – 19 years (the values for 19 years were applied to individuals aged 19 years and older). Besides, the relative positions within the teams were computed from the results of hand-to-hand struggles.

The outcome of the hand-to-hand contests in a vertical position. The contests were conducted according to a modified sumo formula until 4 fights were won. The contests were performed on soft ground provided by two 2×2 m tatami mattresses (children) or in a delimited ring of radius equal to 1.8 m (cadets).

Three indices were computed to assess the overall contest performance: ranking position in a given team, contest index (% of the contests won relative to all the contests performed by a given subject) and fight index (% of the fights won relative to all the fights performed by a given subject).

A fight consisted of pushing the opponent out of the field. A push-out was counted when the subject touched the ground outside the field with at least one foot or other body part. Only the simplest combat elements were used: tugging, shoving, getting off the line of attack, carrying the opponent off-field (but remaining inside the field). No knocks, throws, trip-ups or the like were allowed. A fight started by taking positions in diagonally opposite corners, feet touching the field line. When the field was circular, the opponents analogously took their positions facing one another. On the instructor's command "Ready!", the opponents touched the ground with their fists, and on the next command – "Go!", they started the fight. After the fight had been concluded by a victory or a tie (e.g. simultaneous fall of both contestants), the fight was resumed as before. The instructor could interrupt the fight in case of breaking any rule by giving the command "Stop", especially when the contestants clutched together, close to the field boundary, went for a simultaneous fall. Such a situation carries the only potential risk of injury, however, never encountered in several hundreds of contests we supervised. Nevertheless, the abovementioned rules were rigorously observed. An immediate resumption of the contest after every interrupted fight was a very important factor, as it created equal opportunities with respect to the time for consideration prior to the following fight. Intermissions between contests depended on the schedule for that team and the duration of the contests, but were never shorter than one minute.

The outcome of hand-to-hand contests in a horizontal position (Experiment 4 only). The contests were conducted according to the judo formula in the robin-round system until 3 fights were won. The contests were performed on judo mats without delimiting the field. Contest performance was expressed by the same 3 indices as above.

The floor (*ne waza*) advantage in every fight was counted according to judo criteria: lever (*kwansetsu waza*), choking (*shime waza*) or holding (*katame waza*) for 20 seconds. Before starting each fight, the

contestants sat back-to-back (backs touching) on the mat. On the instructor's command "Ready!", the opponents touched the ground with their fists, and on the next command – "Go!", they started the fight in a horizontal position, i.e. no upright position was allowed at any moment of the fight, but one-leg kneeling was admissible. After the fight had been concluded by a victory or a tie (e.g. mutual blocking of movements for about 5 seconds), the fight was resumed as before. Resumption of fights and intermissions between contests were as in the case of sumo.

Data processing. Correlation coefficients between the studied variables were computed and presented in tables. Whenever partial correlations were computed, they were reported in the text only. It should be pointed out that whenever ranking positions were correlated with measurements, the signs of correlation coefficients were inverted in comparison with those based on measurements alone or ranking positions alone. This was due to the inverted ranking orders, i.e. ranking position "1" corresponded to the highest measurement.

Results

The results of this study demonstrated that being superior to the opponent with respect to physical fitness was not a prerequisite for success in the hand-to-hand struggle performed by 3 – 18 subjects in the round-robin system. Correlations between ranking positions of individual subjects within a group with mean values of the Physical Fitness Test attained by them was found only in experiments 1 (11 year-old boys who had only begun their judo training) and 4 (military cadets performing judo in a horizontal position; Table 1). On the other hand, physical fitness results did not correlate significantly with the contest performance indices (Table 2).

Correlations between the struggle dynamics indices (or corresponding ranking positions) and the values of other variables (or corresponding ranking positions) are presented in Tables 3 and 4. It seems that body mass, although well correlated with the contest outcomes, did not play a great role since partial correlations between the results of sumo and judo fights performed by the military cadets were not markedly decreased by eliminating the effect of body mass: r = 0.778 (contests) and 0.740 (fights), vs. 0.890 and 0.876 (simple correlations), respectively. In the case of children the correlations are to be regarded with care, as ranking positions were often based on very small differences in quantitative measures.

An analysis of the experimental results supplied interesting information. In 4 out of 6 teams in experiment 1 those, who attained the highest results in physical fitness tests, won the contests. In team B, the differences between the winner and his 2nd and 3rd best contestants amounted to 22 and 16.8 points, respectively, while in team E those differences were only 1 and 1.2 points, respectively. In that latter case, the winner was thus probably the most talented one, as the differences in body mass were also slight, only 1.5 and 1 kg, respectively.

Similar relations were observed in experiment 2: in 3 out of 5 teams the winners were the most fit by the test criteria. Greatest differences between the winner and his sumo contestants were noted in team D (12, 10 and 4 points to the 2nd, 3rd and 4th best, respectively). In other teams, the differences ranged from 1.5 to 7.2 points. Other variables, i.e. age or body height and mass, were not correlated with the contest performance indices (except with the ranking position in age; see Table 4). The lack of effect of body mass was rather surprising, as the in-team differences in body mass were fairly high and ranged from 3 to 9.2 kg.

Table 1. Coefficients of correlation between ranking position in the team and physical fitness, body mass or age

Experiment No.		Fitness [pts]	Body mass [kg]	Age [years]
1 (n = 22)		-0.475**	-0.282	-
2 (n = 21)		-0.377	-0.123	-0.420
3 (n = 115)		0.120	0.241**	0.021
4 (n = 33)	Sumo	-0.190	-0.711***	-
	Judo	-0.435*	-0.691***	-

* p<0.05; ** p<0.01; *** p<0.001

Table 2. Coefficients of correlation between contest performance indices and physical fitness, body mass or age

Experiment No.		Percentage of the contests won			Percentage of the fights won		
		Fitness [pts]	Body mass [kg]	Age [years]	Fitness [pts]	Body mass [kg]	Age [years]
1 (n = 22)		0.269	0.047	-	0.261	0.011	-
2 (n = 21)		0.366	-0.061	0.271	0.297	-0.075	0.271
3 (n = 115)		0.146	0.240**	0.022	0.130	0.255*	-0.010
4 (n = 33)	Sumo	0.196	0.710***	-	0.213	0.748***	-
	Judo	0.415**	0.711***	-	0.438*	0.707***	-

* p<0.05; ** p<0.01; *** p<0.001

Table 3. Coefficients of correlation between ranking position in the team in contest performance, and ranking positions in physical fitness, body mass or age

Experiment No.		Fitness [pts]	Body mass [kg]	Age [years]
1 (n = 22)		0.454*	0.442*	-
2 (n = 21)		0.653**	-0.041	-0.420
3 (n = 115)		0.122	0.315**	0.020
4 (n = 33)	Sumo	-0.190	-0.711***	-
	Judo	-0.435*	-0.691***	-

* p<0.05; ** p<0.01; *** p<0.001

points, respectively. The analogous values for Experiment 2 were 58.2 (range: 53.5 – 64.2) and 52.5 (range: 40.8 – 62.8) points, respectively.

Junior judokas are not essentially inferior to the military cadets examined at the beginning of their service, with respect to age-related physical fitness. As mentioned earlier, physical fitness data recorded for the Polish male population aged 19 years served as standards for military cadets and bodyguards. The relative global fitness of the military cadets (experiment 4) – winners in both teams, ranged from

Table 4. Coefficients of correlation between contest performance indices and ranking positions in physical fitness, body mass or age

Experiment No.		Percentage of contests won			Percentage of fights won		
		Fitness [pts]	Body mass [kg]	Age [years]	Fitness [pts]	Body mass [kg]	Age [years]
1 (n = 22)		-0.427*	0.047	-	-0.369	0.011	-
2 (n = 21)		-0.519*	0.038	-0.505*	-0.476*	0.074	-0.573**
3 (n = 115)		-0.119	-0.328***	-0.031	-0.145	-0.333***	-0.016
4 (n = 33)	sumo	0.288	0.651***	-	0.323	0.656***	-
	judo	0.424**	0.687***	-	0.570***	0.607***	-

* p<0.05; ** p<0.01; *** p<0.001

The findings discussed above show that physical fitness and body mass do not condition the results of a hand-to-hand struggle, at least in children and, especially, of the same age. An adequate psychomotor competence ("talent") appears to be the prerequisite for winning a hand-to-hand struggle, provided physical fitness does not markedly deviate from population norms (e.g. Pilicz, Przewęda, Dobosz, & Nowacka-Dobosz, 2002, for the Polish population). The lightest judokas aged 11 years, confronted with other children studied by us, are an exception; the winner in that category achieved 25.5 points in the Physical Fitness Test, the values recorded for his mates ranging from 17.2 to 37 points. The mean value of that test recorded for winners and non-winners in Experiment 1 amounted to 47.8 (range: 25.5 – 58.2) and 39.1 (range: 17.2 – 51) 54.4 to 54.6 points., and from 42.8 to 65.5 points. in others. Higher values were observed in those cadets after 9 months of military service and in the bodyguards (experiment 3). Relative global fitness of the winner cadets in the judo teams ranged from 62.5 to 63.9 points, and from 49.8 to 68.8 points. in others. The data for the winner bodyguards and the remaining ones ranged from 44.8 to 74.2 and from 41.2 to 73.8 points, respectively. These data show that the winners – either military cadets or bodyguards – were not the leading ones in the physical fitness tests applied.

However, it should be remembered that the results of global physical fitness are not, strictly speaking, comparable between groups of subjects studied, as the numbers of individual fitness tests ranged from 4 to 8 in various experiments.

Table 5. Coefficients of correlation between contest performance indices for sumo (vertical position) and judo (horizontal position) determined in military cadets (n = 33)

Variable	2S	3S	4S	1J	2J	3J	4J
1S	-0.970	0.980	0.958	**0.892**	-0.846	0.869	0.854
2S		-0.991	-0.957	-0.878	**0.869**	-0.895	0.876
3S			0.974	0.874	-0.870	**0.889**	0.869
4S				0.867	-0.869	0.879	**0.876**
1J					-0.969	0.981	0.958
2J						-0.990	-0.967
3J							0.972

Legend: 1 – Number of contests won; 2 – Ranking position in team; 3 – Contest index (percentage of contests won); 4 – Fight index (percentage of fights won); S – Sumo; J – Judo. All coefficients are significant at p<0.001

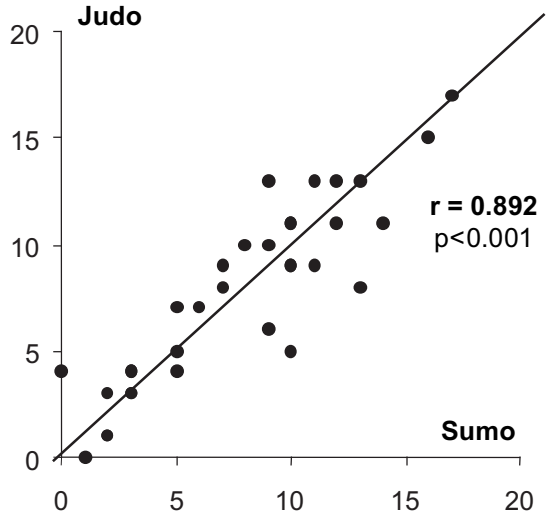

Figure 1. Relationship between the numbers of sumo and judo (ne waza) contests won by military cadets.

The high correlations between the struggle indices (numbers of contests won, percentages of contests or fights won), determined for sumo and those for judo in 33 military cadets (Table 5 and Figure 1) are an interesting finding, especially in the light of non-significant (sumo) or only moderate (judo) correlations of those indices with physical fitness (Tables 1 – 4). It should be empasised that the cadets were subjected to physical fitness tests twice, and had most fights in the round-robin system of all the subjects (14 or 17). Besides, they had never practised combat sports before, however they competed every week throughout the academic year and were highly motivated. Moreover, partial correlations between the results of sumo and judo fights were unaffected by eliminating the physical fitness factor: r = 0.906 (contests) and 0.891 (fights), vs. 0.890 and 0.876 (simple correlations), respectively.

Discussion and conclusions

No publications on that subject have been found in the available literature, therefore, no comparisons are possible. There is a number of reports on the relations between the results of recommended motor tests and those motor tasks, which are elements of combat sport, combat arts, or professional actions, in which a direct fight constitutes an essential element. Some kind of simulation was always used in such empirical tasks (Greenberg & Berger; 1983, Sterkowicz & Ambroży, 1992; Hofman & Collingwood 1995; Syska & Magnuska, 2003).

The test contests used in this study reflect well the real situations since using the same mode of action, a world championship may be won or an attack effectively countered (the assassin who in 1981 fired 6 shots at President Reagan within 2.8 seconds, was pulled down in a simple manner and immobilised by the President's bodyguards (see www.regan.utexas.edu, 2003-11-22; Chmielarz, 1999).

The presented results indicate that it is useful to have combats between volunteers irrespectively of age in the initial phase of the combat sport training, or at the beginning of self-defence training (Rudman, 1979; Kalina & Jagiełło, 2000; Jagiełło, 2002; Kalina, Kruszewski, Jagiełło, & Włoch, 2003). Maybe those, who are capable to execute motor tasks best in such simplified training combat are talented in the hand-to-hand combats and optimally improve their civilization-inhibited fighting instinct, as reflected by the helplessness of many individuals when threatened. That view is being verified experimentally by the two of the authors (Kalina and Niedomagala) and the future results will be reported.

Summing up, combats conducted according to a modified sumo formula as described in this paper do not require any training and may be performed even by children at an early school age. Owing to these advantages, as well as to the very high correlation with the results of the judo contest in a horizontal position (*ne waza*), such combats may serve as a specific test for hand-to-hand combat competence. Further studies with the use of test combats based on the modified sumo formula are expected to supply information which would enable the prediction of success in diverse combat sports (or only in wrestling) and in self-defence.

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EMPIRIJSKA OSNOVA ZA PREDIKCIJU USPJEHA U BORILAČKIM SPORTOVIMA I SAMOOBRANI

Sažetak

Uvod

Jedno od temeljnih pitanja sportske znanosti jest pitanje utvrđivanja pouzdanoga kriterija za selekciju sportaša. U okviru selekcije talentiranih pojedinaca za borilačke sportove primjenjuju se različite metode. U dosadašnjim se istraživanjima pokazalo da početak treninga juda u ranoj dobi nije nužan preduvjet za vrhunska postignuća. Identificirane su motoričke sposobnosti važne za uspjeh u judu, hrvanju, tae kwon dou i ostalim borilačkim sportovima, a brojni su se radovi bavili procjenom statusa specifične pripremljenosti, kao i relacijama psihološkog i intelektualnog statusa s natjecateljskom uspješnošću. Neki su autori smatrali ključnim natjecateljsko iskustvo (broj sportova u kojima je pojedinac sudjelovao i razina postignuća), drugi daju prednost odabiru talentiranih na temelju iskustva u borilačkim sportovima, na temelju uloženog napora i natjecateljskih opterećenja. Postojeća literatura daje dobar pregled načina rada i savjeta kako poboljšati sustav treninga i pripreme u borilačkim sportovima i samoobrani, no informacije o preciznim selekcijskim kriterijima za ovo područje (sport ili posao, kao primjerice u policiji, vojsci i sigurnosnim službama i dr.) nedostaju. Komercijalizacija sporta mnogim trenerima (ali i znanstvenicima) daje priliku da se pozabave područjem selekcije. Iskustva iz prakse pokazuju da mnogi treneri za selekciju koriste najjednostavnije kriterije, uglavnom utemeljene na motoričkim sposobnostima. Takav pristup proizlazi iz nedovoljne upućenosti u područje, čak i iz pogrešnog predznanja. Naime, norme su prilagođene različitim kategorijama, što se rijetko uzima u obzir, pa se biraju snažniji, agilniji, izdržljiviji i slično, što odgovara većini sportova, no ne nužno uvijek i svima (npr. judu).

Cilj ovog rada jest provjeriti postavku o tome kako tjelesni status (superiornost) nije apsolutni preduvjet za pobjeđivanje protivnika u izravnoj borbi ni u stojećem stavu ni na tlu. Postavka će se provjeriti na ispitanicima koji nemaju iskustva u borbi i na sportašima borilačkih sportova.

Metode

Provedena su četiri ispitivanja, a u svakome je korištena specifična istraživačka tehnika kako bi se odgovorilo na problem.

Ispitivanje 1 provedeno je radi utvrđivanja povezanosti opće tjelesne pripremljenosti s ishodima borbe u judu u stojećem stavu. Ispitana su 22 dječaka u dobi od 11 godina, tjelesne mase 20,5 do 39,5 kg koji su se borili u okviru 6 timova oblikovanih prema tjelesnoj težini.

Ispitivanje 2 provjeravalo je povezanost dobi, tjelesne mase i ishoda borbe u judu u stojećem stavu na uzorku od 21 dječaka, početnika u judu. Dob ispitanika bila je 7 do 13 godina, a težina je varirala između 22 i 44,6 kg. Formirano je 6 natjecateljskih timova.

Ispitivanje 3 provjerilo je povezanost dobi, tjelesne mase i ishoda borbe u judu u stojećem stavu na uzorku profesionalnih tjelesnih čuvara ili kandidata za taj posao. Ispitano je 113 muškaraca u dobi od 19 do 43 godine, tjelesne mase od 67 do 125 kg. Formirana su 23 natjecateljska tima.

Ispitivanje 4 istražilo je povezanost dobi, tjelesne mase i ishoda borbe u judu u stojećem stavu i na tlu na uzorku vojnika. Također je utvrđena povezanost ishoda oba tipa borbe. Ispitana su 33 kadeta, dobi od 19 do 21 godine, tjelesne mase od 58 do 96 kg. Oblikovana su dva tima.

Tjelesna pripremljenost ispitana je baterijom od 8 motoričkih i funkcionalnih testova.

Ishod borbe u stojećem stavu utvrđen je pomoću modificirane sumo formule na temelju 4 pobjede. Ukupna natjecateljska efikasnost definirana je pomoću tri indeksa: rang u pripadajućem timu, indeks natjecanja i indeks borbe.

Ishod borbe na tlu utvrđen je pomoću formule juda u kružnom sustavu borbe do postignute tri pobjede.

Izračunati su keoficijenti korelacija između utvrđenih mjera.

Rezultati i rasprava

Dobiveni rezultati pokazuju da superiornost nad protivnikom u tjelesnoj pripremljenosti nije preduvjet za uspjeh u borbi prsa o prsa. Povezanost ranga pojedinca unutar grupe i tjelesne pripremljenosti, utvrđene baterijom motoričkih i funkcionalnih testova, potvrđena je samo kod ispitanika koji su sudjelovali u prvom i četvrtom ispitivanju. Međutim, tjelesna pripremljenost nije se pokazala povezanom s pokazateljima efikasnosti natjecanja.

Postoji povezanost između tjelesne mase i ishoda natjecanja, a dodatno se pokazalo da parcijalizacija tjelesne mase utječe na smanjenje povezanosti ishoda sumo i judo borbe kod kadeta. Kod djece se takav rezultat treba oprezno tumačiti, budući da su razlike njihovih pozicija u grupi znatno manje. Na temelju rezultata čini se da je adekvatna psihomotorna kompetentnost (‘talent’) važniji preduvjet pobjede u borbi kod djece. Judaši juniori nisu se pokazali nužno inferiornim vojnim kadetima s obzirom na njihovoj dobi odgovarajuću tjelesnu pripremljenost. Dobivene su visoke korelacije između pokazatelja uspješnosti sumo i judo borbe vojnih kadeta, no tjelesna pripremljenost nije statistički značajno povezana s uspjehom u sumu, dok je umjereno povezana s uspjehom u judu. Parcijalizacija tjelesne

pripremljenosti nije utjecala na veličinu povezanosti ishoda sumo i judo borbe.

Zaključak

Dobiveni su rezultati važni u inicijalnim fazama judaškog treninga, kao i u treningu samoobrane svakog dobrovoljca, neovisno o dobi. Može se reći da borbe provedene prema modificiranoj sumo formuli ne zahtijevaju prethodan trening i mogu se provoditi među djecom i u ranoj školskoj dobi. S obzirom na metodološke prednosti i jednostavnost organiziranja sumo borbe te uz činjenicu visoke povezanosti ishoda sumo i judo borbe na tlu, sumo natjecanja mogu poslužiti kao specifičan test sposobnosti za borbu prsa o prsa.