

# Criteria for effective sports selection in judo schools – on example of sportsmanship’s progress of young judo athletes in Russian Federation

## Authors’ Contribution:

- A** Study Design
- B** Data Collection
- C** Statistical Analysis
- D** Manuscript Preparation
- E** Funds Collection

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**Received:** 06 March 2017; **Accepted:** 12 April 2017; **Published online:** 16 June 2017

**AoBID:** 11449

## Abstract

### Background Study Aim:

Analysis of scientific researches points at significant discrepancies in opinions about criteria of sports selection in Judo schools and structure of junior athletes’ training activity. The purpose of the research is to fulfil of different methodic of young people’s selection and dynamic of their future competition functioning’s sports results.

### Material and Methods:

In the research judo athletes (n = 60) of age 11-21 years participated. The research was being conducted during 10 years. We used different criteria of boys’ selection: superiority in physical condition; high coordination and balance; ability to master judo techniques.

### Results:

With the same methodic of training the following young people to achieve confidently high sports results: who, as on the moment of selection, had better coordination and balance in complicated conditions; adolescents with high ability to master judo techniques. Mean time of these judo athletes preparation for fulfilment normative of the master of sports of Russian Federation is 6.4-7.2 years. On reaching 21 yrs age judo athletes sports results in average equalise.

### Conclusions:

The level of some boys’ physical superiority over their peers as on the moment of selection to judo schools cannot be an objective criterion of significant sports results’ achievements during the short period. In sports selection, it is necessary to clear up the following: coordination and abilities to master judo techniques quickly.

### Key words:

aggressiveness • elite judokas • physical conditioning • sport selection

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### Conflict of interest:

Authors have declared that no competing interest exists

### Ethical approval:

The research was approved by the local Ethics Committee

### Provenance & peer review:

Not commissioned; externally peer reviewed

### Source of support:

Departmental sources

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**IJF** – International Judo Federation.

**Nage-waza** – throwing techniques.

**Ne-waza** (prone techniques) – a related concept is that of *katame-waza* (grappling techniques) – judo techniques executed from a horizontal posture: *osaekomi-waza* (pinning techniques), *shime-waza* (strangle technique), *kansetsu-waza* (joint holds).

**Shido** – (instruction/light penalty) is called when a rules violation occurs during a judo contest.

**Waza** – a technique or movement which is based on a standard form and is used to challenge and defeat the opponent [59].

**Elite** – *adjective* more talented, privileged or highly trained than others [58].

**Position** – *noun* 1. the place where a player is standing or playing 2. the way in which a person's body is arranged [58].

**Posture** *noun* the position in which a body is arranged, or the way a person usually holds his or her body when standing; **postural** *adjective* relating to posture [58].

**Physical conditioning** – *noun* same as conditioning *noun* the work or programme used to bring somebody or something to a good physical state [58].

**Technique** – *noun* a way of performing an action [58].

**Aggressiveness** – a human characteristic is manifesting itself in inclinations to hurt others, to destructive behaviour. *Aggressive* = virulent, truculent, attacking [60].

## INTRODUCTION

It is known that judo is one of the most popular kinds of world martial arts. Olympic status, millions of trainees, a great number of competitions and TV show permit judo to gain still more and more fans throughout the world. During rather short time judo transformed from applied martial art (as certain philosophy and life style) to Olympic kind of sports [1]. It should be admitted that this process was accompanied by significant changes in judo techniques and rules [2, 3]. It is known that even insignificant changes in competition rules influence significantly on judo techniques and tactic. Analysis of most known scientific researches of different aspects of elite judo athletes training showed that scientists have no single opinion about planning and structure of judokas training to competitions in modern conditions [2, 4]. Some studies prove that scientific articles and achievements are not used in practice of Russian Federation judo athletes training [5].

Coaches and athletes focus, mainly, on own training and competition experience. Besides, it was found in some directions of Russian judo athletes training for competitions there is a significant deficit of scientific papers and recommendations [4]. Analysis of significant scientific publications on judo showed that scientific researches are in early stages are of low priority, compared with other kinds of sports [6]. Thus, any scientific articles on sport judo problems will facilitate progressing of this kind of wrestling (like sumo, kurash, national variations of wrestling etc.) and enrich sports science.

For success in international competitions, Judo wrestlers shall have high physical and physiological fitness [7]. The athletes' technical sportsmanship and tactical fitness shall also be maximally high. L. Bocioaca [8] affirms that technical and tactic fitness of judo athletes is a fundamental factor in athletes' final success at competitions. In the opinion of Zaggelidis et al. [9], judo athletes successful performance at the elite level will depend on proper technical sportsmanship, endurance and flexibility. Judo training requires high endurance. It is conditioned by great intensity of training and competition loads [10]. In scientific literature, there are many papers devoted to the targeted development of judokas endurance and flexibility [11]. At the same time, some specialists think that the questions of the complex planning of judo athletes technical training different parts and kinds for different age groups have been studied

insufficiently [12, 13]. In other papers, it is noted that it is necessary to pay more attention to judokas technical-tactic training since junior age with a special accent on active attacking actions [4]. It is also important to work out criteria for selection for judo coaches [14]. The authors named 8 such criteria for selection in national teams.

In the opinion of Pashintsev et al. [15], the main factor of techniques' successful realisation in competition activity is high speed-power workability of athletes. In this case, only great number of attacking techniques will bring success to athlete [16]. An example is outstanding judo athlete of the present time – Teddy Riner's. In competition duel, Teddy Riner's fulfils more attacking techniques than his opponents [17, 18]. It is assumed that athletes' speed-power fitness should increase with rising of judokas qualification. Besides, the general level of judo athletes motor activity in duels will depend on athletes' age [19].

Franchini et al. [20] found that training process of judo athletes (Olympic Games' participants) is, in the most of the aspects, the same at the final stage of training. Athletes of the same age, with the same training method, demonstrate approximately equal indicators of physical and functional readiness for competition duels [21]. Therefore it is necessary to pay more attention to the process of athletes' many years' training. It is especially important at the initial stage of training. Specialists note that it is very difficult to correct mistakes in judokas training at initial stage [22]. Criteria for selection of young judokas can be aerobic power, muscular endurance and body composition [23]. Physical training of young judo athletes shall be directed at the development of the following qualities: strength, quickness, endurance, flexibility and coordination [24].

Specialists also affirm that with the correct organisation of training process judo athletes shall master all required for successful sports activity technical tactic basis by 20 years age [22]. In this age, it is also necessary to consider behavioural motives of young athletes [25] and their anthropometric profiles [26, 27].

The volume of judo training and competition loads is increasing with every year. It creates certain difficulties. Judo progress in any country will depend on the quality of training process's planning and quality of children's selection in judo schools. Training at the initial stage is especially important [28].

Analysis of scientific articles permitted to find unsolved problems. They are the quality of sports selection in judo schools and further training at the initial stage.

The purpose of the research is to fulfil of different methodic of young people's selection and dynamic of their future competition functioning's sports results.

## MATERIAL AND METHODS

### Participants

In the research judo athletes ( $n = 60$ ) of age 11-21 years participated. As on the moment of selection, their age was 11-12 years.

In the process of sports selection, the participants were divided into 3 equal groups. *Group 1* consisted of boys, who were superior to their peers by physical qualities (first of all strength). *Group 2* consisted of adolescents with better coordination and balance in different body postures. *Group 3* consisted of boys, who were the best in mastering different judo techniques.

For analysis of the tested judokas competition functioning 5 experts were invited: 3 referees of the international category, having the right to serve international competitions of IJF; 2 honoured coaches of Russian Federation. In the opinion of Witkowski et al. [29], choice of experts is a very important criterion for correct selection of research methods.

### Organization of the researches

We studied the dynamic of judo athletes sportsmanship progress from the moment of selection to judo schools to 21 years' age. The maximal age of athletes was determined, considering recommendations of Parkhomovich [22]. The period of the researches was 10 years. The place of the researches was Academy of sport wrestling, named after D.G. Mindiashvili (Krasnoyarsk).

When selecting adolescents to judo schools coaches used the following control tests for the general physical condition: pressing ups; chin ups; sprint (60 and 100 meters run); shuttle run (3x10 m); cross (800 m run) [30]. Besides, the following tests for flexibility and balance were used: keeping the body in an unstable position (posture); rolls with further going along a straight line, forward bends with touching the floor with hands

[31]. Besides, the ability for quick mastering Judo techniques was found. Athletes fulfilled main technical actions in stance (*nage-waza*): throw over hip (*tsuri-goshi*) and throw by rear step (*osoto-gari*). After it, an assessment of athletes' fulfilment of these techniques was achieved [22, 32].

After selection, boys started judo training, according to the standard methodic of the Russian sports schools. This methodic implies consequent training of judo techniques. At the end of every academic year athletes' testing was conducted. A significant part of training consisted of exercises, oriented on the development of general and special physical qualities of judokas. Judo athletes-physical qualities were also assessed by every year passing control tests. After three years of training, young athletes, who successfully passed all control tests, were admitted to competition activity.

Then, analysis of all young judo athletes competition activity was carried out. Time intervals, spent by athletes for the achievement of significant results, were also analysed. In Russian Federation, for prize places at Republican and National competitions athletes' were awarded sports categories: candidate master of sports and master of sports of Russian Federation. The passing of such tests shows significant mastering of judo technical-tactic basis and ability to demonstrate skills in competition fight. We determined time periods from selection to judo school to receiving sports titles; reaching 21 years' age and transition to adult team.

Besides, we fulfilled expert analysis of quality of all three groups' athletes. We considered all active technical actions of judo athletes in competition duels. For analysis, we took competition duels of all tested groups' judo athletes for 6 years of their sport activity (from start of active competition activity and reaching 21 yrs. age). Analysis of such period of competition activity permitted to obtain a significant base for researches [33].

Analysing competition duels, experts used video records of judo athletes performances at National competitions. Such method of repeated analysis of judokas competition duels is rather an accurate method of determination of athletes' technical tactic skilfulness [18].

### Statistical analysis

For more precise assessment of competition results, we used SPSS 20 software. Student's t-test

was used for testing of correlation results in inter-connected samples.

## RESULTS

Expert analysis of competition fight at the beginning of the researches showed a significant advantage of Group 1 judo athletes practically by all indicators. We found confident ( $p < 0.05$ ) advantage of this group of athletes in quantity of successfully fulfilled technical actions in a vertical posture (*nage-waza*) and fight in a horizontal posture (*ne-waza*). In judokas of Group 1 total quantity of successfully fulfilled

techniques was 1087; in judo athletes of Group 2 (458), in Group 3 (440). The quantity of received by judo athletes referees' remarks (*shido*) in Group 1 was noticeably lower (367) than in Group 2 (564); *shido* in Group 3 (552). Only dynamic of competition duel (time interval between real attempts of technical actions) differs insignificantly in all groups. In judo athletes of Group 1 this interval was 17.2 seconds; in Group 2: 19.4 seconds and in Group 3: 19.8 seconds (Table 1).

With sportsmen's reaching 18 years age indicators of judokas competition activity noticeably changed: the total quantity of competition duels

**Table 1.** Competition fight's quality analysis of the tested judo athletes.

Variable	The tested sportsmen						Experts' assessment
	Group 1 (n = 20)		Group 2 (n = 20)		Group 3 (n = 20)		
<b>Age/ quantity</b>	<b>15-16 years 8 competitions</b>		<b>15-16 years 8 competitions</b>		<b>15-16 years 8 competitions</b>		
Duels	576	<b>418*</b>	514	289	512	263	(1+), (2-), (3-)
Nage-waza	1803	<b>874*</b>	1624	371	1608	344	(1+), (2-), (3-)
Ne-waza	552	<b>213*</b>	432	87	427	96	(1+), (2-), (3-)
Shido	<b>367*</b>		564		552		(1+), (2-), (3-)
Dynamic of duel	17.2		19.4		19.8		(1+), (2+), (3+)
<b>Age/ quantity</b>	<b>17-18 years 10 competitions</b>		<b>17-18 years 10 competitions</b>		<b>17-18 years 10 competitions</b>		
Duels	814	<b>386*</b>	869	562	854	547	(1-), (2+), (3+)
Nage-waza	2138	1046	2385	1162	2298	1114	(1+), (2+), (3+)
Ne-waza	674	282	665	247	648	243	(1-), (2-), (3-)
Shido	584*		427		432		(1-), (2+), (3+)
Dynamic of duel (sec.)	<b>26.3*</b>		19.2		20.3		(1-), (2+), (3+)
<b>Age/ quantity</b>	<b>19-20 years 12 competitions</b>		<b>19-20 years 12 competitions</b>		<b>19-20 years 12 competitions</b>		
Duels	1072	<b>413*</b>	1286	704	1248	685	(1-), (2+), (3+)
Nage-waza	<b>2714*</b>	<b>1127*</b>	3271	1783	3187	1753	(1-), (2+), (3+)
Ne-waza	693	294	726	318	712	304	(1-), (2-), (3-)
Shido	<b>735*</b>		447		463		(1-), (2+), (3+)
Dynamic of duel (sec.)	<b>28.5*</b>		22.4		23.1		(1-), (2+), (3+)
<b>Age/ quantity</b>	<b>21 years 8 competitions</b>		<b>21 years 8 competitions</b>		<b>21 years 8 competitions</b>		
Duels	679	381	692	376	695	364	(1+), (2+), (3+)
Nage-waza	1442	765	1512	714	1498	727	(1+), (2-), (3-)
Ne-waza	649	<b>322*</b>	638	256	641	243	(1+), (2-), (3-)
Shido	427		481		445		(1-), (2-), (3-)
Dynamic of duel (sec.)	32.7		29.4		30.1		(1-), (2-), (3-)

Notes: \*statistical confidence ( $p < 0.05$ ) by Student's t-test

of all tested groups did not differ noticeably. The quantity of won duels was confidently greater ( $p < 0.05$ ) in *Group 2* (562) and *Group 3* (547). *Group 1* athletes have 386 won duels. Analysis of athletes' attacking actions' quality in stance *nage-waza* and lying position *ne-waza* showed that total quantity of successful attacks is approximately equal in all groups. The quantity of referees' remarks (*shido*) in *Group 1* was much greater (584) than in judo athletes of other groups: 427 *shido* in *Group 2* and 432 *shido* in *Group 3* judo athletes. Dynamic of duel shows that *Group 1* athletes spend confidently ( $p < 0.05$ ) more time for an attempt to realise technical action with high quality than athletes of other groups (Table 1).

On reaching 20 years' age by young judokas in groups 2 and 3 we found significant ( $p < 0.05$ ) increase of the total quantity of attacking actions in vertical posture *nage-waza* and quantity of successful attacks. The quantity of attacking actions in horizontal posture *ne-waza* was approximately equal in all groups. The quantity of won competition duels by *Group 1* athletes was confidently ( $p < 0.05$ ) less (413), than in *Group 2* (704) and *Group 3* (685). Assessment of competition duels' dynamic showed that interval between active attacking actions in judo athletes of *Group 1* is noticeably ( $p < 0.05$ ) more (28.5 seconds), then in other groups: 22.4 seconds in *Group 2* and 23.1 seconds in *Group 3*. The quantity of remarks (*shido*) in *Group 1* is much more (735 *shido*), than in other groups: 447 *shido* in *Group 2* and 463 *shido* in *Group 3* (Table 1).

The final stage of competition activity's quality experts' assessment (athletes' age 21 yrs.) points at equalising of most indicators. In all tested groups, only insignificant differences were found, which were not significantly confident: the total quantity

of competition duels; quantity of victories in duels; quantity of active attacking actions. Only quantity of successful attacking actions in *ne-waza* in *Group 1* judo athletes is much higher ( $p < 0.05$ ), than in other groups. The quantity of referees' remarks (*shido*) in competition duels also differs insignificantly. Time intervals between attempts of active attacking actions' realisation are from 29 to 32 seconds in different groups. Such difference is also insignificant (Table 1).

Analysis of time periods in judo athletes sports qualification's progress showed that at the beginning of active competition functioning (14–16 years) *Group 1* sportsmen have an advantage. As on the moment of 16 years' age reaching judo athletes of this group confidently quicker ( $p < 0.05$ ) receive the titles of masters of sports and candidate master of sports of Russian Federation. In age from 17 to 20 years, a significant advantage in sports results' progress is observed in second and third groups' sportsmen. It was found that most of the athletes ( $n = 26$  from *Group 2* and  $n = 21$  from *Group 3*) pass normative of the master of sports of Russian Federation just in this age. For comparison, only 8 judo athletes from *Group 1* could become masters of sports of Russian Federation in this age. On reaching 21 years' age by all athletes, indicators of sportsmanship progress equalise in all groups. Confident ( $p < 0.05$ ) quantity of athletes from second and third groups, who passed normative of the master of sports of Russian Federation should also be noted. In *Group 1* normative was fulfilled by 19 judo athletes and in *Group 2* (34 judoists); in *Group 3* (32 judo athletes).

Time indicators of athletes' high sports results' achievement (normative of candidate masters of sports and masters of sports of Russian Federation) are given in Table 2.

**Table 2.** Time intervals of athletes' fulfilment of candidate masters of sports and masters of sports of Russian Federation normative.

The tested groups	Athletes' age (years)				
	13-14	15-16	17-18	19-20	21
Group 1 (n = 40)	-	21(C); 3(M)	12(K); 4(M)	1(K); 4(M)	8(M)
Group 2 (n = 40)	-	12(C)	10(K); 15(M)	2(K); 12(M)	7(M)
Group 3 (n = 40)	-	14(C)	9(K); 12(M)	6(K); 11(M)	9(M)

Notes: C candidate master of sports of Russian Federation; M masters of sports of Russian Federation



## DISCUSSION

Training of elite judo wrestlers often is reduced to the domination of physical strength and fitness-profile. The most brightly it is manifested in comparison of the physical condition of heavy weight category judo athletes. Fitness profile of heavy weight judo athletes significantly surpasses physical and functional fitness indicators of judo athletes, taking lower places in IJF rating [34]. It should be admitted that physical efficiency in different martial arts to a large extent depends on wrestlers' sizes, weight and body constitution [35]. Specialists note that training of judokas physical strength is an important element of preparation to successful competition activity. However, it should not be practised separately from the training of judo athletes technical and tactic fitness [36]. There was an assumption that increasing of competitions' quantity for young athletes would permit to raise judo athletes physical and special speed-power qualities' level. However, it should happen at the account of targeted training for competition activity [37].

Experts' assessments show that even participation in a large number of competitions (6-8 during the year) is not a guarantee of athletes' fitness improvement. Experts found the insufficient activity of the tested athletes in fighting in a horizontal posture (*ne-waza*); significant quantity of referees' remarks (*shido*). In experts' opinion, most *shido* were received for insufficient activity in competition duels. It was noted that with age judo athletes noticeably reduce the total quantity of technical actions in duels and fighting dynamic. In such cases athletes transform duels in the tactical fight, not risking and waiting for opponent's mistake. In the opinion of Parkhomovich [22], judo competitions among boys of Russian Federation as on today are competitions in physical strength but not in technical skillfulness. Till recent time such negative tendency could have also been observed on international judo competitions. Boguszewski [38] Points at the insufficient quantity of active technical actions of judo athletes on competitions. Only recent years there have been appeared positive tendency of technical actions' increasing during duels. It should be noted that increasing of technical actions' quantity is caused by noticeable changes in judo competitions' regulations [39].

Specialists note that many coaches plan judo training process to achieve as quick as possible significant physical strength and quickness of technical actions' fulfilment [40]. Even at a selection of boys

in judo schools coaches, first of all, pay attention to the physical condition of adolescents [41]. At the initial stage, only adolescents, who passed control normative for the general physical condition, enter sports schools. Such approach is not a selection of high quality [42]. Training of young athletes in most of the schools is built on the base of accelerated development of physical qualities at the expense of technical tactic skillfulness. Moulongo et al. [43] note that targeted training of young athletes by principle "strength-quickness" significantly influences on their cardiovascular and respiratory systems. It is not always a positive factor. In other paper the negative influence of excessive training on young athletes' organism is noted, if these trainings are organised by the principle of accelerated development of physical qualities [32]. It should be admitted that quality of young judo athletes preparation for competitions is not optimal in Russian Federation's sports schools.

Analysis of scientific articles on problems of sports selection in judo schools shows that there is no single opinion about criteria of effectiveness of young talented athletes' selection among different specialists [2]. The deficit of recommendations on the development of sports talents is also noted by foreign specialists [44]. Most of the Russian specialists are in positions of children's selection based on the principle of their physical superiority over their peers [30, 45]. Osipov [32] is on other principles of adolescents' sports selection: the presence of high coordination abilities. Parkhomovich [22] points at the necessity to pay attention to young people's ability to fulfil different techniques at the moment of selection. D. Challis [46] is of the same opinion. The author affirms that it is necessary to assess fulfilment of wrestling techniques when selecting adolescents to schools [46]. Japanese specialists call, with selecting to judo schools, to pay attention to the following: general and special endurance; psychological assurance and morality of young people; their attitude to judo forms and traditions [47]. They also note demand in the assessment of young people (children and adolescents) motivation to judo training [48]. For achievement of significant sports results, judo athletes have to improve the ability to torso rotations on the different side, and sideward body bends [49]. More successful young judo athletes have advantages in strength. They have better coordination, comparing with their peers, who do not take prize places in competitions [50].

An important component of talented boys and adolescents' successful selection in judo schools is the presence of coordination abilities and balance feeling in complicated conditions in them. Synthetic nature has the recommended after many years of research "testing fights in a vertical posture" (TFVP) as a criterion of talent for combat sports and self-defence [51, 52]. Niedomagala [53] provided empirical evidence that TFVP has prognostic value as a selection criterion for professional training of judo sport. TFVP is based on sumo formula, but inspiration was fun forms of martial art [54, 55]. Perspective on usefulness TFVP as a selection criterion for professional training of judo should not overshadow their much wider mission. Fun forms of martial arts are effective tools in diagnosing and reducing aggressiveness [56]. Aggressiveness, contrary to the postulates of some practitioners and sports commentators, it is not desirable not only in judo and other combat sports [57].

## CONCLUSIONS

By results of our study, we can affirm that there is a great number of Russian and foreign scientific articles, devoted to different aspects of sports selection, an organisation of young athletes' training and competition functioning. However, there is a deficit of objective scientific data on these directions. We found a noticeable discrepancy between opinions of Russian and foreign judo specialists about organisation and criteria for children's and adolescents as well as the selection of judo schools at the initial stage of athletes' training.

The received results permit to conclude that initial level of some young people's physical superiority over their peers as on the moment of selection to sports schools cannot be an objective criterion of their future significant sports results. When selecting children, coaches shall find and consider coordination abilities' level and young people's ability to quickly master judo techniques.

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Cite this article as: Osipov AY, Kudryavtsev MD, Iermakov SS et al. Criteria for effective sports selection in judo schools – on example of sportsmanship's progress of young judo athletes in Russian Federation. *Arch Budo* 2017; 13: 179-187