INFLUENCE OF JUDO WOMANS AGE ON SELECTION AND PERFORMANCE IN THE TOKYO OLYMPIC GAMES 2020

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Summary. Purpose: to analyse the results of the selection and performance of judo women at the Olympic Games Tokyo 2020 depending on their age indicators. Material and methods. During the study of this direction of research the following methods were used: theoretical analysis and generalization of scientific and methodical literature, analysis of competition protocols of the Olympic Games Tokyo 2020, analysis of the world ranking of elite athletes according to the IJF. Linear regression analysis was used to represent the relative age as one of the indicators of measuring the success of elite judo women. Results: The total number of female judo women - 1444, in all weight categories, who participated in the selection for the TOG 2020 and 192 athletes who performed at the TOG 2020 were studied based on data from the official website of the International Judo Federation. After analysing the performances of 192 female athletes at the TOG 2020, it can be seen that the percentage of younger than average age judo women was 59% (113 athletes), and older than average age judo women - 41% (79 athletes). After a comparative analysis of the relatively younger average age of female athletes who passed the selection with those who passed it for the TOG 2020, it can be seen that the percentage of younger judo women is only 9%, while the percentage of older judo women relative to the average age of judo women is 43%. This may be due to the fact that older relative to the average age female athletes can be much higher in the direction of cognitive development (decision-making, abstract thinking,
creativity, acquisition of competitive experience and psychological factors) than younger relative to the average age female athletes, who mostly use this selection to gain competitive experience. Further analysis showed that younger female athletes who took part in the TOG-2020 are only 9% of all judo woman who passed the selection. While the number of older judo womans relative to the average age is 41% of all those who have been selected for the TOG-2020. Having a gap in age from 20 to 42 years, high-class female athletes who took part in the Olympic Games Tokyo 2020 have a peak age of 28-31 years. **Conclusions.** Thus, older judo womans should spend less time to win than younger athletes. Gaining with age the experience necessary to participate in high-ranking competitions, it is necessary to take into account that the functional capabilities of athletes decrease with age.

**Keywords:** judo, judo woman, age indicators, average age, older, younger, weight category

**Introduction.** Judo is currently one of the most popular sports [1,2]. In the Tokyo Olympic games 2020 (TOG-2020), 393 athletes (201 men and 192 women) from 5 continents, 128 countries took part in judo competitions. The achievement of high sports results and the development of judo depend on the level of training of specialists in this field. First of all, these are athletes and coaches-teachers [3]. Successful and effective management of sports training is impossible without sound forecasting, adequate to modern scientific knowledge [4,5,6,7]. The paradox of measuring the success of athletes in elite sport is one of the most pressing, so the paradigm of the issue is to measure the time spent on training an athlete to participate in high-class competitions and the age of his peak form.

Analysis of the literature, Internet resources shows that similar studies of the analysis of the results of performances in athletes at different stages of training in wrestling were engaged [8,9,10,11]. Judo is a situational, complex coordination, acyclic, speed and power kind of martial arts. A coach-teacher in this sport for the preparation of a high-class athlete needs not only to select an athlete, taking into account his innate qualities, genetic predisposition, but also to spend some time for his further development.

In the process of training from judo beginners (5 years old) to elite athletes (28-30 years old) you need to pay attention to the following areas:

1. Development of physical qualities. In the fight, judo womans use various technical and tactical actions related to the complex manifestation of physical qualities in the conditions of variable modes of motor activity, continuous changes in situations and forms of action, significant muscle tension, speed, flexibility, agility and endurance, so it is important not to miss the age at which the most effective development of physical qualities that are needed for future victories.

2. Learning judo techniques, including: nage-waza, katame-waza, takes time and effort. Judo techniques have a complex structure and timely execution [12].

3. Compliance with hygiene requirements. During the competition, the judo woman has to conduct several fights and maintain a certain weight. All this requires him to know how to maintain personal hygiene. A rational daily routine allows you to create optimal conditions for training and sports, helps to maintain high performance. The ability to properly monitor your weight, restore your energy expenditure takes a lot of time to learn.

4. Improving the tactics of fighting. Judoists always have to face new competitors, so the nature of the fight and its dynamism depends on the ability to
use their advantages to win. Intellectually, judo womans must have a high level of operational thinking, good spatial orientation and the ability to make quick, correct decisions in a short time.

5. Judo, as a speed and strength sport, requires an explosive temperament, mental stability to external and internal factors [13]. Therefore, there must be mental endurance, the ability to internally withstand the growing fatigue. The nervous system must be inert, but the nervous processes must have great strength.

Achieving international and especially Olympic sports success is becoming increasingly important. However, it is not clear what factors influence the results of the performance at the Olympic Games. One of the factors is the age of the athlete who is selected and participates in the Olympic Games.

Analyzing the above, it can be noted that the coaches-teachers, who spend time on the preparation of the athlete and his successful performance in high-ranking competitions, often face the question at what age a judo woman can get the peak form, so the chosen direction of research is quite relevant in judo. For all the importance of the tasks being solved, the methods of training and development, on the example of judo, are not fully disclosed in special educational and methodological literature [14].

The purpose of the study is to analyze the results of the selection and performance of judo womans at the TOG-2020 depending on their age indicators.

Materials and methods of the research. The following methods were used in the study of this area of research: theoretical analysis and generalization of scientific and methodological literature, analysis of competition protocols of the TOG-2020, analysis of the world ranking of elite athletes according to the IJF. Linear regression analysis was used to represent the relative age as one of the indicators of measuring the success of elite judo women.

The results of the study and their discussion. The total number of judo women - 1444, in all weight categories, who participated in the selection of the TOG-2020 and 192 athletes who performed at the TOG-2020 based on the data of the official website of the International Judo Federation [15].

According to the results of the performances, the following age indicators of judo women were analyzed:
- average age of female athletes who performed at the TOG-2020 in judo in each weight category;
- the number of female judo women who took part in the selection for the TOG-2020 in each weight category, younger relative to the average age of judo women and older relative to the average age of judo joms in terms of average age;
- the number of judo women who took part in the TOG-2020 in each weight category, younger relative to the average age of judo women and older relative to the average age of judo women in terms of their average age;
- the number of judo women who took the 1st-5th place at the TOG-2020 in each weight category, younger relative to the average age of judo women and older relative to the average age of judo women by the average indicator of their age;
- the time of fights spent by athletes younger relative to the average age of judo women and older relative to the average age of judo women in terms of average age to win 1-5 places at the TOG-2020 in judo (Table 1).
The study was the first to examine and study the relative age of world-class female athletes by analyzing the world selection rankings and performance at the TOG-2020. The full ages of 1444 female judo women of all weight categories who participated in the selection for the TOG-2020 and 192 female athletes who directly performed at the Games were collected and processed.

Having examined the sample of judo women who took part in the selection for the TOG-2020 in 7 weight categories, we see that the age difference is from 20 to 42 years. Most of the athletes competed at the TOG-2020 at the age of 26 (19 athletes), 28 (18 athletes), 31 (23 athletes), the least number of judo women was at the age of 20-21 (4 athletes each) and after 37 years (from 1 to 2 athletes) (Fig. 1).

Table 1

<table>
<thead>
<tr>
<th>Weight category, kg</th>
<th>NA</th>
<th>Amount YCAAJW</th>
<th>%</th>
<th>Amount ORAAFJW</th>
<th>%</th>
<th>TA participants TOG-2020</th>
<th>Number of participants TOG-2020 YCAAJW</th>
<th>%</th>
<th>Number of participants TOG-2020 ORAAFJW</th>
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<tr>
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<td>11</td>
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<td>30</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>1444</strong></td>
<td><strong>1260</strong></td>
<td><strong>87</strong></td>
<td><strong>184</strong></td>
<td><strong>13</strong></td>
<td><strong>192</strong></td>
<td><strong>113</strong></td>
<td><strong>59</strong></td>
<td><strong>79</strong></td>
<td><strong>41</strong></td>
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Notes: NA - number amount; YCAAJW - younger compared to the average age of judo woman; ORAAFJW - older relative to the average age of female judo woman; TOG-2020 - Tokyo Olympic Games 2020; MA - middle age.

Fig. 1. Distribution of judo women participants of the Olympic Games Tokyo 2020 by age

Using samples of the full age of female athletes in each weight category and using the formula for calculating $\overline{x} = \frac{1}{n} \sum_{i=1}^{n} x_i$, we find the standard deviation of judo women who took part in the TOG-2020 for each weight category. The calculations...
showed that the age of the participants of the TOG - 2020 is in the range of 28-30 years. The value of the approximation reliability was 0.3878, which indicates a possible approximation error, the curve corresponds to the data (Fig. 2) [16]. In relation to the standard deviation, female athletes were divided into relatively young and relatively older judo womans [17,18,19,20].

Fig. 2. Average age of judo woman in all weight categories

Considering the data in Table 1, a comparative analysis of judo women relative to the average age by weight categories was made: 48 kg - younger relative to the average age of judo woman 89%, older relative to the average age of judo woman 11%; 52 kg - younger relative to the average age of judo woman 88%, older relative to the average age of judo woman 12%; 57 kg - MSVD 86%, older than the average age of judo woman 14%; 63 kg - younger than the average age of judo woman 87%, older than the average age of judo woman 13%; 70 kg - younger than the average age of judo woman 90%, older than the average age of judo woman 10%; 78kg - younger relative to the average age of judo womans 85%, older relative to the average age of judo womans 15%; +78kg - younger relative to the average age of judo woman 85%, older relative to the average age of judo woman 15%, while the % of judo womans who performed at the TOG-2020 by weight categories was distributed in other 48 kg - younger relative to the average age of judo woman 61%, older relative to the average age of judo woman 39%; 52 kg - younger than the average age of judo woman 59%, older than the average age of judo woman 41%; 57 kg - younger than the average age of judo woman 52%, older than the average age of judo woman 48%; 63 kg - younger than the average age of judo woman 55%, older than the average age of judo woman 45%; 70kg - younger than the average age of judo woman 68%, older than the average age of judo woman 32%;78kg - younger than the average age of judo woman 58%, older than the average age of judo woman 42%;+78kg - younger than the average age of judo woman 59%, older than the average age of judo woman 41%. According to the selection rating for TOG-2020, out of 1444 judo womans, 87% (1260 people) are younger than the average age of judo womans, while 13% (184 people) are older than the average age of judo
womans. After analyzing 192 participants of the TOG-2020, we can see that relatively younger judo womans made up 59% (113 people), and relatively older judo womans made up 41% (79 people) relative to the average age (Fig. 3). Having conducted a comparative analysis of the relatively younger relative to the average age of female judo womans who were selected with those selected for the TOG-2020, we see that the younger relative to the average age of judo womans is only 9% of the total number, while the relatively older relative to the average age of judo womans is 43%. This may be due to the fact that relatively older compared to the average age of female judo womans may be much better advanced in terms of cognitive development (decision-making, abstract thinking, creativity, gaining competitive experience and psychological factors) than relatively younger compared to the average age of female judo womans, who mostly use this selection to gain competitive experience, although there are exceptions that need to be studied further.

![Fig. 3](image-url)

**Fig. 3.** Judo woman younger than the average age and older than the average age who were selected and participated in the TOG-2020 by age

Analysing the fights of the final block in all weight categories, we can see that the judo womans in relation to the male judo womans were distributed as follows: 1st place younger relative to the average age of judo womans - 57% (4 persons), older relative to the average age of judo womans - 43% (3 persons); 2nd place younger relative to the average age of judo womans - 71% (5 persons), older relative to the average age of judo womans - 29% (2 persons). Analyzing the time of all fights of the final block, we see that the younger relative to the average age of judo womans who won spent an average of 06:20, while the older relative to the average age of judo womans spent 02:59. Thus, female athletes relatively older than the average age of judo womans lost if the fight lasted longer. The struggle for bronze medals showed that the relatively younger relative to the average age of judo womans were 79% (11 people), relatively older relative to the average age of judo womans 21% (3 people), 5m. Relatively younger compared to the average age of judo womans were 64% (9 people), relatively older compared to the average age of judo womans 36% (5 people). The average time of the fight, which was spent on the victory of relatively younger than the average age of female judo womans, was 04:46, and the average time of the fight of relatively older than the average age of female judo womans was 01:54.

**Conclusions.** The average age of judo womans who took part in the TOG-2020 was 28-30 years. Making a comparative analysis of the elite judo woman-leaders in
the selection for the TOG-2020 by age, we see that much more athletes were relatively younger than the average age of judo woman (87%) than relatively older than the average age of judo woman (13%). For female judo women who passed the selection and took part in the TOG-2020, the distribution in relation to the NE was quite different: younger relative to the average age of judo women (59%), older relative to the average age of judo women (41%). Analyzing further, we can see that the number of female athletes relatively younger than the average age of judo women who took part in the TOG-2020 is only 9% younger than the average age of judo women from all judo women who were selected. While the number of older judo women relative to the average age is 41% of all those who were selected for the TOG-2020. Having a gap in age from 20 to 42 years, high-class athletes who took part in the TOG-2020 have a peak age of 28-31 years. The final block shows that the ratio of relatively younger relative to the average age of judo women to older relative to the average age of judo women ranged from 57% to 43% - 1st place, and from 71% to 29% - 2nd place, while analyzing the average time of the fight we see that relatively younger relative to the average age of judo women win in fights where the time is about 06: 20, while older judo women win with an average time of 02:59. For the 3rd place the victory was won by younger relative to the average age of judo woman - 79% against older relative to the average age of judo woman - 21%, respectively 5th place by younger relative to the average age of judo woman - 64% against older relative to the average age of judo woman - 36% while analyzing the average time of the fight we see that relatively younger relative to the average age of judo woman win in fights where the time is approximately 04: 46 while older judo women win with an average time of 01:54. As we can see, judo woman of older age should spend less time to win than younger athletes. Gaining experience with age, which is necessary to participate in high-ranking competitions, it is necessary to take into account that with age the functional abilities of athletes decrease.

References:


