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Original Article

Formation of motivation for judo classes in 9–10-year-old children

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Abstract:
Studying the motivational factors in children participating in sports is a relevant and important task for optimizing educational and training programs. **Objective:** To identify the factors influencing the motivation of 9–10-year-old children to participate in judo, and to develop and test a methodology designed to develop long-term interest in the sport and improve physical fitness. **Materials and methods:** The pedagogical experiment involved 30 boys aged 9–10 years, all of whom practiced judo at a sports school in Russia. They were divided into a control group (CG, n = 15) and an implementation group (IG, n = 15). The sports training program for all martial artists was based on the requirements of the federal judo standard. Athletes in the IG participated in one training session per week, incorporating the motivation development methodology we developed. This approach included activities tailored to address the psychological, age-related, and social characteristics of children. The initial level of motivation for judo in children was assessed using T. Ehlers' questionnaires, "Motivation to Achieve Success" and "Motivation to Avoid Failures." The study of dominant motivational goals in children during judo classes was performed using the "Motives for Doing Sports" technique. Control tests were performed for both the initial and final assessments of motor qualities. **Results:** At the beginning of the experiment, both observation groups showed a low level of motivation for judo. The primary factors influencing the development of motivation in children were social self-affirmation, the desire to achieve success in sports, and physical self-affirmation. The developed and tested methodology, designed to promote sustained interest in the sport, demonstrated high effectiveness. By the end of the experiment, a significant improvement in motivational factors and test scores was observed in all motor assessments, surpassing the results of the CG. **Conclusions:** Given the significant effectiveness of the proposed method in enhancing children's motivation to practice judo, it can be recommended for implementation in children's sports schools and judo programs.
Key Words: **martial arts, physical educational, motivation factors, physical training, motor skills**

Introduction

Physical education and sports are crucial factors in maintaining and improving the health of the younger generation (Mischenko et al., 2021; Romanova et al., 2023; Zhou et al., 2025). Martial arts such as judo, kendo, and karate are widely practiced around the world, not only by adults (Oja et al., 2024; Vorozheykin et al., 2020) but also by children and adolescents (Jakšić et al., 2024). According to the authors, judo training can be introduced as an organized physical activity starting at ages 4–6. The growing interest in judo among school-age children is attributed to its potential for developing self-defense skills (Benítez-Sillero et al., 2023), fostering discipline and team spirit, and reducing aggression (Lindell-Postigo et al., 2023). Judo classes are related to obesity prevention and a significant reduction in physical inactivity, particularly during childhood (Kowalczyk et al., 2023). The impact of this martial art on fostering balanced physical development in adolescents has been well-established (Griban et al., 2024). Additionally, participants experience considerable improvements in motor skills. According to R.C. Honorato (2021) and A. Osipov et al. (2023), judo athletes demonstrate significantly better strength indices and strength endurance compared to untrained young men. Furthermore, improvements in balance, vertical jump performance, and cardiorespiratory endurance have been recorded (Brasil et al., 2020;

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Kovalev et al., 2024). It has been confirmed that practicing judo enhances cardiovascular function, providing protection against heart and vascular diseases later in life (Suetake et al., 2018; Kolokoltsev et al, 2021). All of these benefits contribute to an improved quality of life for individuals who practice judo (Rosa et al., 2021).

When mastering a judo program, it is important to correctly form motivation for training to achieve positive results, particularly in children aged 9–10 years, who are at a stage of actively acquiring new knowledge and skills ((Bguashev, & Klimenko, 2021; Trushkova, Trushkov, 2024; Mischenko et al., 2021). Athletes need a high level of motivation to perform at their best during each training session and competition (Skugor et al., 2023). This is especially important given the high dropout rate in childhood and adolescence sports. Motivation plays a key role in an individual's participation in sports and competitions. Assessing motivation can help identify children who are at risk of dropping out of sports (Jakšić et al., 2024).

At the theoretical level, the formation of sports motivation in children is a topic of research at the intersection of psychology and pedagogy. Theoretical models of motivation, such as self-determination theory and the concept of acquired motivation, provide a foundation for understanding how a child's individual needs and social environment influence their motivation for sports (Lindell-Postigo et al., 2023; Jakšić et al., 2024; Gryaznykh et al., 2021). Researchers highlight the importance of targeted interventions by coaches and sports psychologists to increase motivation levels in sports (Krasmik et al., 2024). Motivations for physical exercise can also improve adolescents' physical health and aerobic capacity (Wang, 2021).

When forming motivation for participating in sports or physical exercise, it is important to consider various factors. These include individual factors, such as gender differences and body image, as well as environmental factors such as school administration policies and the availability of extracurricular physical education and sports activities (Lima et al., 2023). Motivational patterns in children in Spain have been identified based on age and gender. Specifically, primary school students were more active than those in junior and senior secondary schools, and boys were more active than girls (Romero-Parra et al., 2023). Understanding these patterns allows us to increase physical activity in children before they move to secondary school, with a particular focus on girls. According to T. Berki et al. (2024), enjoyment of physical activity was a key predictor of general self-esteem in children and adolescents, a finding also supported by Frömel et al. (2022). Additionally, other researchers (Galan, 2022) found a strong relationship between motivations for physical exercise, body composition, and cardiorespiratory endurance in schoolchildren aged 13–16 years in the province of Seville.

The analysis of scientific sources presented here highlights extensive research by scholars on motivation related to physical exercise. However, a gap in the literature was identified regarding the study of motivation for judo practice among primary school children. We agree with the view of W. Huang et al. (2021) on the importance of further research into children's motivation for physical exercise. According to the authors, such research can help promote physical activity intervention programs among schoolchildren. We believe that exploring this issue will enhance the motivational aspect of judo training for children, ultimately improving their training efficiency and competitive performance.

Research aim. To identify the factors influencing motivation in 9–10-year-old children to practice judo, and to develop and test a methodology aimed at developing a lasting interest in the sport to improve physical fitness.

Material & methods

The study was performed during 2023–2024 at the Olympic Reserve Sports School in St. Petersburg, Russia. A random sample of 30 boys aged 9–10 years was selected for the study. These participants attended judo training sessions in the basic sports training group three times a week for 90 min each session. The participants were divided into a control group (CG, n = 15) and an implementation group (IG, n = 15). All athletes received training in accordance with the federal judo training standards. Athletes in the IG participated in one training session per week based on our methodology for developing motivation in children.

Informed written consent was obtained from all parents for their children's participation in the experiment. The research was performed in accordance with the 2008 Helsinki Declaration, adhering to its ethical guidelines for scientific work involving human participants. Researchers from various universities in Russia and Kyrgyzstan contributed to the study.

The methodology for forming motivation for judo classes in children aged 9–10 was implemented in the IG over a period of 5 months. The approach aimed to create conditions that would encourage the development of a lasting interest and desire to engage in the sport. It involved a series of activities designed to consider the psychological, age-related, and social characteristics of children, making the sessions both more engaging and effective. Recognizing the age-related need for play, communication, and self-expression, game-based techniques were incorporated into the training sessions.

Various game formats and competitions were incorporated into the training sessions. To increase interest in judo, the following games were included: "Tug of War," "Cockfight," "Who is Stronger?", "Change of

Places," "Fight for a Stick," and "Carousels." The developed methodology for forming motivation also included elements of social influence. During judo classes, children in the IG worked on developing communication skills, learning about teamwork, and cultivating a respectful attitude toward their opponents. Group work and interactive elements were used to promote the social adaptation of children in the IG. This approach helped children develop these qualities, which, in turn, increased their self-confidence.

The methodology incorporates elements of psychological support, such as positive reinforcement, to help children overcome fears and insecurities, fostering lasting motivation. It aims to form a positive perception of judo as a sport that not only develops physical abilities but also moral qualities, such as discipline, respect, and honesty.

The primary goal of the methodology is not only to attract children to the classes but also to sustain their interest over time, promoting the development of a healthy lifestyle and encouraging physical activity.

To effectively teach judo, modern coaching methods and standards were applied, requiring a clear approach and a well-structured strategic plan. This approach includes providing beginner athletes with detailed instructions on technique execution, along with visual demonstrations, which aids in their understanding and learning. The relevance of this method lies in the fact that training can only be considered effective when it simultaneously improves both motor skills and technique. These elements contribute to the development of both physical and psychological training in judokas.

In the CG, as part of the motivational activities, children were shown a documentary program and engaging excerpts from judo competitions. Additionally, they were assigned homework to research and present an interesting fact about the origin and development of judo.

The initial level of motivation in children to practice judo was assessed using T. Ehlers' questionnaires, "Motivation to Achieve Success" and "Motivation to Avoid Failure" (Kotik, 1989). The "Motivation to Achieve Success" technique, developed by T. Ehlers, is a diagnostic questionnaire consisting of 41 questions with "yes" or "no" responses. Based on the results, motivation can be categorized into four levels: low, medium, high, and very high. The "Motivation to Avoid Failure" technique focuses on individuals who aim to avoid failure. This test contains 30 questions, each consisting of three separate concepts. The respondent is asked to select the word that best reflects their psychological traits. The assessment is scored as follows: 0–10 points indicate a low level, 11–16 points represent an average level, 17–20 points correspond to a high level, and more than 20 points suggest an overprotection of motivational attitudes.

In this study, we focused on examining the dominant goals of children during training sessions. To do so, we used the "Motives for Sports" methodology (Shaboltas, 1998), which consists of 45 pairs of statements and identifies 10 main categories of sports motivation. For a more accurate assessment of preferences, participants selected the most appropriate options 9 times, marking their choices with a "+" sign.

The motivation categories included: emotional pleasure (EP), motivation for social self-affirmation (SS), physical self-affirmation (PS), socio-emotional motivation (SE), socio-moral motive (SM), achievement of success in sports (SS), sports activity and knowledge (SP), rational-volitional motive (RV), and civic patriotism (CP).

To assess the initial and final levels of physical fitness of children in both groups, control exercises were used, including: forward bend while standing on a gymnastic bench (in cm), push-ups from a lying position (number of repetitions), 60-m run (time in seconds), 500-m run (speed in m/s), torso flexion and extension from a supine position (number of repetitions in 1 min), and pull-ups on a high bar (number of repetitions).

Parametric research methods were applied, with the calculation of sigma, arithmetic mean, and its error. The reliability of differences in indicators was determined using Student's t-test. Indicator values were considered statistically significant at $p \leq 0.05$.

Results

The analysis of the data obtained using the "Motivation to Achieve Success" technique indicates that 80% of children exhibit a low level of motivation to achieve success, while 20% demonstrate an average level.

The results of testing using the "Motivation to Avoid Failures" technique revealed a low level of this indicator in the children, which aligns with the previous test results.

The distribution of children by score is as follows: 85% of children scored 2–10 points (low level of protective motivation), 10% scored 11–16 points (average level), and 5% scored 17–20 points (high level of protective motivation) in both groups. No significant difference in motivation levels was found between the children in the CG and IG using either method of assessment.

Table 1 presents the baseline results of the study on the dominant goals of judo classes among children in both groups, assessed using the "Motives for Sports" method.

Table 1. Threshold values of indicators for judo training motives in children from both groups, M ± m

No.	Name of motive, points	Experimental group, n = 15	Before the experiment, n = 15	After implementation, n = 15
1.	Emotional pleasure	CG	7.80±1.70	9.50±1.70
		IG	9.30±1.43	13.90±1.87*
2.	Social self-affirmation	CG	5.70±1.48	9.45±1.28*
		IG	6.70±1.78	12.40±1.06*
3.	Physical self-affirmation	CG	11.60±1.60	14.25±1.33*
		IG	11.10±1.61	16.35±1.13*
4.	Social-emotional	CG	9.60±1.16	9.75±1.52
		IG	9.95±1.78	13.5±1.32*
5.	Social-moral	CG	10.10±1.19	11.60±1.45
		IG	10.80±1.88	12.60±1.83
6.	Achieving success in sports	CG	10.60±1.76	10.85±1.94
		IG	11.60±1.78	15.85±1.15*
7.	Sports-cognitive	CG	10.75±1.85	11.15±1.00
		IG	11.55±1.65	14.95±1.57*
8.	Rational-volitional (recreational)	CG	11.20±1.08	6.80±1.35*
		IG	10.55±1.28	7.00±1.61*
9.	Preparation for professional activity	CG	10.90±1.50	11.65±1.68
		IG	10.40±1.87	11.75±1.33
10.	Civic-patriotic	CG	11.00±1.80	11.95±1.74
		IG	10.00±1.10	12.25±1.86

At the beginning of the study, the motivation levels for judo classes in children in both groups were nearly identical, with $p > 0.05$, allowing the study to proceed. By the end of the experiment, a significant increase in motivation values was observed in 6 out of the 10 motives for the children in the IG, while one motive (rational-volitional) showed a significant decrease in its value ($p < 0.05$). In the CG, by the end of the observation period, a significant increase in the value of the indicators was observed in 2 motives, while one motive showed a significant decrease in its value ($p < 0.05$). The dynamics of the changes in the motivation indicators for the children are depicted in Figure 1.

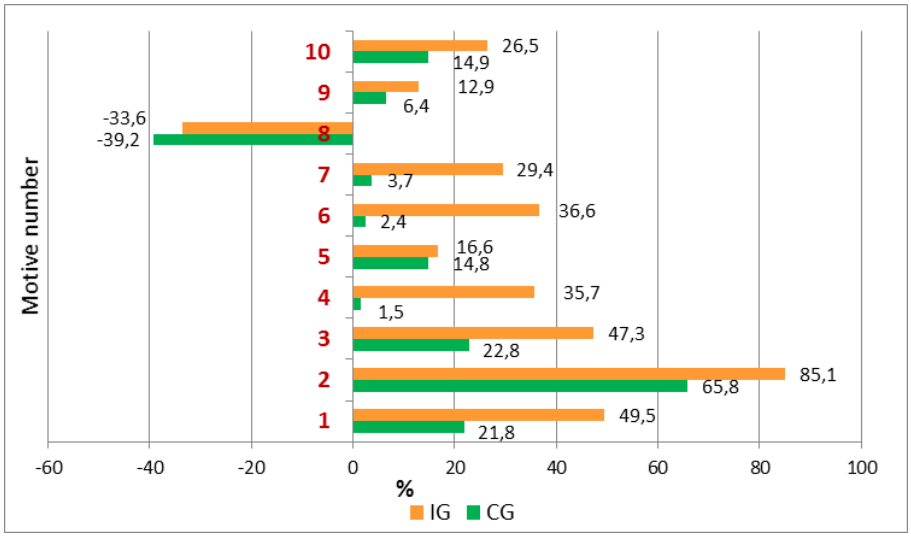

Fig. 1. Change in the value of judo training motives in children at the end of the study

It was determined that, in the IG, the increase in all motivation indicators was greater compared to the CG. One of the key factors influencing the motivation of judokas in the IG was social self-affirmation and the motive to achieve success in sports. A significant increase of 85.1% in the social self-affirmation motive in the IG, compared to 65.8% in the CG, positively affected the increase in the children's self-esteem.

This positively influences their physical self-affirmation, as evidenced by a significant increase in the values of indicators for this motive—47.3% in the IG and 22.8% in the CG. Emotional pleasure also plays a role in the development of this motive, with a significant increase of 49.5% in the IG. At the end of the experiment, no significant changes were observed in the motives related to preparation for professional athletic activity, and

negative dynamics were noted in the rational-volitional (recreational) motive. To confirm the impact of motivation on physical fitness, a milestone motor skills test was performed with children in both groups, as shown in Table 2.

Table 2. Values of motor skills test indicators at the beginning and end of the experiment, M ± m

No	Test	CG, n = 15		IG, n = 15	
		At the beginning	At the end	At the beginning	At the end
1.	Forward bend while standing on a gymnastic bench, cm	23.2±0.1	23.4±0.2	23.1±0.1	26.1±0.3*
2.	Push-ups in a prone support position, number of repetitions	15.4±1.4	16.2±1.7	16.6±1.3	24.7±3.3*
3.	60-m run, s	12.34±0.2	12.02±0.2	12.56±0.2	11.95±0.2*
4.	500-m run, m/s	6.08±0.14	5.86±0.13	6.27±0.11	5.75±0.12*
5.	Trunk flexion and extension from a supine position, number of repetitions in 1 min	28.5±1.1	30.5±1.5	27.5±0.7	34.2±2.7*
6.	Pull-ups on a high bar, number of repetitions	1.4±0.2	1.9±0.4	1.5±0.3	2.4±0.5*

It was determined that at the beginning of the study, the values of the motor test indicators in children from both groups did not differ significantly ($p > 0.05$), indicating a comparable level of basic motor skill development.

The pedagogical experiment revealed improved motor skills in both groups. However, boys in the IG showed significantly greater improvement than the CG, as shown in Figure 2.

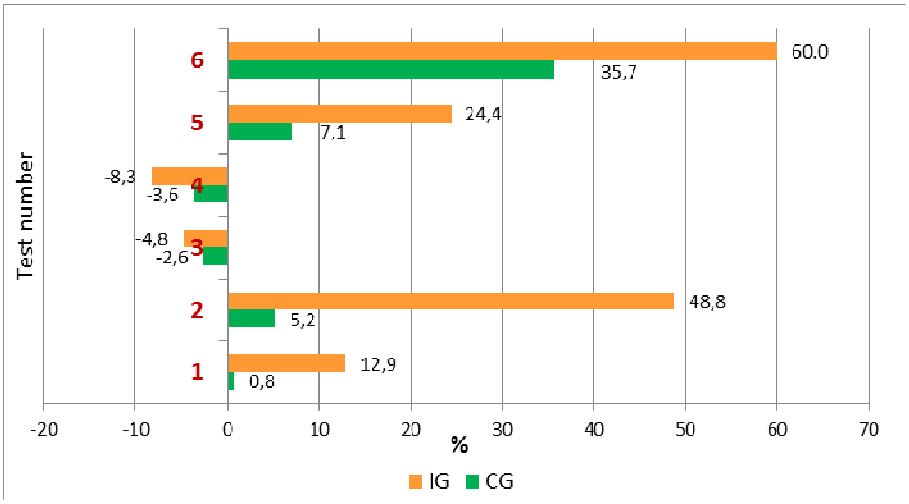

Fig. 2. Changes in the growth of motor test indicator values in children at the end of the experiment

The IG showed statistically significant improvements ($p < 0.05$) in all motor tests at the end of the experiment. The CG showed no statistically significant changes. IG boys demonstrated the largest gains, particularly in strength and speed–strength tests (tests 2, 5, and 6). Specifically, IG boys showed 1.8 times greater improvement in speed, 2.3 times greater improvement in endurance, and 16 times greater improvement in flexibility compared to the CG. These results demonstrate that the proposed methodology significantly improves children's judo motivation compared to the standard federal training program.

Discussion

In recent years, there has been an increase in interest in judo among various population groups (Oja et al., 2024), including young people (Jakšić et al., 2024; Bocharin et al., 2021;). According to researchers, this is due to the positive effect of this martial art on the morphofunctional characteristics of the body (Brasil et al., 2020; Griban et al., 2024). Judo plays a role in the formation of self-defense skills (Benítez-Sillero et al., 2023) and discipline, team spirit and reduced aggression (Lindell-Postigo et al., 2023).

To achieve positive results in this martial art, it is important to correctly form the motivation for classes (Skugor et al., 2023). This is especially necessary in childhood (Bguashev, & Klimenko, 2021), due to the psychoemotional characteristics of their body. The high dropout rate of children from sports at this stage of life plays a role. Motivation assessment can help identify children who are at risk of leaving the sport (Jakšić et al.,

2024; Bocharin et al., 2021). Athletes must have a high level of motivation to complete each training session and compete at a high level. The motivational qualities of an athlete increase the effectiveness of a training session and the performance in sports competitions. Therefore, studying the issues of motivation in children aged 9-10 years in judo seems to be a relevant and timely task. Such studies are of practical importance for the work of the coaching staff in this sport (Wang, 2021; Krasmik et al., 2024). The methodology for developing motivation in children for judo that we proposed and tested includes a set of activities aimed at taking into account the psychological, age and social characteristics of children, which makes classes more attractive and effective. To develop motivation, it is important to create favorable conditions that will contribute to the positive development of desires for sports. This includes taking into account individual factors such as age, gender, and body type. Environmental factors such as the attitude of school administration toward sports activities and the availability of extracurricular physical education activities also play a role in shaping motivation (Lima et al., 2023).

The data we obtained at the beginning of the pedagogical experiment confirmed the researchers' opinion that there is a problem caused by a weak level of motivation in children involved in sports (Romero-Parra et al., 2023). We agree with the authors' opinion that insufficient motivation for training sessions can negatively affect their progress in sports. The results of our research have established that important factors that influence the development of judokas' motivation are social self-affirmation and the motive for achieving success in sports. According to our data, a reliable increase of 85.1% in the self-affirmation motive was established in the implementation group and by 65.8% in the control group.

These results are consistent with the findings of other researchers (Lindell-Postigo et al., 2023; Jakšić et al., 2024). Such positive dynamics of motivation is reflected in their physical self-affirmation, as evidenced by a reliable increase of 47.3% in this motive in children in IG and by 22.8% in CG. The motive of emotional pleasure from playing sports plays a role. We agree with the opinion of T. Berki et al. (2024) that pleasure from physical activity is a significant predictor of overall self-esteem in children and adolescents. This is evidenced by the results of K. Frömel et al. (2022). An increase in the level of motivation for playing sports causes a more significant increase in the effectiveness of training sessions. This is indicated by the results of our milestone testing of motor qualities in children in both experimental groups.

We have found that the implementation of the proposed method for increasing motivation for judo classes made it possible to significantly improve the results in test trials of motor qualities. In the implementation group, a reliable increase in the values of indicators in all motor qualities was found compared to the beginning of the pedagogical experiment. In the control group, no reliable increase in the values of indicators was found in any of the motor tests. These data are consistent with the results of observations by other authors (Galan-Lopez et al., 2022). The researchers found a close relationship between the motives for physical exercise, body type, and cardiorespiratory endurance in schoolchildren aged 13-16 years.

It has been proven that high motivation for physical exercise can improve the level of physical health of adolescents and their aerobic abilities (Wang, 2021). Our research data confirm the opinion of these authors about the significant relationship between motivation and the level of development of basic motor qualities. We believe that the recommendations we have developed for increasing motivation for judo can help coaches and parents create a favorable motivational environment for young athletes, which will increase the effectiveness of training sessions and the effectiveness of sports performances.

Conclusions

Both groups initially exhibited low judo motivation. This study identified key motivational factors for 9–10 year olds: social self-affirmation, achievement motivation, and physical self-affirmation. A new methodology, designed to cultivate sustained interest in judo, was developed and tested. This methodology incorporates age-appropriate and socially relevant activities to increase engagement and effectiveness. The proposed methodology is significantly more effective than the traditional CG program at fostering children's motivation in social self-affirmation, athletic achievement, emotional pleasure, and physical self-affirmation. The proposed methodology for increasing judo motivation significantly improved test results across all motor skills in participating children compared to a CG. This methodology, developed for 9–10 year olds, is recommended for use in children's judo schools and clubs.

Conflicts of interest. The authors declare no conflict of interest.

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