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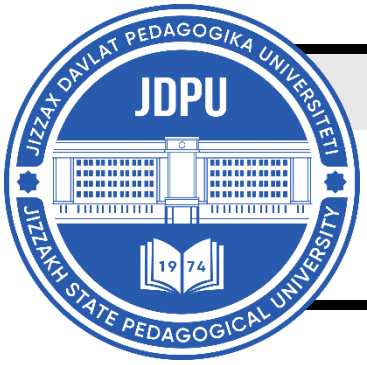


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# CHARACTERISTICS OF STRENGTH TRAINING OF DIFFERENT AGED ROWERS IN CANOE

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## ABOUT ARTICLE

**Key words:** strength, endurance, maximum strength, explosive power, barbell, phase, general physical training, special physical training.

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**Abstract:** Canoeing is a sport that demands considerable endurance. Clearly, athletes training with rowing need specialized strength training. This article examines the age-specific characteristics of various components of strength training for canoeists. It delineates a series of exercises designed to develop strength qualities, as well as objectives for defining the direction and content of the training process. Furthermore, it outlines the methodological principles that should govern the organization of strength training for canoeists across different age groups.

## Introduction

During the preparatory stage in the sport canoe, it is always emphasized on the athletes' moral and volitional qualities, their effective and perfect rowing techniques, tactical proficiency

and high intelligence. Such kind of qualities serve as the foundation for not only achieving high level of results, but also successfully defeating opponents in competitions. Therefore, long-term and goal-oriented training, from beginner to master in the sport level, is usually necessary to gain consistently high results. It is a process that involves the implementation of training exercises at varying levels of complexity, according to beginner, advanced and highly skilled canoeists' physical properties, proficiency, and specific objectives [4].

Aim of the research. In this research the development of strength characteristics in athletes of different age groups is examined during the preparation process. Furthermore, the main attention is given to identify the types of exercises which are used to improve strength qualities in both young and experienced canoe athletes during training.

Research methods. Comparative and mathematical-statistical methods are widely used in this research. Athletes who are between 15 and 20 years old were selected as participants. In order to determining the specific forms of the strength manifested in canoeists of different age groups, both general and specialized physical training exercises were effectively used.

Results and discussion. For achieving good results in canoe, one of the necessities is beginning training at the age of 12-13. Such an early beginning of the training is regarded as an available period for the biological development of children and forming their fundamental physical qualities [2].

At the initial stage of training, young athletes are taught how to do the high-volume exercises in the sport. At this time, their capability of training and strength qualities are also developed. Athletes learn the techniques of rowing, reinforce these techniques step by step and also they try to gain tactical experience at this period [5].

As the influencing training, strength response and speed development reach their peak efficiency between the ages of 9-11 and 13-14. By the age of 14, these parameters reach level of adults and rarely improve. However, speed continues to increase due to the developing of explosive strength qualities. Between the ages of 12 and 14, boys primarily develop agility and

endurance, whereas girls enhance agility, endurance and types of strength. In this period, young canoeists can assimilate complex technical activities not only demonstrating, but also explanation. This period is considered significant for establishing a strong technical foundation and improving speed in rowing. So, it is necessary not to miss doing these activities [6]. Training programs for young athletes are predominantly based on general preparatory exercises and many of them have a specialized character. Such exercises serve as a foundation for developing strength endurance in young canoeists. Additionally, this preparatory period is suitable for choosing talented athletes and their systematic development. To achieve this, it is essential to assess athletes' anthropometric characteristics, monitor their physical development dynamics, evaluate their moral and volitional qualities, and determine their level of commitment to their athletic goals.

Absolute strength begins developing through maximal movement techniques when athletes are at the age of 18-19. At this time, the volume of general physical preparation decreases and more attention is given to the specialized training exercises [4,5].

The best performance results in canoeing are generally observed between the ages of 21 and 24. This period is characterized by an intensification of training loads without a significant increase in volume, modifications in the ratio of general and specialized preparatory training, and the attainment of technical and tactical excellence.

Based on the above theoretical framework, we selected and conducted a series of control tests to determine the differences in functional development and the manifestation of strength-related indicators among canoeists of various age groups. These test exercises express not only highlight the morphological and functional difference among athletes of various ages but also the internal functional structure of strength training. In our view, this process plays a crucial role in determining an appropriate approach to achieving high-level sports performance.

For the control tests, exercises recommended in canoeing were used, including indicators that reflect the athlete's general and specific strength preparedness.

The conditions for performing general and specialized physical training exercises were standardized for athletes of all age groups. These exercises were completed in the specialized gym and on the water basin of the Republic Rowing facility, located at the Tuyabugiz Reservoir in the Tashkent region.

In particular, for general physical preparation we select exercises containing bench pressing and barbell row while lying down at maximal load and with a 30 kg weight, as well as hanging leg raises at a right angle. These exercises were used equally applied for athletes of all age groups.

Bench pressing and rowing a barbell at maximal load help to determine absolute strength. Through performing bench pressing a barbell and barbell row exercises with a 30 kg barbell for two minutes while lying down, we evaluated strength endurance. These tests specifically assess the endurance of the shoulder, arm, and back muscles, which play in important role in the sport canoe. The main necessity is to do these exercises without rest. It is important to emphasize that these types of exercises are widely used in the training of highly skilled canoeists to develop strength endurance. Three attempts were given to athletes and the best result was recorded. Additionally, the static strength of an athlete's muscles was evaluated based on the duration of hanging leg raises at a right angle.

We used a technique for determining maximum strength, which helps athletes develop at different phases of rowing. This method comprehensively evaluates the level of strength training of canoeists in special physical training. Therefore, maximum level of muscle strength was defined using this method. During the rowing process, the athlete's strength output was recorded on the three phases: at the beginning, in the middle, and at the end of the rowing. In this research, all age groups of athletes did these exercises. Performing such a set of exercises and movements for all participants makes it possible to identify individual ways and options for organizing rowing activities.

For this research, a canoe boat and paddle were used as a sport instrument. A specialized video recording device was installed on the front of the canoe boat, a dynamometer was attached to the rear using a special wire. After commanding, the athletes started rowing to perform movements with maximal strength. The results of the athlete's strength while rowing were measured based on dynamometer readings. Each participant completed three attempts and their best result was recorded for analysis.

The results of general and specialized physical training test exercises are presented in Tables 1 and 2.

**Table 1**

**The general physical training parameters of the canoe rowers**

| Group of athletes | Canoeists between the age of 14-16 | Qualified canoeists |
|---|---|---|
| Barbell row at maximum weight while lying down, kg | 85±5 | 135±5 |
| Bench pressing the barbell at maximum weight, kg | 90±5 | 130±5 |
| Bench pressing a 30kg barbell for 2 minutes, reps | 80±5 | 118±7 |
| Rowing a 30kg barbell for 2 minutes while lying down, reps | 87±7 | 130±8 |
| Hanging leg raises, s | 40±5 | 75±6 |

It is known from Table 1 that the parameters of strength qualities in adult athletes have an advantage over young athletes. The parameter of qualified canoeists in rowing a barbell at maximum weight is 55% higher than that of athletes in the initial training period. Furthermore, the results of bench pressing a 30kg barbell for 2 minutes are over by 40% than young

canoeists' result. The difference in hanging leg raises position between highly skilled athletes and those at the initial training stage reaches 87%.

It can also be stated that when performing special rowing exercises in canoeing, the difference in strength used by athletes of different ages is limited in the same way as in general training exercises. However, the results of our research do not allow us to confirm the conclusion about the strength qualities that the athlete used during the training period.

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Table 2 presents parameters characterizing the level of strength preparedness developed at different peiods of the support phase among canoeists of various age groups.

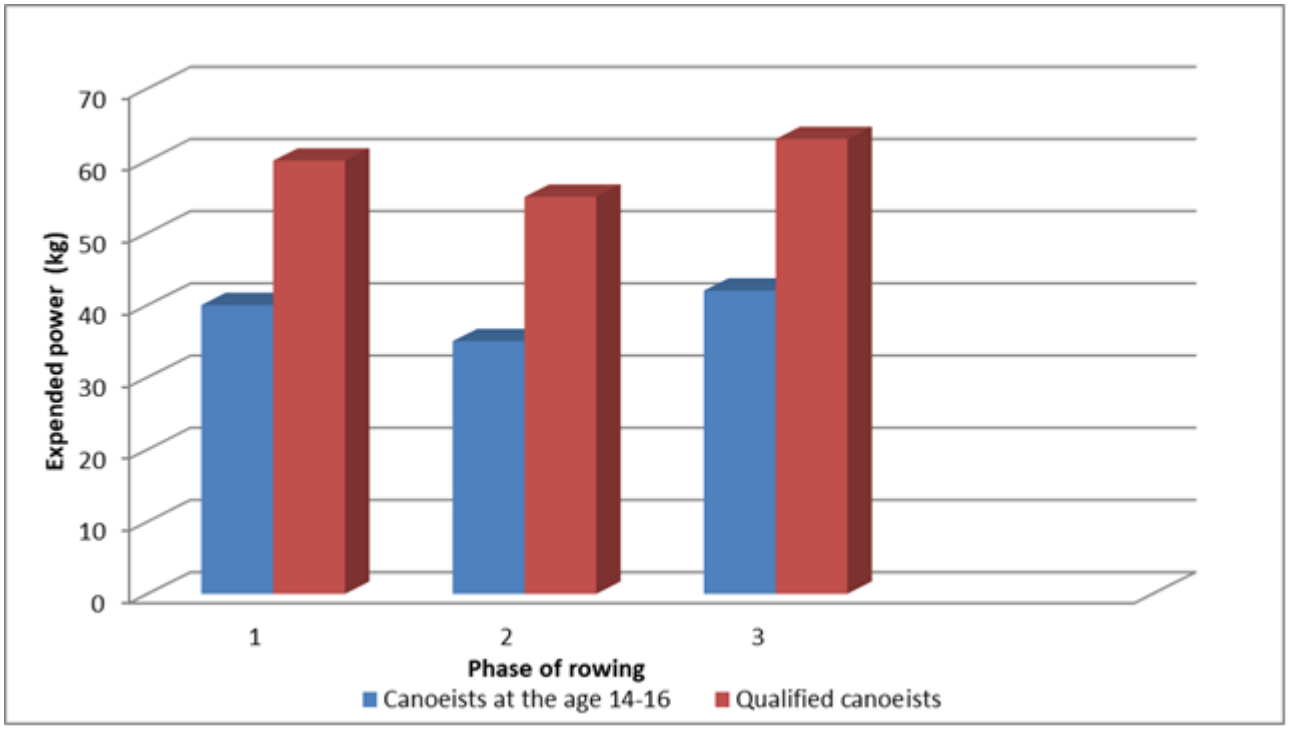
**Table 2**

**Parameters of special strength training of canoeists of different ages**

| A group of athletes | Canoeists aged 14-16 | Qualified canoeists |
|---|---|---|
| The athlete's strength in the starting phase of rowing, kg | 40±3 | 60±5 |
| The athlete's strength in the middle phase of rowing , kg | 35±5 | 55±7 |
| The athlete's strength in the finishing phase of rowing , kg | 42±5 | 63±6 |

The results show that elder canoeists with several years of training achieve higher performance in each phase of rowing compared to younger athletes. It is known from that the strength preparedness level of the adult group is more advanced. The superiority of older

athletes over younger ones in terms of specialized training parameters can also be observed in Figure 1.




**1-rasm. Description of the maximum strength quality of young and adult canoeists during the rowing phases.**

Note: 1. Starting phase 2. Middle phase 3.Finishing phase

The diagram illustrates that the total strength on the water developed by adult rowers during individually paddling differs by nearly 40% compared to younger canoeists.

It is shown that the superiority of qualified adult athletes in general physical training does not give an effective result in special physical training exercises. This discrepancy is typically attributed to deficiencies in technical preparation. However, it does not provide a comprehensive characterization of strength training of canoe rowers in different age groups.

This suggests that the overall physical superiority of experienced older athletes does not necessarily translate into effective performance in specialized physical training exercises. This discrepancy is typically attributed to deficiencies in technical preparation. However, it does not provide a comprehensive characterization of strength preparedness across different age groups of canoeists.

Therefore, to achieve optimal results in sports, it is essential to identify the internal functional structure of strength training components and determine their significance within the training process.

**Conclusion.**

In most cases, the manifestation of a canoeist's strength abilities is determined by specific factors such as muscle composition, anthropometric characteristics of the body, energy potential, and the topography of muscle groups. Additionally, one of the key conditions for achieving optimal strength training in this sport is to organize training process purposefully. The primary goal of such training is to establish a foundation necessary for developing the canoeist's specialized strength abilities. General physical development serves as the basis for enhancing an athlete's functionality and technical proficiency, which directly impacts performance outcomes.

During specialized strength training, the focus is on increasing maximal muscle strength and strength endurance, as well as improving the athlete's speed-strength capabilities. To achieve this, a combination of general and specialized physical training exercises is widely used. In the training of highly skilled canoeists, the development of maximal strength and strength endurance is effectively supported through using of gymnastics, training equipment, additional weights, and resistance-based exercises.

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