

During the training process, the breathing rate was significantly accelerated, and the average breathing rate increased from 12-15 times / min before the training to 20-25 times/min ( $P < 0.05$ ). Some students (about 20%) developed symptoms of respiratory alkalosis at the beginning of the training, such as dizziness, numbness of hands and feet, shortness of breath, etc. Blood gas analysis showed that blood partial pressure of  $CO_2$  was decreased and pH was increased. This is due to rapid breathing and excessive carbon dioxide, resulting to acid-base balance in the blood.

Muscle strength and endurance improvement. The isokinetic muscle strength test showed that the maximum strength of the upper limb biceps and triceps increased on average 12% -18% ( $p < 0.05$ ) and 10% -15% ( $p < 0.05$ ), respectively, and the lower limb quadriceps and hamstrings by 15% -20% ( $p < 0.05$ ) and 13% -18% ( $p < 0.05$ ). Muscle explosive power and endurance are also significantly improved, making students performance in basketball skills (such as shooting, dribbling, jump, passing) more stable and powerful. This improvement in muscle performance is due to a high-intensity and high-density training that stimulates muscle fiber hypertrophy and altered metabolic adaptation [3].

Increased bone density. Double-energy X-ray BMD showed that lumbar BMD increased 2% -3% ( $p < 0.05$ ) and femoral neck increased 1.5% -2.5% ( $p < 0.05$ ). Jump, running and confrontation in basketball training produce positive stress stimulation to the bone, promote bone formation, help to improve bone strength and reduce the risk of osteoporosis.

**Conclusion.** The results show that this training method has a positive effect on improving the function of cardiovascular system, respiratory system and musculoskeletal system, including improving heart function, enhancing respiratory and ventilation ability, increasing muscle strength and endurance, and improving bone density. However, there are also certain risks, such as abnormal heart rate abnormalities, respiratory alkalosis, sports injuries and obvious physical fatigue.

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## STUDY ON THE YOUTH TAEKWONDO STRENGTH TRAINING

**Liu Daohuai,**

*VSU named after P.M. Masharov,*

*Vitebsk, Republic of Belarus*

*Scientific supervisor – Khloptsava M.V., Master of Pedagogical Sciences*

Keywords. Taekwondo, physical and mental development of adolescents, healthy lifestyle.

Taekwondo is a martial art that originated in Korea and spread around the world. A characteristic feature of taekwondo is the active use of legs in combat, both for punches and for defensive actions. The word "taekwondo" consists of three Korean words: [tae] "trample" + [kwon] "fist" + [do] "path, method, teaching, tao". The generally accepted interpretation of "taekwondo" sounds like "the path of the foot and the fist» [0, 2].

Taekwondo training promotes the comprehensive development of the motor and functional capabilities of the athlete's body. Almost all the qualities that taekwondo practitioners need when performing a specific job: dexterity, endurance, speed, flexibility and strength develop with a rationally planned training. Taekwondo sparring is characterized by a large technical base, a significant variety of techniques and the emergence of new technical and tactical elements that can bring success in a duel. Taekwondo is characterized by specific fast, high and rotating strokes with a very demanding motor structure for most muscle groups of athletes, and strength abilities are the basis for mastering such movements [0].

Taekwondo is a sport based on force confrontation, therefore, in the practice of training athletes, strength exercises are very important. In a real taekwondo fight, the intensity of the exercises is high with obvious confrontation, which means that athletes must have strong strength training and good physical fitness. Strength is one of the important factors determining the technical level of taekwondo athletes. Therefore, strength training is the basis of taekwondo and one of the key exercises in sports training. At the same time, taekwondo practitioners should enhance not only the general strength training, but also the quality of special strength, therefore, the development of specialized training principles is especially important. It is believed that muscular strength and strength endurance are extremely important for taekwondo practitioners, as each attack and counterattack action is performed quickly, strongly and repeatedly [4].

Purpose of the study – the impact of Taekwondo strength training on the physical development of adolescents.

**Material and methods.** Literature Research Method. Survey Questionnaire Method. Interview Method: Conduct in-depth interviews with Taekwondo coaches and participating adolescents to obtain more intuitive feedback and insights.

**Results and their discussions.** «Strength» is a central element of sports and, therefore, no less a central theme in sports science. Sports science considers strength as a natural scientific object and takes into account the variety of power phenomena in sports. Strength is one of the basic conditions for the motor activity of every person and, consequently, every athletic movement. Strength is a requirement of all athletic movements, whether running short or long distances, swimming or climbing, sprinting from a standing position or somersault, running jump, bouncing up or down, moving up or down a slope, lifting, pulling, pushing or pushing an object – including your own or someone else's body – or kicking, throwing or rolling a ball.

The strength training of youth taekwondo athletes has its own characteristics, which are related to the age of athletes and the specifics of this sport. When planning a strength training program, coaches need to take into account the special nature of taekwondo movements. Strength training of youth taekwondo practitioners should be aimed at the harmonious development of all muscle groups and not lead to excessive stress on the child's body. It is important to take into account age restrictions and observe safety precautions. For youth practitioners, the main purpose of strength training is to strengthen the musculoskeletal system, develop the strength of the muscles of the arms, legs, and trunk, and increase the ability to withstand loads during training and competitions.

When choosing exercises and determining the weight of the load, it is necessary to take into account the individual characteristics of each athlete, his physical fitness and training goals. For children 5-10 years old, it is recommended to use exercises with their own weight, such as push-ups, squats, pull-ups on a low crossbar and others. You can also use exercises with light dumbbells or stuffed balls. At the age of 10-15 years, you can gradually increase the weight of weights and complicate exercises. At the age of 15-18, it is recommended to add exercises using the plyometric method. However, it is necessary to ensure that the load is moderate and corresponds to the capabilities of the adolescent's body. It is important to include exercises for all muscle groups in training, as well as pay attention to the development of flexibility and coordination of movements. You should also remember the importance of warming up before training and stretching after it. Warm-up helps to prepare muscles for exertion, and stretching helps to prevent muscle pain and speed up recovery. This will help to avoid injury and increase the effectiveness of strength exercises.

**Conclusion.** Thus, strength training is an important tool for improving the performance of youth taekwondo practitioners, as well as developing the quality of their health. At the same time, it should be borne in mind that the strength training plan for youth people should not be the same as for adults, but should be organized in accordance with the physical development of youth people and their individual developmental characteristics. It is also necessary to develop a scientifically based plan for special strength training in accordance with the training goals, taekwondo rules and the athlete's level of training. Coaches need to realize that the benefits of strength training will be felt only if they are selected taking into account the specialization and individual characteristics of the athlete. Otherwise, the training will be ineffective. When developing a strength training program for youth athletes, it is necessary to pay attention to intensity

and time intervals. In addition, youth athletes should not be given excessive loads during strength exercises in order to avoid injury and not harm their sports career. Therefore, it is important to rely on scientific knowledge when planning and organizing special physical training.

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## APPLICATION OF TAI CHI QUAN IN PHYSICAL EDUCATION OF SCHOOLCHILDREN

*Ouyang Jinhua,*

*VSU named after P.M. Masherov,*

*Vitebsk, Republic of Belarus*

*Research supervisor – Minina N.V., candidate of pedagogical sciences, associate professor*

**Keywords.** Physical education, school students, Taiji movement, developmental status.

Taijiquan is a traditional Chinese national sport based on the Taoist theory of yin and yang and the meridian theory of traditional Chinese medicine. It promotes physical harmony through slow and gentle movements and improves coordination. It is important to integrate national sports into the physical education system. The promotion of Tai Chi continues to face challenges: lack of trained teachers, facilities and student interest.

Identifying problems in the development of Tai Chi will allow us to formulate plans for training and promoting this type. This will further increase the popularity of Tai Chi, encouraging young people to be active, form good habits, and improve physical fitness. This study also provides development ideas and recommendations for schools to spread the Tai Chi movement [1, 2].

The goal is to study the problems of spreading Tai Chi in educational institutions.

**Material and methods.** We conducted a study on the development of the Tai Chi movement. Students, teachers, and coaches were interviewed. Research methods: analysis of literary sources, survey, mathematical statistics.

**Findings and their discussion.** We analyzed the curriculum, the number of tai chi teachers, and student participation in tai chi sports and came to the following conclusion. The total number of teaching hours is too small to meet the needs of students. The training content is mainly based on Tai Chi techniques, and there is no theoretical knowledge of Tai Chi. The training facilities and equipment generally meet the needs. Evaluation methods mainly use procedural and summative evaluation. The age structure of Taijiquan sports teachers in high schools is mainly concentrated in the age group of 35-44 years old, the education is mostly higher education, and the academic level is relatively high.

The professional status of teachers is mainly not related to martial arts, and the professional level of Tai Chi is not high. 78% of Tai Chi teachers have not received Tai Chi trainer certifications. 93% of students are highly motivated to practice Tai Chi. Classes are mainly held in school physical education classes. A survey of teachers showed that in teaching Tai Chi, too much attention is paid to technology and the teaching of theoretical knowledge is ignored.

**Conclusion.** Analysis of the development of Tai Chi led to the conclusion: it is necessary to strengthen the training of Tai Chi sports teachers; conduct a variety of Tai Chi sports activities; expand extracurricular activities and training related to the sport of Tai Chi.

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