

THE INFLUENCE OF HIGH INTENSITY AND HIGH DENSITY TRAINING ON THE BODY OF PUBLIC PHYSICAL EDUCATION AND BASKETBALL STUDENTS

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High-intensity and intense training in mass physical education and basketball teaching affects the body of students. We examine the role of this training regimen on college students' cardiovascular, respiratory, musculoskeletal, fatigue, and recovery systems, aiming to provide scientific guidance for community physical education and basketball teaching and promote healthy development. students.

The purpose of the work to systematically explore the effects of high-intensity and high-density training on students physical training in public physical education, including cardiovascular function, respiratory function, musculoskeletal development. Through quantitative analysis and comprehensive evaluation, it provides scientific basis for optimizing the basketball teaching and training program, and realizes the balanced development of improving basketball skills and ensuring students health.

Material and methods. Analysis of literary and experimental data. The subjects of the study were physical education students from Guizhou University aged 18 to 24 years with the same physical fitness and no history of serious illness. The statistical analysis of the collected data was performed using the SPSS 25.0 software. For the data of various physical indicators before and after training, the paired sample t test was used.

Results and their discussion. After training, the students resting heart rate decreased on average (5-80) times per minute ($P < 0.05$), indicating that the heart did more work efficiency at the resting state. During exercise, the highest heart rate increased on average 10-15 times/min ($P < 0.05$), and the mean heart rate also increased significantly, reflecting the enhanced cardiac pumping function under training stimulation. However, during the high-intensity training stage, about (15%) of students had a short too fast heart rate (exceeding 90% of the maximum heart rate), and some students had palpitations, which may cause a certain burden on the heart [1]. High-intensity and high-density training makes the heart bear a large load, and through the nerve-humoral regulation mechanism, the heart can undergo adaptive changes.

Changes in cardiac function ECG examination revealed that about 10% of the students had mild abnormalities such as ST-T segment depression or T-wave inversion after high-intensity training, suggesting a possible transient ischemic hypoxia condition in the myocardium. In the long term, this training method causes adaptive changes in the heart, but may increase the potential risk of cardiovascular disease if the training intensity is improperly controlled. However, the excessive heart rate and ECG abnormalities seen during training suggest a potential risk. This may be due to the rapid increase in training intensity, beyond the adaptability of students hearts, resulting in a sharp increase in myocardial oxygen consumption and a relative lack of blood supply to the heart muscle [1].

Respiratory system effects lung capacity and forced lung capacity increased 200-300 ml ($P < 0.05$) and 150-250 ml ($P < 0.05$) equally after training, respectively, indicating a significant improvement in the ventilatory function of the respiratory system. This is mainly attributed to the enhancement of respiratory muscle strength, increased thoracic mobility, and adaptive changes in respiratory depth and frequency. High-intensity and high-density training stimulates the strength and endurance development of respiratory muscles (such as diaphragm and intercostal muscles), expanding the range of thoracic motion and respiratory depth, thus improving lung capacity and forced lung capacity. This is beneficial for students to maintain a good breathing state in basketball and meet the oxygen demand during high-intensity exercise [2].

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

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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].