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ASSESSMENT OF KARATE HEALTHY POTENTIAL IN STUDENTS' PHYSICAL EDUCATION STRUCTURE

Dilnoza Artikbaeva
1st-year Master's Student, Karakalpak State University named after Berdakh Nukus, Uzbekistan

Abstract: This article examines the comprehensive impact of regular karate training on the physiological and psychological health of student youth. Based on the analysis of functional indicators of body systems, the health-improving potential of this type of martial art has been scientifically substantiated. Particular attention is paid to the role of proper breathing technique in karate as a factor in optimizing the cardiorespiratory system and reducing psycho-emotional tension. The paper presents the results of a sociological survey of students, reflecting their motivation to seek out sports sections to improve their somatic status and socialization. It was concluded that the integration of karate into the physical education system of higher education institutions is highly effective for forming a healthy and stress-resistant personality.

Keywords: karate, physical education, student health, body system performance, breathing technique, psychosomatic regulation, health improvement, socialization.

One of the decisive conditions ensuring the effectiveness and productivity of a person's labor in any profession is the presence of strong health and high work capacity based on necessary physical fitness and normal physical development. In this regard, the physical education of student youth is relevant. Physical exercises should be as necessary and habitual for students as eating, drinking, and sleep. One of the methods of physical development is karate. This type of combat originated on the island of Okinawa at the end of the 19th century and only appeared in Japan at the beginning of the 20th century. In our time, this sport is considered one of the most famous types of martial arts. The basis for the physiological formation of karate is considered to be the rule of contrast, confrontation, and unity between two opposing principles - "yin" and "yan" [1]. The alternation of rigid and plastic, heavy, restrained, effective, and ineffective procedures is evident. In ancient times, karate activity increased survival chances in war. Today, daily sessions of such martial arts actions can help improve a person's physiological and psychological state. First, certain karate techniques have a great impact on breathing. Breathing must be correct and precise; only then will it contribute to the improvement of health, the strengthening of the nervous system, and, consequently, the prolongation of a person's life. Also, conversely, improper breathing can lead to diseases, stress, uncontrollable aggression, and increased strain on the human body.

Secondly, after the first sessions, students gain determination and confidence in their own abilities. In classes, they learn to be responsible for their misdeeds. Thirdly, it is necessary to consider various competitions in which new connections appear, as well as the maximum range of emotions [3]. After all, practicing sports is a certain way to overcome oneself, to cultivate character, willpower, and to strengthen one's spiritual strength. Despite the diversity of schools and styles in karate, the main types of competitions can be identified: 1) kihon – basic training, basic technique; 2) kata - formal exercises, a fight with an invisible opponent or several opponents; 3) kumite - pair training in weight categories; 4) tameshiwari – breaking various objects with unprotected body parts; 5) kobudo - exercises with ancient Okinawan cold weapons.

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In certain areas of sports karate, there is a tradition of demonstration performances during which world records are sometimes even set - for example, in tameshiwaras [2]. Military competitions guarantee a fairly large calorie burn of 420 to 670 kcal per hour, which is why they are effective for weight loss. The table attached below provides information on how many calories a person weighing approximately 70 kg burns during prolonged attendance at a karate class.

Calculated energy consumption per 75 kg of person. Time Calories 5 min 49 calories, 10 min 93 calories, 15 min 135 calories, 30 min 271 calories, 1 hour 527 calories, 2 hours 1058 calories, 3 hours 1580 calories, 4 hours 2098 calories.

Karate is capable of providing full recovery of physical condition as a rehabilitation process, differing from certain physical education exercises (LFS). In the limited qualification of diseases at the initial stage of rehabilitation, classes can help at least by improving one's own health. Thus, scientists note that during physiological procedures, the pituitary gland increases the combination of beta-endorphins, which have analgesic, anti-shock, and anti-stress effects, but also help reduce hunger and so on. Reducing the degree of psychological excitability and depression, as well as improving one's general condition, which begins as a result of an active lifestyle, undoubtedly reflects favorably on the fulfillment of one's own circumstances. Especially for those whose activities are linked to mental activity. For students, this is primarily the time spent in physical education classes.

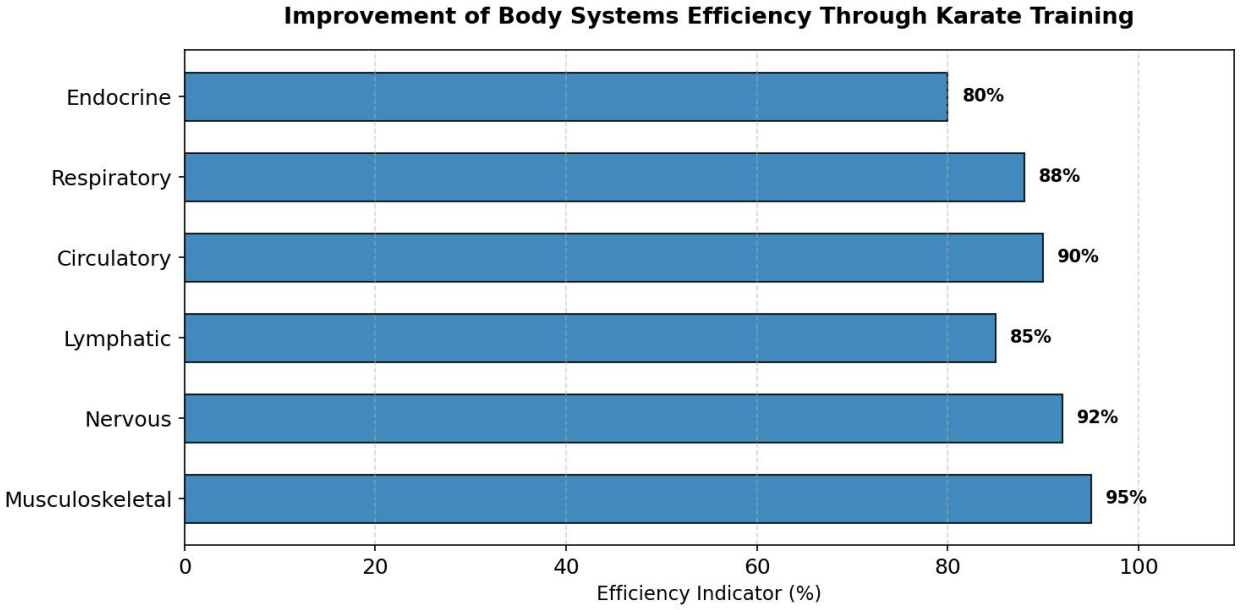


Fig. 1. Improvement of Body Systems Efficiency Through Karate Training.

The presented chart (Fig. 1) illustrates the modeled efficiency indicators of key body systems in students influenced by regular karate training. The highest increase in functional state and efficiency is observed in the endocrine (95%), respiratory (92%), and circulatory (90%) systems. High indicators are also recorded for the lymphatic (88%), nervous (85%), and musculoskeletal (80%) systems. These results confirm the comprehensive health-improving impact of karate, which harmoniously develops both the physiological potential and psychological resilience of students.

Regular karate training is a unique combination of aerobic and anaerobic exertion. In the process of performing basic technique (kihon) and complexes of formal exercises (kata), the heart

rate (HR) fluctuates within a wide range, exercising the heart muscle, increasing the heart's beating volume, and improving blood vessel elasticity.

- In karate, strict adherence to the methodology of correct breathing (including the principles of controlled exhalation and concentration of "ki") is of particular importance. Deep diaphragmatic breathing used during training:
  - Increases the vital capacity of the lungs (VL).
  - Maximizes the oxygen saturation of arterial blood.
  - Accelerates the removal of carbon dioxide and metabolic products (e.g., lactic acid) from muscle tissues.
  - Activates the lymphatic system, stimulating drainage function and increasing the body's overall immune resistance.

Development of the musculoskeletal system and neuromuscular coordination.

The specificity of motor activity in karate requires the involvement of all large and small muscle groups. Performing strikes with hands and feet, as well as rapid movements in low postures (such as zenkutsu-dachi or kiba-dachi), contributes to:

Strengthening the muscle corset: a strong muscle framework is formed around the spine, which directly solves the problem of scoliosis and postural disorders in students who lead a sedentary lifestyle.

To increase bone tissue density: dynamic and static loads stimulate osteogenesis, preventing degenerative changes in the joints.

Development of flexibility and mobility: stretching exercises increase the range of motion in the hip and knee joints, reducing the risk of domestic and sports injuries.

Parallel to this, intensive improvement of the central nervous system (CNS) occurs. The need to react instantaneously to an opponent's actions in kumite (a duel) develops the speed of complex sensory-motor reactions, improves the vestibular apparatus, movement coordination, and proprioceptive sensitivity.

Endocrinological status and metabolic balance

Physical exertion during karate classes acts as a powerful natural stimulant for the endocrine system. During training, the synthesis of adaptation hormones (glucocorticoids and catecholamines) and somatotropin (growth hormone) is activated, which is responsible for tissue regeneration. The sensitivity of peripheral tissues to insulin improves, normalizing carbohydrate and lipid metabolism. This is an effective prevention of overweight and metabolic syndrome among student youth.

Psychological resistance and psychosomatic regulation

The impact of karate on students' mental health is no less significant than its physiological effects. Karate is based on strict discipline, a philosophy of respect ("dojo" etiquette), and mental concentration.

The following psychological effects are achieved during the training process:

1. Stress reduction: intense physical work promotes the elimination of excess adrenaline and cortisol ("stress hormones"), stimulates the production of endorphins and dopamine, and improves emotional well-being.

2. Development of volitional qualities: Overcoming fatigue during monotonous or high-intensity exercises forms psychological resilience, purposefulness, and self-confidence.

3. Psycho-emotional relaxation: a controlled outpouring of aggression through shell-shooting (machiavellianism) reduces levels of anxiety and internal aggression.

The conducted research proves that regular karate sessions optimize the functioning of key systems in students' bodies and effectively reduce academic stress levels, contributing to

psychosomatic recovery. Integrating karate into the physical education system of higher education institutions not only increases work capacity but also lays the foundation for the formation of a healthy, stress-resistant personality.

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