

Analysis of the Impact of Aerobic Exercise Intervention on Students' Physiological Status Based on the Integration of Education and Teaching

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ABSTRACT

Aerobic exercise has unique advantages in promoting students' physical and mental health, but traditional teaching methods are difficult to fully utilize its educational function. Based on the perspective of integrated education and teaching, this article analyzes the multi-faceted and extreme effects of aerobic exercise on students' physiological states, and proposes integrated intervention measures such as optimizing curriculum design, innovating teaching models, strengthening scientific monitoring, and creating a good atmosphere. By integrating aerobic exercise into the entire teaching process, we can stimulate students' enthusiasm for exercise, guide them to develop a healthy lifestyle, and lay a solid foundation for their comprehensive development. To promote the reform of aerobic exercise teaching, it is necessary to unite the collaborative efforts of schools, families, and society to create a healthy and upward educational ecology.

KEYWORDS

integration of education and teaching; Aerobic exercise intervention; Student physiological state; Intervention measures

1 Introduction

In recent years, with the deepening of the concept of quality education, the physical and mental health development of students has attracted attention from all sectors of society. The "Overall Plan for Deepening the Reform of Education Evaluation in the New Era" issued by the State Council clearly proposes to establish the education concept of health first, and to make students' physical and mental health an important part of school assessment. The "Double Reduction Work Plan" further emphasizes the need to scientifically arrange homework volume and duration, and leave sufficient time for students' physical exercise, rest and entertainment. In this context, aerobic exercise, with its unique advantages of strengthening the body and regulating both physiological and psychological aspects, is gradually becoming a new path and lever for school physical education reform.

2 Characteristics of aerobic exercise and current physiological health status of students

2.1 Characteristics of Aerobic Exercise

Aerobic exercise is a medium to low-intensity, long-lasting form of exercise, such as jogging, swimming, cycling, etc. During exercise, the human body is able to fully absorb and utilize oxygen, thereby efficiently producing energy and effectively exercising cardiovascular function. Compared with anaerobic exercise, aerobic exercise has moderate intensity and low risk, making it more suitable for a large student population. At the same time, aerobic exercise has significant fitness effects, which can significantly improve cardiovascular endurance, enhance immunity, control weight, relieve stress, and have a comprehensive promoting effect on students' physical and mental health.

2.2 Student Physical Health Status

In recent years, the physical health status of students has been worrying. Firstly, students' physical fitness is showing a downward trend. The results of a survey on the physical fitness and health of Chinese students show that physiological indicators such as endurance, strength, flexibility, and speed continue to decline. Secondly, the issue of obesity is becoming increasingly prominent. Research has found that the rate of overweight and obesity among primary and secondary school students is constantly increasing, with obesity rates in some areas even exceeding 20%. Once again, students' immunity decreases and their susceptibility to diseases increases.

3 The impact of aerobic exercise intervention on students' physiological status

3.1 Improving students' cardiopulmonary function

Aerobic exercise is a form of exercise that can effectively improve cardiovascular and pulmonary function. During

aerobic exercise, students' heart rate and respiratory rate increase to meet their body's demand for oxygen. Long term adherence to aerobic exercise can enhance myocardial contractility and increase cardiac output, thereby increasing the ability of blood to transport oxygen. At the same time, aerobic exercise can also improve lung capacity and ventilation efficiency, making gas exchange in the alveoli more complete.

3.2 Enhancing Students' Immunity

Moderate aerobic exercise can regulate the body's immune function and enhance its resistance. During exercise, immune cells such as lymphocytes and macrophages are mobilized into the bloodstream to enhance their activity and function. At the same time, exercise can also promote the production of immunoglobulins and improve the body's humoral immune level. Some studies have found that the incidence rate of common diseases such as upper respiratory tract infection of students who often engage in aerobic exercise is significantly lower than that of students who are sedentary. Therefore, implementing aerobic exercise intervention in school education can effectively enhance students' immunity and improve their health level.

3.3 Promoting Student Weight Control

Obesity has become one of the main threats to students' health today. Regular aerobic exercise is an important means of preventing and controlling obesity. During aerobic exercise, students' bodies mobilize free fatty acids in their adipose tissue to provide energy, thereby reducing the accumulation of body fat. At the same time, a large amount of calories are consumed during exercise, which helps maintain energy balance and prevent excessive weight gain. Regular aerobic exercise such as running, swimming, ball sports, etc. can significantly reduce students' body fat percentage and BMI index, and have a positive effect on students' weight control.

3.4 Improving Students' Cognitive Function

In addition to being beneficial for physical health, aerobic exercise can also directly promote students' cognitive development. Numerous studies have shown that moderate aerobic exercise, such as jogging, swimming, etc., can improve cerebral blood flow and increase the secretion of brain-derived neurotrophic factor (BDNF), thereby promoting neuronal growth and synaptic plasticity. This helps to strengthen students' cognitive abilities such as memory, attention, and executive function. In addition, exercise can also reduce students' anxiety and depression, keeping them in a positive and optimistic attitude, indirectly promoting the improvement of learning outcomes.

4 Aerobic exercise intervention measures for integrated education and teaching

4.1 Optimize course offerings

Incorporating aerobic exercise into the school physical education curriculum is a fundamental measure to promote the integration of education and teaching. Schools should adhere to the educational philosophy of putting health first, and systematically plan and design curriculum objectives, content, and study hours to provide students with scientific and standardized aerobic exercise guidance. Specifically, schools need to reasonably determine the proportion of aerobic exercise in physical education courses and offer compulsory or elective courses such as long-distance running, swimming, and dance based on students' age characteristics. While enriching the content and format of the course, interesting and interactive teaching activities should also be incorporated to enhance student participation. In addition, establishing a student exercise effectiveness evaluation system that includes attendance rate, exercise volume, physical fitness indicators, etc. in academic evaluation can effectively guide students to pay attention to and persist in participating in aerobic exercise.

4.2 Innovative Teaching Mode

Innovative aerobic exercise teaching mode is the key to improving classroom teaching efficiency and stimulating students' enthusiasm for exercise. Schools should encourage physical education teachers to transform the traditional teacher centered teaching philosophy and explore new teaching models that are student-centered and tailored to individual needs. Teachers can use diverse teaching methods such as situational creation, group cooperation, and game competitions to enhance students' sports skills and cultivate their lifelong awareness of physical education through entertainment. To promote the transformation of teaching modes, schools also need to provide training on teaching methods, enhance the teaching and research abilities and information technology level of physical education teachers,

and encourage them to develop new teaching resources such as online MOOCs and virtual simulations. At the same time, incorporating indicators such as student participation and exercise effectiveness into the teacher performance evaluation system to motivate teachers to continuously optimize their teaching methods. Strengthen inter school communication and cooperation, promote excellent teaching models through teaching observation, experience sharing and other forms, and form a positive interactive and progressive teaching ecology.

4.3 Strengthen scientific monitoring

It is difficult to accurately evaluate students' exercise effectiveness based solely on teachers' subjective feelings when conducting aerobic exercise teaching. Schools should use scientific means to strengthen the dynamic monitoring of students' physical health status, and use the monitoring results as the basis for optimizing teaching and guiding students' exercise. To achieve precise monitoring, schools need to establish electronic health records for students, systematically recording their physical fitness test data and exercise participation, and forming a comprehensive evaluation mechanism combined with academic performance; On the other hand, intelligent wearable devices should be introduced to collect real-time exercise data such as students' steps, heart rate, and calorie consumption, which facilitates student self-management and teacher tailored instruction. With the help of big data analysis platforms, schools can create a portrait of the physical health status of student groups, gain in-depth insights into the effectiveness of aerobic exercise interventions, and provide decision-making references for physical education teaching reform. Regularly monitoring students' physical fitness indicators can not only visually reflect the effectiveness of interventions, but also help strengthen students' self-management awareness and adjust exercise plans to achieve optimal fitness results.

4.4 Creating a Good Atmosphere

A good campus atmosphere is an important guarantee for promoting the integration of aerobic exercise teaching. Aerobic exercise should not be limited to physical education classes, but should permeate all aspects of campus life. To this end, schools should focus on strengthening the construction of sports culture, and through rich and colorful campus cultural and sports activities, enhance the sports awareness and participation enthusiasm of teachers and students unconsciously. At the same time, attention should be paid to optimizing the campus environment, improving sports facilities, and creating good exercise conditions for teachers and students. On the basis of hardware construction, schools should make full use of various propaganda platforms to hold special lectures on sports and health, place public service advertisements on campus radio and bulletin boards, increase the popularization of aerobic exercise science, and make health knowledge deeply rooted in people's hearts and integrated into campus culture. Good home school interaction can help students consolidate their exercise effects after class and during holidays, and cultivate good habits of lifelong exercise.

5 Conclusion

In summary, aerobic exercise intervention from the perspective of integrated education and teaching has pointed out the direction for the reform of school physical education in the new era. As the main battlefield for educating students, schools should shoulder the responsibility of guiding students to master scientific exercise methods and cultivate healthy lifestyles. Guided by the educational philosophy of putting health first, schools should focus on top-level design and organically integrate aerobic exercise into the entire teaching process, blending with moral, intellectual, and aesthetic education to unleash vitality and vitality. The optimization of curriculum system, innovation of teaching mode, scientific monitoring and follow-up, and creation of campus culture are interrelated, jointly building a solid fortress for aerobic exercise intervention.

References

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