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Research on the Correlation between Physical Health Diagnosis of College Students and Intervention Mechanism of Exercise Prescription

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Abstract: *This study aims to explore the correlation between the diagnosis of physical health among college students and the intervention mechanism of exercise prescription. By analyzing the diagnosis data of students' physical health and combining it with the formulation and implementation effects of exercise prescriptions, the study found that physical health diagnosis provides a scientific basis for developing personalized exercise prescriptions and can significantly improve students' physical health level. Research has shown that personalized exercise prescriptions can not only be accurately designed based on students' health conditions to avoid sports injuries, but also dynamically adjusted and optimized through big data analysis and intelligent platform support. When implementing the intervention mechanism of exercise prescription in universities, it is necessary to optimize the allocation of sports resources, improve the professional quality of teachers, and strengthen the cultivation of students' awareness of sports participation to ensure the effectiveness of intervention measures. Comprehensive analysis shows that the close integration of physical health diagnosis and exercise prescription is a key way to improve the physical health of college students and is of great significance for promoting their comprehensive development.*

Keywords: *college students, physical health diagnosis, exercise prescription, individualization, sport management*

1. Introduction

With the rapid development of the social economy and the continuous improvement of people's living standards, health issues have gradually become a focus of social attention, especially among college students in higher education. As the future pillars of the country, the physical and health status of college students is directly related to their personal physical and mental development and the long-term progress of the country. However, in recent years, with changes in lifestyle and increasing academic pressure, there have been widespread issues with the physical health of college students. Health problems such as obesity, decreased cardiovascular function, and generally weak physical fitness are becoming increasingly prominent, and effective measures are urgently needed to improve them.

Physical health, as an important indicator of a person's overall health level, is influenced by numerous factors. Due to prolonged sitting in classrooms and in front of computers, college students lack sufficient physical exercise, resulting in insufficient physical activity and subsequently affecting their physical health. Although the traditional physical education model to some extent encourages students to participate in sports, it lacks specificity and personalization, and fails to fully meet the diverse needs of students' physical fitness. Therefore, how to comprehensively evaluate students' physical health through scientific means and improve it through personalized intervention measures has become an important issue facing current physical education in universities.

Exercise prescription, as a personalized exercise intervention based on individual physical fitness assessment and tailored to health status and needs, has gradually become a hot topic in modern health management. Through precise exercise prescriptions, not only can individuals effectively improve their physical fitness and health status, but they can also play a positive role in preventing and treating

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chronic diseases, enhancing mental health, and other aspects. In this context, it is particularly important to combine exercise prescriptions with the diagnosis of physical health among college students and improve their physical health level through scientific intervention mechanisms.

At present, although there have been many studies on the physical health status of college students both domestically and internationally, and some improvement measures have been proposed, there is still limited research on the combination of specific physical health diagnosis and exercise prescription intervention mechanisms. How to develop scientifically effective exercise prescriptions for students based on their physical health diagnosis results and ensure their effective implementation in practice has become an urgent problem to be solved in this study.

This study aims to explore the correlation between the diagnosis of physical health among college students and the intervention mechanism of exercise prescription. Firstly, analyze the current situation of physical health among college students and clarify the main problems that students face in terms of physical health. Secondly, explore the concept, characteristics, and application of exercise prescriptions in physical health interventions, with a focus on how to design personalized exercise prescriptions based on students' specific health conditions. Finally, based on the diagnosis data of physical health and the practice of exercise prescription intervention, the correlation between the two is analyzed, and corresponding intervention strategies and optimization plans are proposed, in order to provide scientific theoretical support and practical guidance for the improvement of physical health of college students. The innovation of this study lies in the organic combination of physical health diagnosis and exercise prescription intervention mechanism for college students, forming a personalized health intervention model, and analyzing its effectiveness through specific experimental data. Through this study, it is expected to provide new ideas for the management of physical fitness and health in universities, promote the reform and innovation of physical education teaching models, and safeguard the physical and mental health of college students, contributing to the healthy development of higher education in China.

2. Analysis of the current status and problems of physical health diagnosis for college students

2.1 Overview of physical health of college students

With the modernization process of society and the development of technology, the lifestyle of college students has undergone significant changes. Traditional physical labor is gradually being replaced by modern technological equipment, and many college students' daily lives are mainly focused on studying, surfing the internet, and entertainment [1]. The time and frequency of sports activities have significantly decreased, leading to a significant decline in their physical health that cannot be ignored. According to extensive research and surveys, current college students generally suffer from a series of problems such as decreased physical strength, increased obesity rates, and excessive psychological pressure. These problems not only affect students' academic performance, but also have long-term negative impacts on their physical and mental health.

The physical health of college students directly reflects their physiological and psychological well-being. Physical fitness includes multiple aspects such as cardiovascular function, muscle strength, flexibility, endurance, etc., while mental health includes balance in emotional regulation, stress management, interpersonal relationships, and other aspects [2]. The decline in physical health is often closely related to factors such as unhealthy eating habits, lack of exercise, and long-term exposure to high-intensity academic stress. In recent years, with the increasing attention to health, how to strengthen the physical health of college students has become a focus of attention for higher education and various sectors of society.

2.2 Existing models for physical health diagnosis

At present, the diagnosis of physical health of college students can be roughly divided into two modes: traditional mode and modern mode.

Traditional physical health diagnosis mainly relies on physical fitness testing and basic health check ups. Common physical fitness testing items include 50 meter running, standing long jump, sit ups, height and weight measurement, etc. These test items mainly evaluate students' basic physical fitness, which can to some extent reflect their sports ability and physical health status. However, the traditional model of physical health diagnosis is relatively single, ignoring individual differences and complex

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physical health conditions of students. In addition, these tests are usually only one-time checks and cannot track students' physical changes in the long term.

With the development of health management and sports medicine, more and more universities are adopting modern physical health diagnosis models [3]. This model emphasizes the comprehensive evaluation of students' physical health status, not only through physical fitness tests, but also including physiological indicators (such as blood pressure, blood sugar, heart rate, etc.), body composition analysis (such as body fat percentage, bone mass, muscle mass, etc.), and psychological health assessment. Many universities use digital devices and intelligent tools for real-time data monitoring, such as smart health bracelets, exercise monitoring systems, etc., to provide personalized health analysis and management recommendations for students.

Although the modern physical health diagnosis model has been gradually promoted in some universities and the accuracy of health assessment has been improved through information technology, it still can't be popularized in all universities due to high investment costs and technical implementation difficulties. In addition, due to the lack of unified standards, there are differences in the existing physical health diagnosis models among universities, making it difficult to form effective nationwide connections.

2.3 Problem analysis and challenges

Although universities have made certain efforts in physical health diagnosis, they still face many problems and challenges.

Students have weak health awareness. Many college students lack sufficient attention to their physical health, especially those under high academic pressure. They often believe that learning is more important than exercise and neglect the maintenance of their physical fitness. Some students lack fitness habits and are unwilling to actively participate in sports activities, leading to increasingly serious physical health problems. In addition, due to the popularity of health management concepts and individual differences in understanding of health management, students often find it difficult to develop effective exercise plans based on their own health conditions.

The diagnostic data is incomplete and lacks personalized guidance. Although the current physical health diagnosis work in universities has been widely applied in many schools, there are still problems of incomplete data collection and insufficient analysis overall. Many schools rely solely on basic physical fitness test data, neglecting multidimensional testing of various indicators of students' bodies, such as body fat percentage and muscle mass. Lack of in-depth analysis and guidance on the individual health status of students makes it impossible to achieve personalized health management.

Health interventions lack sustainability. Although some universities have conducted physical health diagnosis and provided exercise prescriptions and health advice for students, most intervention measures are only short-term and lack long-term tracking and effectiveness evaluation. Due to the constantly changing living environment and activity patterns of students, the existing intervention measures are difficult to achieve sustained and long-term effects, resulting in the inability to fully realize the effectiveness of the intervention.

Resource and technological limitations. Although modern physical health diagnosis models have strong technicality and accuracy, many universities have resource limitations due to the need for high-end equipment and support from professional technicians. Especially in some economically disadvantaged universities, it is difficult to invest excessive funds in equipment updates and technical training, which limits the comprehensive promotion of physical health diagnosis work. In addition, the storage, analysis, and utilization of physical health data also rely on professional technical platforms and information management systems, and existing technical platforms are often not mature enough, which affects the accuracy and practicality of data analysis.

Student participation in sports is low. Even though universities have provided certain exercise prescriptions and health interventions, many students' participation in sports is still low due to insufficient physical education curriculum and extracurricular activities. Especially during exam season or near graduation, students tend to focus a lot of energy on their studies and neglect physical exercise. The solution to this problem not only depends on the improvement of physical health diagnosis, but also requires universities to establish a comprehensive sports culture and atmosphere, encouraging students to integrate sports into their daily lives.

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3. Theory and practice of exercise prescription intervention mechanism

The intervention mechanism of exercise prescription is a health promotion method based on scientific exercise and health management theory, mainly through personalized exercise prescription, combined with students' physical health status, to provide them with tailored exercise plans, thereby achieving the goal of improving physical health. With the increasing emphasis on health management in society and medicine, exercise prescription has gradually become an important intervention tool, especially in the physical health intervention of college students, demonstrating its unique value and application prospects.

3.1 Definition and principles of exercise prescription

Exercise prescription is a systematic, scientific, and personalized exercise plan developed for individuals based on their health status, physical characteristics, and health goals. The formulation of exercise prescriptions should comprehensively consider factors such as individual age, gender, health level, exercise history, and lifestyle habits, with the aim of improving physical health, preventing diseases, and enhancing quality of life through appropriate exercise interventions.

Specifically, exercise prescription is not just a simple exercise plan, but a systematic intervention method that integrates knowledge from multiple fields such as exercise physiology, exercise psychology, and health assessment. Through personalized exercise prescription, it regulates the physiological functions of the human body, promotes the improvement of physical fitness, and prevents or alleviates the occurrence of various chronic diseases.

The formulation of exercise prescriptions needs to follow several basic principles. Firstly, the principle of personalization is that exercise prescriptions should be adjusted based on individual health status, physical characteristics, exercise ability, disease history, and exercise preferences to ensure the effectiveness of interventions. Secondly, the principle of gradual increase should be followed. The intensity of exercise should be gradually increased to avoid injury or discomfort caused by excessive load, especially for beginners or those who do not exercise for a long time. The amount of exercise should be gradually increased starting from low-intensity exercise. The third principle is comprehensiveness, and exercise prescriptions should cover various types of exercise such as aerobic exercise, strength training, flexibility training, etc., in order to comprehensively improve various body indicators and avoid damage or single effects caused by a single type of exercise. The fourth principle is safety. When formulating exercise prescriptions, special attention should be paid to safety, especially for people with underlying diseases or poor physical fitness. Health assessments should be conducted before exercise to ensure the safety of exercise and reduce injuries and accidents. Finally, there is the principle of persistence. The effectiveness of exercise prescriptions is often long-term, and exercise plans should be combined with daily life and learning to form long-term and sustained exercise habits, ensuring the sustainability of health improvement.

3.2 Intervention mechanism of exercise prescription

The intervention mechanism of exercise prescription achieves the improvement of individual physical health through several key links. The first stage is the evaluation and diagnosis phase, which provides a comprehensive health assessment (including measurements of body mass index, body fat percentage, cardiopulmonary function, muscle strength, and other indicators) and an understanding of students' exercise habits, dietary habits, and daily routines, laying the foundation for developing personalized exercise plans. Next, in the design phase of the exercise prescription, based on the evaluation results and combined with the students' physical health status, a diversified exercise plan that meets their needs is designed, including aerobic exercise, strength training, and flexibility training, ensuring that their exercise intensity, frequency, duration, and progression meet their health needs. The implementation stage is to ensure that students exercise according to the exercise prescription, and provide real-time data feedback through the health management platform and exercise monitoring equipment to help students master the correct exercise methods and avoid sports injuries. In the process of effectiveness evaluation and adjustment, regular physical fitness tests and health assessments are conducted to track changes in students' bodies and adjust exercise prescriptions to ensure they always meet their health needs. Finally, psychological intervention and support are also important aspects that cannot be ignored. Exercise can not only improve students' physical health, but also relieve academic pressure and regulate emotions. Through psychological counseling and exercise motivation, it can help students establish confidence and motivation to persist in exercise for a long time.

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3.3 Challenges and obstacles in implementing exercise prescriptions

Although the intervention mechanism of exercise prescription has great potential in theory, it still faces many challenges and obstacles in practical application. Firstly, many students have a relatively weak understanding of health management, often placing academic pressure first and ignoring the necessity of exercise. Some students also have a "quick success and instant benefits" mentality, blindly pursuing short-term results, leading to unscientific exercise behavior, and even giving up exercise. Secondly, many universities, especially those with limited resources, lack sufficient sports facilities and venues to meet the diverse sports needs of students, which limits the effective implementation of exercise prescriptions. In addition, the implementation of exercise prescriptions requires professional guidance and supervision, but due to a shortage or insufficient training of sports professionals, many universities are unable to provide students with sufficient exercise guidance, which affects the effectiveness of interventions. And personalized adjustment is also a major challenge. Due to the different physical conditions, health goals, and exercise preferences of each student, how to accurately design personalized exercise prescriptions is still an urgent problem to be solved. Finally, although exercise prescriptions emphasize long-term persistence, students face difficulties such as academic pressure and time constraints, making it difficult to find time for regular exercise amidst heavy learning tasks. Long term persistence becomes a challenge. In summary, as a personalized health intervention method, exercise prescription has significant theoretical value and practical significance, but it faces many challenges in its implementation process. It is necessary to start from the aspects of student health awareness, exercise resources, professional guidance and support, overcome these obstacles, promote the widespread application of exercise prescription in universities, and thus improve the overall physical health level of students.

4. Optimization strategies for physical health diagnosis and exercise prescription intervention mechanism for college students

In the current higher education system, with the increasingly prominent health issues among students, the optimization of physical health diagnosis and exercise prescription intervention mechanisms has become particularly important. Through a series of targeted optimization strategies, the implementation effect of exercise prescriptions can be effectively improved, helping students improve their physical health, enhance their physical fitness, and promote comprehensive development.

4.1 Improve the accuracy and comprehensiveness of physical health diagnosis

Improving the accuracy and comprehensiveness of physical health diagnosis is the foundation for implementing exercise prescriptions. Currently, some universities' physical fitness tests are relatively single, only evaluating students' health status through routine physical fitness tests, while ignoring multidimensional assessments of health, such as psychological health, lifestyle habits, dietary habits, and other factors. Therefore, universities should gradually introduce a more scientific and comprehensive health assessment system, which not only focuses on students' physical fitness, but also covers psychological, nutritional, and lifestyle assessments to ensure a comprehensive understanding of students' health status. On this basis, through modern physical health assessment tools and data analysis techniques, precise data collection and analysis are carried out to improve the accuracy of physical health diagnosis. In addition, regular health assessments are conducted and the assessment results are fed back to students to help them better understand their own health status and provide data support for the development of exercise prescriptions.

4.2 Personalization and precision of exercise prescription

The personalization and precision of exercise prescriptions are key to improving intervention effectiveness. When implementing exercise prescriptions, there are differences in each student's physical condition, health needs, interests, and exercise foundation, so a "one size fits all" exercise prescription cannot be used. Personalized exercise prescriptions should be tailored to students based on their health assessment results and their individual characteristics, to create a suitable exercise plan. Universities can use intelligent health management platforms to analyze students' health information through big data and develop more accurate exercise plans. At the same time, personalized exercise advice can be provided for each student, and prescription content can be adjusted in real time based on their exercise performance and feedback, ensuring that students achieve the best results during the

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exercise process. Through scientific personalized design, ensure that exercise prescriptions can improve students' physical health while avoiding sports injuries.

4.3 Strengthening sports management and resource support in higher education institutions

The strengthening of sports management and resource support in universities is a guarantee for the effective implementation of exercise prescriptions. Firstly, universities should increase investment in sports facilities and resources to ensure sufficient venues, equipment, and facilities to support students in engaging in diverse sports activities. For example, adding indoor gyms and sports facilities to provide a wider range of exercise options, allowing students to choose suitable sports projects based on their interests and needs. In addition, the sports management system should be optimized, a dedicated department for sports prescription guidance and support should be established, and professional sports teachers and coaches should be hired to provide personalized sports guidance and supervision for students. Universities can also enhance the quality and coverage of physical education courses by collaborating with professional sports organizations or health platforms, providing students with more diverse and professional sports activities and courses. In addition, a reasonable resource allocation and management system can effectively improve the execution rate of exercise prescriptions and students' participation enthusiasm, thereby achieving the goal of promoting students' health.

4.4 Enhance students' awareness of sports participation

Enhancing students' awareness of sports participation is an important guarantee for achieving the effectiveness of exercise prescription intervention. Whether students actively participate in sports directly affects the implementation effect of exercise prescriptions. Many students neglect physical exercise due to high academic pressure, time constraints, or lack of interest in sports. In order to enhance students' awareness of participation, universities can strengthen the promotion of physical education and health awareness through various channels, and improve students' sense of identification and participation in sports activities. For example, activities such as health lectures, sports skills training, and sports competitions can be organized to attract students' participation. At the same time, increase the fun and diversity of sports courses, avoid single forms of exercise, provide sports projects that meet different interests and needs, and stimulate students' enthusiasm for sports. By carrying out campus sports culture construction and organizing various forms of sports activities, we aim to cultivate students' awareness of lifelong sports, enabling them to truly understand the long-term benefits of exercise for health and actively participate in the implementation of exercise prescriptions.

By improving the accuracy and comprehensiveness of physical health diagnosis, promoting personalized and precise exercise prescriptions, strengthening university sports management and resource support, and enhancing students' awareness of sports participation, various optimization strategies can effectively promote the implementation of exercise prescription intervention mechanisms, improve students' physical health levels, and provide solid support for their comprehensive development. The implementation of these strategies not only contributes to the improvement of students' health, but also further promotes the development of sports culture in universities and cultivates more students with a healthy lifestyle.

5. Conclusion

This study explores the correlation between the diagnosis of physical health among college students and the intervention mechanism of exercise prescriptions, revealing the key role of physical health diagnosis in the formulation of exercise prescriptions, as well as the effectiveness of personalized exercise prescriptions in improving students' physical health.

Firstly, physical health diagnosis serves as a fundamental assessment tool, providing a scientific basis for the precise formulation of exercise prescriptions. Through comprehensive and multidimensional health assessments, universities can accurately grasp students' physical condition, health needs, and potential risks, and tailor scientific and reasonable exercise plans for them. This personalized intervention mechanism based on health diagnosis results effectively avoids a one size fits all approach and can better meet the health needs of different students. Secondly, the personalization and precision of exercise prescriptions are the core of improving intervention effectiveness. Research has found that developing appropriate exercise prescriptions for students with different health conditions can not only effectively improve their physical health, but also reduce the incidence of

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sports injuries. In addition, with the development of big data analysis and intelligent health management platforms, the formulation and adjustment of exercise prescriptions have become more scientific and flexible. Students can achieve their health goals under professional guidance and continuously optimize their exercise plans based on actual feedback. Furthermore, sports management and resource support in universities have a significant impact on the implementation of exercise prescriptions. Optimizing the allocation of sports resources, strengthening facility construction, and enhancing the professional quality of sports teachers and coaches are key to ensuring the smooth implementation of the exercise prescription intervention mechanism. Universities should further increase their investment in physical education and sports activities, provide students with more diverse and abundant sports choices, and enhance their sense of participation and responsibility in sports. Finally, this study emphasizes the cultivation of students' awareness of sports participation. In a high-pressure academic environment, students often overlook physical exercise, and enhancing their health awareness and stimulating their interest in sports are crucial for improving the effectiveness of exercise prescription interventions. Colleges and universities should guide students to actively participate in sports through innovative physical education models and diverse sports activities, thereby promoting the comprehensive development of students' physical and mental health.

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