



## Perspective Physical Exercise of Students' Health and Fitness in Xi'an Physical Education University

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### Abstract

**Background and Aim:** The university stage is a crucial period for promoting the healthy development of adolescents, and it also plays a pivotal role in cultivating exercise habits among undergraduate students. However, in the realm of exercise, we have observed a declining trend in proactive engagement, with students lacking access to a systematic exercise program to guide them. To address these issues and enhance the health and well-being of undergraduate students in Xi'an while simultaneously reducing anxiety, our goal was to develop an exercise program that can help students enhance their physical fitness and alleviate anxiety. Our ultimate aim is to foster the healthy growth of undergraduates by improving their physical fitness and reducing anxiety through a well-designed exercise regimen.

**Materials and Methods:** First review physical fitness of low physical fitness and high anxiety of 1000 students at Xi'an Physical Education University. Survey anxiety of 45 students from university who had high anxiety levels by special sampling method. Result of a physical fitness test and anxiety test. Second semi-structured questionnaire and draft exercise program by experts' deep interview. Next, we conduct an experimental exercise program. Finally, we can confirm the exercise program by survey.

**Result:** Through the exercise programs we designed, we successfully increased students' fitness levels and reduced anxiety levels. After the students continued to exercise through this exercise program for eight weeks, the results of all physical fitness test items reached the passing level, and 31 students no longer felt anxious, while the number of students who felt mild anxiety dropped to 14. The findings strongly suggest that through targeted exercise programs, students' physical fitness levels can be significantly improved and help reduce anxiety on a psychological level.

**Conclusion:** There are many students whose physical fitness scores are unsatisfactory, unqualified, and anxious. After eight weeks of physical exercise, the anxiety scores of 31 students were within the normal range, and the anxiety scores of 14 students had been reduced to low anxiety.

**Keywords:** Health-related Physical Fitness; Anxiety; Physical Fitness Training Method; Anxiety Training Method; Related research

### Introduction

The university stage is a crucial period for promoting the healthy development of adolescents, and it also plays a pivotal role in cultivating exercise habits among undergraduate students. However, it has come to our attention that most previous studies exploring the impact of exercise on the physical and mental health of university students have relied on unsystematic exercise models and intervention programs. These interventions were typically integrated into physical education classes, lasting over an hour, which posed a challenge for many university students to commit to due to the demands of their undergraduate studies and other factors, leading to increased feelings of anxiety. In the realm of exercise, we have observed a declining trend in proactive engagement, with students lacking access to a systematic exercise program to guide them. Even when individuals express a desire to engage in physical activity, they often struggle to decide which specific activities to pursue and how to structure their exercise routines.

To address these issues and enhance the health and well-being of undergraduate students in Xi'an while simultaneously reducing anxiety, we conducted a survey targeting non-sports major undergraduates at Xi'an Institute of Physical Education. Through this survey, we aimed to understand and analyze the relationship between students' physical fitness and anxiety levels. Subsequently, our goal was to develop tailored exercise programs, carry out experiments, observe the outcomes of these experiments, and ultimately devise a comprehensive exercise program that can help students enhance



their physical fitness and alleviate anxiety. Our ultimate aim is to foster the healthy growth of undergraduates by improving their physical fitness and reducing anxiety through a well-designed exercise regimen.

The practical significance of this study is to explore a new exercise program for the physical exercise and sports and fitness of undergraduate universities and even all kinds of social people and to conduct empirical research, which is of great significance to change people's physical health, mental health, lifestyle, and sports concept.

## Objectives

### 1. Main objective

To develop of exercise program to improve health-related physical fitness and anxiety for Xi'an Physical Education University students.

### 2. Subsidiary objectives

2.1 To investigate the problem of health-related physical fitness and anxiety in Xi'an Physical Education University students.

2.2 To develop exercise programs to improve health-related physical fitness and anxiety for Xi'an Physical Education University students.

2.3 To evaluate health-related physical fitness and anxiety within the group between pre-test, 4 text, 6 text, and 8 text.

## Literature Review

### Localize Research

At present, research on sports testing usually uses questionnaire surveys and sampling surveys to explore the level of physical health. Wu Jian, Zhao Jinwei, and others took Zhengzhou University as the research object and proposed reasonable measures and suggestions for the physical health of Zhengzhou University students by understanding and comparing the physical health testing results of university students, combined with the actual situation (Wu, et al, 2018: 146). Shi Huiying, Wang Hui, and others conducted statistical analysis on the physical fitness test data of university students in a certain university in Anhui Province using a literature review, measurement, questionnaire survey, and mathematical statistics. Combining the test results and questionnaire, they identified the reasons for the weak physical fitness of university students and proposed suggestions on how to enhance their physical fitness (Shi Huiying, et al., 2018: 110). Guo Yuliang and Fan Zizhe investigated the physical fitness testing status and future direction of physical education and teaching reform of medical university students under the background of big data, using all physical fitness and health test data from a certain Western Medical University's Grade 16 undergraduate students during the four years of university as samples, using methods such as literature review, interview, and descriptive statistics (Guo & Fan, 2022: 99). Ye Jinyong's literature report shows that regular physical exercise helps to reduce psychological problems such as somatization, anxiety, depression, paranoia, terror, and sensitivity, and promotes mental health (Ye, 2021: 85). Sun Lili's literature abstract shows that sports, as an important part of university education, have a positive effect on the physical and mental health of university students (Sun, 2022: 22). It is not only conducive to strengthening the body and improving physical quality but also of great significance in improving self-confidence and cultivating strong and optimistic qualities. Reasonable allocation of time to exercise can not only improve the physical function level but also improve the psychological state, to promote the comprehensive development of students' physical and

mental health.

Based on this study, Lin Xiaomin found that the different sports participation behaviors of university students, such as sports participation degree, physical exercise frequency, and physical exercise load, have different effects on the mental health of university students. High and moderate-intensity exercise users had significantly higher levels of mental health than low-intensity exercises. The longer the physical exercise time, the better the mental health state of university students. Under the premise of regular participation in physical exercise, maintaining a certain frequency of physical exercise is more conducive to improving the mental health of university students (Lin, 2019: 88).

Physical exercise for psychological adjustment, can help university students to better understand themselves, form the correct self-consciousness, effectively overcome inferiority or proud of paranoia, improve the ability to self-evaluation, correctly treat their faults, accept themselves, treat themselves, form healthy self-esteem, self-confidence and self-discipline, self-improvement, self-reliance, good personality. The psychological adjustment of physical exercise can help university students to better understand others, develop an open mind, tolerate the shortcomings of others, and have no prejudice to people, not demanding, not to blame. Through sports activities, communicate with people, not be stubborn, and be timely. Be good at appreciating others. I am also willing to help others, and I am willing to cooperate with them, actively experience the process of activities, and be good at sharing the troubles of failure with others, I am also willing to share the joy of success with others (Zhong, 2018).

#### **Foreignize research**

Stubbs, et al reviewed the research on the influence of physical exercise on emotion in the past 20 years, and the results showed that most of the research proved that physical exercise had a positive effect on improving emotion (Stubbs, et al, 2017). Perchtold-Stefan, et al proposed that more physical exercise can promote high-quality cognitive reappraisal because these high-quality cognitive reappraisals predict stronger psychological resilience, and they may serve as a mediating mechanism to promote a deeper association between physical exercise and subjective well-being (Perchtold-Stefan, et al, 2020: 274). The university students' regular participation in physical exercise can improve their psychological resilience and make them remain psychologically stable in stressful and frustrating situations. Therefore, they can make more positive evaluations of their life conditions and maintain a positive emotional experience. Yoshikawa et al. showed that physical exercise can reduce depressive symptoms through the mediation of social support and psychological resilience (Yoshikawa et al, 2016: 8). Physical exercise can play an intermediary role in the positive effect of subjective well-being, which is conducive to maintaining an efficient life for university students.

Foreign scholars believe that physical exercise behavior can promote psychological and physiological development, thus improving mental health and physical health. For example, Sampedro-Piquero et al., explain the molecular mechanism of physical exercise in promoting the development of psychological resilience, and physical exercise can regulate the activity of gene FKBP 5. It is a strong inhibitor of the glucocorticoid receptor and an important regulator of the stress response (Sampedro-Piquero, 2021: 1156). university students with high psychological resilience levels, who can successfully cope with adversity and stress in life, will have less stress response and are more likely to maintain mental health.

The other half is the pursuit of physical exercise on psychological and emotional regulation. Brand's research has shown that physical exercise can enhance emotional regulation, such as the generation of emotion regulation strategies (Brand, 2018: 249). In addition, physical exercise is related

to emotional cognitive control and the success of cognitive reappraisal, which can improve the effectiveness of cognitive reappraisal and reduce emotional responses to negative emotional cues. Participation in physical exercise can give people a sense of empowerment, vitality, and freedom, and achieve sensory experience through the use of the body. By facing their bodies, people can selectively modify their state and inhibit reactive regulation during physical exercise, to obtain direct body perception experience and help to build a sense of security.

In addition, some researchers have found that proper intensity of physical exercise can effectively combat psychological pressure, relieve and release psychological pressure, and establish a self-protection mechanism. Scholar Gerber found in a study that the pressure perceived by individuals with medium and high-intensity exercise is low. Kobasa Studies have also shown that individuals who regularly exercise will have much lower stress responses and an increased ability to withstand setbacks. To sum up, physical exercise provides a solid material foundation for the development of mental health, and human psychology is the activity of the human brain. The development of mental health must be based on a normal and healthy body, especially on the normal and healthy development of the nervous system and the brain. Physical exercise can promote students' normal and healthy physical development, and provide a solid material foundation for psychological development. This is an important condition of psychological development. Sports practice has proved that the human body fitness exercise is mostly systemic, sports can be both fitness and brain health. Therefore, exercise is not simply limited to shaping the body surface of strong muscles and flexible limbs, but also has the internal regulation function of the brain and fitness heart. Due to the particularity of physical education, the effect of mental health education cannot be replaced by other disciplines. At the same time, physical exercise can adjust people's psychological state, edify sentiment, and hone the will, to meet the needs of growing physical and mental development. Physical exercise is not only beneficial to physical health but also has a function of psychological, in sports participation, physical, psychological, and mental are very good satisfaction, so, this paper through the present situation of university students 'physical exercise and mental health, further verifies and explore the relationship between physical exercise and mental health, to expect through physical exercise to better solve the practical problems of university students' psychology.

The above research shows that domestic and foreign scholars have conducted in-depth analysis and discussion on the relationship between sports and individual mental health, which to some extent reflects that there is a correlation between physical exercise and mental health, and the specific theoretical basis for the positive effect of physical exercise on mental health needs further analysis and research according to experimental data.

## Conceptual Framework

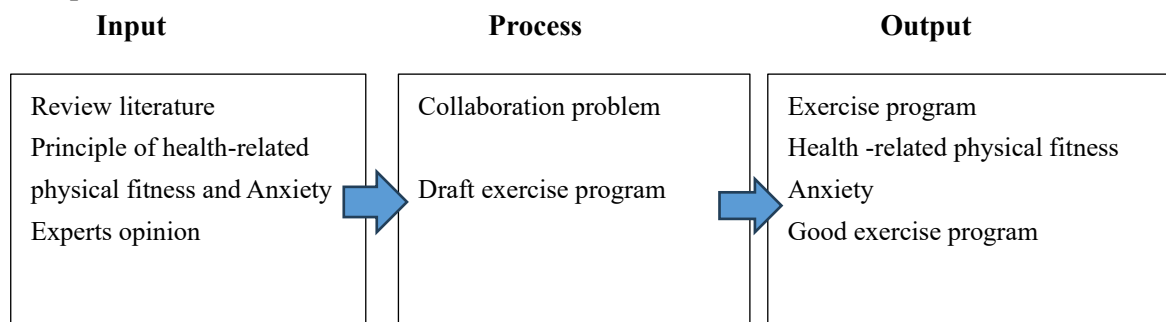


Figure 1 Conceptual Framework

## Methodology

This research is R&D. Population and sample: Population: A low physical fitness and high anxiety of 1000 students at Xi'an Physical Education University. Sample: 45 students university who high anxiety levels by special sampling method. Experimental method: Analyze the survey results, make the corresponding exercise program, and carry out relevant experiments according to the schedule. And Data Analysis: Evaluation text result.

## Results

Before designing the exercise program, the physical fitness of 1,000 non-sports major undergraduates at Xi'an Physical Education University was tested. The results showed that only 400 non-sports major undergraduates' physical fitness scores were fully qualified. The remaining 600 undergraduate students who were not majoring in physical education all had unsatisfactory scores in certain categories. This ratio shows that more than half of the students failed the physical fitness test. These events include 11 test items including height, weight, BMI, vital capacity, 50-meter run, standing long jump, seated forward bend, 800-meter middle-distance run, 1000-meter middle-distance run, one-minute crunches, and one-minute pull-ups. The number of students with unsatisfactory results accounts for 600 students. This unsatisfactory result is in great need of change. The physical fitness scores of students are not ideal and there are many unqualified students.

After an eight-week exercise program trial, the designed exercise program was effective. It can improve students' physical fitness and reduce students' anxiety. This study conducted a physical fitness test on 45 students selected through a special sampling method and concluded that 42 students eventually reached the normal range in terms of BMI, and the remaining three students' BMI values gradually returned to the normal range. In the spirometry test, 45 students reached the passing level, and all of them passed. In the 50-meter sprint test, 45 students met the passing standard, and all of them passed. In the standing long jump test, all 45 students passed the test. In the seated forward bend test, 45 students met the passing standard, and all of them passed. In the 800-meter middle-distance running test, the passing standard is that freshman and sophomore girls run within 4 minutes and 34 seconds, and sophomore and junior girls run within 4 minutes and 32 seconds. All 22 female students passed. In the 1,000-meter middle-distance running test, the passing standard is that freshman and sophomore boys run within 4 minutes and 32 seconds, and sophomore and junior boys run within 4 minutes and 30 seconds. All 23 male students passed. In the sit-up test event, the final results of the freshman and sophomore girls reached 26 in one minute, and the final results of the junior and senior girls reached 27 in one minute. All 22 girls in total were deemed to have passed the test. qualified. In the pull-up test, the final results of the freshman and sophomore boys reached 10 in one minute, and the final results of the junior and





senior boys reached 11 in one minute. They were all deemed to have passed the test. A total of 23 boys qualified.

In the anxiety test, after eight weeks of physical exercise, the anxiety scores of 31 students were within the normal range, and the anxiety scores of 14 students had been reduced to low anxiety.

## Discussion

Through the experiment with the development of an exercise program, it can be seen that the students' physical fitness has been significantly improved and their anxiety has been significantly reduced, indicating that the exercise program of this study is effective. Comparing the physical fitness test data of students before exercise, and after eight weeks of testing.

In the first test, 38 students passed the BMI test, 18 students reached the pass standard for vital capacity, 19 students reached the pass standard for the 50-meter run, 19 students reached the pass standard for the standing long jump, and 19 students reached the pass standard for the sitting body. 17 students met the passing standard for forward bending, 8 students met the passing standard for the 800-meter middle-distance running, 11 students met the passing standard for the 1000-meter middle-distance running, and 6 students met the passing standard for sit-ups and pull-ups. Standard has 7 students.

Eight weeks after the exercise program experiment, the student's physical fitness test results showed that there were 41 students with qualified BMI, one more student than the six-week test results. There were 45 students whose lung capacity reached the passing standard, an increase of 5 compared to the six-week test. 45 students met the passing standard in the 50-meter run, an increase of six students from the number who passed the six-week test. 45 students met the passing standard in the standing long jump, an increase of 8 students from the number who passed the six-week test. 45 students met the passing standard for seated forward bending, 8 more than the number who passed the six-week test. 22 students met the passing standard in the 800-meter middle-distance running, an increase of 7 students from the number who passed the six-week test. 23 students met the passing standard in the 1,000-meter middle-distance running, which was an increase of 3 students from the number of qualified students in the six-week test. 22 students met the passing standard for sit-ups, an increase of 5 students from the number who passed the six-week test. 23 students met the passing standard for pull-ups, an increase of 3 students from the number of qualified students in the six-week test. After eight weeks of experimenting with the exercise program, the students have all reached the passing standards.

In addition, Prior to creating the workout plan, Xi'an Physical Education University undergraduates who did not major in sports had their physical fitness evaluated. The findings showed that only 400 students met the requirements for physical fitness, and the other 600 students had inadequate scores in a number of areas, including running events, vital capacity, and BMI. More than half of the students failed the physical fitness test, which raises serious concerns about this distribution and emphasizes the need for intervention to raise student health and fitness levels. After putting a specially created exercise program through eight weeks of trial, the participants showed notable improvements. Forty-five students participated in the program's testing, and every single one of them showed notable gains in a variety of fitness metrics. In the 50-meter sprint, standing long jump, and spirometry test, for example, every participant achieved the passing standards, demonstrating improved muscular and cardiovascular endurance. In addition, 42 students' BMIs fell within the normal range, while the remaining three showed a slow improvement. The success of the exercise regimen in meeting the unique fitness needs of various genders and age groups is also demonstrated



by the high percentage of participants passing the sit-up, pull-up, and 800-meter and 1,000-meter runs. Apart from its physiological advantages, the physical education program had a noteworthy effect on the mental well-being of the pupils, particularly in terms of decreased anxiety. At the conclusion of the eight weeks, the anxiety scores of thirty-one students fell into the normal range, and the scores of fourteen students fell to low levels. This result highlights the benefits of consistent physical activity on improving mental and physical health. The results of the study highlight how crucial structured exercise programs are for promoting students' overall health in academic settings (Xi'an Physical Education University, 2024).

## Recommendation

This study has had a significant impact on improving student's physical fitness and reducing anxiety. Nevertheless, it's worth noting that the student samples used in this study were exclusively non-sports majors from Xi'an Physical Education University. Therefore, it is recommended that future research consider a more comprehensive design program that can be optimized to apply to a wider range of majors and undergraduate students from various institutions.

While we acknowledge that there will be challenges and difficulties in expanding the scope of the research, employing robust research and development (R&D) methods can lead to better-designed exercise programs for undergraduate university students, ultimately enabling them to enhance their physical fitness and reduce anxiety. This approach not only enhances the practicality and credibility of the research but also ensures its relevance across diverse academic disciplines.

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