

# Study on the Buffering Effect of Physical Exercise on College Students' Psychological Stress

Yanqin Huang<sup>1,2\*</sup>

## Abstract

In the face of stressful events beyond their own coping scope or negative evaluation, individuals will experience pressure and negative emotions will increase. Therefore, it is a very important research topic to adopt effective ways to adjust college students to correctly face psychological pressure and negative emotions, so as to promote their physical and mental health. Studies have shown that physical exercise, as a way of regulation, can promote mental health and individual mood. Most of the previous studies adopted transverse studies, and the follow-up studies were relatively limited, ignoring the changes at the individual level. A research method is designed to study the buffering effect of physical exercise on psychological stress of college students. To begin, study objectives and techniques are chosen, and descriptive statistics are computed. Second, the correlation coefficients of psychological pressure, negative mood, and physical activity among college students are compared and studied to complete the buffer effect research. The application value of the cushioning effect research technique is shown by the practical example analysis, which indicates that it can properly represent the cushioning impact of physical exercise on college students' psychological strain.

**Keywords:** physical exercise; college students; psychological; pressure; buffering effect; research

## 0. Introduction

In this era of great development of knowledge economy, knowledge economy has put forward a comprehensive test to the psychological quality of modern people. The future international competition is the competition of comprehensive national strength (Shinohara & Taito, 2020; Yang, Pan, & Xie, 2020), but also the competition of talents. In the face of the rapidly changing world, people's psychological pressure keeps increasing, and psychological disorders keep happening. Psychological problems have increasingly threatened human health (Biteli et al., 2021; Wittmer et al., 2021). Psychological stress is a kind of pressure on people's bodies and spirits that is created by a variety of life events, unexpected traumatic experiences, and persistent stress in people's everyday lives. The environment in which individuals live and the parties involved experience generates this desire. Some pressures are really large and heavy, and individuals can clearly feel them as well as understand their source, magnitude, and coping mechanisms (Storck et al., 2020; Wang, 2021). However, certain pressures are so subtle and insignificant that individuals may not be aware of them, but they often make people jittery and unsure of what to do. Plus, some of life's pleasures may be difficult. Because people's inner equilibrium is disrupted, good things produce psychological strain. For example, after a job promotion,

responsibilities and workload will rise in tandem (Ding, Yan, & Fu, 2021), which may make people unable to eat or sleep easily. Physical exercise, as a means of psychological treatment and mental health, has become a common method at home and abroad (de Oliveira Santos et al., 2021; Yu & Chi, 2021).

Studies show that sports not only enhance physical fitness, but also play a positive role in alleviating individual psychological pressure and regulating mental health (Alexopoulos, Frounta, & Perneczky, 2022; Jones, Reneau, & Dos Santos, 2021). Therefore, we should pay attention to its positive role in classroom teaching, use reasonable practice means and methods, so that students can experience the fun of exercise in the process of physical exercise, release depression, relieve psychological pressure, and serve for better completion of their studies. When exercise reaches a certain amount, the skin removal effect produced by the body can delight the nerves (Alexopoulos, Frounta, & Perneczky, 2022; Vassão et al., 2020) and even take away the pressure and unpleasantness. In addition, human brain and muscle information is two-way transmission. Nerve excitation can be transmitted from the brain to the muscles and from the muscles to the brain (Chang et al., 2019; Law et al., 2020). Active muscle activity, from the muscle to the brain to transmit more impulse, the brain's excitement level is high, the mood will be high. The reason why sports can effectively regulate people's psychological emotions is to follow this principle.

<sup>1</sup> Center for Studies of Ethnic Groups in Northwest China of Lanzhou University, Lanzhou University, Lanzhou, Gansu 730020 China

<sup>2</sup> University Of Sanya, School of Social Hainan, Sanya, 572000, China

\*Corresponding Author E-mail: [hyqczy13@sina.com](mailto:hyqczy13@sina.com)

Contemporary Chinese college students are a cross-century generation, a special group bearing high social and family expectations (Bressi et al., 2021). Along with their physiological and psychological development and development of society, the competition (Lavebratt et al., 2021), updating the self-image, the change of thinking mode, the expansion of social experience. They are under increasing pressure in study, employment, economy, emotion and other aspects (Hedlund et al., 2019), and inevitably form a variety of psychological problems and abnormal behaviors, which bring great psychological harm to students' families and have a strong impact on universities and the society (Improta-Caria & Aras Júnior, 2021; Shawahna & Nairat, 2021), causing widespread concern and profound reflection in the society. As an important part of school education, school physical education plays a special role in promoting students' mental health. Sports teaching because of its dynamic teaching activities, the physical activity of practical, flexible arrangement of interpersonal interaction, psychological complexity of the operation, the psychological experience of the compound and so on (Çiçek, Eagderi, & Sungur, 2019; Maria & Kush, 2022). It helps students improve the psychological condition, correct psychological defects, improve the psychological quality, to overcome the psychological barriers and so on, have other education can't replace the special effect. It is the most easily controlled and realistic mental health education tool, which should be attached great importance to it (Clerico et al., 1988).

## 1. Research method design of buffering effect of physical exercise on college students' psychological stress

### 1.1 Selection of research objects and research methods

The first step is to carry out the research hypothesis. Hypothesis 1: Daily psychological stress in college students has a long-term influence on the occurrence of unpleasant emotions. Hypothesis 2: Medium-high MET has a moderating influence on the connection between daily psychological stress and negative emotions in college students throughout the monitoring procedure. Figure 1 depicts a possible relationship model.

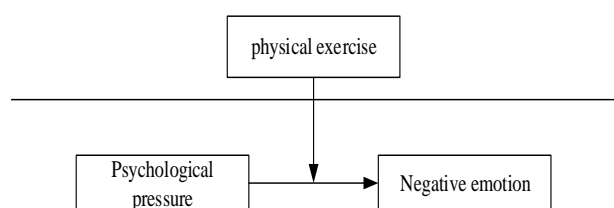


Figure 1. Hypothesis relation model

The Figure 1 shows that the model design is new, the track design, compared with a cross-sectional study, advantage is that can describe the psychological pressure in their daily lives and the continuity of negative mood change, can analyze the cause and effect, at the moment there is a causal calculation coefficient  $M$ , computation formula (1) is as follows:

$$M = mr - m_0r \quad (1)$$

In formula (1),  $m$  represents the change factor,  $r$  represents the relevant constant, and  $m_0$  represents the factor after iteration. This coefficient can be used for multi-layer model statistics, which can fully explain the tracking data, make more effective use of the tracking data, and make hierarchical analysis of the data. It can reflect the level changes between individuals and within individuals, and provide a basis for the tracking research of this field in daily life.

The term "stress" has varied meanings in different cultural contexts and scientific domains. As a result, there are several reasons for stress. According to one research, stress is described as "a condition of psychological tension and stimulation" as a technical word in psychology. Simply simply, "stress" is a term used to describe both emotionally and physically demanding circumstances. The body's reaction to stress is called stress. When confronted with stressful situations or perceived dangers, people will respond in a variety of ways. In this respect, stress theory research have shown that in unfamiliar and unexpected settings with no control or social assessment, negative appraisal of persons by others or by themselves is the determinant of psychological stress response, as illustrated in Figure 2.

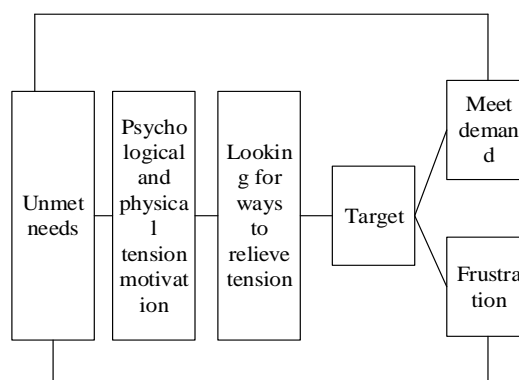


Figure 2. Psychological pressure forms the framework

By shown in Figure 2, from some of the complex environment and stress events in everyday life, these factors produce negative evaluation to individual, resulting in the individual psychological tension, and physical discomfort, the multi-level modeling is required to select research objects and research methods, modeling diagram are shown in Figure 3.

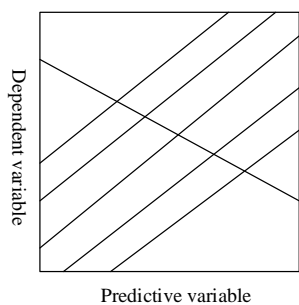


Figure 3. Modeling diagram

It can be seen from Figure 3 that the multi-layer linear model mainly solves the problem of data nesting. The advantage of the multi-layer linear model for data analysis is that multiple equations can be established, as shown in formula (2) and formula (3).

$$f(x) = Mr \tag{2}$$

$$f(x_0) = \frac{1}{Mr} \tag{3}$$

Formula (2) and formula (3) can be used to stratify variables according to the research hypothesis of this study. The modeling diagram is shown in Figure 4.

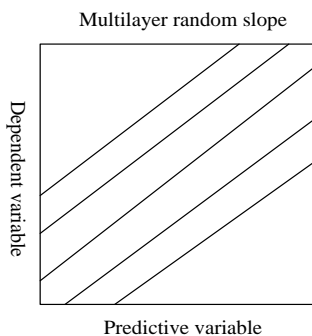


Figure 4. The second layer modeling schematic diagram

Figure 4 shows how the connection between variables may be evaluated and discussed at various levels. Regression of regression is another name for this procedure. Longitudinal research, sometimes known as "follow-up research," focuses on the change trend of people over time, as well as the change trend of inter-individual and intra-individual variables, as indicated by the change coefficient (see formula) (4).

$$k = \frac{mr - m_0r}{mr + m_0r} \tag{4}$$

Follow-up studies require a continuous follow-up of individuals and repeated measurements to record the data of each individual, with different observations for each individual through repeated measurements. Through the statistics of the tracked data, HLM was used for analysis and the first-level regression formula (5) was established. According to formula (5), the results of data tracking under different observation times are obtained formula (6).

$$g(x) = \frac{1}{Mr \frac{|mr - m_0r|}{mr + m_0r}} \tag{5}$$

$$b = k - g(x) = k - \frac{1}{Mr \frac{|mr - m_0r|}{mr + m_0r}} \tag{6}$$

As can be seen from formula (5) and formula (6), HLM statistics are used to analyze the changing trend of the correlation between college students' psychological stress and negative emotions as well as the influence of psychological stress on negative emotions over time. In the second layer, how different individuals exercise can affect the changing trend of this relationship can be discussed. In the process of data tracking, sample loss and data loss are caused by the large amount of sample data. HLM can compensate for this by allowing the existence of missing values. In addition, the sample data information obtained can be better used in establishing the first-level equation. Different research hypotheses can be proposed at different levels by HLM, and multiple models can be established to draw conclusions by testing the hypotheses. The use of HLM for tracking data statistics enables comprehensive analysis of the problem and is more convenient and flexible. This study used the CNKI database, Wanfang database, ISI database, and EBSCO psychological database to collect and integrate relevant literature on psychological stress, negative emotion, and physical exercise, as well as improving the study on the basis of previous studies and putting forward hypotheses to provide a scientific demonstration basis for this study. The questionnaire is made up of uniform standards due to the precise design of the questions. The amount of physical activity, psychological stress, and negative emotional state of college students were evaluated using a questionnaire in this research. Collecting samples using standard measurement, judging the general situation, features, and development law of the study object, integrating statistics and measurement, conducting descriptive statistics, processing the link between variables, and presenting hypotheses HLM was used in this study to analyse follow-up data on psychological stress, negative emotion, and physical exercise, as well as to investigate the influence of psychological stress on negative emotion and the moderating effect of physical exercise on the relationship between psychological stress and negative emotion..

### 1.2 Implementation of descriptive statistics

In this study, negative emotion was measured by the positive negative emotion scale (PANAS) developed by D. WASTON. Due to the requirements of this study, only the negative emotion scale was used. The negative emotion scale consists of 10 items, all of which are adjectives describing negative emotions. Participants were asked to recall their negative emotions within 24 hours to choose

the degree of negative emotions they experienced. The scale uses Likter five-point score, which is 1-5 points, and the total score of negative emotion ranges from 10-50 points. Negative emotion is judged according to the score. The higher the score, the higher the negative emotion. Domestic scholars concluded from the study on the adaptability of the scale in Chinese population that the positive and negative emotion scale is very good for the measurement of emotion, and has high reliability and validity. Psychological stress was measured by the Chinese version of perceptual stress scale. Participants were asked to rate their experiences of daily trivia, major events, and stressful situations dealing with resource changes within 24 hours. CPSS contains fourteen projects. There are seven reverse projects (4, 5, 6, 7, 9, 10, 13) and seven forward projects (1, 2, 3, 8, 11, 12). A 5-point Likert scale was used, with options ranging from 1 to 5 and psychological stress from 14 to 70. A higher score indicates greater psychological stress. The  $\alpha$  coefficient of the scale was 0.78. CPSS has been used in previous studies and is suitable for Chinese people's cultural background.

The physical activity level in this study was measured using metabolic equivalent (MET) to quantify the amount of physical activity. Godin's leisure physical activity level questionnaire (LTEQ) was adapted to obtain data on the frequency of leisure physical activity during the day. According to the previous study design, subjects were asked to fill in the LTEQ measurement data for the frequency of light (walking, class), moderate (brisk walking, cycling) and vigorous exercise (such as running, aerobic fitness and basketball) of more than 20 minutes in the past 24 hours, and calculate MET. Metabolic equivalent (MET) was used to evaluate and determine the amount of physical exercise, and the internal consistency of reliability and validity was good.

In the previous study, the quantification of physical exercise using the above measurement methods was analysed and evaluated using tracking data of daily psychological pressure, negative emotion, and physical activity of college students, and data analysis was conducted using SPSS25.0 and HLM8.0 software. Intra-individual data (layer 1) are layered at the inter-individual level (layer 2), with intra-individual data including psychological stress and negative mood characteristics and inter-individual data containing physical activity. The hypothesis is investigated by looking at whether psychological stress has a long-term impact on unpleasant mood and if physical activity may mitigate this relationship. Prior to data import, level variables within individuals were centralized and physical exercise was centralized as a whole. When tracking and measuring samples, changes in

variables within individuals may be correlated over time, which may lead to inaccurate data. In order to better explore the changes of individual psychological stress and negative emotions as well as the regulating effect of physical exercise over time. Therefore, the difference method of likelihood ratio was used to explain the missing values of variables according to the multi-layer model analysis. This study established three models for testing. The first is to establish the "zero model" test, which is mainly to analyze the variance variation of variables within the individual. Only when significant variation exists, multi-level analysis can be carried out, among which the first and second layers have no predictive variables. It was determined whether it was necessary to intervene in the second level variable for interpretation through studying hypotheses. 3 inspections. Finally, the establishment model in model 2 on the basis of introducing physical exercise for the second level variable regression model, to verify the relationship between physical exercise on mental stress and negative emotion regulation, the description statistics, statistics of college students' mental stress, negative emotions and the overall situation of physical exercise, the results are shown in Table 1.

**Table 1**

*Descriptive statistical results ample survey content*

	Minimum	sample	Size	Maximum	Mean
Total psychological stress score	60	14	34	26.85	5.31
Total negative emotion score	60	10	31	17.28	6.78
Total score for Physical Exercise	60	3	19	12.46	13.01

Table 1 shows that the average level of total psychological pressure among college students is 26.85, with scores ranging from 14 to 70, indicating that the degree of overall psychological strain among college students is medium to low. The negative emotion score of college students ranges from 10 to 50, with the mean value of negative emotion being 17.28, suggesting that the general negative emotional condition of college students is low. College students' physical activity is assessed in metabolic equivalents, and the mean physical activity level of college students is 12.48, indicating that their general exercise capacity is quite high, and their physical activity level is relatively high.

### **1.3 Selecting the correlation coefficient between college students' psychological pressure, negative emotions and physical exercise**

Through the first measurement of psychological pressure, negative emotion and physical exercise, according to the



correlation coefficient of each variable, it can be seen that the three variables of psychological pressure, negative emotion and physical exercise, their relationship is related in pairs. There is a significant positive correlation between psychological stress and negative emotion ( $R = 0.35$ ,  $P < 0.01$ ), there is a negative correlation between physical exercise and psychological stress ( $R = -0.42$ ,  $P < 0.05$ ), there is a significant negative correlation between physical exercise and negative emotion ( $R = -0.03$ ,  $P < 0.01$ ). There is a significant negative correlation between low MET and medium high MET and negative emotion ( $R = -0.56$ ,  $P < 0.01$ ;  $R = -0.37$ ,  $P < 0.01$ ), and the selection of correlation coefficients is shown in Table 2.

**Table 2**

*Correlation coefficient selection table*

The coefficient	M	SD
Psychological pressure	1.92	0.37
Negative emotions	1.73	0.68
Physical exercise	4.15	4.33
Low MET	0.35	0.23
Middle and high MET	3.74	4.10

As can be seen from Table 2, negative emotions do not change linearly with the passage of time, in which the psychological pressure of college students will also change, and negative emotions are unstable. According to the data of tracking the physical exercise level of college students, measured by MET, the average amount of physical exercise consumed by the subjects was 4.15MET per day, but the standard deviation was very high, ranging from 3.45 to 4.43, indicating that there was a great difference in the physical exercise level of different individuals.

#### 1.4 Comparison and analysis

The data of tracking daily psychological stress of college students in this study shows that the overall psychological stress level of college students is medium and low, which is consistent with the results of previous studies. There may be two reasons for the low perception of psychological pressure among college students. Individual college students' environment, in the face of a bad review, may shape psychological adaptation, and the sense of pressure can be positive to change, and provide some positive impact, lowering psychological pressure. This also explains why the university is now paying greater attention to the mental health of college students. When students' psychological health is good, their impression of pressure is low. Second, college students will now encounter a range of tests, and they will have developed a stronger capacity to withstand pressure. Negative emotions among college students are observed to be moderate to low. The findings

of this research are in line with those of prior investigations. This demonstrates that they can understand the head of obstacles and appropriately handle adversity and change their emotional condition in the face of setbacks and difficulties, which also indicates the generally steady emotional state of college students during this time.

Nowadays, schools pay more attention to mental health education, so they often open lectures in this field and invite professors in this field to popularize knowledge. These lectures are conducive to improving students' enthusiasm and actively facing difficulties, thus reducing negative emotions and increasing positive emotions. The overall level of exercise is relatively high in terms of tracking data. This study differs from previous studies, possibly due to the different populations involved. With the social and economic progress, sports venues are gradually emerging, and the awareness of exercise among college students has changed. More and more people begin to do sports, and schools will open public sports courses.

Although the measurement results of this study are good, there are still some college students with high levels of psychological pressure and negative emotions and low levels of physical exercise. The measurement of daily psychological stress of college students showed that there was no significant relationship between gender and psychological stress ( $T = 1.85$ ,  $P > 0.05$ ). The results of the survey on psychological stress differ from previous studies, which may be due to differences in the measurement of psychological stress. The psychological stress measurement tool selected in this study is the Chinese version of the perceived stress scale, which focuses on different aspects. Previous studies focused on academic stress, and this study mainly investigated the psychological stress of the subjects in a specific time. Secondly, the target population is different, and the cultural education received is different. This study is mainly aimed at college students, so the results are different. In today's society, boys and girls face different pressures in life, interpersonal relationships and exams. Nowadays society tends to equalize the role standard gradually. In this study, there is no significant difference in the psychological stress level of college students in the origin of students ( $t = -0.91$ ,  $P > 0.05$ ), and there is a significant difference in the psychological stress level of liberal arts students and science and engineering students ( $t = -1.53$ ,  $P < 0.01$ ).

When confronted with bad occurrences, science and engineering students experience higher psychological strain than liberal arts students, according to this research. Higher professional requirements for students, society requires a large number of strong science students with strong logic thinking and judgement ability, so school of

science students are under more pressure, and too much stress can cause them to be unable to self-adjust, in order to perfectly follow the progress of science and technology, science and engineering for their professional requirements, and create psychological pressure.

The results of tracking and measuring negative emotions of college students shows that there was no difference in gender ( $T=1.73, P > 0.05$ ), and no difference in majors and places of origin ( $T=1.70, P > 0.05; T=0.24, P > 0.05$ ). Previous studies have disputed gender differences in negative emotions, with studies showing that male students have higher levels of negative emotions than female students. On the contrary, some studies have found that female students have a higher level of negative emotions than male students. The existence of this situation may be due to regional or other differences, or research methods and tools are inconsistent, so the results will be different. Although there are differences in the physical and mental structures of men and women. Nowadays, people's concept has been changed and their gender requirements are constantly updated. They pursue equality between men and women and treat them equally. Women have become more independent and can face social responsibilities as rationally as men. College students who have just come of age are still in the early stage of adulthood. Most students spend their rebellious period of youth and are emotionally stable. At the same time, college students themselves in the living environment is roughly the same, will face emotion, examination and work problems. Therefore, there is no difference in the level of negative emotion between male and female college students in this study.

There was no significant relationship between physical exercise and major ( $T=0.38, P > 0.05; T=-0.22, P > 0.05$ ). There was a significant difference in the level of physical exercise between males and females ( $t=2.08, P < 0.01$ ). This is roughly the same as previous studies have found, and may be due to structural and psychological differences between men and women. Studies have found that women are less likely than boys to engage in physical exercise in terms of duration, frequency, intensity and persistence. Boys like intense sports with high intensity, such as resistance sports and anaerobic sports. Competitive sports pique their curiosity. Boys like a good challenge, so they get a lot of exercise and a wide variety of exercises. Girls, on the other hand, are more concerned with health, beauty, and fashion, and choose activities like yoga, ballroom dance, and cycling. Girls are more adaptable in their workout pursuits and place a greater emphasis on body and mind growth. And the majority of the guys have a new perspective on fitness, or the quest of a fit physique. Girls, on the other hand, are more likely to practise heart-

strengthening activities, therefore guys get a lot more exercise than girls.

According to the research results, this study conducted correlation analysis on the relationship between daily psychological stress and negative emotions of college students. The analysis found that there was a significant positive correlation between psychological stress and negative emotions ( $R=0.35, P < 0.01$ ), and the increase of psychological stress would increase negative emotions, which was consistent with previous studies. First of all, college students are in the early adulthood, they are not adapted to the complex environment, and they are more likely to feel pressure in the face of life events. The experience of stress occurs when you have a negative assessment of an event or feel out of control over something meaningful to you. According to Brown's theory, unreasonable ways of coping with stress may increase the negative emotions brought by stress. When individuals cannot properly cope with the pressure, some negative effects will occur. Long-term experience of psychological stress will lead to an increase in negative emotions, and may affect immune and inflammatory processes. Secondly, there are some competitive pressures among college students, so the sense of tension and pressure also come into being, accompanied by a variety of negative emotions. Some researchers have found that there is a significant positive correlation between psychological stress and negative emotions in the study of college students. This provides theoretical support for the influence of psychological stress on negative emotions.

There was a significant negative correlation between negative emotion and physical exercise ( $R=-0.03, P < 0.01$ ). There was a significant negative correlation between negative emotion and physical exercise ( $R=-0.56, P < 0.01; R=-0.37, P < 0.01$ ), which was roughly the same as previous studies. According to the emotional effect theory of exercise, exercise can reduce the occurrence of negative emotions. In this study, individuals who maintained a high level of physical activity reported less negative emotions. Proper exercise has a positive effect on physical and mental health, and reduces tension and irritability. And long-term physical exercise can cultivate firm consciousness, improve the individual's positive emotions, but also reduce the occurrence of individual's negative emotions. Moderate-intensity exercise may assist to lessen negative feelings like disappointment and despair, according to the findings of this research. Other research have shown no significant difference in the influence of short-term physical activity on negative emotions, suggesting that these studies may have methodological issues. According to studies, the more physical exercise one engages in, the lower the degree of

negative feelings one experiences. Because the outcomes of most research are similar to those of this one. The investigation shows that regular exercise may lessen the incidence of unpleasant emotions, provide persistent psychological impacts, and improve one's stress resistance. There is a negative correlation between college students' psychological stress and physical exercise ( $r=-0.42$ ,  $P < 0.05$ ), which is consistent with previous studies, that is, college students with a high level of physical exercise perceive a lower level of psychological stress. Physical exercise is a healthy way to promote health, which can relieve the perception of pressure and promote the stable development of the body state. And it can also improve individual psychological disorders. Regular exercise can improve tension under stress and improve individual self-confidence. Therefore, physical exercise is a very good stress management strategy, which can relieve the negative emotions caused by stress.

## 2. The Example Analysis

### 2.1 Preparation and Overview

Selecting province university sports professional and non-professional sports college students' psychological pressure and mental resilience and physical exercise, mental pressure, the relationship between psychological resilience as the research object, research subjects sampled from A normal university, B agricultural university, D, C, H college five universities, statistics of the basic situation as shown in Table 3.

**Table 3**

*Sample statistical characteristics*

Variable	Category	The number
Gender	Male	192
	Female	96
Source of family	Cities and towns	93
	Rural	195
	In grade one	67
Grade	Second grade	72
	The third grade	89
	In fourth grade	60
	The sports education	108
Professional	Social sports	90
	Sports training	90
	First-class athlete	48
Athlete grade	Secondary athlete	33
	Athlete	19

According to the statistical characteristics of Table 1, psychological measurement method was selected to

measure the psychological stress scale for college students adopted in this study. The scale consists of 21 items and 5 dimensions. Scale including pressure size and frequency of two parts, with level 5 score method, the stress level no less (1), (2), medium (3), (4), a larger (5 points), the frequency item no (1), (2), occasionally (3 points), sometimes more often (4), often (5 points). The total score of psychological pressure is 105 points, 8-40 points of learning pressure, 4-20 points of employment pressure, 2-10 points of economic pressure, 2-10 points of interpersonal love and 5-25 points of interpersonal pressure. The higher the score of degree and frequency, the greater the psychological pressure of college students, vice versa. The internal consistency coefficients of each subscale are that, the reliability of interpersonal pressure subscale is 0.603, the reliability of employment pressure subscale is 0.707, and the reliability of learning pressure subscale is 0. The recovery strength table of college students consists of 6 dimensions and 31 questions. Entirely inconsistent (1 point), essentially inconsistent (2 points), unsure (3 points), basically consistent (4 points), and completely consistent (5 points) are the five levels of the scale (5 points). The total score of the psychological recovery strength scale is 160, with self-efficacy 5-25, self-acceptance 3-15, emotional stability 7-35, problem solving 3-15, friend support 8-40, and family support 5-25. In terms of reliability, the fractional reliability of the scale is 0.6334, the fractional reliability of each factor is 0.6713-0.8600, the internal consistency coefficient of the scale is 0.8594, the internal consistency coefficient of each factor is 0.6383-0.8383. Taking scl-90 as calibration scale, the scalar total score of college students' mental resilience was significantly correlated with scl-90 total score. The above reliability and validity indicate that the scale meets the standardization requirements of psychometrics. At this time, buffer reliability  $H$  needs to be calculated according to buffer effect coefficient  $B$ , and the calculation formulas are as follows formula (7) and formula (8).

$$B = UY \tag{7}$$

$$H = \frac{\sqrt{B}}{B} \tag{8}$$

In formula (7) and formula (8),  $U$  represents buffer factor and  $Y$  represents sample characteristics. This formula can be used to calculate the reliability of subsequent buffering research methods and complete performance tests.

### 2.2 Application effect and discussion

On the basis of the above samples, the psychological pressure buffering effect research method and the traditional psychological pressure buffering effect research method designed in this paper were used to conduct the

buffering effect research experiment, and the reliability of different samples was calculated. The reliability of the

standard was set as 1, and the closer it was to 1, the higher the reliability was. The application effect was shown in Table 4.

**Table 4**

*Application effect*

Sample	The reliability of the psychological stress buffering research method designed in this paper	The reliability of traditional research methods for psychological stress buffering
A	0.948	0.746
B	0.995	0.666
C	0.965	0.549
D	0.994	0.678
E	0.998	0.713
F	0.943	0.569
G	0.947	0.475
H	0.973	0.773
I	0.985	0.551
G	0.988	0.543

As can be seen from Table 4, under the circumstances of different samples, the reliability of the buffering effect research method designed in this paper is always higher than that of the traditional buffering effect research method, which proves that the designed method has high reliability, better research effect and certain application value.

### 3. Conclusion

Participating in sports activities can bring people a good emotional experience, physical exercise can promote the elimination of mental fatigue, improve work efficiency. Especially for people who are often exposed to fierce competition, physical activity can effectively eliminate mental fatigue, reduce anxiety level and depression, and make the mind more clear, more responsive and more efficient. Physical activity has a cathartic function, in physical activity you can release the inner depression, forget the troubles, but also can bring physical and mental pleasure to the exerciser, so as to reduce psychological pressure. When a person feels the pressure and trouble because of the problem on the job, takes part in sports activities can temporarily leave the pressure source. It can play their favorite music in the movement, can make you forget the trouble quickly, make the spirit get comfort, make the mood can adjust. At the same time, through

physical activity to make the body fever, sweating, is also an effective means to eliminate mental stress. Sports play a positive and effective role in cultivating sentiment and perfecting personality.

College students who take part in different levels of physical exercise have different coping styles of pressure, while there is no significant difference in coping styles of college students who take part in different types of physical exercise. Physical exercise can promote college students to adopt a more positive way of coping with stress. So that every student can find their favorite sports projects, and provide materials and places for them to participate in exercise. Encourage and organize students to take part in physical exercise regularly. To make students know that regularly participate in physical exercise can promote people to adopt a more positive way of coping, not only can enrich the activities of college students after school time, but also can improve their mental health, so that they stay away from the negative pastime.

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