Exploring the Path of Integrating Sports Psychology Education into College Physical Education Teaching

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Abstract

In order to explore the path of integrating sports psychology education into physical education teaching in universities. The author takes undergraduate students from A Normal University in B city as the research object, and takes the physical exercise habits and mental health status of the research object as the research content. 1131 undergraduate students from Normal University were surveyed using the "Questionnaire on Exercise Habits of College Students" and the Symptom Checklist 90 (SCL-90).According to the criteria for judging whether it is a sports population, that is, the frequency of participating in physical exercise weeks is greater than or equal to 3 times, lasting for more than 30 minutes each time, and the exercise load is greater than or equal to medium based on one's own physical fitness and the sports activities performed. The strongest impact is on the mutual influence between "exercise effectiveness" and "somatization", followed by "exercise behavior" and "depression", while the non-impact is on the relationship between "thinking mode" and "fear", "paranoia", and "psychosis". Students with good "exercise behavior" and "exercise effect" have a certain degree of good mental health, among them, the improvement of depression is the most significant. Students with good mental health have significantly better physical exercise habits in terms of "exercise behavior" and "exercise effect", and "compulsion" has the greatest impact on "exercise behavior".

Keywords: Undergraduate Students; Physical Exercise Habits: Mental Health.

Introduction

As the backbone of the country's future and social construction, college students' physical and mental health is not only of great significance for individual success, but also plays a crucial role in the cultivation of national talents, the development of economic and cultural undertakings, and even the rejuvenation of the nation. However, as a social group with high intelligence and aspirations, college students may appear bright, relaxed, and free, but in fact, they face more challenges than the general public. With the continuous expansion of universities, the increasing openness of modern society, and the rapid development of material and spiritual resources, college students are facing various pressures such as academic, life, emotional, economic, and employment, their values and moral standards are increasingly influenced and impacted by more and more factors. In addition, it is difficult for people to connect mental health issues with a highly educated group such as college students (Jufang, 2022). The neglect of college students' mental health by various sectors has led to some college students experiencing serious mental health illnesses due to their lack of timely and effective psychological counseling. In severe cases, they may even do things that threaten their own and others' lives. Behind the shocking news incident, it reflects the psychological issues of college students that require high attention. According to the relevant public data released by the National Bureau of Statistics in 2021, as of 2020, there were 3.14 million graduate students in school and 32.853 million students enrolled in regular undergraduate and vocational colleges (Zhou, 2021). The psychological health issues of such a large group of college students cannot be ignored. The mental health status is an important indicator of talent quality assessment in the new era. As the main battlefield for talent cultivation, universities should pay special attention to the mental health issues of college students. The combination and utilization of various teaching resources should promote the formation of a healthy psychological state among college students. In recent years, education departments and universities have provided support for the mental health education of college students from various aspects. However, the current situation of psychological education in universities is still not optimistic, and there are still many problems in some universities (Chow & Li, 2021). For example, a survey result shows that currently, teachers in mental health centers in universities often work part-time. Teachers not only undertake mental health education work, but also

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multiple administrative or teaching tasks, and even more so, only when dealing with higher-level inspections will they temporarily hire someone to serve as a mental health teacher, and psychological counseling is a job that requires high professional skills. If professional skills do not meet the standards, they will have no way to start when facing students' actual psychological problems. Every year, tragedies caused by psychological problems among college students emerge one after another. After conducting a survey on the mental health status of students in a certain university, some scholars found that the proportion of college students with psychological problems is as high as 16% of the total number of students. However, in reality, less than 1/5 of people have received professional mental health counseling. Therefore, it is necessary to conduct in-depth research on the influencing factors of college students' mental health from both theoretical and practical perspectives, and analyze their formation mechanisms. To address this research question,Tamura, T. et al Data from global Positioning System (GPS) are used to clarify the distance and speed of students in college sports football classes. In total, 12 participants were randomly selected from 33 college students (male only) who attended the general liberal arts course. Location data for each participant were measured by GPS mapping and distance and speed were calculated for participants in a total of four classes. According to a prior study, low intensity was considered below 15 km/h, moderate intensity was 15-21 km/h, and high intensity was 21.1km/h or higher (based on participant speed). The GPS equipment used (42mm wide, 72mm high, 16mm thick, weight 67g, sampling rate of 15Hz) is special equipment for competitive sports. The relationship between kicking experience and distance and speed was further investigated. Results and conclusion: The class with the longest measured distance is 6821.6±893.7m. The distance ratios of low-intensity (below 15 km / h), moderate-intensity (15-21 km/h) and high-intensity (above 21.1 km/h) were 86.3%, 11.0% and 2.7%, respectively. The distance of each group (with football experience and without) was analyzed. Students with football experience ran significantly greater distances on the 11th and 13th. On the other hand, there was no significant difference in the distance covered by low, medium, and high-intensity exercise across all classes. The results show that the distance between college sports football is long, despite the distance between football players and non-football players, there is no difference in the intensity (Tamura et al., 2021).Wan, L.In view of the understanding of human motor function in physical education, they put forward the multi-dimensional evaluation index of motor function based on fatigue, muscle strength, muscle contraction and relaxation ability, and studied the mapping rules between the fatigue characteristic value, muscle strength, fractal dimension characteristic change, and motor function state. According to the characteristics of surface EMG signals and their production principle, the collected signal is median filtered and preprocessed to obtain the filtered signal. The effectiveness of the filtering method is demonstrated by comparing the signals before and after filtering. The current muscle force calculation methods based on SEMG signals were analyzed and studied. The muscle model was established by using the muscle activity and force length curve calculated by EMG signal. The feasibility of the experimental method was verified by obtaining the muscle model and comparing it with the calculated actual muscle strength (Wan et al., 2022).

Educationists all believe that teaching activities are a bilateral activity process between teachers and students, which can involve a specific teaching process. The vast majority of people often only explain the learning process of students, but less about the process of teachers' teaching. Cognitive psychology (Cognitive Psychology) is a psychology with the view of information processing as the core. In the 1960s, cognitive psychology emerged in the United States, and later developed rapidly. With its new theoretical viewpoint and rich experimental results, cognitive psychology has rapidly changed the face of psychology and exerted great influence on many branches of psychology, which has become the dominant trend of thought in psychology. Cognitive psychology has a solid theoretical foundation of psychology and pedagogy, which reveals the internal psychological mechanism of the cognitive process. Cognitive psychology believes that the process of learning is the process of information processing, as well as the process of encoding, storing and extracting information. Cognitive psychology emphasizes that learning is a process of knowledge construction, not only the recording and absorption of knowledge, but also students must use existing knowledge to build new knowledge; it emphasizes that learners acquire the ability of processing information from environmental stimuli, and learning is highly consistent with the situation of learning. Cognitive psychology divides the various knowledge that people have to learn and master into: declarative knowledge and procedural knowledge. This paper studies undergraduates from A Normal University in B city and studied the physical exercise habits and mental health of the subjects.

The discipline of physical education in universities is the main way to implement quality education and also a powerful means to improve the physical fitness of college

students. In the teaching of physical education in universities, traditional physical education only focuses on explaining theoretical knowledge of sports, neglecting students' psychological quality and health situation, resulting in difficulty in effectively improving students' comprehensive literacy (Wan et al., 2022). The emergence of sports psychology has made up for the shortcomings of traditional physical education in universities. By integrating sports psychology education into physical education teaching in universities, it can not only promote students' mental health growth, but also enhance their physical fitness and promote the further development of physical education teaching in universities. Therefore, physical education teachers in colleges and universities should pay more attention to sports psychology education in a timely manner, adopt reasonable teaching methods and new training forms, reform the traditional physical education classroom, alleviate the psychological stress of students' physical education learning, improve the quality of physical education teaching, and promote the improvement of students' physical and psychological literacy.

Method

Research Subjects

Stratified sampling is carried out according to the majors, and students of Arts (non-arts), Arts (arts), and Science of A Normal University are selected, and then the School of Arts and the School of Political Science and Law are selected by random sampling; Conservatory of Music and Academy of Fine Arts; The research focuses on undergraduate students from freshman to junior years in the School of Life Sciences and the School of Mathematics and Statistics (Han & Gong, 2022).

Research Methods

Literature method

Through consulting the China Journal Network and the full text database of China's outstanding master and doctor's Thesis, the article on college students' physical exercise habits, mental health and other aspects was collected, and the relevant materials were intensively read and analyzed. At the same time, several books were read to provide theoretical basis for this study.

Questionnaire survey method

The questionnaire consists of three parts: the first part is basic information, including gender, subject, and grade; The second part is a survey of physical exercise habits, including the situation of the sports population and the self-designed "Questionnaire on Exercise Habits of College Students" by Dr. Wang Kun, the reliability and validity of the questionnaire are 0.747 and 0.769 respectively; The third part is a survey of mental health status, using the widely used mental symptom checklist (SCL-90) both domestically and internationally. A total of 1260 questionnaires were distributed and 1163 were collected, with a recovery rate of 92.30%. Among them, 1131 were valid questionnaires, with an effective rate of 97.25%. The number of questionnaires distributed, collected, and effective by each college, grade, and gender is shown in Table 1.

Table 1

Statistics of Statistics.

	Research Object	Distribution (Copies)	Collection (Copies)	Validity (Copies)
Major	College of Arts	150	142	138
	School of Political Science and Law	250	223	218
	School of Biological Sciences	250	242	240
	School of Mathematics and Statistics	150	142	141
	Conservatory of Music	150	147	134
	Academy of Fine Arts	310	267	260
Gender	male	418	378	366
	female	842	785	765
Grade	Freshman year	533	493	483
	Sophomore year	391	361	350
	Junior year	336	309	298
	total	1260	1163	1131

Scoring standards and content of the "Questionnaire on Exercise Habits of College Students"

This scale contains a total of 26 items, including three factors: "exercise behavior", "thinking mode", and "exercise effect" of physical exercise habits. Each question is scored on a 5-level scoring system, and its total average score and factor score are calculated. The "Exercise Behavior" subscale includes items 1, 4, 7, 10, 14, 17, and 23. The scores are added together, and the higher the score, the stronger the stability of exercise behavior. Conversely, the stability of exercise behavior is poor; The 'Thinking Mode' subscale includes items 3, 5, 8, 11, 12, 15, 18, 20, 21, 24, and 26. When the scores are added together, the higher the score, the higher the level of automation. Conversely, the lower the level of automation; The "Exercise Effect" subscale includes items 2, 6, 9, 13, 16, 19, 22, and 25. The higher the scores, the better the exercise effect. Conversely, the worse the exercise effect.

In the 26 evaluation items of the "Questionnaire on the Exercise Habits of College Students", except for questions 2 and 25 with a score of 5-1 for the reverse question, all other questions are scored 1-5: (1) 1 point for completely non-compliant questions (5 points for reverse questions); (2) 2 points for basic non-compliance (4 points for reverse questions); (3) Sometimes not meeting: 3 points (3 points for reverse questions); (4) Basic compliance: 4 points (2 points for reverse questions); (5) Fully compliant: 5 points (1 point for reverse questions).

Scoring standards and content of SCL-90

This scale includes 9 mental health factors, namely "somatization", "obsessive compulsive symptoms", "interpersonal relationships", "depression", "fear", "hostility", "paranoia", and "psychoticism", with a total of 83 questions. Each question is scored on a 5-level scoring system. Among them, somatization includes questions 1, 4, 12, 27, 40, 42, 48, 49, 52, 53, 56, and 58, a total of 12 items; Obsessive compulsive symptoms include questions 3, 9, 10, 28, 38, 45, 46, 51, 55, and 65, totaling 10 items; Interpersonal sensitivity includes questions 6, 21, 34, 36, 37, 41, 61, 69, and 73, totaling 9 items; Depression includes questions 5, 14, 15, 20, 22, 26, 29, 30, 31, 32, 54, 71, and 79, totaling 13 items; Anxiety includes questions 2, 17, 23, 33, 39, 57, 72, 78, 80, and 86, totaling 10 items; Hostility includes questions 11, 24, 63, 67, 74, and 81, totaling 6 items; Phobia anxiety includes questions 13, 25, 47, 50, 70, 75, and 82, totaling 7 items; Paranoid ideation includes questions 8, 18, 43, 68, 76, and 83, totaling 6 items; Psychiatric includes questions 7, 16, 35, 62, 77, 84, 85, 87, 88, and 90, totaling 10 items. The smaller the score of each factor and the overall average score, the better the level of mental health. On the contrary, it indicates that the level of mental health is more worrying. SCL-90 is included in its 83 evaluation items. Each project adopts a 5-level scoring system (with a pressure of 5 points), and the specific instructions are as follows: (1) If there is no symptom (problem), one point will be given; (2) Mild refers to the conscious presence of the symptom (problem), but has no significant or minor impact on the subject, resulting in 2 points; (3) Moderate refers to the conscious presence of this symptom (problem), which has a certain impact on the subject, resulting in 3 points; (4) Bias refers to the conscious occurrence of this symptom (problem), which has a significant impact on the subject, resulting in a score of 4 points; (5) Severe refers to the conscious awareness that the frequency and intensity of the symptom (problem) are very serious and have a serious impact on the subject, resulting in a score of 5 points. Among them, the statistical content includes the total average score, the number of positive and negative items, and factor scores. The total average score refers to the sum of the individual scores of each item and dividing it by 87 to determine the severity of the condition. The change in the total average score can reflect the evolution of the condition; The number of positive items and the number of negative items indicates the number of items in which patients present "symptomatic" (score ≥ 2) and "asymptomatic" (score=1); The factor score is equal to the total score of each factor/the number of items in that factor, which can reflect the degree and distribution of certain symptoms in a person.

Mathematical Statistics

Input the data obtained from the survey questionnaire and symptom self-evaluation scale into the computer, use SPSS statistical software to conduct descriptive statistics on the data, and use statistical methods such as analysis of variance, t-test, correlation analysis, etc. to conduct difference tests and mean comparisons on the corresponding data.

Result Analysis

Current Situation of Physical Exercise Habits among Undergraduate Students in A Normal University

The sports population is an important indicator for evaluating physical exercise status, including the number of times per week to participate in exercise, the duration of each exercise, and the intensity of each exercise. The standard for sports population is that the frequency of physical exercise is no less than 3 times per week, the duration is no less than 30 minutes per time, and the exercise load is suitable for one's own conditions and sports items and is no less than or equal to the moderate level. A survey was conducted on 1131 undergraduate students from A Normal University using the standard of sports population, and the results are shown in Table 2.

Table 2

Statistical Table of Sports Population Situation.

	Exercise Situation	N	%
Exercise frequency	3 or more times per week	256	22.63
Exercise time	30 minutes or more each time	551	48.72
Exercise intensity	Feeling tired or very tired, thinking that the amount of exercise is moderate	671	59.33
	Sports population	154	13.62

From the frequency of physical exercise, there are 256 people who participate in exercise three times or more per week, accounting for 22.63% of the total number of people. From the perspective of exercise time, there are 551 people who exercise for 30 minutes or more each time, accounting for 48.72% of the total number of people; From the perspective of exercise intensity, 671 people believe that the amount of exercise each time is moderate or above average. Only 154 people met the standards for sports population in terms of frequency, duration, and intensity of physical exercise, accounting for 13.62% of the total population.

The above results indicate that the physical exercise situation of the vast majority of undergraduate students does not meet the standards for sports population and is not optimistic. This may be due to students' insufficient understanding of health, insufficient motivation and need to participate in physical exercise, and insufficient emphasis on physical exercise. It may also be due to students' psychological tendency to participate in physical exercise, however, due to the influence of the external environment, these external environmental factors include the effective use of school Sports venue and equipment, the attitude of peers to participate in physical exercise, and so on (Zubiaur et al., 2021).

Physical exercise habits demonstrate the stability of behavior and are reflected in specific situational stimuli. Therefore, the premise for the formation of exercise habits is the stability of exercise frequency and context, and is not affected by other external factors, that is, stable behavior; During the process of exercise, people organize and summarize the experience gained from practice, resulting in abstract sublimation, which is the exercise of thinking patterns; Good exercise habits can make people happy physically and mentally, have good Physical fitness and sports ability, and realize their own needs, these are all the effects of good exercise motivation. A survey was conducted on the physical exercise habits of undergraduate students in A Normal University from three dimensions: "exercise behavior", "thinking mode", and "exercise effect". The results are shown in Table 3.

Table 3

Statistics of Physical Exercise Habits.

Physical Exercise Habits	X+SD
Exercise behavior	3.24±0.6
thinking model	3.21±0.59
Exercise effect	3.26±0.65
population	3.24±0.62

The total average scores of physical exercise habits and their three-dimensional "exercise behavior", "thinking mode", and "exercise effect" of undergraduate students in A Normal University are (3.24 ± 0.62), (3.24 ± 0.60), (3.21 ± 0.59), and (3.26 ± 0.65), respectively. The maximum and minimum values of physical exercise habits and their various dimensions are 5 and 1, respectively. According to the scores corresponding to each option in the questionnaire, physical exercise habits can be divided into five levels: Low ($1 \leq$ average<2), medium to low ($2 \leq$ average<3), medium (average=3), medium to high ($3<$average ≤ 4), and excellent ($4<$average ≤ 5).

The above results indicate that the overall situation and various factors of physical exercise habits among undergraduate students in A Normal University are slightly above average, but still need to be strengthened. On the basis of adhering to physical exercise, the process of forming exercise habits should be considered, and the practical experience of physical exercise should be highly summarized and sublimated. Sports activities that are in line with one's own interests, hobbies, and abilities should be adopted to enhance one's enthusiasm for exercise (Hammami et al., 2023).

The Relationship between Physical Exercise Habits and Mental Health of Undergraduate Students in a Normal University

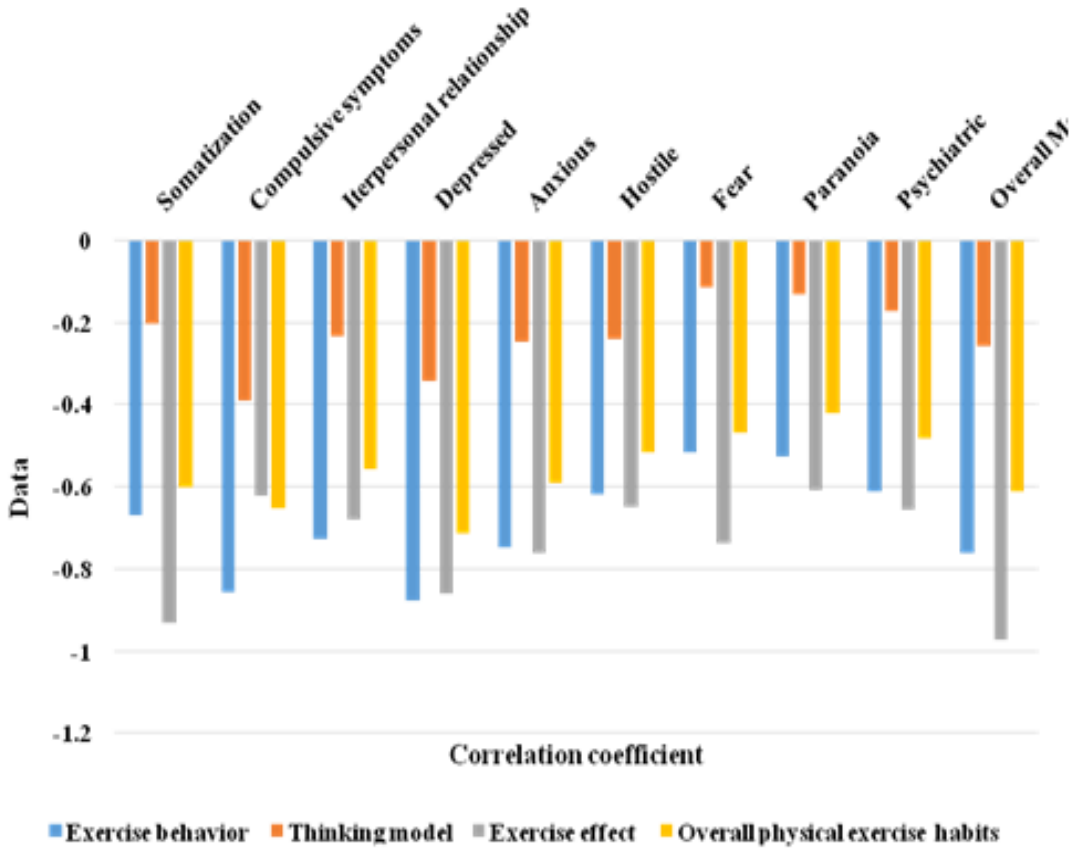

Figure 1: Correlation Analysis of Physical Exercise Habits and Mental Health.

The correlation analysis results between physical exercise habits and mental health of undergraduate students at A Normal University are shown in Figure 1. The results show that the Person Correlation (Pearson correlation coefficient) between physical exercise habits and mental health is -0.659, indicating that physical exercise habits and mental health are generally negatively correlated, and the degree of correlation is strong. Overall, there is a negative correlation between physical exercise habits and various factors of mental health. Among them, except for a strong correlation with "somatization", "compulsive symptoms", and "depression", there is a moderate correlation between physical exercise habits and the other six factors of mental health. Overall, there is a negative correlation between psychological health and various factors related to physical exercise habits, with the exception of a weak correlation with 'thinking patterns', and a strong correlation between psychological health and the other two factors related to physical exercise (Xu & Jiesen, 2022).

There is a negative correlation between various factors of physical exercise habits and psychological health. There is no degree of correlation between "thinking mode" and "fear", "paranoia", and "mental illness", while there is a weak correlation between "thinking mode" and "somatization", "obsessive compulsive symptoms", "interpersonal relationships", "depression", "anxiety", and "hostility", there is a moderate correlation between "exercise behavior" and "fear", "exercise behavior" and "paranoia", while there is a strong correlation between "exercise behavior" and "compulsive symptoms", "exercise behavior" and "depression", "exercise effect" and "somatization", "exercise effect" and "depression", in addition to the above situations, there is a strong correlation between physical exercise habits and other factors of mental health. Among them, the highest correlation is "exercise effect" and "somatization", followed by "exercise behavior" and "depression", and the lowest correlation is "thinking mode" and "fear". The above results indicate that, the better the habit of physical exercise, the better the mental health; On the contrary, the better mental health, the better physical exercise habits. The strongest impact among them is the mutual influence between "exercise effectiveness" and "somatization", followed by "exercise behavior" and "depression", while the ones that have not been affected are "thinking patterns" and "fear", "paranoia", and "psychoticism" (ZHONG et al., 2022).

Table 4

Comparison of the Mental Health Levels of College Students with Different Physical Exercise Habits.

Factor	Strong Group X ± SD	Weak Group X ± SD	T	P
Somatization	1.46±0.58	1.54±0.58	-0.081	0.021
Compulsive Symptoms	1.84±0.67	1.95±0.68	-0.115	0.005
Interpersonal Relationship	1.69±0.66	1.79±0.69	-0.095	0.019
Depressed	1.60±0.64	1.72±0.66	-0.123	0.002
Anxious	1.54±0.60	1.63±0.61	-0.084	0.021
Hostile	1.56±0.62	1.65±0.64	-0.096	0.011
Fear	1.49±0.61	1.55±0.61	-0.066	0.074
Paranoia	1.56±0.61	1.63±0.61	-0.063	0.087
Psychiatric	1.57±0.58	1.63±0.56	-0.061	0.078
Overall Mental Health	1.59±0.57	1.68±0.56	-0.087	0.011

Compared with the overall average score of mental health, the "strong" group of physical exercise habits had significantly better mental health status than the "weak" group, and the difference was significant (P<0.05). Comparing the scores of various psychological health factors, the results showed that the students in the "strong" group had lower scores than the "weak" group in various psychological health factors, and further T-tests showed that, there was no significant difference (P>0.05) between the two groups in the factor scores of "fears", "paranoia", and "psychoticism". There was an extremely significant difference (P<0.01) between the factor scores of "obsessive-compulsive symptoms" and "depression", and there was a significant difference (P<0.05) between the other factor scores (Table 4).

The above results show that students with different levels of physical exercise habits have different levels of mental health. Students with good physical exercise habits have significantly better mental health levels than students with slightly worse physical exercise habits. In order to further verify the psychological health status of college students with different levels of physical exercise habits, the levels of psychological health factors in the strong and weak groups of physical exercise habits were compared, and the results are shown in Table 5.

Table 5

The Influence of Different Physical Exercise Habits on College Students.

	Exercise Behavior X ± SD		Thinking Mode X ± SD		Exercise Effect X ± SD	
	a	b	a	b	a	b
Somatization	1.45+0.57	1.55+0.59	1.49+0.58	1.50+0.58	1.42+0.55	1.62+0.62
	P=0.003		P=0.846		P=0.000	
Compulsive symptoms	1.82+0.66	1.96+0.69	0.86+0.68	1.91+0.67	1.83+0.66	1.98+0.7
	P=0.001		P=0.259		P=0.001	
interpersonal relationship	1.67+0.65	1.80+0.69	1.72+0.68	1.75+067	1.68+0.65	1.82+0.7
	P=0.001		P=0.413		P=0.000	
depressed	1.58+0.63	1.74+0.66	1.63+0.65	1.68+0.65	1.58+0.62	1.79+0.69
	P=0.000		P=0.15		P=0.000	
anxious	1.52+0.6	0.165+0.61	1.56+0.6	1.6+0.6	1.52+0.58	1.68+0.63
	P=0.001		P=0.319		P=0.000	
hostile	1.55+0.6	1.66+0.65	1.58+0.62	1.62+0.64	1.54+0.61	1.70+0.65
	P=0.004		P=0.213		P=0.000	
fear	1.47+0.59	1.57+0.62	1.52+0.62	1.51+0.6	1.46+0.58	1.61+0.65
	P=0.008		P=0.510		P=0.000	
Paranoia	1.55+0.61	1.64+0.61	1.58+0.63	1.60+0.59	1.54+0.58	1.68+0.66
	P=0.007		P=0.510		P=000	
Psychiatric	1.56+0.58	1.64+0.56	1.59+0.59	1.61+0.54	1.55+0.52	1.68+0.6
	P=0.016		P=0.618		P=0.000	

Comparing the "strong" and "weak" groups of physical exercise habits and "exercise behavior," the "strong" group is a, and the "weak" group is b. The results show that the "weak" group has poorer psychological health factors than the "strong" group. Among them, the difference between the two groups in the "depression" factor score is the largest, with a score of 0.152; The difference between the "psychotic" factor scores is the smallest, with a score of 0.082. The other factor scores, in descending order, are "obsessive-compulsive symptoms", "interpersonal relationships", "anxiety" and "hostility", as well as "somatization", "paranoia" and "fear". Further t-tests showed that there was a significant difference ($P<0.05$) between the two groups in terms of "psychotic" factors, while there were extremely significant differences ($P<0.01$) in other factors.

Comparing the "strong" and "weak" groups of physical exercise habits' thinking patterns, the results showed that except for the "fear" factor, the "weak" group was better than the "strong" group, and the "weak" group was worse than the "strong" group in all other psychological health factors. Among them, the difference between the two groups in the "depression" factor score is the largest, at 0.056; The difference between the "fear" factor scores is the smallest, with a score of 0.006. The other factor scores, in descending order, are "hostility", "compulsive symptoms", "anxiety", "interpersonal relationships", "paranoia", "psychotic", and "somatization". Further t-tests showed that there was a significant difference ($P<0.05$) between the two groups in the factors of "obsessive-compulsive symptoms" and "depression", but there was no significant difference in the other factors ($P>0.05$).

Comparing the "strong" and "weak" groups of physical exercise habits with "exercise effectiveness", the results showed that the "weak" group had poorer psychological health factors than the "strong" group. The difference between the two groups in the "interpersonal relationship" factor score is the largest, at 0.208; The difference between the "paranoid" factor scores is the smallest, with a score of 0.125. The other factor scores, in descending order, are "somatization", "psychotic", "depression", "anxiety", "compulsive symptoms", "fear", and "hostility". Further t-tests showed that there was a highly significant difference between the two groups in all factors ($P<0.01$).

The above results can indicate that there is a close connection between physical exercise habits, "exercise behavior", "exercise effectiveness", and various factors of mental health, while there is no close connection between "thinking mode" and mental health. Students with good "exercise behavior" and "exercise effect" have a certain degree of good mental health, with the most significant effect on improving depression.

Suggestions

On the school side, A Normal University should increase financial investment in hardware facilities, attach importance to the construction, planning, and effective utilization of sports venues, equipment, and facilities, and provide basic conditions for students' physical exercise; In terms of the cultural atmosphere of campus sports, it is necessary to vigorously promote the importance of cultivating good physical exercise habits and lifelong physical ability, enhance students' awareness of participating in physical exercise, carry out rich and colorful extracurricular sports activities that are closely related to students' lives, and encourage students with good physical exercise habits to organize and lead other students to exercise, maximizing their active participation in physical exercise; In terms of curriculum design and physical education teaching, it is necessary to offer more physical education courses that students are interested in, and reform the teaching mode of public physical education courses;

In terms of school policy and management, a reward and punishment system and powerful administrative measures should be formulated to deeply break down the inertia of some students, urge them to take physical exercise and persevere. In terms of teachers, non-PE teachers should take the lead, set an example, take the initiative to participate in and lead students in physical exercise; Physical education teachers should improve their professional literacy in sports and enhance their comprehensive abilities. In teaching, they should strengthen students' learning of basic sports knowledge and skills, guide them to develop scientific and effective exercise plans based on their own characteristics, communicate well with students, help them gain successful experiences, and enhance their confidence and enthusiasm in participating in physical exercise (Lu, 2023).

On the student side, it is necessary to overcome their own inertia, study the basic knowledge and skills of sports seriously, choose suitable exercise programs based on their physical condition, interests, hobbies, time, etc., develop exercise plans that are suitable for them, fully and effectively utilize campus facilities, and persevere in repeated practice to ultimately form good physical exercise habits. In terms of schools, efforts have been made to promote mental health education, making students highly concerned about their mental health status; Improve the effectiveness of teaching psychology and other courses, regularly hold psychological lectures that are closely related to the lives of classmates, popularize college students' knowledge of mental health, and expand their

knowledge base, so that students can conduct self-diagnosis and self-treatment; Improve the psychological counseling and counseling institutions of our school, enhance the professional ability and literacy of psychological counseling personnel, regularly conduct psychological health assessments on students, and conduct dynamic research on test data; Strengthen the construction of campus culture, create a healthy, civilized, and positive school environment and mental health atmosphere.

In terms of teachers, they should establish a harmonious teacher-student relationship with students, especially class teachers and counselors. They should pay more attention to students' lives and studies, be good at observing students' emotional changes, etc., in order to timely and effectively solve students' problems in interpersonal communication, learning, and other aspects, and avoid causing unnecessary trouble; In teaching, attention should be paid to language, adjust the requirements for college students based on their personality traits, and communicate to help them correctly understand success and failure. On the part of students themselves, they should establish a correct outlook on life, values, and the world, have a correct understanding and evaluation of themselves, improve their self-control and adaptability, face their own mental health status, and provide psychological counseling when necessary.

Conclusion

The physical exercise habits of undergraduate students at A Normal University are closely related to their mental health and have a strong correlation. Among them, the strongest impact is the mutual influence between "exercise effectiveness" and "somatization", followed by "exercise behavior" and depression, while the ones that have no impact are "thinking patterns" and "fear", "paranoia", and "psychoticism". There is a close connection between physical exercise habits, "exercise behavior," "exercise effectiveness," and various factors of mental health, while there is no close connection between "thinking mode" and mental health. Students with good "exercise behavior" and "exercise effect" have a certain degree of good mental health, among them, the improvement of depression is the most significant. Students with good mental health have significantly better physical exercise habits in terms of "exercise behavior" and "exercise effect", and "compulsion" has the greatest impact on "exercise behavior". The other factors of mental health have the greatest impact on "exercise effect", and each factor has the smallest impact on "thinking mode". In summary, physical exercise habits and mental health are interrelated, influencing, and developing each other. Good physical exercise habits are beneficial for the development of students' mental health, and good mental health can also promote the formation of good physical exercise habits to a certain extent. Taking students as the center, using cognitive psychology to design teaching, in the teaching process, inspire students to recall and establish the previous knowledge and current problem solving ideas, can better help students to establish their own knowledge system, promote students' knowledge and skills programmed. So as to cultivate the students hard work, solidarity, dedication, struggle and enterprising good qualities; cultivate their courage, tenacity, courage to overcome difficulties, self-confidence, self-control, pioneering and innovative spirit, in moral, intellectual and physical aspects.

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