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Construction of Outdoor Adventure Education Courses to Develop Psychological Resilience for University Students

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Abstract

Background and aims: Most schools only pay attention to the cultivation of students' bodies, knowledge, and skills, but neglect the development and training of university students' psychological skills. When university students exhibit some psychological problems, often will be given to students' mental health education centers to solve, due to the student's mental health education center teachers and the site being more limited. This study aims to evaluate the impact of outdoor adventure education courses on the psychological resilience of university students.

Materials and methods: The researchers used an experience-based learning circle model, incorporating The Resiliency Wheel, Full value contracts, and guidance techniques. Using quantitative studies, interviews, and experimental data, participants were divided into two groups: the experimental group and the control group. The effect of the adventure education course as an 8-week intervention was studied using the psychological resilience Scale. Data were analyzed using a t-test and one-way ANOVA. The experimental group scored higher than the control group in the total scores of psychological resilience and the three components (tenacity, strength, optimism), and these results were statistically significant. Further, the experimental group shows marginal positive changes in the total resilience scale and its three dimensions in terms of effect size. The designed adventure education courses significantly improve the psychological resilience of university students.

Results: The results found that the psychological resilience level of university students was significantly improved after the intervention, and the scores in the dimensions of tenacity, strength, and optimism significantly increased after the intervention. through the research of this paper, we can expand the analytical perspective of psychological resilience and provide a new way of thinking for the improvement of the psychological resilience of university students.

Conclusion: The content of previous interventions on psychological resilience and the factors affecting psychological resilience, applying the concept of the psychological resilience wheel to this course, And the full value contract, guide technology, and outdoor adventure education courses are fully combined and designed.

Keywords: Outdoor Adventure Education; Psychological Resilience; University Students

Introduction

The lack of psychological resilience will make them lose the ability to meet challenges, get frustrated in the face of failure, and eventually give up. University students are dealing with a critical period of physical and mental development, at the stage of the formation of their worldview, teachers should pay attention to the cultivation of psychological resilience of university students, and help them develop a strong character, which will benefit them in the future study and life（Liu, X. 2019）.

Most schools only pay attention to the cultivation of students' bodies, knowledge, and skills, but

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neglect the development and training of university students' psychological skills. When university students appear some psychological problems, often will be given to the student's mental health education center to solve, due to the student's mental health education center teachers and the site is more limited, more counseling students, time is short or some students due to personal privacy is not willing to say it, cannot fundamentally solve the student's psychological problems (Pan, J.-Y., & Zhuang, X. 2022). After 1970, the model of action therapy has gradually been applied to adolescents and has proven to be effective in research. In recent times, adventure interventions have also been promoted in some non-profit institutions in China, and have achieved good results among young people. Adventure interventions are developed through the philosophy of experiential education "reflective learning from participation", which emphasizes learning from concrete experiences internalizes individual learning, and promotes individual change through physical and psychological feelings. According to many foreign research results, adventure intervention has a good effect in intervening in the behavior and cognitive changes of dangerous adolescents. As a relatively novel intervention method, adventure education originated from experiential learning in the United States, which helps individuals explore their psychology and behavior through comprehensive counseling courses and promotes the improvement of relevant aspects of individuals (Harper, N., Rose, K., & Segal, D. 2019). Adventure education, that is, through the way of "adventure", so that individuals from a familiar comfortable environment to an unfamiliar and challenging environment, individuals must complete the challenges in the situation through practical actions, in such a situation, individuals will actively explore solutions to problems by changing their original behavior patterns (Wu, C.C., & Li, C.W. 2023). Although the well-being effects of nature, in general, have been widely studied, the research on the mental health and subjective well-being benefits of outdoor adventures is still limited and scattered. Outdoor adventure education has a positive impact on the emotions, recovery, and life satisfaction of participants, and it greatly helps to improve the social relationships and group cohesion of participants (Puhakka, R. 2023). Participating in outdoor adventure programs provides university students with an opportunity to get away from daily challenges, thereby reducing their psychological stress levels and temporarily relieving their physiological stress levels (Chang, Y., Davidson, C., Conklin, S., & Ewert, A. 2019). Adventure programs foster eudaemonic aspects of subjective well-being (e.g., purpose and meaning, life satisfaction) by supporting the satisfaction of basic psychological needs for autonomy, competence, relatedness, and beneficence (Houge Mackenzie, S., & Hodge, K. (2020).

Therefore, this article decided to conduct research on the resilience of university students by using the method of adventure education. I believe that through the research of this paper, we can expand the analytical perspective of psychological resilience and provide a new way of thinking for the improvement of the psychological resilience of university students. At the same time, through the research in this paper, we can also expand the application scope of adventure education, so that adventure education can be better and more effectively developed in other fields.

Objectives

1. Construct outdoor adventure courses appropriate to university students.
2. Explore the effectiveness of this course on improving psychological resilience among university students.

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Literature Review

1. Outdoor adventure education

Outdoor adventure education is often understood as adventure-based learning (Adventure Based Learning). ABL is a series of adventures in which people engage in purposeful, creative problem-solving that promotes physical, mental, and social development through a variety of games. Outdoor adventure education is a way of experiential learning through sensory participation in outdoor situations, through the form of adventure activities to achieve the educational purpose. In outdoor adventure education, through direct participation in the design of activities with challenging, highly adventurous, and novel growth experiences, we learn interpersonal and inner abilities to achieve the educational goals of personal growth and development. As far as outdoor adventure education is concerned, there are more than 20 different forms of activities, for example, mountaineering, rock climbing, kayaking, hiking, camping, high-altitude challenges, wild survival, and so on (Ewert, A.W. 2014).

2. Psychological resilience

Psychological resilience refers to the firmness, efficiency, and flexibility shown by individuals in implementing and maintaining the pursuit of goals and psychological resources. Psychological resilience can be defined as the ability of university students to be determined and committed to achieving training goals. It represents the ability of university students to deal with problems, including focus, self-discipline, and confidence. Previous studies have shown that psychologically tough university students can always keep a cool head, maintain emotional stability, in the face of pressure keep relaxed, calm, and energetic, at the same time always have the confidence to achieve goals, and can quickly recover from setbacks. Even in the case of interference, he still has a high degree of confidence, believes that he has better abilities and qualities than his opponents, and is always full of strong motivation and desire to succeed (Vella, S.L.C., & Pai, N.B. 2019).

At present, with the diversity of university students' environment and the diversity of class forms, many university students have a variety of psychological confusion in adapting to the corresponding campus life. Mainly in the learning aspect, the complexity of the curriculum, the diversity of teaching methods, the jump in teaching progress, etc., make them difficult to adapt, resulting in a series of learning problems. If these problems cannot be solved in time, it will have a huge impact on the sound personality and healthy psychology of university students, and hinder their effective learning, especially the improvement of adaptability. According to the theory of psychological quality, adaptability is the comprehensive performance of personality factors and cognitive factors in the social environment, and personality factors have an effect on individual mental health through the level of adaptability, mental health is the functional state and symbol of the completion of mental quality. Psychological resilience is a personality trait, while adaptability is a positive representation of mental health and psychological resilience and adaptability are closely related to mental health (Flett, G.L. 2018). The above-mentioned literature points out the relationship between psychological resilience adaptability and mental health. The adaptability problems faced by university students and the positive adjustment ability provided by psychological resilience can make university students adjust themselves in time and face the learning adaptability problems with a positive attitude. In contrast, psychological resilience is not only helpful in learning adaptation but also has a significant impact on university students' professional adaptation, interpersonal adaptation, and emotional adaptation (Zhang Jingyi, Chen Jing, Yu Xiaomin, 2021).

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Nowadays, it is necessary for us to actively cultivate the psychological resilience of university students, so that they can better adapt to the changes in teaching, learning tasks, and learning knowledge in the changing environment. As a more important interpersonal communication among university students, psychological resilience is a positive adjustment ability that promotes good communication between university students and classmates, roommates, and teachers and makes interpersonal relationships harmonious. From these aspects, it is not difficult to see that psychological resilience is of great significance to the mental health education of university students. Psychological resilience not only improves the level of mental health of university students, but also improves the interpersonal harmony on campus (Liu, Z., & Guo, L. (2020).

The researcher summarizes the relationship between outdoor adventure education and psychological resilience, which has been studied relatively little before. The researcher studied the construction of outdoor adventure education courses to develop psychological resilience in university students' projects is very necessary.

Conceptual Framework

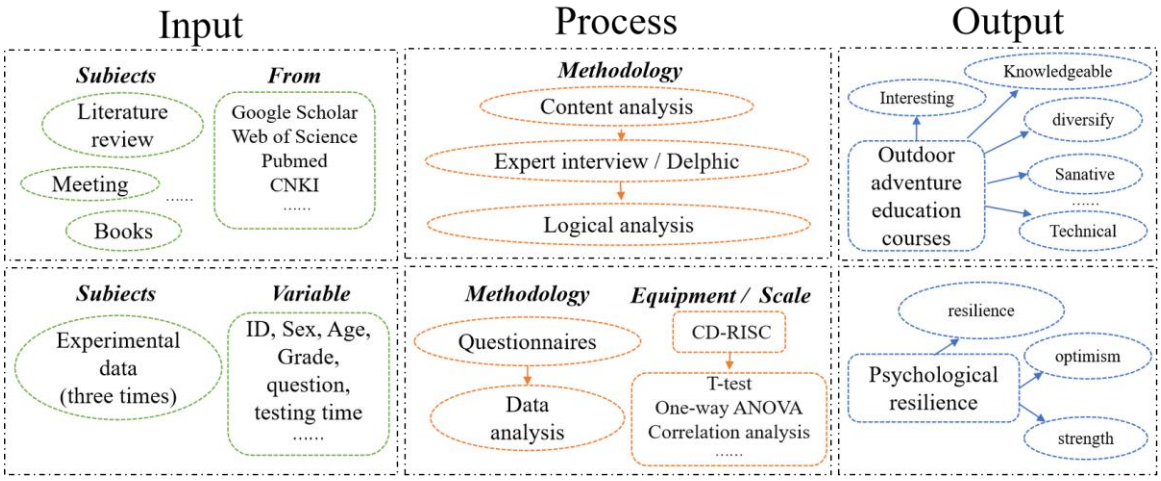

Figure 1: Conceptual Framework of Research

Methodology

This study used quantitative research methods, The Chinese version of the Psychological Resilience Scale (CD-RISC), revised by Yu Xiaonan and Zhang Jianxin (Yu, X., & Zhang, J. (2007), was used in this study. To ensure the validity of the study, a randomized experimental design was used, consisting of three stages: before intervention, during intervention, and after intervention.

During the experiment, the experimental group underwent adventure education courses, while the control group did not receive any training related to resilience development. The experimental group participated in an 8-week outdoor adventure educational course, with 120-minute lessons twice a week. After the experimental intervention, both the experimental and control groups were observed during a test administered by the teacher to assess the impact of the intervention on the students' resilience and adventure abilities.

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1. Participants' specifications and size: The study was conducted on a group of first-year university students at Hainan A University who had not received any physical education training before. Firstly, Hainan A University is a comprehensive university that emphasizes both teaching and research. It has qualified faculty and specialized facilities for conducting outdoor adventure education courses. Secondly, Hainan A University is located in a coastal area, regularly engaging in exchanges with foreign universities and actively promoting outdoor adventure education programs. The inclusive campus atmosphere and ongoing curriculum reforms provide a unique advantage for the development of adventure education courses.

Initially, the sample size was determined to be 60 people using G-power, a statistical tool for calculating the sample size. The sample size was calculated for a statistical test of moderate-intensity effect size, Cohen's d=0.25, taking into account a sample loss of 30%. The sample consisted of 28 men and 32 women. To ensure the experiment's validity, the principle of random allocation was used to divide the 60 students into two groups. The experimental group consisted of 30 students, including 14 males and 16 females. The control group also consisted of 30 students, including 14 males and 16 females.

Before the experiment, the psychological resilience of all 60 subjects was measured. To ensure that there was no significant difference in psychological resilience between the experimental groups and control groups, equal matching groups were used for the experiment. This means that the participants in the experimental groups and control groups were matched based on their psychological resilience.

2. Research Approach: The researcher conducted an in-depth study on outdoor adventure education and psychological resilience. After thoroughly analyzing various sources, they formulated a questionnaire ensuring its pertinence. Standard measures for psychological resilience were employed, and the content was further refined based on the advisor's feedback. After validation, the questionnaire was distributed to eligible participants, offering valuable insights into the subject.

3. Data Analysis: After collecting the above data and information, the next step in the research process would be to utilize repeated measures of variance. This statistical analysis will help to determine the effectiveness of outdoor adventure education courses on a variety of indicators, including but not limited to tenacity, strength, and optimism. By using this method of analysis, we can better understand the long-term impact of outdoor adventure education and the potential benefits it may provide for individuals seeking personal growth and development.

Results

In this study, the results of qualitative analysis and experimental results show that the intervention effect of outdoor adventure education courses on improving university students' psychological resilience and its branching dimensions is significant, both in the comparison between groups and in the time series. The detailed analysis results are as follows:

1. The Impact of Outdoor Adventure Education Courses on University Students' Psychological Resilience

1.1 Experimental Preparation and Reliability Analysis

1.1.1 Experimental Preparation

Before the experiment, the psychological resilience scores of a total sample of 60 individuals

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were measured. It was found that before university students underwent outdoor adventure education courses, their levels of psychological resilience were generally poor. Specific manifestations included: fear of facing challenges, constant worry about making mistakes, lack of emotional control, lack of psychological regulation, and lack of self-confidence. In addition, the results of the differential tests for gender, age, and whether they were an only child showed: that there were no significant differences in the total psychological resilience scores and the three sub-dimensions between males and females; students in the age groups of 18, 19, 20, and 21 also did not show significant differences; there was no difference in psychological resilience between those who were and were not only children.

Subsequently, the research sample was randomly divided into experimental and control groups (EG and CG). Independent sample T-tests were conducted on the two groups using SPSS software. The results showed that there were no significant differences between the experimental group and the intervention group in terms of total psychological resilience scores and various sub-dimensions.

1.1.2 Questionnaire Reliability and Validity Analysis

The "Reliability Analysis" function in SPSS was used to analyze the reliability of the questionnaire data from the three measurements, with Cronbach's alpha coefficient as the statistical measure. The results are shown in Table 1. It can be seen that the results of the three measurements are all reliable. Based on the successful use and reliable performance of references in the Chinese population, we believe that this scale is standardized and feasible and is valid for this experiment.

Table 1 Reliability Analysis of Questionnaire Data from the Three Measurements

Test \ Alpha	Total Score	Tenacity	Strength	Optimism
Pre-test	0.877	0.834	0.829	0.779
Mid test	0.926	0.845	0.797	0.707
Post-test	0.932	0.867	0.764	0.806

*p<0.05. **p<0.01

1.2 Descriptive Statistical Results of Psychological Resilience Indicators for the Experimental Groups and Control Groups of University Students

This study explored the impact of outdoor adventure education on the psychological resilience of university students and collected data in three phases: ① distributing questionnaires before the course (pre-test), ② distributing questionnaires 4 weeks into the course (mid-test), and ③ distributing questionnaires 8 weeks into the course (post-test). Table 2 displays the mean square results (mean (M) and standard deviation (SD)) of the psychological resilience pre-test, mid-test, and post-test for the subjects (experimental groups and control groups). As seen in Table 2, after the intervention of the outdoor adventure education course, there was a significant increase in the psychological resilience total score and various sub-dimensions for both males and females in the experimental group.

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Table 2 Mean-variance in all dimensions of psychological resilience during pre-, mid, and post-testing in experimental groups and control groups

Process	Tenacity		Strength		Optimism		Total Points	
	E G	C G	E G	C G	E G	C G	EG	C G
Pre-test								
female	33.94±4.88	33.81±5.25	21.13±3.24	21.38±3.50	9.75±2.28	9.50±2.32	64.81±9.05	64.69±8.72
male	31.64±3.98	32.43±4.32	21.36±3.81	21.36±4.12	9.14±2.42	9.43±2.13	62.14±7.16	63.21±7.98
Mid-test								
female	39.31±4.04	34.19±4.43	23.56±3.06	22.19±3.24	10.06±1.78	9.56±2.18	72.94±7.88	65.94±8.07
male	37.79±3.41	33.00±3.64	23.64±3.54	22.36±4.01	12.00±0.85	9.50±2.03	71.57±6.85	64.86±7.38
Post-test								
female	41.56±3.45	33.38±4.64	25.63±2.60	21.81±2.72	12.13±0.93	9.50±2.06	79.31±6.23	64.69±7.35
male	40.00±3.25	32.00±4.09	25.57±2.74	22.00±3.59	12.36±1.04	9.29±1.75	77.93±5.44	63.29±6.85

1.3 Repeated Measures Analysis of Variance

Using SPSS software, we conducted a 2×3 repeated measures analysis of variance on the changes in the experimental group and the control group at three time points, Test time (pre-test, mid-test, and post-test). The results of the differences between groups at different time points are shown in Table 3.

Table 3 Independent Sample T-test of Each Indicator between experimental and control groups

Test \ P	Total Score	Tenacity	Strength	Optimism
Pre-test	0.844	0.811	0.890	0.909
Mid test	0.001**	0.001**	0.148	0.273
Post-test	0.002**	0.000**	0.001**	0.000**

*p<0.05. **p<0.01

Results Overall Psychological Resilience Score: There were significant differences in the overall psychological resilience scores between the experimental group and the control group during the mid-test and post-test (Table 3, $p<0.01$). Moreover, both the main effect of test time and the interaction effect between test time and groups were significant. The overall psychological resilience score of the experimental group showed a noticeable increase with the intervention, while the differences in the control group across the three tests were not significant (Figure 2a). ②Tenacity Dimension: There were significant differences in the tenacity dimension between the experimental group and the control group during the mid-test and post-test ($p<0.01$). Additionally, both the main effect of test time and the interaction effect between test time and groups were significant. The scores for the tenacity dimension in the experimental group showed a noticeable increase with the intervention, while the differences in the control group across the three tests were not significant (Figure 2b). ③Strength Dimension: There were significant differences in the strength dimension between the experimental group and the control group during the post-test ($p<0.01$). The analysis results showed a significant main effect of test time. The scores for the strength dimension in the experimental group showed a noticeable increase with the

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intervention, while the differences in the control group across the three tests were not significant (Figure 2c). ④Optimism Dimension: There were significant differences in the optimism dimension between the experimental group and the control group during the post-test ($p<0.01$). Moreover, both the main effect of test time and the interaction effect between test time and groups were significant. The scores for the optimism dimension in the experimental group showed a noticeable increase with the intervention, while the differences in the control group across the three tests were not significant (Figure 2d).

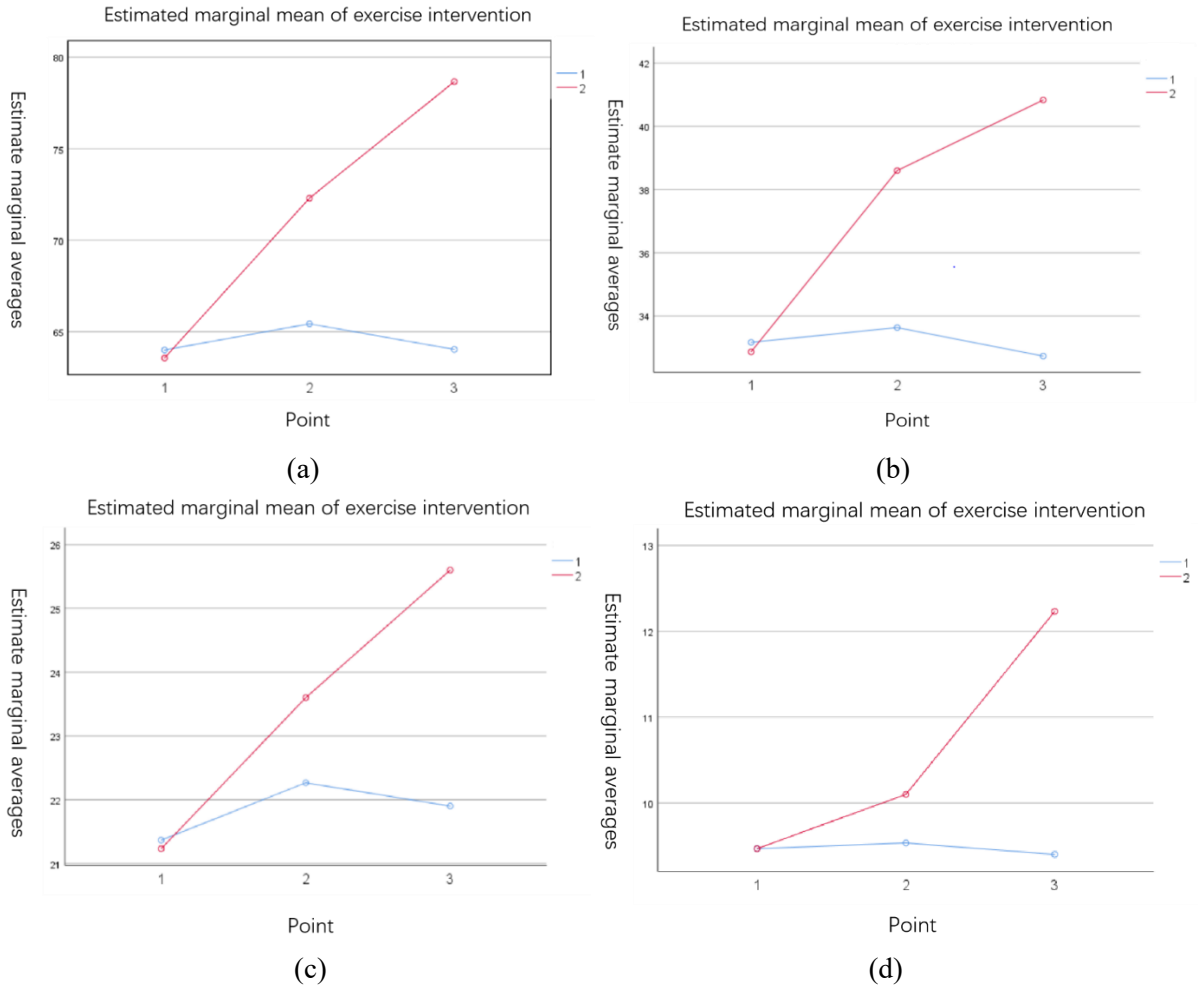

Figure 2 The change in psychological resilience in the experimental group and control group during three tests

In summary, the outdoor adventure education course has a good effect on enhancing the psychological resilience of university students, with the most noticeable effect being in the tenacity dimension.

Conclusion

This study is based on the empirical learning circle model, by summarizing the content of previous interventions on psychological resilience and the factors affecting psychological resilience, applying the concept of the psychological resilience wheel to this course, And the full value contract, guide

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technology, and outdoor adventure education courses are fully combined and designed, Reference to the design principles of past studies to design outdoor adventure education courses, Is in line with the physical and mental development needs of modern university students, Let the students break through the comfort zone, Deepening the understanding and knowledge of oneself and others in outdoor and realistic situations, Not only learn knowledge, skills and gain emotions, Moreover, I can combine what I have found, learned and learned in the course and transfer it into my daily life, work, and study. Through the experiment, the experimental group and the control group were set up, and the study design of "pre-test、mid-test、post-test" was adopted. The results found that the psychological resilience level of university students was significantly improved after the intervention, and the scores in the dimensions of tenacity, strength, and optimism significantly increased after the intervention, as illustrated in Figure 3.

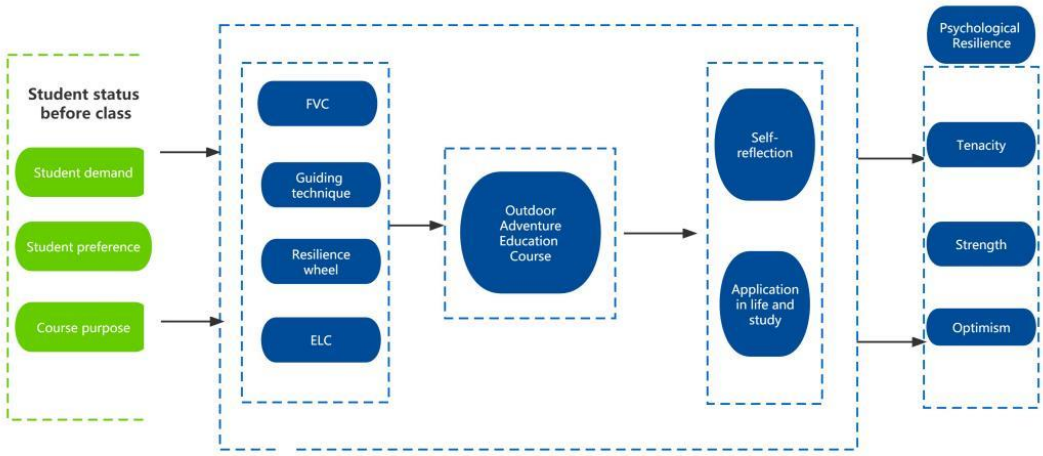

Figure 3 Curriculum Model

Discussion

In the focus of the study, the researcher proposed several plausible reasons contributing to significant improvement in psychological resilience development, such as the influence of (1) outdoor adventure education courses and (2) the outdoor environment. To discuss these ideas in further detail, the researcher elaborated on each factor separately.

1.Influence of outdoor adventure education courses

Overall, the present results strongly support the effectiveness of outdoor adventure education courses in improving the psychological resilience of university students. First, this study constructed an outdoor adventure education course suitable for university students, which had a significant impact on the improved psychological resilience of university students when attending outdoor adventure education courses. At the same time, the school provides participants with some outdoor adventure education courses (such as canoeing、 tree climbing, etc.) in a challenging natural environment. According to the researchers' observations, all university students actively participated in each course of outdoor adventure education. Courses promote the positive development of university students in the following aspects: (1) physical (i.e., strength, speed, coordination); (2) psychological (i.e., courage,

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confidence, optimism); (3) social (such as trust, communication, cohesion), previous studies also confirmed the benefits of outdoor adventure courses for improving physical, psychological and psychosocial aspects (Lin, H., & Wu, C. 2021).

In addition, a more concentrated adventure education curriculum also exerted pressure on university students, during the course, each group has two adventure education courses a week, each course duration of about 2 to 2.5 hours, these courses are gradual and continuous, can give university students in limited time continuous experience and challenges, the researchers put forward, university students to these extensive experiences and challenges may help to improve their psychological resilience. This is also supported by Middleton et al, who found that psychological resilience is a result of individual responses to adversity, including ongoing physical stress (Shafie, M. S., & Che Mat, H. 2014).

By observation, each outdoor adventure education course may have a different impact on the psychological resilience of university students. For example, courses such as high-altitude challenges, kayaking, and escape walls make additional contributions to improving the psychological resilience of university students who require higher physical and psychological stress compared to other traditional physical activities. Based on these arguments, the researchers propose that different types of risk courses may have different effects on the improvement of psychological resilience. Therefore, outdoor teachers should creatively plan and design students' adventure education courses to maximize the psychological resilience of university students (Wang, Y., & Li, Y. 2021).

2.Impact on the outdoor environment

The researchers believe that the environment of adventure education courses may have an impact on the psychological resilience of university students. The course uses diverse and multi-region experiences and challenges to encourage university students to experience personal and team challenges, high, middle, low, water, and other challenges, especially when university students are used to a technology-dependent lifestyle, high altitude challenges, and water projects create a challenging environment. Guusadi et al (Webb, D. J. 1999) suggest that challenging situations do influence the development of psychological resilience and the ability to overcome these challenging situations helps to improve the psychological resilience of participants. In addition, during the adventure education course, university students also experienced challenging climates, such as heavy rain and high temperatures, These conditions increase their challenges but also increase the risk factors during the course, these challenging situations will also affect the participants' psychological resilience, Bull et al (Bull, S., Shambrook, C., James, W., & Brooks, E. 2005), the impact of the environment is the most important factor affecting the development of psychological resilience. So, the researchers believe that challenging environments contribute positively to the development of individual psychological resilience.

However, equally important is that improved psychological resilience is not limited to remote and natural environments. Some outdoor adventure projects are also organized in indoor or urban areas. For example, adventure classes such as venue projects, rope classes, and rock climbing can be conducted indoors and have similar effects in improving psychological resilience.

Suitable course planning and design, both indoor and outdoor, natural and urban environments, improve participants' psychological resilience. Ultimately, the researchers found that challenging

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outdoor environments were more likely to influence participants' improved psychological resilience than indoor environments. This statement is based on Bull et al (Bull, S., Shambrook, C., James, W., & Brooks, E.2005), which stated that challenging environments are the biggest contributors to the development of psychological resilience and that the way participants cope with the challenging environment greatly affects the improvement of their psychological resilience.

Research recommendations

1. Advice for adventure education courses

According to the results of this study, Future adventure education courses: (1) regardless of the activity attributes used by adventure education, When recommending the planning of the course, According to the course purpose, course structure, learning objectives, To meet the needs of the students, Integrating the appropriate learning materials, Strengthening the cognitive guidance, Help to construct the self-identity, Improve your capacity for self-reflection, Promote learning results; (2) It is suggested that the guide should not just build a team, And more so, at multiple levels, More the learning community, Establish positive interactions with the students, Promote diverse communication among students, By giving feedback from each other, Improve the learning effect; (3) Pay attention to the guide's cognition and cultivation of role playing, responsibility and ability, Play activities to lead, community management, innovative and lively teaching, By a diverse process of guided reflection, Help students to study together; (4) Adhering to the principle of "starting with the end", Application and practice after the course, Inclusion of considerations in the curriculum design, In the course, Actively create situations that to learning transfer, By assessing the learning status of the trainees, To help students develop "learning autonomy" And the ability to "take it away."

2. Recommendations of the study subjects

（1）Because this study is limited by practical factors, the experimental time is short for 8 weeks, and the improvement of psychological resilience is a long-term, systematic process, so the experimental time can be extended in future studies.

（2）The number of subjects selected in this study is small, so in future studies, it is suggested to further expand the number of samples and further explore the impact of outdoor adventure education on the psychological resilience of university students.

3. Policy recommendations

School sports to raise students' comprehensive ability, is the fundamental task of national Khalid ends, at the same time, the school in promoting the modernization of education, education power, and construction of sports power plays an important role, in cultivating students' collectivism, striving forward, indomitable will quality, implementation to sports intelligence, with sports heart has a special function. Open qi open group of physical education, according to the characteristics of students' physical and mental development and student needs and preferences, diversification of adventure education courses, rich course content, overall coordination, integration of social resources, according to the actual situation of the school and available space, strengthen the infrastructure of school adventure education site and equipment, to meet the needs of the course teaching practice.

4. Recommendations for Further Research

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Firstly, in future research, we should have a fixed schedule to ensure the schedule and fixed teachers to complete the course; secondly, to expand the audience and improve the intervention quality, we can strengthen the training of school counselors and related teachers, use the theory and guiding technology of outdoor adventure education, and mental health education content, not only strengthen the psychological theory foundation of teachers, to more flexibly design course activities and deal with various problems raised by students, and also help the counselors' daily work. Finally, there should be intensive training and discussion on in-depth interpretation of reference materials, so that activities more suitable for students can be designed under the guidance of theory and combined with the work experience of counselors.

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