

Influence of Bodybuilding on Mental Resilience and Subjective Well-Being of Applied University Students in Yunnan Province

Shuai Luo^{1,a}, Chaohu He^{1,b,*}, Yuhong Wang^{1,c}

¹*School of Physical Education, Kunming University, Kunming, Yunnan, China*

^a*1561120078@qq.com*, ^b*holy921@qq.com*, ^c*yuhongwangynkm@sina.com*

^{*}*Corresponding author*

Keywords: Fitness and Bodybuilding, Applied Universities, Psychological Resilience of College Students, Subjective Well-being

Abstract: In recent years, in the context of rapid development in daily life, the mental health issues of college graduates have increasingly attracted people's attention. Among them, psychological resilience, subjective well-being, etc., are important indicators to measure the level of mental health of college students. This article adopts methods such as questionnaire survey and interview to study the psychological resilience and subjective well-being of college students in applied universities in Yunnan Province after exercising. A total of 300 people from three applied universities in Yunnan Province were selected as the research subjects, and a combination of questionnaire and experimental methods was used to conduct a 6-month follow-up survey. A self-designed questionnaire was used to evaluate the psychological resilience and subjective well-being of college students participating in fitness activities. In the exploration of the impact of exercise frequency on subjective well-being, participants who exercise once a week increased their subjective well-being from an initial average of 6.6 points to 7.2 points after 6 months, an increase of 0.6 points. This article found that college students who frequently participate in fitness and bodybuilding exercises have significantly improved their psychological resilience and subjective well-being, especially in areas such as stress resistance and emotional regulation. Through this study, it can provide certain reference for the reform and development of physical education teaching in Chinese ordinary universities.

1. Introduction

Students from applied undergraduate colleges in Yunnan Province face various pressures such as academic performance, employment, and social relationships, which pose certain risks to their mental health. In recent years, the psychology community has begun to pay attention to the role of a healthy lifestyle in enhancing personal psychological resilience and improving subjective well-being. Numerous studies have shown that physical exercise, especially physical exercise, has a significant effect on improving a person's mental health level. However, there is still little systematic research on applied undergraduate colleges in Yunnan Province. Therefore, this article

takes this as the starting point and adopts empirical research methods to explore the mechanism of the effect of regular participation in fitness exercises on the psychological resilience and subjective well-being of college students. This can provide theoretical basis and practical guidance for Chinese universities to carry out fitness activities. Therefore, through physical exercise for college students, it can improve their psychological resilience, enhance their subjective well-being, promote their comprehensive development, and build a harmonious campus environment, which has very practical significance.

This article takes 300 students from three applied universities in Yunnan Province as the research subjects, and uses methods such as questionnaire surveys and experimental methods to conduct a six-month study on this basis. This article takes college students participating in fitness and bodybuilding activities as the research object, evaluates them from aspects such as psychological resilience and subjective well-being, and studies their correlation with exercise frequency and intensity. Through comparative analysis, it was found that regular exercise has a specific effect on improving the mental state of students, and its value in carrying out mental health education in universities was explored.

The research framework of this article is divided into the following parts: Firstly, by reviewing the literature, the impact of fitness and exercise on human psychological resilience and subjective well-being is elucidated, providing a theoretical basis for the impact of physical exercise on human psychological resilience and subjective well-being. Then, this article introduces the research methodology and data collection process, and elaborates on the methods of participant screening, data processing, and analysis. Finally, the conclusion of this article is presented, and the guiding role of this article in providing psychological health education for applied undergraduate students in Yunnan Province is explored, providing some reference for future research. On this basis, a comprehensive evaluation of the positive effects of fitness exercise on the psychological resilience and subjective well-being of college students is conducted, and reference is provided for the formulation and optimization of relevant education policies in China.

2. Related Work

The research results indicate that under high stress conditions, fitness activities can effectively improve an individual's psychological resilience and subjective well-being. Wang Lijun used college fitness and bodybuilding athletes as an example to study the relationship between mental health, dietary behavior, and exercise pleasure [1]. Li Mengke explored the impact of functional training on fitness and bodybuilding [2]. Xie Hui studied the impact of fitness and bodybuilding exercises on the physical and mental health of college students [3]. Tian Liang studied the effect of suspension training on shoulder joint stability in bodybuilding and fitness exercises [4]. Han Zimo explored the value and health promotion role of bodybuilding and fitness activities from the perspective of national health management [5]. Although there have been some studies on how exercise can improve a person's mental state, there is still a lack of large-scale surveys and long-term tracking studies for college students in specific regions.

Studying the mechanism of the effect of fitness on the psychological resilience and subjective well-being of college students can provide a theoretical basis for the formulation and implementation of sports education policies in universities. Zhu Yue studied the application of online teaching methods in university fitness clubs using the example of Jiageng College, Xiamen University [6]. Bhati Y S investigated the comparison of health status between bodybuilders and regular athletes [7]. Huang Y studied the current situation and attention issues of extracurricular fitness and bodybuilding activities among college students [8]. Boguszewski D explored methods to support female and male fitness training and post exercise recovery [9]. Geanta V A studied the

comparison of multi-joint and single joint fitness economics [10]. Previous studies often overlooked the different effects of exercise intensity and frequency on mental health, and could not provide quantitative evidence for the psychological benefits brought by fitness. Therefore, this article intends to propose more precise and practical intervention suggestions to address the above issues.

3. Method

3.1 Research Design and Participant Selection

This article takes three applied undergraduate colleges in Yunnan Province as the research objects and adopts a longitudinal queue research method. Before the experiment begins, data can be collected and then randomly divided into an experimental group and a control group. The experimental group underwent personalized fitness exercise for 6 months, while the control group maintained normal exercise. In this way, a more accurate evaluation of the psychological benefits of fitness and bodybuilding activities can be made without being affected by variables.

Psychological resilience R :

$$R = \frac{\sum(P_i - \mu_P)^2}{n} \quad (1)$$

Here, P_i is the individual's psychological resilience score, μ_P is the average psychological resilience score of the sample, and n is the sample size.

3.2 Data Collection Methods

This article can use standardized survey questionnaires and mental health assessment tools to analyze the survey results. A survey can be conducted before, after, and 6 months after intervention to evaluate its long-term efficacy. On this basis, further research can be conducted on the basic health status, lifestyle habits, academic pressure, and other aspects of the survey subjects.

Subjective well-being SWB :

$$SWB = \sum_{i=1}^n W_i \times F_i \quad (2)$$

Here, W_i is the weight of various life satisfaction, and F_i is the corresponding satisfaction score.

3.3 Development of Fitness and Fitness Training Plan

For different types of students, different training programs can be designed based on different teaching contents, in order to improve their mental health. The training content includes aerobic exercise, strength exercise, and flexibility exercise. On this basis, the intensity and content of training can be adjusted in a timely manner based on factors such as the physical fitness and psychological feedback of the students.

The correlation between fitness and mental resilience r_{PR} :

$$r_{PR} = \frac{n\sum XY - \sum X \sum Y}{\sqrt{(n\sum X^2 - (\sum X)^2)(n\sum Y^2 - (\sum Y)^2)}} \quad (3)$$

Among them, X is the frequency or duration of fitness and bodybuilding exercises, and Y is the psychological resilience score.

3.4 Data Analysis Methods

The data processing and analysis were carried out using the SPSS software package. This article adopts methods such as descriptive statistics, inter group comparison, and time series analysis. On this basis, a multiple stepwise regression method was used to explore the effects of factors such as exercise frequency, intensity, and duration on psychological resilience and happiness.

3.5 Interpretation and Practical Application of Results

The research results of this article can reveal the specific mechanism of the effect of fitness and bodybuilding exercise on the psychological resilience and subjective well-being of college students, and explore its correlation with the mental health index [11]. Through this study, it can provide scientific basis for schools to carry out more targeted sports teaching and psychological intervention measures, and provide theoretical and practical support for subsequent research.

The correlation r_{SWB} between fitness and subjective well-being:

$$r_{SWB} = \frac{n\sum XZ - \sum X\sum Z}{\sqrt{(n\sum X^2 - (\sum X)^2)(n\sum Z^2 - (\sum Z)^2)}} \quad (4)$$

Among them, Z is the subjective well-being score.

4. Results and Discussion

4.1 Experimental Exploration Conditions

This article evaluates the impact of fitness and bodybuilding exercises on the psychological resilience and subjective well-being of college students in applied universities in Yunnan Province through specific experiments. In order to ensure the reliability and scientificity of the data, this article strictly defines the experimental environment, parameter settings, and evaluation indicators in the experimental design.

Experimental environment and parameter settings:

The experiment was conducted in the sports facilities of three applied universities in Yunnan Province, each of which has standardized sports halls and fitness facilities. The experiment is divided into six months, covering different time points during the middle and end of the semester, to explore the potential impact of academic stress on the experimental results. The experimental group of students received personalized fitness and fitness training programs based on their individual physical and mental health baseline levels, including aerobic exercise, strength training, and flexibility training, three times a week for 60 minutes each time. The control group of students maintained regular daily activities and did not engage in additional physical exercise.

Detailed explanation of evaluation methods:

Measurement of psychological resilience: the article uses a psychological resilience scale containing multiple items to evaluate an individual's ability to adapt and recover from stress. These entries delve into the psychological mechanisms of individuals in coping with adversity, with the score range of the scale used to indicate the strength of psychological resilience. The higher the score, the better the individual's psychological resilience.

Evaluation of subjective well-being: The subjective well-being scale is used for evaluation, which covers multiple aspects such as life satisfaction, positive and negative emotions. The total score calculated through these items is used to measure an individual's overall subjective well-being. The higher the score, the more significant the individual's well-being.

4.2 Result Analysis

(1) Basic evaluation experiment

The participants involved in this article are generally aged between 19 and 22 years old and are all students in school. Gender composition is balanced, specifically consisting of four males (numbered 1, 3, 5, 7) and four females (numbered 2, 4, 6, 8). They come from the School of Business, School of Engineering, School of Medicine, School of Humanities, School of Information, School of Arts, School of Education, and School of Foreign Languages, reflecting the wide range of disciplinary backgrounds. In the assessment of psychological resilience, the student with the highest score is student number 4, from the Chinese Language and Literature major of the School of Humanities, with a score of 85; The minimum score is 68 points, obtained by students majoring in clinical medicine from the medical school with ID 3. In addition, regarding the score of the subjective well-being scale, the highest and lowest scores were 7.5 and 6.5, respectively, with an average score of 7.04, indicating that the subjective well-being level of most participants was above average. In this article, there seems to be a positive correlation between psychological resilience and subjective well-being. Especially, participant number 4 with the highest score for psychological resilience is also the leader in subjective well-being. The basic evaluation experiment results are shown in Table 1.

Table 1: Basic evaluation experiment results

Participant number	Age	Gender	College	Professional	Psychological resilience scale score	Score of subjective well-being scale
1	20	Male	Business school	Marketing	75	6.8
2	21	Female	School of engineering	civil engineering	82	7.2
3	19	Male	Medical college	Clinical medicine	68	6.5
4	22	Female	College of humanities	Chinese language and literature	85	7.5
5	20	Male	School of information technology	Computer science and technology	72	6.9
6	21	Female	College of art	Fine arts	80	7.1
7	19	Male	Education college	Education	78	7.0
8	22	Female	School of foreign languages	English	76	7.3

(2) Intensity change experiment

This article examines the effect of exercise intensity on psychological resilience. The initial average psychological resilience score of the low-intensity exercise group was 71 points, which

increased to 81.5 points after six months, an increase of 10.5 points. The average initial score for the moderate intensity group was 69.5 points, and after six months, it significantly increased to 86.5 points, an increase of 17 points. The high-intensity group increased from an initial score of 66 points to an average score of 84 points, with an increase of 18 points. This trend indicates that the improvement of psychological resilience is directly proportional to the intensity of exercise, especially in the moderate and high-intensity exercise groups, which showed more significant progress.

In this article, the article explores the relationship between exercise intensity and subjective well-being. Data analysis shows that the members of the low-intensity exercise group increased from an initial average subjective well-being score of 6.65 points to 7.35 points six months later, an increase of 0.7 points. The average score of the moderate intensity group increased from 6.45 points to 7.85 points, an increase of 1.4 points. The high-intensity group increased from a lower starting point of 6.1 points to 7.55 points, an increase of 1.45 points. These results indicate that the improvement of subjective well-being increases with the increase of exercise intensity, especially in the moderate and high-intensity exercise groups. The results of the intensity change experiment are shown in Figure 1 (Figure 1 (a) initial/six month psychological resilience score, Figure 1 (b) initial/six month subjective well-being score). Participant numbers 1 and 2 indicate low intensity; 3 and 4 are medium strength; 5,6 is high strength.

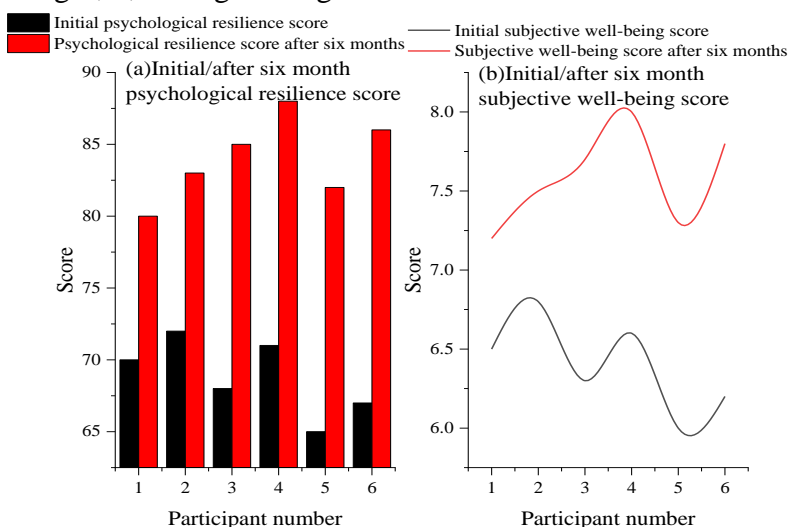


Figure 1: Results of Strength Change Experiment

(3) Frequency variation experiment

In this article, the article explores the correlation between exercise frequency and psychological resilience. The analysis results indicate that as the frequency of exercise increases, the psychological resilience score also shows an increasing trend. Specifically, participants who exercise once a week increased their psychological resilience score from an average of 71 points to 78.5 points after six months, an increase of 7.5 points. The number of participants twice a week increased from 70 points to 84 points, an increase of 14 points. The group that exercises three times a week has significantly increased from 69 points to 88 points, an increase of 19 points. Especially for the group that exercises three times a week, their psychological resilience is most significantly improved.

This article further explores the impact of exercise frequency on subjective well-being. The data shows that participants who exercise once a week increased their subjective well-being from an initial average of 6.6 points to 7.2 points after 6 months, an increase of 0.6 points. The participants

who exercise twice a week increased their score from 6.5 to 7.7, an increase of 1.2 points. Significantly, the number of participants who exercise three times a week increased significantly from 6.4 points to 8.1 points, an increase of 1.7 points. The results indicate that the improvement of subjective well-being is positively correlated with exercise frequency, especially in the group that exercises three times a week. The results of the frequency change experiment are shown in Figure 2 (Figure 2 (a) initial/six month psychological resilience score, Figure 2 (b) initial/six month subjective well-being score). Participants 1 and 2, 3 and 4, 5 and 6 exercise once a week, twice a week, and three times a week, respectively.

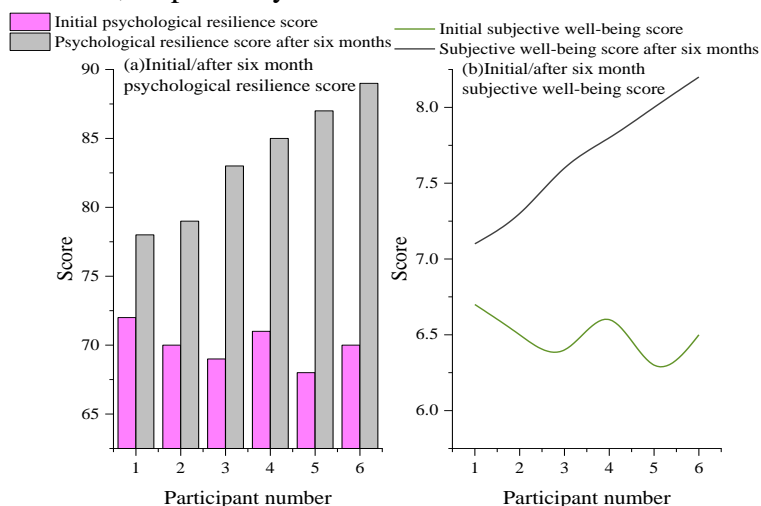


Figure 2: Experimental results of frequency variation

(4) Comprehensive intervention experiment

The results of the comprehensive intervention experiment are shown in Figure 3. Participant numbers 1, 2, 4, and 6 have a comprehensive intervention for exercise frequency, while 3 and 5 have a control group (no intervention) for exercise frequency.

When exploring the impact of comprehensive intervention measures, the intervention group members (numbered 1, 2, 4, 6) showed a significant positive change in psychological resilience, increasing from an average of 70 points to 86 points. In addition, the subjective well-being of these participants also increased. Relatively, the data from the control groups (numbered 3 and 5) showed almost no changes in psychological resilience and subjective well-being (with a small magnitude).

These results emphasize the effectiveness of comprehensive interventions, particularly in enhancing individuals' psychological resilience to life challenges and enhancing their perception of life satisfaction. Through these interventions, participants have significantly improved their adaptability and overall satisfaction with life when facing stress and difficulties, which has a profound impact on promoting their mental health and quality of life.

(5) Seasonal variation experiment

This article analyzes the psychological resilience scores of participants and finds that regardless of whether it is in spring or autumn, all participants show significant progress after participating in regular exercise. Specifically, the average score of the spring group increased from 70 points to 82 points, an increase of 12 points; The autumn group increased from 69 points to 85 points. These data emphasize the positive role of regular physical activity in promoting psychological resilience.

In terms of subjective well-being, participants showed an increase in their scores after exercise regardless of the season. The average score of the spring group increased from 6.6 to 7.4, while the score of the autumn group increased from 6.6 to 7.7. This further confirms the positive impact of sports activities on improving people's life satisfaction.

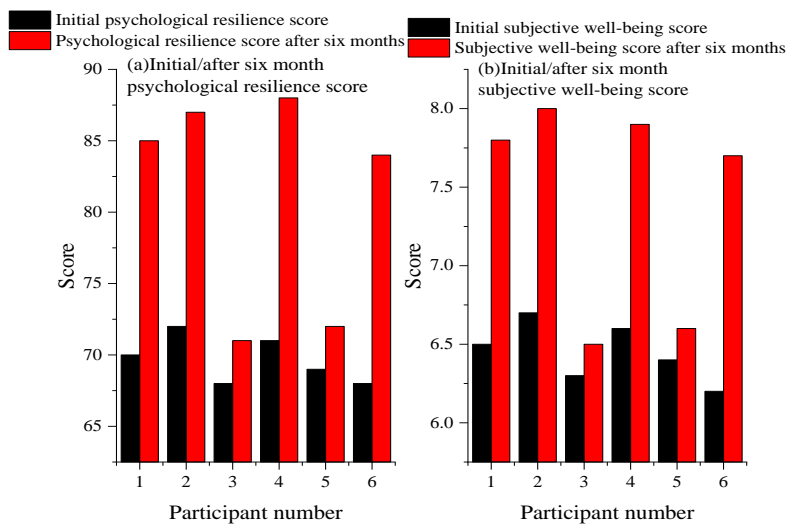


Figure 3: Results of the comprehensive intervention experiment

In addition, the analysis results did not show a significant impact of seasonal factors on psychological resilience or subjective well-being improvement. The data increase in spring and autumn is almost consistent, suggesting that the mental health benefits of exercise may exceed the limitations of seasonal changes. The results of the seasonal variation experiment are shown in Table 2.

Table 2: Seasonal variation experiment results

Participant number	Sports season	Initial psychological resilience score	Post exercise psychological resilience score	Initial subjective well-being score	Subjective well-being score after exercise
1	Spring	72	84	6.8	7.6
2		70	82	6.6	7.4
3		69	80	6.5	7.2
4	Autumn	71	85	6.7	7.8
5		69	87	6.8	7.9
6		68	83	6.4	7.5

5. Conclusions

This article adopts methods such as questionnaire survey and interview to investigate students from applied universities in Yunnan Province. This article focuses on personalized physical training as the research object, using methods such as questionnaire surveys and psychological assessments to provide physical training and psychological counseling to different types of college students. On this basis, this article can conduct a systematic evaluation of different exercise frequencies, intensities, and durations, and analyze the psychological conditions of different periods. Research

has found that college students who regularly participate in fitness and exercise have significantly improved their psychological resilience and subjective well-being. Research has found that participants who exercise more than three times a week within six months have higher psychological adaptability compared to the control group and low-frequency exercise group. In addition, people who participate in high-intensity exercise have significantly improved stress response and emotional regulation abilities. There are some shortcomings in this article. Firstly, although the sample size is large, as the research subjects are three applied universities in Yunnan Province, it cannot fully reflect students from other regions and similar universities. Secondly, currently, the evaluation of individual psychological resilience and subjective well-being is mostly based on questionnaire surveys, which have a certain degree of subjectivity. Thirdly, although multiple variables have been controlled for, there is still a possibility of unobservable interference factors, such as individual social support, personal background, etc. This article can be conducted on a larger scale and across a wider range of universities to enhance the universality of research findings. In addition, individual differences in physical exercise, such as gender, age, and whether or not one has engaged in physical exercise, can all affect the effectiveness of physical exercise. At the same time, long-term follow-up studies are needed to better understand the long-term mechanisms of fitness and bodybuilding.

Acknowledgement

This work was supported by the Education Department of Yunnan Province graduate program "Study on the influence of bodybuilding on mental resilience and subjective well-being of applied university students in Yunnan Province" (ZX20240103)

References

- [1] Wang Lijun, Zhang Hongli, Sun Manman, etc. *Research on the relationship between mental health, eating behavior, and exercise pleasure--Taking college fitness bodybuilders as an example*. *Fujian Sports Technology*, 2022, 41(4):27-31.
- [2] Li Mengke. *Research on the influence of functional training on fitness and aerobics*. *Contemporary sports technology*, 2022, 12(6):56-58.
- [3] Xie Hui. *Analysis of the impact of fitness and aerobics on the physical and mental health of college students*. *New Academic Vision of Sichuan Institute of Industry and Commerce*, 2021, 006(003): P.35-38.
- [4] Tian Liang, Xu Lei. *Research on the effect of TRX suspension training on the stability of shoulder joints in bodybuilding and fitness exercises*. *Sports Science and Technology Literature Bulletin*, 2023, 31(6):275-277.
- [5] Han Zimo. *Research on the value of bodybuilding and fitness exercise and its health promotion effect from the perspective of national health management*. *Stationery and technology*, 2021, 003(003):28-29.
- [6] Zhu Yue, Lu Rui. *Research on the application of online teaching method in university fitness and Bodybuilding Clubs--Taking Jiageng College of Xiamen University as an example*. *Sports boutique*, 2022, 41(1):67-69.
- [7] Bhati Y S, Saini J N. *A Comparative Study of Cardiovascular Fitness of Bodybuilders and Athletes During 50's Age*. *Central Asian Journal of Medical and Natural Science*, 2022, 3(5): 124-132.
- [8] Huang Y. *The Current Situation and Attention problems of College Students' After-school Fitness and Bodybuilding Exercise*. *International Journal of Social Science and Education Research*, 2022, 5(5): 461-466.
- [9] Boguszewski D. *Methods of supporting training and post-exercise recovery in women practising fitness and men practising bodybuilding: Supporting of training in amateur athletes*. *Journal of Education, Health and Sport*, 2022, 12(10): 162-168.
- [10] Geanta V A, Herlo J N. *Comparative study on multi-joint and single-joint exercises in bodybuilding economics*. *Arena-Journal of Physical Activities*, 2020 (9): 81-92.
- [11] Braghieri L, Levy R, Makarin A. *Social media and mental health*. *American Economic Review*, 2022, 112(11): 3660-3693.