

The Influence of Subjective Well-Being on University Students' Physical Exercise Behavior: The Mediating Role of Body Esteem

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Abstract: This study examines the impact of subjective well-being on university students' physical exercise behavior, with a focus on the mediating role of body esteem. Using a questionnaire survey, data on students' subjective well-being, body esteem, and exercise behavior were collected. Structural Equation Modeling (SEM) and the Bootstrap method were used for data analysis. The results indicate that subjective well-being does not directly influence physical exercise behavior. Instead, it enhances body esteem, which in turn promotes exercise participation, demonstrating a full mediation effect. These findings provide insights into the psychological mechanisms linking subjective well-being and exercise behavior and offer theoretical support for university sports education and mental health interventions. This study suggests that efforts to encourage physical exercise among university students should focus on improving body esteem. Strengthening body esteem can enhance students' exercise participation and overall psychological well-being. Future research could explore additional mediating or moderating factors, such as exercise self-efficacy and social support, to gain a more comprehensive understanding of the factors influencing university students' exercise behavior.

1. Research Background

With the rapid development of society and increasing competition, university students face growing academic, employment, and life adaptation pressures. Mental health issues have gradually

become a significant concern. Physical exercise, as an essential health promotion method, plays a crucial role in maintaining the physical and mental well-being of university students. It refers to activities performed during leisure time with the goal of improving health, involving a certain level of intensity, frequency, and duration [1].

Research shows that physical exercise significantly benefits cardiovascular function, muscle strength, and cognitive abilities while also effectively addressing metabolic diseases. Regular participation in physical exercise can help reduce stress, improve mood, and strengthen psychological resilience, thereby enhancing subjective well-being. Specifically, physical exercise promotes the release of endorphins, which improve emotional states, relieve anxiety and depression, and ultimately enhance overall quality of life [2]. When university students maintain good physical health, stable emotions, and high-quality living conditions, their life satisfaction and happiness levels are also positively affected [3].

2. Research Hypothesis

2.1 Relationship between Subjective Well-being and Physical Exercise Behavior

Subjective well-being, an important indicator of mental health, has gained significant attention in recent years. Diener and Sim [4] define subjective well-being as an individual's subjective assessment of their overall life satisfaction and happiness, which includes three aspects: life satisfaction, positive emotions, and negative emotions. This concept reflects students' subjective experiences across areas such as emotional states, interpersonal interactions, academic stress, and quality of life [5].

Further research suggests that improving subjective well-being is closely linked to a reduction in negative emotions. Individuals who experience fewer negative emotions often report higher levels of subjective well-being and greater life satisfaction [6]. Recent studies have revealed that subjective well-being levels among university students in China are generally low. With the development of positive psychology, enhancing subjective well-being has been recognized as an important way to promote the healthy development of university students [7].

Studies in sports psychology have further confirmed that university students' subjective well-being is closely related to their level of participation in physical exercise [5]. Empirical studies demonstrate that engaging in physical activity not only significantly improves subjective well-being but also helps individuals experience feelings of joy, calmness, and positivity. Moreover, Lin, Li [8] found that higher subjective well-being enhances students' motivation to participate in physical activities, while physical exercise has a significant positive predictive effect on subjective well-being. Similarly, Shang, Xie [3] reported that the more frequently and intensely university students engage in physical exercise, the higher their levels of subjective well-being. Based on the findings above, this study proposes the following hypothesis:

H1: Subjective well-being is positively and significantly correlated with physical exercise behavior among university students.

2.2 Relationship between Subjective Well-being and Body Esteem

Self-esteem refers to an individual's emotional assessment of their self-worth, which can manifest in both positive and negative ways. It is recognized as a key psychological factor influencing the likelihood of engaging in healthy behaviors [9]. Research has demonstrated that individuals with higher self-esteem generally experience lower levels of depression [10], build more stable and positive interpersonal relationships and achieve greater life satisfaction. These findings

suggest that self-esteem plays a vital role in safeguarding subjective well-being. Chunhan [11] further emphasized that self-esteem embodies an individual's confidence in their abilities, significance, self-value, and perception of success, making it a strong predictor of subjective well-being.

In the context of physical exercise, researchers generally believe that both extracurricular sports activities (Yan et al., 2019) and physical exercise incorporated into academic curricula (Zhu et al., 2010) can significantly enhance self-esteem. At the same time, improvements in self-esteem can also foster greater enthusiasm for participating in physical exercise, forming a positive cycle.

Body esteem, as an essential component of self-esteem, refers to an individual's evaluation of their body image and physical capabilities [12]. Higher body esteem is closely related to body satisfaction and self-identity, and it has significant implications for mental health and social interactions. Studies have found that higher body esteem can boost an individual's confidence, reduce anxiety and depressive symptoms, and ultimately enhance subjective well-being [13].

Self-esteem is closely linked to various components of subjective well-being and is widely recognized as an important indicator of an individual's happiness [14]. Chunhan [11] emphasized that self-esteem is not only a subjective evaluation of one's abilities, self-worth, and success but also a strong predictor of subjective well-being.

Therefore, enhancing university students' subjective well-being can not only contribute to their psychological health but also improve their body esteem, fostering a more positive attitude toward their body image and physical abilities. This relationship suggests that prioritizing university students' psychological well-being can promote healthier lifestyles and stronger self-identity, ultimately leading to improved overall happiness and well-being. Based on the findings above, this study proposes the following hypothesis:

H2: Subjective well-being is positively and significantly correlated with Body esteem among university students.

2.3 The Relationship between Body Esteem and Physical Exercise Behavior

Body esteem, which refers to an individual's positive evaluation of their body image, is not only a crucial indicator of psychological well-being but also a significant factor influencing social interactions and interpersonal relationships. Buecker, Simacek [5] found that an increase in body esteem effectively promotes mental health, largely due to improvements in social interactions. Physical exercise, as a positive lifestyle choice, plays a key role in enhancing body esteem.

Research has shown that regular participation in physical exercise significantly improves individuals' body image, thereby boosting body esteem [15]. Physical exercise not only contributes to better physical health and fitness but also enhances individuals' recognition and satisfaction with their own bodies. Through exercise, individuals can improve their physical condition while fostering a more positive perception of their bodies.

Peralta, Santos [16] further revealed the impact of physical exercise on self-confidence and a sense of achievement. Engaging in physical activity allows individuals to experience personal progress and accomplishments, which enhances their self-confidence and strengthens their sense of self-worth. This positive psychological experience is essential for the development and maintenance of body esteem. Based on the above findings, this study proposes the following hypothesis:

H3: Body esteem is significantly and positively correlated with physical exercise behavior among university students.

2.4 The Mediating Role of Body Self-esteem between Subjective Well-being and Physical Exercise Behavior

Some studies suggest that physical exercise has a positive impact on an individual's self-esteem. For example, Shang, Xie [3] point out that regular physical activity not only improves physical health but also significantly enhances an individual's self-esteem. More importantly, research has found that self-esteem serves as a complete mediator between physical exercise and subjective well-being. This means that physical exercise influences an individual's well-being by improving self-esteem. Yu and Mao [17] further propose that physical exercise may be an important factor in the development of students' self-esteem. They argue that engaging in any form of exercise promotes the enhancement of self-esteem, which in turn may stimulate students' positive emotions and behaviors, thereby increasing subjective well-being.

Furthermore, Diener and Diener [18] suggest that self-esteem is one of the key predictors of subjective well-being. Individuals with higher self-esteem tend to have more positive emotions and higher happiness levels, as they have a stronger sense of self-worth and are better able to face life's challenges and pressures with a positive attitude. A study by [19] further indicates that self-esteem is not only an important predictor of subjective well-being but also a key factor in the mental health of the elderly.

Based on existing research, it can be concluded that self-esteem plays a crucial "bridge" role between physical exercise and subjective well-being. This conclusion provides a new perspective for psychological research and theoretical support for the design of practical intervention strategies. For example, Guo, Fu [20] conducted a study on high school students and found that subjective well-being not only directly affects students' physical exercise behavior but also indirectly influences their participation in exercise through self-esteem, interpersonal relationships, personality, and other mediating factors. Therefore, this study proposes the following hypothesis:

H4: Body esteem mediates the relationship between subjective well-being and physical exercise behavior among university students.

Summary, subjective well-being may have a significant impact on university students' physical exercise behavior. Students with higher subjective well-being are more likely to actively participate in physical exercise, and body esteem may play a key mediating role in this process. Previous studies have shown that positive body esteem can enhance an individual's subjective well-being, increase motivation for exercise, and further promote physical activity. However, there is limited research exploring how subjective well-being influences university students' exercise behavior through body esteem, and the underlying psychological mechanisms remain unclear. Therefore, this study aims to examine the relationship between subjective well-being and physical exercise behavior among Chinese university students and further test the mediating role of body esteem by developing a corresponding research model (Figure 1). This study seeks to contribute to theoretical research and provide new perspectives and practical insights for promoting physical exercise among university students.

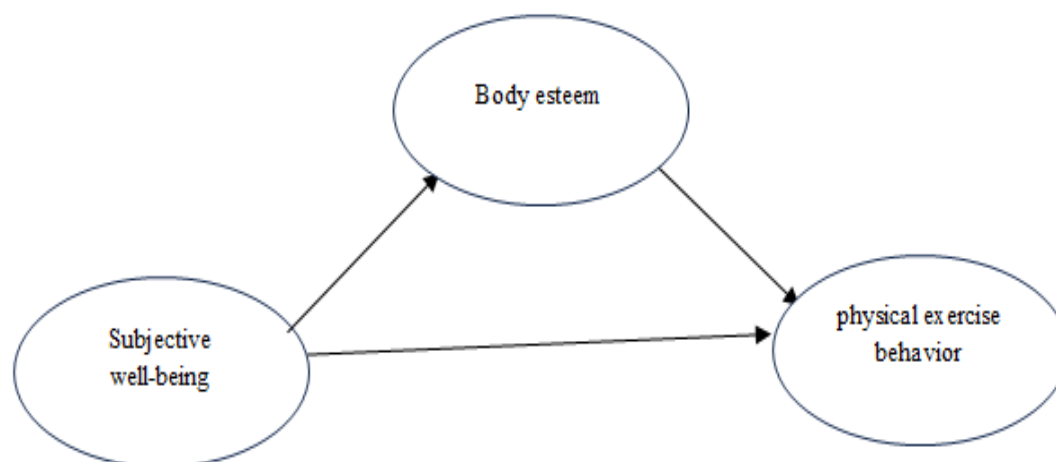


Figure 1: Research Model

3. Research methods

3.1 Participants

This study recruited 900 university students from six universities in China. These universities were located in three different economic regions (Eastern, Central, and Western China) and included three public universities and three private universities. The survey was conducted using the Wenjuanxing app from November 1 to November 30, 2024. A total of 150 questionnaires were distributed to each university, and the collected responses were used for research purposes. After screening and eligibility checks, 793 valid questionnaires were obtained, resulting in a valid response rate of 88.11%.

3.2 Data Collection Methods

During the data collection process, the researcher worked with six lecturers to distribute the survey by email to students from six universities. The email included details about the study's purpose, participation terms (voluntary, anonymous, and confidential), and a link to the online survey on the Wenjuanxing platform. This link provided the survey questions, instructions, and an informed consent statement following ethical guidelines. The lecturers then forwarded the email to their students, allowing them to decide freely whether to participate. All responses were collected online, with no time limits, and only students who agreed to the terms took part in the study.

3.3 Questionnaire Design and Measurement Tools

3.3.1 Questionnaire Design

This study's questionnaire consists of four main sections. The first section collects demographic information, including gender, age, academic year, and major, recorded using numerical values. The second section measures university students' physical exercise behavior, the third section assesses subjective well-being, and the fourth section examines the mediating variable—body esteem. Except for demographic data, all variables are measured using a 5-point Likert scale, ranging from

1 ("strongly disagree") to 5 ("strongly agree"), with higher scores indicating greater agreement with the corresponding statements [21].

3.3.2 Measurement Tools

Physical Exercise Behavior Measured using a tool adapted from [22, 23], which includes three items assessing exercise intensity, duration, and frequency among university students. Subjective Well-Being Adapted from the scales developed by [24, 25], consisting of five items to evaluate students' subjective well-being. Body Esteem Measured using a tool based on [26, 27], with seven items assessing students' body esteem levels. All measurement tools have been widely used in previous studies and are appropriate for the context of this research.

4. Data Analysis

In this study, SPSS 27.0 was used to conduct descriptive statistics, correlation analysis, and preliminary regression analysis [28]. Before analysis, all data underwent screening and cleaning to identify and remove errors or outliers. Once the preliminary results confirmed the suitability of the data for structural equation modeling (SEM), AMOS version 28 was employed to perform SEM analysis. Path analysis was further conducted to test and validate the proposed research hypotheses.

5. Research Results and Discussion

5.1 Direct Relationship Analysis

As shown in Table 1, Hypothesis H1 was not supported because the data indicated that there was no significant positive correlation between subjective well-being and physical exercise behavior ($\beta = 0.038$, $p = 0.346$, $p > 0.05$). This finding contradicts the initial hypothesis. In contrast, Hypothesis H2 was supported, as the relationship between subjective well-being and body esteem was statistically significant ($\beta = 0.240$, $p < 0.001$). Similarly, Hypothesis H3 was supported, with results confirming a significant positive correlation between body esteem and physical exercise behavior ($\beta = 0.228$, $p < 0.001$). The β coefficient of 0.228 indicates a moderate positive effect, reinforcing the theoretical assumption that higher body esteem is associated with greater participation in physical exercise.

The results of H1 differ from those of [11], whereas the findings for H2 are consistent with previous studies [29, 30]. Likewise, the results for H3 align with existing research [31-34], further supporting the theoretical framework.

Table 1: SEM Analysis Results

Path	Std. Estimate	Estimate	S.E.	C.R.	P
SW → PEB	0.038	0.054	0.057	0.943	0.346
SW → BSE	0.240	0.210	0.032	6.599	***
BSE → PEB	0.228	0.372	0.078	4.786	***
*** $p < 0.001$					

The possible reasons for the results in Table 1 are as follows: While subjective well-being

reflects an individual's overall psychological state and life satisfaction, its direct effect on physical exercise behavior may be limited. University students' exercise behavior is often more influenced by external environmental factors, such as the accessibility of campus sports facilities, class schedules, and peer influence, rather than solely determined by subjective well-being. Compared to internal emotional experiences, specific behavioral decisions are more likely to depend on external conditions and habitual behavior patterns. Additionally, cultural factors may play a crucial role. In a social environment that emphasizes academic achievement and career development, even individuals with high subjective well-being may reduce their participation in physical exercise due to time or energy constraints.

On the other hand, university students with higher subjective well-being tend to have a more positive attitude toward their body image and are more likely to recognize the value of physical exercise. Instead of directly driving exercise behavior, subjective well-being may primarily influence individuals' evaluation and satisfaction with their bodies, thereby enhancing body esteem. Increased body esteem, in turn, may serve as a key factor motivating individuals to engage in physical exercise. Those with higher body esteem generally have a more positive perception of their physical abilities and appearance, making them more willing to exercise to maintain or improve their physical condition. Additionally, they may experience less self-doubt or social anxiety during exercise, which helps them develop and maintain stable exercise habits.

5.2 Mediating Effect Testing

As shown in Table 2, the mediating effect value was 0.055, with a bootstrap confidence interval of 0.025–0.097, which does not include zero. This indicates that the mediating effect is statistically significant. Additionally, the direct effect value was 0.038 and did not reach statistical significance, suggesting that body esteem fully mediates the relationship between subjective well-being and physical exercise behavior. Therefore, Hypothesis H4 was supported, which is consistent with previous research findings [3, 20], further validating the proposed research hypothesis.

Table 2: Mediation Analysis

Path	Effect	Std. Estimate	95%CI		p	Result
			Lower	Upper		
SW → BSE → PEB	Direct Effects	0.038	-0.062	0.141	0.449	Not Supported
	Indirect Effects	0.055	0.025	0.097	0.000	Supported
	Total Effects	0.093	-0.003	0.187	0.056	Not Supported

The possible reasons for the results in Table 2 are as follows: Subjective well-being significantly influences body esteem, which in turn promotes physical exercise behavior. This suggests that the effect of subjective well-being on physical exercise is likely achieved through enhancing individuals' positive evaluation of their bodies. Specifically, individuals with higher subjective well-being typically have a more positive view of their overall life status, which may translate into a greater sense of body acceptance and, consequently, higher body esteem.

Moreover, individuals with higher body esteem tend to have a more positive attitude toward physical exercise, as they are more concerned with their physical health and appearance and view exercise as an essential means of improving fitness and shaping their bodies. In contrast, individuals with lower body esteem may participate less in physical exercise due to dissatisfaction with their

bodies. For example, they may lack confidence in exercising or fear being judged when exercising in public, leading to lower motivation for physical activity. Therefore, body esteem plays a critical mediating role between subjective well-being and physical exercise behavior, allowing subjective well-being to influence exercise participation indirectly through individuals' body perception and self-esteem levels.

6. Conclusion

This study explores the relationship between subjective well-being, body esteem, and physical exercise behavior among Chinese university students. The findings indicate that subjective well-being does not directly influence exercise behavior. Instead, it affects exercise participation indirectly by enhancing body esteem, demonstrating a full mediation effect. Students with higher subjective well-being tend to adopt a more positive attitude toward life, which boosts their body esteem. In turn, higher body esteem increases their likelihood of engaging in physical exercise.

This study highlights the crucial role of body esteem in this process and provides theoretical support for mental health interventions. It suggests that promoting body esteem through physical education, body positivity training, and social support can encourage university students to participate in physical exercise.

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References

- [1] Farooq, A., et al., *Longitudinal changes in moderate - to - vigorous - intensity physical activity in children and adolescents: A systematic review and meta - analysis. Obesity Reviews*, 2020. 21(1): p. e12953.
- [2] Bourke, M., et al., *The acute affective response to physical activity in people with depression: A meta-analysis. Journal of Affective Disorders*, 2022. 311: p. 353-363.
- [3] Shang, Y., H.-D. Xie, and S.-Y. Yang, *The relationship between physical exercise and subjective well-being in college students: The mediating effect of body image and self-esteem. Frontiers in Psychology*, 2021. 12: p. 658935.
- [4] Diener, E. and J.H. Sim, *Happiness/Subjective well-being, in Emotion Theory: The Routledge Comprehensive Guide. 2024, Routledge. p. 199-217.*
- [5] Buecker, S., et al., *Physical activity and subjective well-being in healthy individuals: a meta-analytic review. Health psychology review*, 2021. 15(4): p. 574-592.
- [6] Schoeps, K., U. de la Barrera, and I. Montoya-Castilla, *Impact of emotional development intervention program on subjective well-being of university students. Higher Education*, 2020. 79(4): p. 711-729.
- [7] Seligman, M.E., et al., *Positive psychology progress: empirical validation of interventions. American psychologist*, 2005. 60(5): p. 410.
- [8] Lin, S., et al., *Physical exercise and undergraduate students' subjective well-being: Mediating roles of basic psychological need satisfaction and sleep quality. Behavioral Sciences*, 2022. 12(9): p. 316.

- [9] Hu, H., *Effect of body image and social physique anxiety on motor behavior in freshman university students*. *J. Chengdu Sport Univ*, 2017. 43: p. 120-126.
- [10] Li, J.-B., et al., *Self-esteem and its association with depression among Chinese, Italian, and Costa Rican adolescents: A cross-cultural study*. *Personality and Individual Differences*, 2015. 82: p. 20-25.
- [11] Chunhan, G., *The Relationship Between College Students' Ego-centrism and Subjective Well-being: The Mediating Effect of Self-esteem*. *Studies of Psychology and Behavior*, 2019. 17(4): p. 546.
- [12] Laporta-Herrero, I., et al., *Body dissatisfaction in adolescents with eating disorders*. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, 2018. 23: p. 339-347.
- [13] Johansson, J.S., *Self-Esteem and Health*. 2023, Alpen-Adria-Universität Klagenfurt.
- [14] Liao, T., et al., *The relationship between physical activity and subjective well-being in Chinese university students: the mediating roles of perceived health, social support and self-esteem*. *Frontiers in Sports and Active Living*, 2023. 5.
- [15] Kim, I. and J. Ahn, *The effect of changes in physical self-concept through participation in exercise on changes in self-esteem and mental well-being*. *International Journal of Environmental Research and Public Health*, 2021. 18(10): p. 5224.
- [16] Peralta, M., et al., *Participation in Physical Activity is Associated with Well-being in European University Students*. *Montenegrin Journal of Sports Science & Medicine*, 2021. 10(2).
- [17] Yu, T. and Z. Mao, *Relationship among physical exercise, self-esteem and personality of teenager in Beijing*. *Chin. Sport Sci*, 2013. 33: p. 49-55.
- [18] Diener, E. and M. Diener, *Cross-cultural correlates of life satisfaction and self-esteem*. *Journal of personality and social psychology*, 1995. 68(4): p. 653.
- [19] Chen, R., et al., *The relationship between physical exercise and subjective well-being in Chinese older people: The mediating role of the sense of meaning in life and self-esteem*. *Frontiers in psychology*, 2022. 13: p. 1029587.
- [20] Guo, S., H. Fu, and K. Guo, *Effects of physical activity on subjective well-being: the mediating role of social support and self-efficacy*. *Frontiers in Sports and Active Living*, 2024. 6: p. 1362816.
- [21] Jebb, A.T., V. Ng, and L. Tay, *A review of key Likert scale development advances: 1995–2019*. *Frontiers in psychology*, 2021. 12: p. 637547.
- [22] Liang, D., *Stress level of college students and its relationship with physical exercise*. *Chin. Ment. Health J*, 1994. 8(2).
- [23] Liu, Z., *Effects of physical exercise on negative emotion for university students—The mediating and moderating effects of self-efficacy and mental resilience*. *J. Phys. Educ*, 2020. 27: p. 102-108.
- [24] Lyubomirsky, S. and H.S. Lepper, *A measure of subjective happiness: Preliminary reliability and construct validation*. *Social indicators research*, 1999. 46: p. 137-155.
- [25] Swami, V., et al., *Associations between women's body image and happiness: Results of the YouBeauty. com Body Image Survey (YBIS)*. *Journal of Happiness Studies*, 2015. 16: p. 705-718.
- [26] Mendelson, B.K., M.J. Mendelson, and D.R. White, *Body-esteem scale for adolescents and adults*. *Journal of personality assessment*, 2001. 76(1): p. 90-106.
- [27] Frost, K.A., et al., *Revising the Body Esteem Scale with a US college student sample: Evaluation, validation, and uses for the BES-R*. *Sex Roles*, 2018. 78: p. 1-17.

- [28] Rahman, A. and M.G. Muktadir, *SPSS: An imperative quantitative data analysis tool for social science research. International Journal of Research and Innovation in Social Science*, 2021. 5(10): p. 300-302.
- [29] Ma, Q.-S., S.-J. Yao, and H.-R. Jia, *The effect of exercise intention on exercise behavior in the post-epidemic era: The moderator role of openness personality and the mediated role of exercise-induced feeling. Frontiers in Psychology*, 2022. 13: p. 1050918.
- [30] Dsouza, J., A. Chakraborty, and J. Veigas, *Biological Connection to the Feeling of Happiness. Journal of Clinical & Diagnostic Research*, 2020. 14(10).
- [31] Shu, J., et al., *Effects of aerobic exercise on body self-esteem among Chinese college students: A meta-analysis. Plos one*, 2023. 18(9): p. e0291045.
- [32] Zhang, Y., et al., *How does exercise improve implicit emotion regulation ability: preliminary evidence of mind-body exercise intervention combined with aerobic jogging and mindfulness-based yoga. Frontiers in Psychology*, 2019. 10: p. 1888.
- [33] Tikac, G., A. Unal, and F. Altug, *Regular exercise improves the levels of self-efficacy, self-esteem and body awareness of young adults. The Journal of Sports Medicine and Physical Fitness*, 2021. 62(1): p. 157-161.
- [34] Iwon, K., et al., *Elevating subjective well-being through physical exercises: an intervention study. Frontiers in psychology*, 2021. 12: p. 702678.