

Physical Education and Student Fitness: Investigating the Psychological Pathways among Vocational University Students in Nanchang

Peng Ding

City Graduate School, City University Malaysia, Jiangxi University of Software Professional
Technology
Email: 506674990@qq.com

Wong Siew Ping

City Graduate School, City University Malaysia
Email: wong.siewping@city.edu.my

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Abstract

This study explores the influence of physical education on the physical fitness of vocational university students in Nanchang, China, with psychological well-being as a mediating factor. The research investigates how different dimensions of physical education—including physical education theory, physical activity intensity, physical activity time, and physical activity frequency—affect students' physical fitness, which is measured through physical form, physical function, and physical quality. Furthermore, psychological well-being, encompassing cognition, emotional, personality, and adaptation factors, is examined as a mediator in this relationship. A quantitative research design was adopted, utilizing a structured questionnaire distributed to vocational university students in Nanchang. The study applied statistical analysis using SPSS to assess the relationships between variables and determine the mediating role of psychological well-being. Behavioral Learning Theory and Constructive Learning Theory provide the theoretical foundation, explaining how environmental and instructional factors shape students' engagement in physical education and, subsequently, their fitness levels. Findings indicate that higher engagement in structured physical education leads to improved physical fitness outcomes, but this effect is significantly mediated by psychological well-being. Students with higher cognition and emotional stability were found to engage more consistently in physical activities, leading to better physical fitness results. The study highlights the need for enhanced physical education programs that integrate psychological well-being strategies to maximize students' overall health. This research contributes to the educational and health policy discourse in China, offering recommendations for curriculum enhancements and institutional interventions to improve

both mental and physical well-being among vocational university students. The findings provide insights for educators, policymakers, and health professionals to design comprehensive fitness programs that foster long-term physical activity habits.

Keywords: Physical Education, Psychological Well-Being, Physical Fitness, Vocational University Students, Nanchang China

Introduction

The literature reveals a concerning trend regarding the decline of physical fitness among students, including those in Nanchang. Despite initiatives to promote physical education, reports indicate a downward trajectory in overall fitness levels, with a significant proportion of Vocational University students experiencing fitness-related issues. The prevalence of physical fitness problems among Chinese students, including those in Nanchang, underscores the urgency of addressing this issue (SHI et al., 2024). The research reveals a concerning trend in the physical fitness of Vocational University students in Nanchang, China, particularly in the context of recent years. The empirical evidence, as presented by Zou (2023), indicates a steady decline in the Body Mass Index (BMI) scores and overall physical fitness levels among university students in Nanchang from 2020 to 2023. The literature highlights a concerning trend in the decline of physical fitness among Vocational University students in Nanchang, China. Recent empirical evidence, notably from Zou (2023), demonstrates a steady decrease in Body Mass Index (BMI) scores and overall fitness levels among university students in Nanchang from 2020 to 2023. Despite efforts to promote physical education, reports suggest a persistent downward trajectory in fitness levels, emphasizing the urgent need to address this issue among Chinese students, particularly those in Nanchang. (Include the facts) Despite positive developments in vital capacity measurements, various indicators of physical quality exhibit fluctuations, with a noticeable decrease in 2021, especially in strength quality, not fully recovering to the 2020 levels by 2022.

In this context, the study observed the following aspects: Physical form manifests itself in poor weight control. With the improvement of living standards and social development, Vocational university students face the problem of obesity and overweight, which may be partly attributed to poor eating habits and lack of exercise (Wang et al., 2019). Physical functioning is manifested in decreased cardio respiratory fitness and decreased muscle strength. Lack of aerobic exercise workout leads to a decline in cardio respiratory function, and poor lifestyle habits such as staying up late lead to a decline in sleep quality among college students, which affects the overall level of physical fitness. The long time sitting, lack of exercise and excessive reliance on electronic devices and other factors lead to a general decline in the muscle strength of college students (Benden et al., 2021). Physical fitness is characterized by a lack of physical training and a decline in flexibility. College students generally lack systematic physical exercise and physical training, resulting in poor overall physical fitness. Long-term sedentary behavior and lack of stretching exercises have led to a decrease in joint flexibility, which increases the risk of sports injuries.

The decline in physical fitness among students, particularly Vocational University students in Nanchang, has profound implications for their academic performance and overall well-being. Poor physical fitness may manifest as an inability to concentrate during learning, decreased memory retention, and hindered cognitive abilities (Blodgett et al., 2023). These effects can impede students' learning outcomes and hinder their academic progress.

Firstly, in terms of learning, a decline in physical fitness can lead to a decrease in learning efficiency as physical discomfort may make it difficult for students to concentrate and stay focused (Wu et al., 2020). Poor physical fitness may affect students' memory and thinking skills, which in turn may affect their performance and achievement in the learning process. Secondly, in terms of life, poor physical fitness leads to reduced quality of life (Wu et al., 2020), making students feel tired, weak and uncomfortable in their daily lives. Poor living habits and poor physical fitness may lead to a range of lifestyle diseases such as obesity and diabetes (Beltrán-Carrillo et al., 2022). Thirdly, in terms of social adaptation, poor physical fitness may affect students' performance in social situations, making them feel low self-esteem and frustrated, thus affecting their communication and interaction with others. Students may lack the motivation and ability to participate in social activities due to physical unfitness, which affects their integration and adaptation in the society. Fourth, on the psychological front, poor physical fitness may lead to mood swings in students, increasing the risk of psychological problems such as anxiety and depression (Wu et al., 2020). Self-perception and self-esteem may be affected, making students doubt their own abilities and values and affecting their psychological well-being and self-confidence.

Therefore, college students' physical fitness problems do not only affect their physical fitness, but may also have multiple negative impacts on learning, life, social adaptation and psychology. At present, the state, society and schools have adopted a series of policies and measures to improve and enhance the physical fitness of college students (Wang et al., 2021). According to Li et al. (2021), the state has formulated a series of educational policies emphasizing the importance of physical education in the overall development of college students, and encouraging schools at all levels to strengthen physical education curricula and physical exercise in order to improve the physical fitness of college students. Second, construction of physical education facilities: the government has increased its investment in the construction of school physical education facilities, providing financial support and technical guidance to improve school stadiums and equipment and facilities, so as to provide college students with better conditions for physical exercise (Zheng et al., 2021). Third, reform of physical education curricula: the state encourages schools to reform their physical education curricula, focusing on improving the practicality and interest of the curricula, and designing physical education curricula that are more in line with the interests and needs of college students, so as to stimulate students' motivation to participate in physical exercise.

Fourth, sports activity promotion: the government organizes and supports various forms of sports activities and competitions, such as campus games and fitness competitions, to encourage students to actively participate and enhance their awareness and habits of physical exercise. Finally, health education promotion: the government strengthens health education promotion, popularizes health knowledge among college students through various channels, guides them to develop good lifestyles and healthy behaviors, and improves their physical fitness and psychological well-being. Therefore, the State has provided relevant assistance in enhancing and improving the physical fitness of college students, including initiatives in educational policy support, sports facility construction, physical education curriculum reform, sports activity promotion, and health education publicity.

The researchers have conducted extensive studies on enhancing and improving the physical fitness of college students in the following areas: First, physical education courses and

exercise programs: researchers have explored the methods that have the best effect on college students' physical fitness improvement by designing different types of physical education courses and exercise programs. This includes adjustments in course content, curriculum, and exercise frequency and intensity (Taylor et al., 2022). Second, lifestyle intervention: researchers focus on the lifestyles of college students, including dietary habits, sleep quality, exercise habits, etc., and explore how to improve their lifestyles through interventions, so as to improve physical fitness. Third, psychological factors influence: some scholars have found that psychological factors are also very important to the physical fitness of college students. Therefore, they pay attention to the psychological well-being status of college students and explore the influence of psychological interventions on physical fitness. Fourth, campus environment and policy support: researchers focus on the influence of campus environment on college students' physical fitness, including the construction of school sports facilities, the curriculum of physical education courses, campus health policies and other aspects.

Some studies highlight initiatives such as mandatory physical education programs and extracurricular activities aimed at promoting physical fitness among students (Saodat, 2023). However, gaps persist in terms of effectively addressing the root causes of declining physical fitness and implementing comprehensive interventions. Although a great deal of effort and research has been done by the state and researchers to enhance and improve the physical fitness of college students, Further research is needed to identify effective strategies tailored to the unique needs of Vocational University students in Nanchang (Xu et al., 2023). First, long-term effect studies: some studies have focused on the effect of interventions in the short term and lacked tracking and evaluation of long-term effects.

Second, multi factorial integrated intervention: most of the current studies are limited to a single intervention factor and lack studies on the effects of multi factorial integrated intervention. Third, research on the differences of different groups: college student groups are diverse, including different genders, ages, and majors, etc. Researchers need to pay more attention to the differential response of different groups to physical fitness interventions. Therefore, future research can be conducted in the above areas to more comprehensively understand and solve the problems in college students' physical fitness.

Previous research has primarily focused on the importance of physical education in improving physical fitness among various student populations in Nanchang University (Zhang et al., 2022). However, there is a notable gap in research specifically examining the influence of physical education on the physical fitness of vocational university students, particularly those in Nanchang (Wang & Wang, 2020). Existing studies have often overlooked this specific demographic, thereby leaving a significant gap in understanding the factors affecting their physical well-being.

There is a discernible gap in comprehending the intricate relationships among variables. By addressing this gap in existing literature, the research aims to contribute valuable insights into the interconnectedness of psychological distress, physical fitness, and social support among Vocational University students in Nanchang (Lim et al., 2022). Through a detailed examination of these variables, the study aspires to guide the development of holistic intervention strategies that can comprehensively enhance the overall well-being of students navigating

the challenges. In essence, this research strives to fill the existing gap in understanding the complex interrelations among these variables, offering a nuanced perspective that can inform targeted interventions and support mechanisms tailored to the unique needs of Vocational University students in Nanchang.

Literature indicates a lack of comprehensive research on the efficacy of online physical education in enhancing student health and fitness levels, especially among vocational university students (Aguilera et al., 2021). According to Petersen, Prichard & Kemps (2019), While online platforms offer potential avenues for physical activity promotion, studies evaluating their effectiveness in improving physical fitness among students, particularly in Nanchang, remain scarce. This gap hinders the development of evidence-based strategies for integrating online sports into educational settings to promote student well-being.

There is limited exploration into the effectiveness and challenges of online physical education initiatives. While the research acknowledges the shift to virtual learning environments, there is a lack of in-depth analysis regarding the impact of this transition on students' engagement, motivation, and overall physical fitness. There is limited attention given to understanding how social support systems, both within educational institutions and broader societal contexts, influence students' ability to maintain physical activity levels and cope with psychological distress during these unprecedented times (Chauhan et al., 2021). Therefore, there is a significant gap in the research regarding the need for empirical research that examines the effectiveness of online physical education programs, the role of social support in mitigating the negative effects of pandemic-induced disruptions, and the development of targeted intervention strategies to promote holistic well-being among vocational university students in Nanchang, China

Despite efforts to promote physical education and fitness among students, including vocational university students in Nanchang, there are shortcomings in existing policies (Wang & Wang, 2020). Literature highlights gaps in policy implementation, such as inadequate allocation of resources, limited accessibility to sports facilities, and inconsistent enforcement of physical education requirements. These policy shortcomings contribute to the challenges faced in addressing the decline in physical fitness among students, underscoring the need for policy reforms and improvements (Altassan, 2023).

Research identifies shortcomings in the implementation of physical education practices within educational institutions, particularly in Nanchang (Zhong, Zhou & Zhu, 2021). While policies may exist mandating physical education, there are challenges in translating these policies into effective practices. Factors such as insufficient training for physical education teachers, limited access to sports facilities, and competing academic priorities often hinder the delivery of quality physical education programs (Xu et al., 2021). These shortcomings in practice impede efforts to improve student physical fitness levels and underscore the importance of addressing systemic barriers within educational settings.

The specific research objectives are as the following:

RO1: To determine the learning of physical education, psychological well-being and physical fitness level of Vocational University students in Nanchang, China

RO2: To analysis the relationship among the learning of physical education, psychological well-being and physical fitness level of Vocational University students in Nanchang, China.

RO3: To investigate the influence of physical education and psychological well-being on Vocational University students' physical fitness in Nanchang, China.

RO4: To assess the mediating influence of psychological well-being on the relationship between the learning of physical education and Vocational University students' physical fitness in Nanchang. China.

Literature Review

As per the view of Denche-Zamorano et al. (2022), physical education and psychological well-being have been related to each other since ancient times. Physical education and physical activities help the students' psychological well-being. Development of physical education the role of the teacher is vital in the classroom. The meaningful reason for physical education students to achieve educational performance and physical fitness. Physical education provides various knowledge of self-assessment and identifies the gap among students about physical fitness. With the knowledge of physical education students can identify their own strengths and weaknesses. The strengths and weaknesses evaluate one's own performance. In accordance with the performance assist to achieve career goals and fulfil long-term achievement. As stated by Daran and Daran (2022), physical education is a formal contact area for the school and higher education which creates standards and benchmarks for the students. In the early stage of learning physical education helps to achieve various curriculum and instruction designs. With the knowledge of curriculum and instructional design, **students** can develop motor skills and knowledge of sportsmanship. Motor skills and sportsmanship is a fundamental thing to studying progress and developmental progress. As a result, psychological growth is boosted to achieve various studies.

According to Niles et al. (2021), **students** who exercise regularly are less prone to acquire anxiety disorders that include generalized anxiety disorder, social anxiety disorder, and panic disorder. They indicate a rise in the prevalence of anxiety-related illnesses when physical activity is reduced. It can increase students' enjoyment of sports, encourage others, stimulate physiological improvements, enhance both psychological and physical comfort, decrease depression and anxiety signs and symptoms, enhance the quality of life, and decrease cognition impairment. Discovered that cooperative intense interval training had a substantial impact on middle-school children's creativity and interpersonal skills and can successfully increase the creativity, satisfaction, and interpersonal skills of inactive adolescents.

As stated by Reuben & Himschoot (2021), it was shown that when adolescents actively engage in pleasurable, non-competitive, and repetitive physical activity, it has noticeable short-term emotional impacts, boosting the creation of a healthy emotional state. Physical activities were found to have a substantial negative correlation with negative emotional evaluations in adult studies. The greater the amount of physical exercise adults participate in, it decreases their adverse emotional scores. Physical exercise, and self-efficacy, for psychological well-being were discovered to communicate in elementary school pupils, with self-efficacy acting as a mediator between physical activity as well as psychological well-being. It was found that a substantial positive link between exercising and psychological intelligence, and confidence would play an intermediary function in the interaction involving physical exercise and psychological intelligence.

Based on the study given by Ran et al. (2022), substantial demographic disparities across three variables among Vocational University students: self-efficacy, physical activity, and emotional intelligence. male not only performed greater physical activity versus females, but they also had significantly greater self-efficacy in addition to emotional intelligence. Individualized body image differs significantly among male and female Vocational University students; males are more engaged with sustaining physical and athletic behaviors and engage in a greater degree of physical activity, whereas females are more preoccupied with how they look than males. As a result, males are more inclined to devote time and effort to physical activity, whereas female are more inclined to participate in passive activity to reduce weight or sustain body size. Meanwhile, numerous studies have found significant gender variations in interpersonal skills and self-efficacy among higher education students of various genders. male were shown to be more adaptable and optimistic in dealing with stress than female were, whereas females performed greater in emotional awareness.

According to Liu & Helwig (2022), there is a significant disparity between participation in sports and psychological intelligence among students pursuing different subjects. Nevertheless, the first group performed better than the second group in self-efficacy, which could have been because natural students in science have more hands-on experience as well as greater logical thinking along with practical ability. On the contrary, Wang et al., (2020) state that various years of students in Vocational University demonstrated significant disparities in sports participation and self-efficacy based on grade allocation. First, new students engaged in substantially greater amounts of exercise than juniors as well as seniors, or second-year students participated in considerably more activity than seniors did; this could be because freshman and second-year students are under less academic pressure and thus are more inclined to maintain physical wellness and athletic behaviour in order to improve their health and physique.

As suggested by Chen et al. (2022), psychological resources could have a significant role in balancing physical exercise and Vocational University students' smartphone addiction. Behavioral capital is a beneficial state of mind expressed by student who are in the course of development and growth, which consists primarily of four components: hope, self-efficacy, adaptability, and enthusiasm. Engaging in physical activity was shown to improve student's psychological capital. Engaging in physical activity promotes a person's self-worth, and resilience. Physical activity boosts self-efficacy, a sense of belonging, and accomplishment. Moreover, physical activity boosted the psychological capital resources available, resulting in a long-lasting and reasonably consistent feeling of well-being. Furthermore, great psychological capital might help students in Vocational University in using mobile Internet effectively and reducing dependence. Social adaptation is defined as a capacity for change in which student go through different psychological in nature physiological, and behavioral adaptations in order to live in equilibrium with the community; it additionally encompasses the individual's capacity to change their behaviour in response to relationships with others, including social abilities, conflict handling skills, as well as abilities in interpersonal relationships.

Physical education affects the psychological state of the human mind by providing a relaxed state and by reducing any kind of anxiety and stress within the mind. The emotional well-being of the person can be improved with the physical activities that the students are made

to do in physical education. The health related to psychological states is better in students who are involved in physical activities (Di Giunta et al., 2022). These students can be relaxed at all times and they do not have any symptoms of having illnesses that are related to the mind. The various aspects that are related to the psychological state of the human mind include the aspect of focus and concentration. Physical education helps students to focus on their academics and their careers. The students that are into physical activities are more focused on their goal and their objectives. Further, these students can easily concentrate and have a peaceful mind. They can think properly during challenging situations and it gives them the ability to make effective decisions that would help them in such situations.

The physical activities that are included in physical education include the ability to reduce the amount of serotonin and endorphins that are secreted in the brain. These are the stress hormones and the secretion of these stress hormones can be reduced with the help of the exercises and the physical activity that are included in the physical education. Further, physical education helps in the development of a controlled sense of self-esteem that can be easily gathered among individuals. The students that are involved in physical activities are psychologically happy as they are able to reach their objectives on a daily basis (Liu et al , 2023). Alternatively, the exercises and doing yoga and other physical activities help in the reduction of negative thoughts from occurring in the minds of the students. The energy levels of the body in terms of psychological aspects increase.

The students have the ability to feel happy and they can easily socialize with other students and the student within their society. Further, student that are exercising on a daily basis have proper psychological well-being and are able to do all the daily tasks that are assigned to them. The student who are not involved in physical activities do not have the areas to vent their stress and their emotions. As opined by White et al. (2019), physical activities can be useful in improving psychological well-being conditions as stress can be released by doing the physical activities and emotional vent outs are released with the help of the exercises that are done. Further, the various kinds of relaxation come from the extra effort that is put into physical activity and it helps student to feel good as it takes their mind into a peaceful place apart from the negative thoughts and frustrations that often come to the mind.

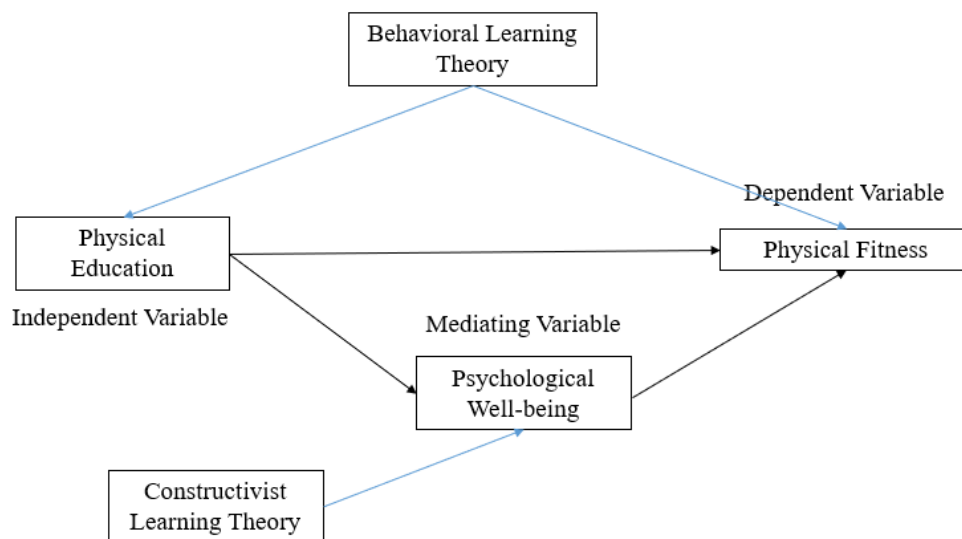
Underpinning Theory

Figure 1: Theoretical Framework

The relevance of the Constructivist Learning Theory to this study lies in its focus on how students shape knowledge about physical education and fitness in an active manner (Neutzling et al., 2019). Within the realm of physical fitness, this theory highlights that students draw on their previous knowledge and experiences to actively integrate new information into what they already know. In this way, the conceptual framework follows what was designed to study how physical education variables were associated with Vocational University students' level of fitness. Knowing the ways students of construct knowledge in relation to physical well-being, especially through participation in physical education lessons and other extracurricular programs as well sports facilities is essential. This theory takes into consideration the uniqueness of each student's point of view as well as that it should be based on an individual experience. In the study, according to Constructivist Learning Theory students with their own different experience develop attitudes and behaviours about physical fitness which helps look at well-being from more complex approaches.

The chosen theories, Behavioral Learning Theory and Constructivist Learning Theory, are highly relevant to this research as they offer complementary perspectives that enhance our understanding of the complex factors influencing physical fitness among Vocational University students in Nanchang, China.

Conceptual Framework

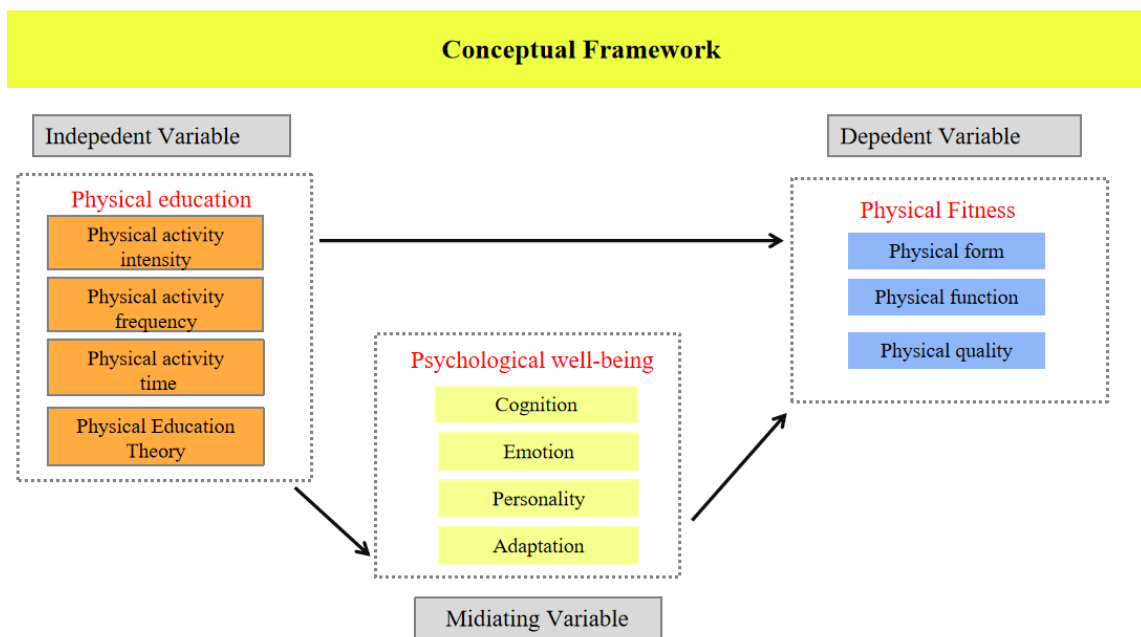


Figure 2: Conceptual Framework

Methodology

The study utilized a quantitative research approach and survey method to analyze the relationship and influence among three variables: physical education, psychological well-being, and physical quality among students at Nanchang Vocational University. Quantitative research was chosen for its ability to provide objective, standardized data. In the context of vocational undergraduate physical education, students’ physical quality was quantified through various test indicators, such as physical fitness and strength tests. This approach enabled the collection of a large number of data samples and facilitated statistical analyses, thereby offering an accurate understanding of the impact of physical education on students' physical quality and psychological well-being (Yucheng, 2019).

The questionnaires were tailored to fit the specific context of Nanchang, China, and the experiences of vocational university students, ensuring the relevance and applicability of the results (Lazar et al., 2020). Lastly, the collected data and results contributed to academic exchange and knowledge sharing (Wang & Liu, 2021), as the questionnaire findings provided empirical support for further research on physical education, psychological well-being, and physical quality, thus promoting academic development in this field.

SNO.	University	Population	Number of questionnaires	Sample
1	Jiangxi University of Software Professional Technology	19885	218	207
2	Nanchang Vocational University	18520	203	193
3	Total	38405	422	400

The population is comprised of students from different academic fields, allowing a holistic approach to determining physical education and psychological well-being and physical fitness of all (Piñeiro-Cossio et al., 2021). The results can also apply to the broader community of Vocational University students in Nanchang.

This study plans to select 422 respondents from two schools. The sampling procedure for this study using a simple random sampling technique. Firstly, 38405 students from the two schools were numbered according to their academic numbers, Forming a continuous sequence of markers; then 422 non-repeating random numbers were generated using Computer Excel software to generate a random number table and making sure that these random numbers were in the range of 1 to 38405; finally, the sample was formed by finding the students with the corresponding numbers based on these random numbers, and distribution of 422 questionnaires.

In the data analysis phase, various statistical methods were employed to address the research objectives systematically.

Table 1

Methods of analysis

Research Objective (RO)	Analysis Method
RO1: To determine the learning of physical education, psychological well-being and physical fitness level of Vocational University students in Nanchang, China	Descriptive Analysis (mean, standard deviation)
RO2: To analysis the relationship among the learning of physical education, psychological well-being and physical fitness level of Vocational University students in Nanchang, China.	Pearson Correlational Analysis
RO3: To investigate the influence of physical education and psychological well-being on Vocational University students' physical fitness in Nanchang, China.	Regression Analysis
RO4: To assess the mediating influence of psychological well-being on the relationship between the learning of physical education and Vocational University students' physical fitness in Nanchang. China.	Mediation Analysis

Results

The findings of this study reveal significant relationships among physical education, psychological well-being, and physical fitness among vocational university students in Nanchang. Physical education positively impacts both psychological well-being and physical fitness, though the influence of psychological well-being on physical fitness is notably stronger. Additionally, psychological well-being serves as a mediator, enhancing the effect of physical education on physical fitness. These results underscore the importance of a holistic approach to student health that integrates physical education and psychological well-being support. The implications for educational practice and policy include the need for comprehensive wellness programs that address both physical and psychological health, training for educators and administrators to support student well-being, and the development of community partnerships to enhance health resources. Future research should build on these findings by employing longitudinal designs, incorporating objective

measures, and exploring the specific mechanisms through which psychological well-being influences physical fitness. This chapter concludes that fostering both physical and psychological well-being is essential for improving the overall well-being and academic success of vocational university students.

Discussion and Conclusion

The study reveals significant interconnections among physical education, psychological well-being, and physical fitness, underscoring the critical role of psychological well-being in enhancing the benefits of physical education on physical fitness. Psychological well-being emerged as a strong mediator, suggesting that students who are mentally healthy are more likely to achieve better physical fitness outcomes. These findings advocate for a holistic approach to student health that integrates psychological well-being services with physical education programs. Recommendations for practice include developing comprehensive wellness programs, training educators to recognize and address psychological well-being issues, and fostering community partnerships to support student health. Future research should employ longitudinal designs, use objective measures, and investigate the specific mechanisms through which psychological well-being influences physical fitness. By addressing both physical and psychological well-being, educational institutions can significantly enhance the overall well-being and academic success of their students. This chapter underscores the necessity of integrated health strategies in promoting a supportive and health-conscious educational environment.

References

- Abdul, L., & Yu, T. F. (2020). Resilient urbanization: a systematic review on urban discourse in Pakistan. *Urban Science*, 4(4), 76. <https://www.mdpi.com/2413-8851/4/4/76/pdf>
- Abdullaeva, B. P. (2022). Use of Team Sports in Physical Education Activities in Preschool Educational Organizations in Our Country and Abroad. *Periodica Journal of Modern Philosophy, Social Sciences and Humanities*, 12, 116-120. <https://www.periodica.org/index.php/journal/article/download/277/244>
- Abulibdeh, A., Zaidan, E., & Abulibdeh, R. (2024). Navigating the confluence of artificial intelligence and education for sustainable development in the era of industry 4.0: Challenges, opportunities, and ethical dimensions. *Journal of Cleaner Production*, 140527. <https://www.sciencedirect.com/science/article/pii/S0959652623046851>
- Abutabenjeh, S., & Jaradat, R. (2018). Clarification of research design, research methods, and research methodology: A guide for public administration researchers and practitioners. *Teaching Public Administration*, 36(3), 237-258. DOI: 10.1177/0144739418775787
- Aguilera, R. V., Aragón-Correa, J. A., Marano, V., & Tashman, P. A. (2021). The corporate governance of environmental sustainability: A review and proposal for more integrated research. *Journal of Management*, 47(6), 1468-1497.
- Altassan, A. (2023). Sustainable integration of solar energy, behavior change, and recycling practices in educational institutions: a holistic framework for environmental conservation and quality education. *Sustainability*, 15(20), 15157.
- Al-Ababneh, M. M. (2020). Linking ontology, epistemology and research methodology. *Science & Philosophy*, 8(1), 75-91.
- Alaro, A. A. (2020). An assessment of cohesion and coherence in students' descriptive and narrative essays: The case of sodo preparatory school grade eleven students. *English*

- Language, Literature & Culture*, 5(1), 45-52. <https://core.ac.uk/download/pdf/287193474.pdf>
- Ali, M. F., Kundra, S., Alam, M. A., & Alam, M. (2021). Investigating stress, anxiety, social support and sex satisfaction on physical education and sports teachers during the COVID-19 pandemic. *Heliyon*, 7(8). [https://www.cell.com/heliyon/pdf/S2405-8440\(21\)01963-0.pdf](https://www.cell.com/heliyon/pdf/S2405-8440(21)01963-0.pdf)
- Al-Jubari, I. (2019). Vocational University students' entrepreneurial intention: Testing an integrated model of SDT and TPB. *Sage Open*, 9(2), 2158244019853467. <https://journals.sagepub.com/doi/pdf/10.1177/2158244019853467>
- Al-Wardat, M., Salimej, C., Alrabbaie, H., Etoom, M., Khashroom, M., Clarke, C., ... & Best, T. (2024). Exploring the Links between Physical Activity, Emotional Regulation, and Mental Well-Being in Jordanian University Students. *Journal of Clinical Medicine*, 13(6), 1533. <https://www.mdpi.com/2077-0383/13/6/1533>
- American Thoracic Society. (2004). ATS/ERS statement on respiratory muscle testing. *American Journal of Respiratory and Critical Care Medicine*, 169(4), 528-562.
- Andermo, S., Hallgren, M., Nguyen, T. T. D., Jonsson, S., Petersen, S., Friberg, M., ... & Elinder, L. S. (2020). School-related physical activity interventions and psychological well-being among children: a systematic review and meta-analysis. *Sports medicine-open*, 6(1), 1-27. <https://sportsmedicine-open.springeropen.com/articles/10.1186/s40798-020-00254-x>
- Ardoin, N. M., & Bowers, A. W. (2020). Early childhood environmental education: A systematic review of the research literature. *Educational Research Review*, 31, 100353. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7348615/>
- Arslan, G., Yildırım, M., & Zangeneh, M. (2021). Coronavirus anxiety and psychological adjustment in Vocational University students: Exploring the role of Vocational University belongingness and social media addiction. *International Journal of psychological well-being and Addiction*, 1-14. <https://link.springer.com/article/10.1007/s11469-020-00460-4>
- Arik, S., & Yılmaz, M. (2020). The effect of constructivist learning approach and active learning on environmental education: A meta-analysis study. *International Electronic Journal of Environmental Education*, 10(1), 44-84. <https://dergipark.org.tr/en/download/article-file/845635>
- Back, M. D. (2021). Social interaction processes and personality. In *The handbook of personality dynamics and processes* (pp. 183-226). Academic Press. <https://psyarxiv.com/evm4n/download?format=pdf>
- Barba-Martín, R. A., Bores-García, D., Hortigüela-Alcalá, D., & González-Calvo, G. (2020). The application of the teaching games for understanding in physical education. Systematic review of the last six years. *International journal of environmental research and public health*, 17(9), 3330. <https://www.mdpi.com/1660-4601/17/9/3330/pdf>