

Exercise Habits and Mental Health Outcomes among Students in a Technology University in China



Meng Xiandong

Graduate School, Emilio Aguinaldo College, Paco, Manila, Philippines

ABSTRACT: This study employed a descriptive-comparative-correlational research approach to examine the relationship between students' exercise habits and their mental health outcomes at a multi-disciplinary university in Zhengzhou, Henan Province. The college of physical education, which provides training across 22 colleges and 73 undergraduate majors, served as the study's setting, involving a large sample of 32,760 undergraduate students. Using stratified random sampling, the researchers selected a representative sample of 380 students, with a 5% margin of error, to identify patterns and explore relationships between exercise habits and mental health. A structured questionnaire, developed to assess exercise habits and mental health, underwent content and face validation, with reliability measured using Cronbach's Alpha (0.980 and 0.974). Data collection took place in person, with the results processed using SPSS and analyzed through means, standard deviation, and Pearson's r correlation. Findings indicated significant positive correlations between various dimensions of exercise habits—including routine stability, goal persistence, adaptability to change, and social influences—and mental health outcomes such as stress levels, coping mechanisms, social support, sleep quality, and access to mental health resources. Notably, adaptability to change exhibited the highest correlation with coping mechanisms and overall mental health ($r = 0.804$), underscoring the importance of flexible exercise routines in managing mental health. The study's insights emphasize that consistent, varied, and socially supported exercise habits are associated with reduced stress, enhanced coping strategies, and improved overall mental health. Promoting regular physical activity and addressing barriers to exercise can foster better mental health among students, suggesting the need for integrated physical and mental health programs within academic institutions.

KEYWORDS: exercise habits, mental health outcomes, technology university, China

I. INTRODUCTION

There is no denying that physical activity is a crucial component of a healthy lifestyle, offering numerous benefits that extend beyond physical health. According to a study by Cong et al. (2022), regular exercise reduces levels of stress, anxiety, and depression, making it highly recommended for people of all ages. However, the prevalence of sedentary behavior among students presents a concerning trend that may exacerbate mental health issues. With increased exposure to multimedia, Pengpid and Peltzer (2019) suggest that excessive leisure time and a lack of physical activity are correlated with higher levels of psychological distress among university students. The lifestyle choices of students, compounded by academic pressures and social stressors, may lead to mental health problems if the importance of promoting regular exercise is not adequately emphasized.

In addition, the type and intensity of exercise appear to influence mental health outcomes differently among students. A study conducted by Zhang et al. (2023) found that engaging in moderate-intensity aerobic exercise, was associated with improved mood and cognitive function among college students. Conversely, excessive high-intensity exercise without adequate rest may lead to burnout and heightened stress levels, highlighting the need for a balanced approach to physical activity.

Yao et al. (2022) emphasize that engaging in regular exercise can not only strengthen the immune system but also improve mental well-being by increasing feelings of hope and resilience. As individuals continue to face challenges and uncertainties during the pandemic, incorporating exercise into their daily routine can provide a sense of control and positivity. By focusing on both physical and mental health, individuals can better cope with the stress and anxiety brought on by the ongoing crisis.

The research of James et al. (2023) indicates that physical activity, particularly aerobic and agility-based sports, positively impacts academic achievement, particularly in focus, memory retention, and problem-solving abilities. The study also found that adding more time to physical activity did not negatively affect academic performance. However, the study's main focus was on the influence of group exercise activities on social contacts and sense of belonging.

Exercise Habits and Mental Health Outcomes among Students in a Technology University in China

The study found that Singapore faces three main barriers to physical activity: lack of time, fatigue, and pollution. Factors such as lack of pavement, weather, age, cost, and fatigue negatively impact physical activity outcomes. To improve physical activity, social support, infrastructure awareness, and workplace interventions can help reduce sedentary behavior. (Koh et al., 2022)

Exercise habits play a crucial role in shaping the mental health outcomes of students. Regular physical activity has been shown to alleviate stress, anxiety, and depression, while also enhancing cognitive function and social well-being. However, systemic barriers and cultural factors pose challenges to promoting active lifestyles among students. Addressing these barriers through targeted interventions and educational initiatives is paramount in fostering a holistic approach to student well-being.

The investigation of the mental health outcomes and exercise practices of students is a broad undertaking. Targeted interventions can be devised to enhance the holistic well-being of students as the comprehension of these connections continues to develop.

Research Question

Is there is significant relationship between the student respondents' exercise habits and their mental health outcomes?

II. METHODOLOGY

This study employed a descriptive-comparative-correlational research method to investigate the relationship between students' exercise habits and their mental health outcomes. The research design allowed for numerical analysis, comparison, and correlation of dependent variables. The study was conducted at a multi-disciplinary university in Zhengzhou, Henan Province. The college of physical education, which covered 22 colleges and 73 undergraduate majors, was responsible for teaching college physical education to all students.

The sample consisted of 32,760 full-time undergraduate students. The researchers used a stratified random sampling technique, dividing the population into smaller groups based on shared attributes. A minimum of 380 students were randomly selected from the 32,760 students using a 5% margin of error. This approach helped identify patterns and disparities across various conditions and provided a robust framework for the examination and interpretation of conditions and relationships in the ongoing study.

The researcher created a questionnaire to assess students' exercise habits and mental health outcomes. The questionnaire was administered face-to-face or onsite and was based on the demographic profile of the students. The questionnaire was rated on the scale of effectiveness, with a range of 3.51 to 4.00. It was also subjected to content validation by experts, face validation with at least five experts, and pilot testing using Cronbach's Alpha. The overall reliability of the questionnaire was found to be 0.980 and 0.974, indicating its statistical reliability.

The researcher obtained permission from the university principal, secured consent from the school administrators, and administered the survey in person. The data was tallied and processed using the Statistical Package for Social Science (SPSS), and the results were used to propose a physical and mental health program for students. The data was analysed using various statistical methods, including, mean, standard deviation, and Pearson's r correlation.

III. RESULTS AND DISCUSSION

Table 1. Relationship of the Self-Assessment of the Respondents on their Exercise Habits and Mental Health Outcomes

Variable	Profile	Computed r	Sig	Decision on Ho	Interpretation
Routine Stability	Stress Levels	.538**	.000	Rejected	Significant
	Coping Mechanisms	.613**	.000	Rejected	Significant
	Social Support	.620**	.000	Rejected	Significant
	Sleep Quality	.547**	.000	Rejected	Significant
	Academic Pressure	.533**	.000	Rejected	Significant
	Access to Mental Health Resources	.590**	.000	Rejected	Significant
	Physical Activity and Mental Health	.608**	.000	Rejected	Significant
	Total	.650**	.000	Rejected	Significant

Goal Persistence	Stress Levels	.569**	.000	Rejected	Significant
------------------	---------------	--------	------	----------	-------------

Exercise Habits and Mental Health Outcomes among Students in a Technology University in China

	Coping Mechanisms	.639**	.000	Rejected	Significant
	Social Support	.635**	.000	Rejected	Significant
	Sleep Quality	.590**	.000	Rejected	Significant
	Academic Pressure	.571**	.000	Rejected	Significant
	Access to Mental Health Resources	.627**	.000	Rejected	Significant
	Physical Activity and Mental Health	.648**	.000	Rejected	Significant
	Total	.687**	.000	Rejected	Significant
Types of Exercise	Stress Levels	.635**	.000	Rejected	Significant
	Coping Mechanisms	.676**	.000	Rejected	Significant
	Social Support	.704**	.000	Rejected	Significant
	Sleep Quality	.649**	.000	Rejected	Significant
	Academic Pressure	.623**	.000	Rejected	Significant
	Access to Mental Health Resources	.672**	.000	Rejected	Significant
	Physical Activity and Mental Health	.676**	.000	Rejected	Significant
	Total	.743**	.000	Rejected	Significant
Barrier Overcoming	Stress Levels	.602**	.000	Rejected	Significant
	Coping Mechanisms	.701**	.000	Rejected	Significant
	Social Support	.713**	.000	Rejected	Significant
	Sleep Quality	.637**	.000	Rejected	Significant
	Academic Pressure	.645**	.000	Rejected	Significant
	Access to Mental Health Resources	.692**	.000	Rejected	Significant
	Physical Activity and Mental Health	.690**	.000	Rejected	Significant
	Total	.751**	.000	Rejected	Significant
Social Influences	Stress Levels	.639**	.000	Rejected	Significant
	Coping Mechanisms	.696**	.000	Rejected	Significant
	Social Support	.735**	.000	Rejected	Significant
	Sleep Quality	.667**	.000	Rejected	Significant
	Academic Pressure	.657**	.000	Rejected	Significant
	Access to Mental Health Resources	.707**	.000	Rejected	Significant
	Physical Activity and Mental Health	.693**	.000	Rejected	Significant
	Total	.769**	.000	Rejected	Significant
Technology Integration	Stress Levels	.644**	.000	Rejected	Significant
	Coping Mechanisms	.708**	.000	Rejected	Significant

Exercise Habits and Mental Health Outcomes among Students in a Technology University in China

	Social Support	.730**	.000	Rejected	Significant
	Sleep Quality	.654**	.000	Rejected	Significant
	Academic Pressure	.653**	.000	Rejected	Significant
	Access to Mental Health Resources	.704**	.000	Rejected	Significant
	Physical Activity and Mental Health	.701**	.000	Rejected	Significant
	Total	.769**	.000	Rejected	Significant
Adaptability to Change	Stress Levels	.664**	.000	Rejected	Significant
	Coping Mechanisms	.767**	.000	Rejected	Significant
	Social Support	.746**	.000	Rejected	Significant
	Sleep Quality	.665**	.000	Rejected	Significant
	Academic Pressure	.702**	.000	Rejected	Significant
	Access to Mental Health Resources	.747**	.000	Rejected	Significant
	Physical Activity and Mental Health	.722**	.000	Rejected	Significant
	Total	.804**	.000	Rejected	Significant
	Overall	.836**	.000	Rejected	Significant

The analysis of the relationship between student self-assessments of exercise habits and mental health outcomes reveals several significant correlations across various dimensions. All reported r-values are significant at the 0.01 level, indicating a strong relationship between exercise habits and mental health outcomes.

Routine Stability shows significant positive correlations with all aspects of mental health outcomes, including stress levels ($r = 0.538$), coping mechanisms ($r = 0.613$), social support ($r = 0.620$), sleep quality ($r = 0.547$), academic pressure ($r = 0.533$), access to mental health resources ($r = 0.590$), and physical activity and mental health ($r = 0.608$). The total correlation ($r = 0.650$) reinforces that consistent exercise routines are positively associated with better mental health outcomes. This suggests that maintaining a stable exercise routine can help improve various facets of mental well-being.

Goal Persistence also exhibits strong positive correlations with all mental health outcomes, with r-values ranging from 0.569 for stress levels to 0.687 overall. These significant correlations imply that persistence in exercise goals is associated with better stress management, improved coping mechanisms, stronger social support, better sleep quality, reduced academic pressure, increased access to mental health resources, and enhanced physical activity and mental health.

Types of Exercise demonstrate similarly high correlations, particularly with social support ($r = 0.704$) and overall mental health outcomes ($r = 0.743$). This suggests that the variety of exercise types may play a crucial role in enhancing social support and overall mental health, indicating that engaging in diverse forms of exercise can contribute positively to mental health.

Barrier Overcoming is strongly correlated with all mental health outcomes, with r-values ranging from 0.602 for stress levels to 0.751 overall. This indicates that students who can effectively overcome barriers to exercise tend to report better mental health outcomes, including lower stress levels, improved coping mechanisms, higher social support, better sleep quality, less academic pressure, and greater access to mental health resources.

Social Influences reveal strong correlations across all mental health dimensions, especially with social support ($r = 0.735$) and overall mental health outcomes ($r = 0.769$). This highlights the importance of social influences in shaping exercise habits and their subsequent impact on mental health, suggesting that supportive social environments can significantly enhance mental well-being.

Technology Integration also shows substantial correlations with mental health outcomes, particularly with social support ($r = 0.730$) and overall mental health ($r = 0.769$). This reflects that integrating technology into exercise routines can improve social connections and overall mental health.

Adaptability to Change exhibits the strongest correlations, particularly with coping mechanisms ($r = 0.767$) and overall mental health outcomes ($r = 0.804$). This underscores that being adaptable in exercise habits is crucial for maintaining mental health, as it enhances coping strategies and overall mental well-being.

Exercise Habits and Mental Health Outcomes among Students in a Technology University in China

Finally, the overall correlation between exercise habits and mental health outcomes is notably high ($r = 0.836$), reflecting a robust and significant relationship. This comprehensive correlation suggests that better overall exercise habits are strongly associated with improved mental health outcomes across multiple dimensions. These findings highlight the importance of maintaining regular exercise routines for not only physical health but also mental well-being. Individuals who engage in consistent exercise are more likely to experience lower levels of stress, anxiety, and depression. By prioritizing physical activity, individuals can significantly enhance their overall quality of life and mental wellness.

In summary, the analysis indicates that various aspects of exercise habits, including routine stability, goal persistence, types of exercise, barrier overcoming, social influences, technology integration, and adaptability to change, all have significant positive correlations with mental health outcomes. These findings emphasize the importance of maintaining diverse and consistent exercise habits to support mental well-being. Hence, it suggests that individuals who engage in a variety of different types of exercise, such as cardio, strength training, and flexibility exercises, may experience even greater mental health benefits. Additionally, the study highlights the importance of overcoming barriers to exercise, such as lack of time or motivation, in order to reap the full mental health benefits. Overall, the results underscore the idea that incorporating a well-rounded exercise routine into daily life can have a profound impact on mental well-being.

IV. CONCLUSION

In conclusion, the analysis demonstrates a strong and significant relationship between students' exercise habits and their mental health outcomes. The findings reveal that stability in exercise routines, persistence in exercise goals, and engaging in various types of exercise all contribute positively to mental health. Overcoming barriers to physical activity, social influences, and the integration of technology into exercise routines further enhance mental well-being. Adaptability to change shows the highest correlation, particularly with coping mechanisms, underscoring its importance in maintaining mental health. Overall, the results emphasize that consistent and diverse exercise habits are crucial for improving stress management, coping strategies, social support, sleep quality, and overall mental health. These insights highlight the value of promoting regular physical activity as a means to foster better mental health outcomes among students.

REFERENCES

- 1) Koh, Y. S., Asharani, P. V., Devi, F., Roystonn, K., Wang, P., Vaingankar, J. A., Abdin, E., Sum, C. F., Lee, E. S., Müller-Riemenschneider, F., Chong, S. A., & Subramaniam, M. (2022). *A cross-sectional study on the perceived barriers to physical activity and their associations with domain-specific physical activity and sedentary behaviour*. *BMC Public Health*, 22, 1051. <https://doi.org/10.1186/s12889-022-13412-5>
- 2) Kong, L., Cui, Y., & Gong, Q. (2022). Duration of Keeping an Exercise Habit and Mental Illness and Life Attitude among University Students. *International journal of environmental research and public health*, 19(18), 11669. <https://doi.org/10.3390/ijerph191811669>
- 3) James, J., Pringle, A., Mourton, S., & Roscoe, C. M. P. (2023). The Effects of Physical Activity on Academic Performance in School-Aged Children: A Systematic Review. *Children (Basel, Switzerland)*, 10(6), 1019. <https://doi.org/10.3390/children10061019>
- 4) Pengpid, S., & Peltzer, K. (2019). Leisure-Time Sedentary Behavior Is Associated with Psychological Distress and Substance Use among School-Going Adolescents in Five Southeast Asian Countries: A Cross-Sectional Study. *International journal of environmental research and public health*, 16(12), 2091. <https://doi.org/10.3390/ijerph16122091>
- 5) Yao, Y., Chen, J., Dong, D., Feng, Y., & Qiao, Z. (2022). The Relationship between Exercise and Mental Health Outcomes during the COVID-19 Pandemic: From the Perspective of Hope. *International journal of environmental research and public health*, 19(7), 4090. <https://doi.org/10.3390/ijerph19074090>
- 6) Zhang, W., Wang, X., Li, X., Yan, H., Song, Y., Li, X., Zhang, W., & Ma, G. (2023). Effects of acute moderate-intensity aerobic exercise on cognitive function in E-athletes: A randomized controlled trial. *Medicine*, 102(40), e35108. <https://doi.org/10.1097/MD.00000000000035108>



There is an Open Access article, distributed under the term of the Creative Commons Attribution – Non Commercial 4.0 International (CC BY-NC 4.0) (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.