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Physical activity as a predictor of locus of control and self-regulation among students

La actividad física como predictor del locus de control y la autorregulación entre estudiantes

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Abstract

Physical activity has been widely recognized as a critical determinant of students' physical health; however, its influence on psychological attributes such as locus of control and emotional regulation remains insufficiently understood. Given the growing concerns regarding students' ability to manage emotions and maintain a sense of personal control in increasingly demanding academic environments, examining the role of physical activity in these psychological processes is warranted. This study aimed to determine whether physical activity predicts locus of control and emotional regulation among college students. The study employed a quantitative research design using a descriptive-correlational approach. The participants were 559 college students selected through simple random sampling from the target population. Data were collected using standardized questionnaires assessing physical activity, locus of control, and emotional regulation. Physical activity was measured using the International Physical Activity Questionnaire developed by Craig (2008), while validated instruments were utilized to assess locus of control and emotional regulation. Descriptive statistics, including frequency, percentage, mean, and composite mean, were used to describe the variables. Pearson product-moment correlation analysis was performed to examine the relationship between physical activity and the psychological constructs under investigation. The findings indicated that the respondents generally demonstrated favorable levels of physical activity and moderate levels of mindfulness-related attributes, including locus of control and emotional regulation. The analysis further revealed a statistically significant positive relationship between physical activity and the combined dimensions of locus of control and emotional regulation. The results suggest that students who engage more actively in physical activity tend to exhibit stronger capacities for self-awareness, emotional management, and personal control over life events. These findings contribute to the growing body of literature highlighting the interconnectedness of physical and psychological well-being among students. The study provides empirical evidence that physical activity is associated with important psychological characteristics that support adaptive functioning in academic settings. The findings underscore the value of considering physical activity as an important factor in understanding students' behavioral and emotional development.

Keywords: college students; emotional regulation; locus of control; mindfulness; physical activity

Resumen

La actividad física ha sido ampliamente reconocida como un determinante fundamental de la salud física de los estudiantes; sin embargo, su influencia en atributos psicológicos como el locus de control y la regulación emocional aún no se comprende plenamente. Ante la creciente preocupación por la capacidad de los estudiantes para gestionar sus emociones y mantener una sensación de control personal en entornos académicos cada vez más exigentes, resulta necesario examinar el papel de la actividad física en estos procesos psicológicos. Este estudio tuvo como objetivo determinar si la actividad física predice el locus de control y la regulación emocional en estudiantes universitarios. Se empleó un diseño de investigación cuantitativo con un enfoque descriptivo-correlacional. Los participantes fueron 559 estudiantes universitarios seleccionados mediante muestreo aleatorio simple. Los datos se recopilaron utilizando cuestionarios estandarizados que

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evaluaron la actividad física, el locus de control y la regulación emocional. La actividad física se midió mediante el International Physical Activity Questionnaire desarrollado por Craig (2008), mientras que para el locus de control y la regulación emocional se utilizaron instrumentos validados. Se aplicaron estadísticas descriptivas y análisis de correlación de Pearson para examinar la relación entre las variables. Los resultados mostraron que los participantes presentaron niveles favorables de actividad física y niveles moderados de atributos relacionados con la atención plena, incluidos el locus de control y la regulación emocional. Asimismo, se identificó una relación positiva y estadísticamente significativa entre la actividad física y las dimensiones combinadas del locus de control y la regulación emocional. Los hallazgos sugieren que los estudiantes con mayor participación en actividades físicas tienden a mostrar una mayor autoconciencia, una mejor gestión emocional y un mayor control personal sobre los acontecimientos de su vida. Estos resultados aportan evidencia empírica sobre la relación entre el bienestar físico y psicológico, destacando la importancia de la actividad física en el desarrollo conductual y emocional de los estudiantes.

Palabras clave: actividad física; atención plena; estudiantes universitarios; locus de control; regulación emocional.

Introduction

Locus of control refers to individuals' beliefs about whether life outcomes are shaped by their own actions or external forces, influencing how they perceive responsibility and control in daily situations (Galvin et al., 2018). Students with an internal locus of control tend to believe they can influence their academic and personal outcomes, while those with an external orientation attribute results to luck, fate, or powerful others (Gatawa & Ibrahim, 2015). Self-regulation, meanwhile, encompasses the capacity to manage emotions, behaviors, and thoughts to achieve long-term goals, enabling students to persist despite distractions and challenges (Minhui, 2023). These constructs are central to academic success, resilience, and personal development because they guide how students plan, monitor, and adjust their actions in various learning contexts (Johnson et al., 2015).

Physical activity among students refers to any form of bodily movement that increases energy expenditure, ranging from structured exercise to daily active routines (Zavalishina et al., 2021). Beyond its physical health benefits, regular engagement in movement enhances cognitive functioning, emotional balance, and behavioral control, making it a vital component of holistic student development (Mavilidi et al., 2018). Students who remain physically active often experience reduced stress, better mood



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regulation, and improved motivation, all of which contribute to healthier academic engagement (Ennis, 2017). As educational institutions emphasize well-being and mental health, integrating meaningful physical activity opportunities has become increasingly important (Khan & Subhan, 2023).

Despite these benefits, many students struggle with maintaining an internal locus of control and adequate self-regulation, which may lead to poor academic outcomes, procrastination, and diminished resilience (Shanava & Gergauli, 2023). Similarly, insufficient physical activity persists as a global concern, as students face rising levels of sedentary behavior driven by academic workload, digital distractions, and lifestyle patterns (Singh et al., 2024). These challenges are often interrelated, as weakened self-regulation can reduce motivation for physical activity, while inactivity can further limit students' psychological functioning (Failde-Garrido et al., 2022). Pressing concerns such as stress, low motivation, and academic burnout exacerbate these difficulties, making it essential to understand the interactions between psychological traits and activity levels among youth (Win, 2024). Addressing these dual concerns is crucial for creating supportive educational environments that foster healthier habits and adaptive behaviors (Srivastava, 2023).

Research on locus of control and self-regulation among students has consistently highlighted their roles in academic behavior, motivation, and coping strategies (De la Fuente et al., 2020). Studies indicate that students with a stronger internal locus of control generally display higher levels of persistence, goal clarity, and adaptive learning behaviors compared to their externally oriented counterparts (Galvin et al., 2018). Likewise, previous findings show that effective self-regulation predicts better academic performance, emotional stability, and resilience in demanding learning settings (Vazsonyi et al., 2022). These studies collectively underscore the relevance of personal control beliefs and behavioral regulation in shaping students' academic trajectories (Tiemeijer, 2022).

Empirical studies on physical activity similarly reveal its significant contributions to students' cognitive and emotional well-being, as well as their overall academic functioning (Gothe et al., 2020). Research has demonstrated that engaging in regular movement enhances executive functioning, improves focus, and reduces symptoms of

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anxiety and stress among young people (Westerbeek & Eime, 2021). Numerous studies also connect physical activity participation to improved self-management skills and healthier lifestyle patterns across diverse student populations (Author, 2023). These cumulative findings reinforce the value of physical activity as a protective factor that supports both physical and psychological development (Marentes-Castillo et al., 2024).

Despite extensive studies on psychological traits and physical activity separately, there remains insufficient evidence on how physical activity functions as a predictor of locus of control and self-regulation among students. Limited studies have simultaneously examined these constructs, leaving a gap in understanding how movement-based behaviors influence students' beliefs about control and their ability to regulate themselves. Therefore, this research seeks to answer the general question: Does physical activity significantly predict students' locus of control and self-regulation? Correspondingly, the main purpose of this study is to determine the extent to which students' physical activity levels contribute to variations in their locus of control and self-regulatory capacities.

Understanding these relationships is valuable for students, educators, and academic institutions, as it may guide the development of programs that strengthen both psychological functioning and health behaviors. This study also contributes to the growing body of knowledge by offering empirical evidence on how physical activity intersects with essential psychological constructs in educational contexts. Moreover, its findings have the potential to inform policies and interventions that promote student well-being, resilience, and academic success. Ultimately, this study aims to support the broader academic community in advocating for holistic approaches that integrate physical and psychological development in higher education.

Methods

Research design

This study employed a quantitative research design, specifically a descriptive–correlational approach. Quantitative research involves the systematic collection and analysis of numerical data to examine patterns, relationships, and generalizations across variables (Creswell, 2002). A descriptive–correlational design, meanwhile, is used to



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determine the degree and direction of association among variables without manipulating them (Dollente & Esto, 2025; Stangor & Walinga, 2019). This design allowed the researchers to examine physical activity as a predictor of students' locus of control and self-regulation in a natural academic setting.

The quantitative descriptive–correlational design was deemed most appropriate for this study because it enabled the analysis of existing conditions and the assessment of how variables are statistically related. Since the study's aim was to determine the predictive capacity of physical activity on locus of control and self-regulation, a design that measures associations rather than causation was necessary. Moreover, this approach provided a structured and objective means of collecting data from a large student population, ensuring accurate representation of trends. It also allowed the researchers to derive empirical evidence that supports understanding of the relationships among the variables examined.

Respondents and sampling

The study involved 559 college students enrolled in the University of Southern Mindanao. The respondents consisted of both male and female students with ages ranging from 18 to 25 years. Participants were drawn from different academic year levels and degree programs, providing a diverse representation of the student population. A simple random sampling technique was employed to select the respondents. Simple random sampling is a probability-based method in which every member of the population has an equal chance of being selected, thereby reducing selection bias and enhancing representativeness (Noor et al., 2022; West, 2016). This sampling approach was considered appropriate because it ensured that each eligible student had an equal opportunity to participate, allowing the sample to reflect the characteristics of the larger student population. The use of a probability sampling method strengthened the credibility and generalizability of the findings within the context of the study.

Research instrument

This study utilized standardized questionnaires adopted from established scales measuring locus of control, self-regulation, and physical activity. The questionnaire on locus of control and self-regulation was adapted from its original author, who reported a reliability coefficient above the acceptable threshold, indicating strong internal



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consistency. The physical activity instrument was adopted (Weston et al., 1997) which has been widely validated in various populations and demonstrates high reliability in measuring activity levels. All instruments were reviewed for clarity and suitability prior to administration, ensuring that they aligned with the study's objectives. The use of these validated scales ensured that the data collected were both reliable and accurate. Responses were measured according to the scoring procedures recommended by the original authors.

Statistical analysis

The study employed descriptive and inferential statistical techniques to analyze the data. Measures such as mean and composite mean were used to summarize and describe students' levels of physical activity, locus of control, and self-regulation. Spearman correlation was used to determine the relationship among the variables, as it is suitable for nonparametric data and ordinal measurement scales. This test was appropriate because the data did not assume normal distribution and involved ranked responses. The analysis allowed for the identification of significant relationships without requiring linearity or interval-level measurement. All statistical procedures were conducted to ensure accurate interpretation of the associations among the variables.

Results

Figure 1 illustrates the respondents' overall level of physical activity engagement as measured by the standardized instrument. The distribution shows how frequently students participate in various forms of physical activity, highlighting whether their engagement falls within low, moderate, or high levels. Overall, the figure provides a clear visual representation of students' movement patterns, allowing for easy comparison of activity levels across the sample.



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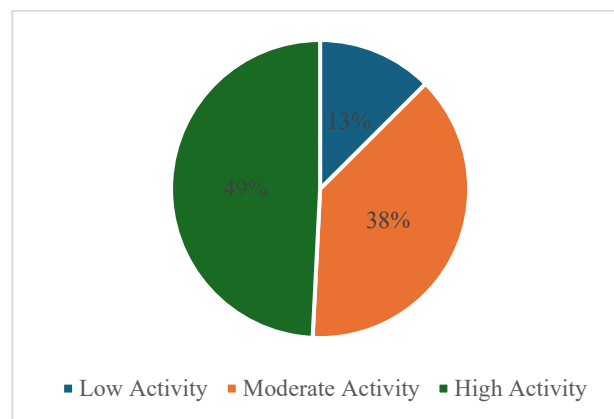


Figure 1. Respondents' Physical Activity Engagement

Figure 2 presents the respondents' levels of locus of control and emotional regulation based on their self-reported responses. The figure illustrates how students vary in their perceived control over life outcomes and their ability to manage emotions effectively. Overall, it provides a comparative view of these two psychological constructs, highlighting patterns that may reflect students' coping tendencies and adaptive behaviors.

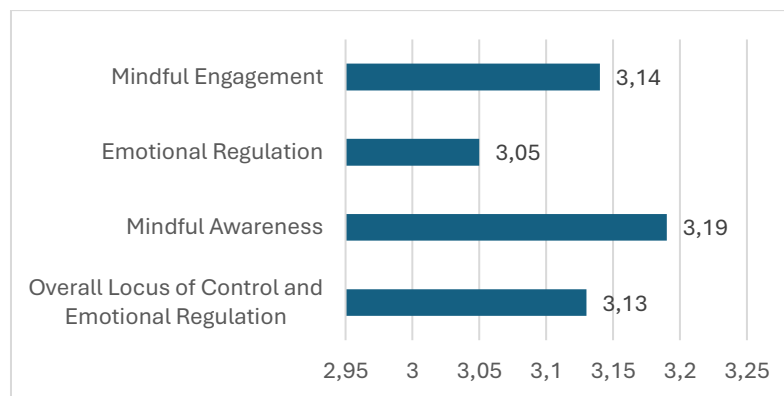


Figure 2. Locus of Control and Emotional Regulation of the Respondents

Legend:

4.00 – 3.50	Strong Mindfulness
3.49 – 2.50	Moderate Mindfulness
2.49 – 1.50	Low Mindfulness
1.49 – 1.00	Very Low Mindfulness

Table 1 presents the statistical test examining the relationship between the respondents' physical activity and their levels of locus of control and emotional



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regulation. The results indicate the strength and direction of the associations, showing whether higher physical activity corresponds to variations in these psychological constructs. Overall, the table provides empirical evidence on how students' activity levels relate to their perceived control and emotional management.

Table 1. Test of Relationship between the Respondents' Physical Activity and Locus of Control and Emotional Regulation

Variables	Pearson Correlation Coefficient	p-value	Interpretation $\alpha=0.05$
Physical Activity and Mindfulness and Emotional Regulation	.307**	.001	Statistically Significant

** . Correlation is significant at the 0.01 level (2-tailed).

Discussion

Respondents' physical activity engagement

The findings reveal that most respondents demonstrated high physical activity engagement, with 275 students or 49.19% classified under high activity levels. This is followed by 214 respondents, representing 38.28%, who were categorized as having moderate activity levels. Meanwhile, only 70 respondents, or 12.52%, fell within the low physical activity category. These results show that a greater proportion of students consistently participate in physical activities, suggesting that active lifestyles are common within the sample. Overall, the distribution indicates varying but generally favorable levels of movement among the respondents.

This means that a significant portion of the student population engages in regular physical activity, which may reflect positive health awareness and active routines. This implies that many students are able to incorporate physical movement into their daily lives despite academic pressures or lifestyle demands. It also means that students' physical behaviors may be shaped by their school environment, social influences, or personal motivations. This further implies that varying levels of activity may contribute to differences in students' psychological and behavioral functioning. Ultimately, the pattern suggests that physical activity forms an integral part of students' daily experiences.



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These findings are consistent with previous studies highlighting that many students tend to maintain high or moderate levels of physical activity when supported by conducive academic or social environments (Morton et al., 2016). Other research similarly noted that young adults often engage in regular physical movement, especially when physical activity is embedded in their routine activities or institutional culture (Reis et al., 2016). Additionally, studies have reported that student populations commonly exhibit diverse but generally adequate levels of physical activity, aligning with the distribution observed in the present research (Wilson et al., 2021). These converging outcomes reinforce that the respondents' engagement patterns reflect broader trends documented in contemporary literature.

Locus of control and emotional regulation of the respondents

The results show that the respondents obtained a mean score of 3.14 in Mindful Engagement, which corresponds to a “Moderate Mindfulness” interpretation. This means that students generally demonstrate a balanced ability to stay aware of their thoughts, emotions, and behaviors in academic and personal situations. This implies that while they can observe and regulate their internal states, their mindfulness is not yet consistently strong across all circumstances. It also means that students may show awareness and presence in some tasks but still experience moments of distraction or emotional fluctuation. Taken together, the findings suggest that their level of mindful engagement reflects a developing but not yet optimal capacity for internal control and emotional regulation.

These findings align with earlier studies showing that many students commonly fall within a moderate range of mindfulness due to academic demands and shifting emotional environments (Ramler et al., 2016). Similar research also found that learners often demonstrate partial but inconsistent mindfulness, which still supports functional self-regulation even if not fully developed (Fan & Cui, 2024). Moreover, other scholars noted that moderate mindfulness levels are typical in higher education populations, as students continue refining their awareness and emotional processing skills during this developmental stage (de Bruin et al., 2015).



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The respondents obtained a mean score of 3.05 in Emotional Regulation, which corresponds to the verbal description “Moderate Mindfulness.” This means that students demonstrate a fair ability to manage their emotions, though their regulation skills may not always be consistently strong. This implies that while they can recognize and adjust their emotional responses in certain situations, they may still experience difficulty when confronted with more demanding or stressful circumstances. It also means that their emotional management strategies are present but not yet fully refined, reflecting a developing level of internal control.

These results are supported by previous studies showing that students commonly exhibit moderate levels of emotional regulation as they navigate academic pressures and personal adjustments (Soge et al., 2025). Other research likewise reported that learners often develop emotional regulation gradually, leading to moderate but not yet optimal levels of emotional awareness and control (Arguedas et al., 2016). Additionally, scholars have noted that moderate emotional regulation is typical among young adults who are still in the process of strengthening their coping mechanisms and self-management skills (Altuntaş & Özkan, 2025).

The respondents obtained a mean score of 3.19 in Mindful Awareness, which corresponds to the verbal description “Moderate Mindfulness.” This means that students show an adequate ability to pay attention to their thoughts, sensations, and experiences as they occur. This implies that they can maintain present-moment awareness in many situations, although this awareness may not be consistently sustained during periods of distraction or heightened stress. It also means that while students demonstrate awareness of their internal states, they may still overlook subtle emotional or cognitive cues at times.

These findings are consistent with earlier studies indicating that students generally exhibit moderate levels of mindful awareness due to the varying cognitive and emotional demands they experience in academic settings (Galante et al., 2018). Other research likewise found that many young adults demonstrate partial but not yet fully refined mindfulness skills as they continue to develop attentional control and emotional insight (Sanger & Dorjee, 2015). Additionally, studies have noted that moderate mindful awareness is common among learners who are still navigating personal, academic, and social adjustments that shape their internal focus (Popescu, 2025).



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The overall results show that the respondents obtained a grand mean of 3.13 in Locus of Control and Emotional Regulation, which corresponds to the verbal description “Moderate Mindfulness.” This means that students generally exhibit a balanced ability to recognize internal states, manage emotions, and perceive their level of control over situations. This implies that while they demonstrate awareness and regulation in many circumstances, these abilities may not be consistently strong across more challenging or unpredictable conditions. It also means that students possess functional yet still-developing self-regulatory mechanisms that guide how they respond to academic and personal demands. Overall, the findings indicate that their combined locus of control and emotional regulation reflect a moderate level of mindfulness, suggesting stable but evolving internal capacities.

These results align with previous studies showing that students commonly fall within moderate ranges of locus of control and emotional regulation due to the transitional nature of their academic and developmental experiences (Kahu et al., 2015). Other research similarly reported that learners often exhibit partial but not fully refined regulatory skills, contributing to moderate mindfulness scores in educational populations (Finkelstein-Fox et al., 2018). Furthermore, scholars noted that young adults typically demonstrate moderate internal awareness and emotion management as they continue forming coping strategies and personal control beliefs (Mayordomo-Rodríguez et al., 2015).

Relationship between the respondents' physical activity and locus of control and emotional regulation

The analysis revealed a Pearson correlation coefficient of .307 with a p-value of .001 between physical activity and mindfulness and emotional regulation, indicating a statistically significant relationship at the $\alpha = 0.05$ level. This positive correlation suggests that higher physical activity levels are associated with higher levels of mindfulness and emotional regulation among the respondents. The significance of the p-value demonstrates that the relationship is unlikely to be due to chance and reflects a meaningful association between the variables. Overall, the results show that students who engage in

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more physical activity tend to exhibit stronger mindful awareness and better emotional management.

This means that students' physical activity may be connected to their internal regulatory processes, allowing them to navigate thoughts and emotions more effectively. This implies that the extent to which students engage in physical movement may relate to how well they maintain awareness, self-control, and emotional balance in daily experiences. It also means that physical engagement may coincide with psychological tendencies that support clearer thinking and steadier emotional responses. Taken together, the findings suggest that students' behavioral patterns and internal cognitive-emotional processes appear to function in tandem.

These results are consistent with previous studies showing that physically active students often demonstrate stronger emotional regulation and greater awareness of their internal states (Cañabate et al., 2020). Other researchers similarly found that regular physical activity is associated with improved mindfulness, attention stability, and emotional processing among young adults (de Bruin et al., 2016). Additionally, studies have reported that individuals who frequently participate in movement-based activities tend to show enhanced psychological functioning, supporting the link observed in the present research (Koch et al., 2019). These converging findings reinforce the conclusion that physical activity and mindfulness-related capacities are meaningfully interconnected.

The findings provide meaningful implications for theoretical perspectives linking physical activity with self-regulatory functioning. The significant relationship between physical activity and mindfulness–emotional regulation supports existing models suggesting that behavioral engagement influences internal cognitive–affective processes (Schneider et al., 2019). It reinforces self-regulation theory, which posits that repeated engagement in structured activities may strengthen awareness, control, and emotional stability (Payan-Carreira et al., 2022). Moreover, the results contribute to locus of control frameworks by indicating that physically active students tend to develop stronger perceptions of internal control, aligning with contemporary research connecting physical engagement and psychological autonomy (Zhou & Chen, 2024). Thus, the study strengthens theoretical assumptions about the interplay between physical behavior and intrapersonal regulation.

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In practice, the findings highlight that students' physical activity patterns are closely linked to their mindfulness and emotional regulation, which are essential for adaptive functioning in academic and personal contexts (Zhou & Chen, 2024). Understanding this relationship allows educators, counselors, and institutional leaders to recognize that students' internal regulation processes may be influenced by their daily behavioral routines (Day et al., 2016). It implies that student well-being, cognitive clarity, and emotional steadiness may correspond with their habitual physical actions within their learning environment (Suganya, 2024). Overall, the results provide practical insight into how aspects of students' daily behavior relate to their psychological functioning, informing future programming, student monitoring, and holistic academic support practices.

Conclusion

The findings of the study indicate that students' engagement in physical activity reflects meaningful patterns that highlight its continued relevance to their overall functioning. Their participation suggests that movement remains an essential avenue for sustaining energy, reducing stress, and supporting daily academic demands. This underscores the importance of integrating regular activity into student routines through accessible campus programs and supportive environments. Overall, the results affirm that physical activity serves as a foundational component of students' holistic development.

The results concerning locus of control and emotional regulation reveal that students possess varying capacities in navigating personal responsibility and managing their emotional experiences. These tendencies demonstrate how beliefs about control and strategies for responding to emotions shape their behaviors and coping patterns. Such insights emphasize the need for educational frameworks that nurture psychological strengths, promote self-belief, and encourage healthier emotional habits. Collectively, these observations highlight the value of supportive learning contexts that enhance students' inner resources.

The demonstrated relationship between physical activity, locus of control, and emotional regulation provides important insights into how behavioral and psychological domains reinforce one another. The interconnectedness of these variables suggests that

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students who engage more consistently in movement may develop stronger internal beliefs and more adaptive emotional responses. This association calls for holistic interventions that integrate physical, cognitive, and emotional support systems within higher education. Ultimately, the study reinforces the idea that well-designed physical activity initiatives can contribute meaningfully to students' psychological resilience and overall well-being.

Limitations

This study is limited by its reliance on self-reported responses, which may be influenced by participants' perceptions and recall biases. The use of a single-site sample also restricts the generalizability of the findings to broader student populations. Additionally, the study employed a cross-sectional design, which prevents establishing causality among the variables examined. Future research may address these limitations by using multiple data sources, diverse samples, and longitudinal approaches.

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