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In motion against distress: the role of physical activity in alleviating psychological strain

En movimiento contra la angustia: el papel de la actividad física en el alivio del estrés psicológico

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Abstract
This study explored the relationship between physical activity engagement and psychological distress among university students. Using a quantitative research design, particularly descriptive correlation, the study surveyed 1,199 respondents selected through simple random sampling. The research adopted two established instruments: the International Physical Activity Questionnaire (IPAQ) to assess physical activity levels and the Kessler Psychological Distress Scale (K10) to evaluate psychological distress. Data were analyzed using descriptive and inferential statistics, including Pearson's Correlation Coefficient, to determine the relationship between the variables. The results indicated a statistically significant negative correlation between physical activity engagement and psychological distress, suggesting that higher levels of physical activity were associated with lower levels of distress. These findings underscore the potential of physical activity as a protective factor against psychological distress in students. The study emphasizes the need for institutions to integrate physical activity programs into their wellness initiatives, as these programs could alleviate mental strain and enhance overall student well-being. The implications of this research suggest that promoting physical activity can improve mental health outcomes, which is crucial for academic success and personal development. In conclusion, fostering environments that encourage physical activity may effectively reduce psychological distress and support students' holistic health, ultimately contributing to a healthier and more productive academic community.
Keywords: college students; mental well-being; physical engagement; student lifestyle; stress management

Resumen
Este estudio exploró la relación entre la actividad física y el distrés psicológico en estudiantes universitarios. Mediante un diseño de investigación cuantitativo, en particular la correlación descriptiva, se encuestó a 1199 participantes seleccionados mediante un muestreo aleatorio simple. La investigación adoptó dos instrumentos consolidados: el Cuestionario Internacional de Actividad Física (IPAQ) para evaluar los niveles de actividad física y la Escala de Distrés Psicológico de Kessler (K10) para evaluar el distrés psicológico. Los datos se analizaron mediante estadística descriptiva e inferencial, incluyendo el Coeficiente de Correlación de Pearson, para determinar la relación entre las variables. Los resultados indicaron una correlación negativa estadísticamente significativa entre la actividad física y el distrés psicológico, lo que sugiere que niveles más altos de actividad física se asociaron con niveles más bajos de distrés. Estos hallazgos subrayan el potencial de la actividad física como factor protector contra el distrés psicológico en los estudiantes. El estudio enfatiza la necesidad de que las instituciones integren programas de actividad física en sus iniciativas de bienestar, ya que estos programas podrían aliviar la tensión mental y mejorar el bienestar general de los estudiantes. Las implicaciones de esta investigación sugieren que promover la actividad física puede mejorar los resultados en salud mental, lo cual es crucial para el éxito académico y el desarrollo personal. En conclusión, fomentar entornos que incentiven la actividad física puede reducir eficazmente el malestar psicológico y apoyar la salud integral de los estudiantes, contribuyendo en última instancia a una comunidad académica más saludable y productiva.

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Palabras clave: estudiantes universitarios; bienestar mental; actividad física; estilo de vida estudiantil; manejo del estrés

Introduction

Psychological strain refers to mental or emotional tension from adverse or demanding circumstances that challenge an individual's coping capacity (Rusu, 2019). It is often associated with feelings of pressure, anxiety, helplessness, and emotional fatigue, which may emerge from persistent stressors such as academic demands, interpersonal conflicts, or societal expectations (Patnaik, 2021). If left unaddressed, this internal strain can significantly impair cognitive functioning, decision-making abilities, and overall well-being. Researchers emphasize that psychological strain plays a pivotal role in the development of mental health issues, including depression, burnout, and anxiety disorders (Sandua, 2023). Understanding psychological strain is essential for developing effective interventions that enhance resilience and promote mental wellness, especially in vulnerable populations (Robbins, 2021).

On the other hand, physical activity engagement refers to consistent participation in bodily movements that require energy expenditure and contribute to maintaining or improving physical fitness and overall health (Maurer & Daukantaitė, 2020). It encompasses various activities, including structured exercises such as aerobic workouts and resistance training, as well as unstructured movements like walking, household chores, and recreational play (Zhou & Xu, 2019). Regular engagement in physical activity has been widely recognized for its benefits to physical health and psychological well-being, enhancing mood, reducing stress, and improving cognitive performance (Malvezzi, 2019). Moreover, individuals who maintain active lifestyles are more likely to exhibit positive health behaviors and greater resilience against mental health challenges (Ehrlenspiel & Mesagno, 2023).

In recent years, psychological strain among students has become a pressing concern, often driven by academic overload, social isolation, financial stress, and uncertainty about the future, leading to increased rates of anxiety, depression, and burnout (Kim et al., 2023). These mental health challenges are further intensified by the lack of coping mechanisms and limited access to psychological support in educational

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institutions (Bülow et al., 2021). At the same time, physical activity levels among students have declined significantly due to sedentary lifestyles, academic pressures, and increased screen time, which contribute to physical inactivity and related health risks (Sensiper, 2023). Many students struggle to incorporate exercise into their daily routines due to time constraints, lack of motivation, or inadequate facilities (Margulis et al., 2021). This dual burden of psychological strain and low physical activity engagement creates a cycle of poor mental and physical health, underscoring the need for integrated wellness programs that promote emotional and physical well-being (Heckel et al., 2021).

Further, numerous studies have explored the nature and impact of psychological strain, particularly among student populations, highlighting its association with poor academic performance, emotional exhaustion, and reduced life satisfaction. For instance, Agnew's General Strain Theory underscores how negative stimuli and the failure to achieve valued goals contribute to emotional distress and maladaptive behaviors (Chauntry et al., 2022). Research emphasizes the role of cognitive appraisal and coping strategies in mediating stress responses, indicating that individuals who lack effective coping mechanisms are more vulnerable to psychological strain (Battalio et al., 2020). More recent findings reveal alarming rates of anxiety, depression, and stress among university students, identifying academic workload and social pressures as key contributors (Cattelino et al., 2023).

Furthermore, a substantial body of research has affirmed the wide-ranging benefits of physical activity, particularly in enhancing students' physical and mental health. Deng & Liu (2025) defined physical activity broadly, highlighting its role in preventing chronic diseases and promoting functional health. Numerous studies have shown that regular physical activity is linked to improved mood, reduced symptoms of anxiety and depression, and better stress management (Gothe et al., 2020a). Moreover, school-based interventions and structured physical education programs have effectively increased students' activity levels and fostered long-term healthy habits.

Despite the numerous studies highlighting the individual significance of psychological strain and physical activity, there remains insufficient data exploring the relationship between these two variables, particularly among student populations. While existing literature provides insights into their separate impacts on well-being, few studies

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have examined how physical activity engagement may directly influence or alleviate psychological strain. This gap in knowledge limits the development of holistic wellness strategies tailored to the unique needs of students. Thus, this study seeks to answer the general research question: How does physical activity engagement relate to psychological strain among students? This study aims to examine the connection between physical activity and psychological strain, aiming to provide evidence-based recommendations for promoting student mental health through physical activity.

This research is vital as it offers valuable insights for students in managing psychological strain through physical activity promoting mental and physical well-being. It contributes to the existing body of knowledge by addressing a gap in understanding the interplay between these two variables in the context of student life. Furthermore, the findings aim to inform educators, mental health professionals, and policymakers in designing effective wellness programs. By doing so, this study also supports the wider academic community in fostering healthier, more resilient learning environments.

Methods

Research Design

This research utilized a quantitative research design, specifically the descriptive correlational method, to examine the relationship between physical activity engagement and psychological strain among students. Quantitative research systematically investigates phenomena through statistical, mathematical, or computational techniques to gather and analyze numerical data (Hirose & Creswell, 2023). On the other hand, descriptive correlational research seeks to determine whether a relationship exists between two or more variables without manipulating them, allowing researchers to describe patterns and associations as they naturally occur ((Creswell & Poth, 2016).

Quantitative research design, particularly the descriptive correlational method, is appropriate for this study as it aims to statistically examine the relationship between two measurable variables: physical activity engagement and psychological strain. This design allows for the collection of objective data that can be analyzed to determine the strength and direction of their association. It is ideal for studies seeking to identify patterns without implying causation. Moreover, it provides a clear, evidence-based foundation for

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interpreting relationships and drawing generalizable conclusions relevant to the student population.

Respondents and Sampling

A total of 1,199 respondents were selected for this study using simple random sampling, which ensures that every individual in the population has an equal chance of being selected (Noor et al., 2022). This technique is particularly suitable for this study as it eliminates biases arising from subjective selection, ensuring a representative sample of the student population. Using simple random sampling, the study can generalize its findings to a broader group of students, providing a more accurate and unbiased assessment of the relationship between physical activity and psychological strain. This approach enhances the reliability and validity of the results, making them applicable to a diverse range of students across different educational settings.

Research Instruments

This research adopted the International Physical Activity Questionnaire (IPAQ) to measure the respondents' level of physical activity engagement. The IPAQ, developed by Craig et al. (2003), is widely used to assess physical activity across various domains, including work, transport, and leisure time. The reliability of the IPAQ has been established with a Cronbach's alpha of 0.82, indicating strong internal consistency. The Kessler Psychological Distress Scale (K10) was also used to assess psychological strain. Developed by Kessler et al., the K10 is a widely validated tool for measuring levels of psychological distress. The reliability of the K10 has been confirmed with a Cronbach's alpha of 0.93, demonstrating excellent internal consistency for this scale.

Statistical Analysis

This research used descriptive and inferential statistics to analyze the data, including frequency counts, mean, and composite mean, to describe the two main variables: physical activity engagement and psychological strain. Descriptive statistics provided a clear overview of the respondents' characteristics and the variables' distribution. The Pearson Correlation Coefficient examined the relationship between physical activity and psychological strain. This statistical test is the most appropriate as it measures the strength and direction of the linear relationship between two continuous variables. Given that both physical activity and psychological strain are measured on

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interval scales, Pearson's correlation is ideal for determining the degree to which changes in one variable are associated with changes in the other. This method precisely quantifies the relationship between the variables, which is essential for drawing meaningful conclusions from the data.

Ethical Consideration:

This study adhered strictly to ethical research standards to ensure the protection and integrity of all participants. Prior to data collection, informed consent was obtained from all respondents, clearly outlining the purpose of the study, their rights, and the voluntary nature of their participation. Confidentiality and anonymity were guaranteed by not collecting any personally identifiable information and securely storing all data. The respondents were assured that they could withdraw from the study at any time without any consequences. The research was conducted with approval from the appropriate institutional review body, ensuring that all procedures complied with ethical guidelines for human subject research.

Results:

Table 1 presents the physical activity engagement levels of the respondents, showing the frequency distribution across various activity categories. It summarizes how often respondents participate in different types of physical activity, such as work, leisure, and transportation-related activities.

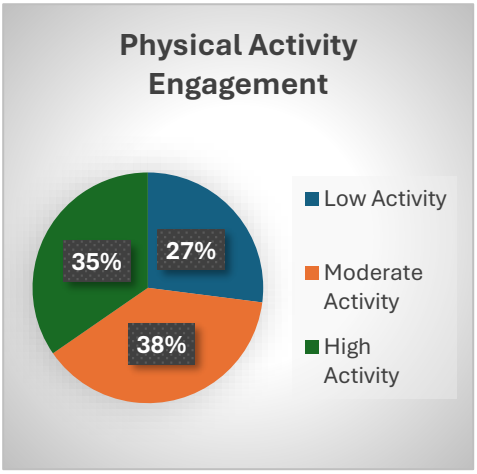

Table 1. Respondents' Physical Activity Engagement

Physical Activity Engagement	Frequency (n=1199)	Percentage (%)
Low Activity	324	27.0
Moderate Activity	460	38.0
High Activity	415	35.0

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Table 2 displays the levels of psychological distress experienced by the respondents, categorized based on their scores on the Kessler Psychological Distress Scale. It illustrates the distribution of respondents across different distress levels, ranging from low to high psychological strain.

Table 2. Respondents' Psychological Distress

Statements	Mean	Verbal Interpretation
1. In the past 4 weeks, how often did you feel tired out for no good reason?	3.63	Most of the Time
8. In the past 4 weeks, how often did you feel that everything was an effort?	3.41	Some of the Time
2. In the past 4 weeks, how often did you feel nervous?	3.39	Some of the Time
5. In the past 4 weeks, how often did you feel restless or fidgety?	3.34	Some of the Time
4. In the past 4 weeks, how often did you feel hopeless?	3.17	Some of the Time
9. In the past 4 weeks, how often did you feel so sad that nothing could cheer you up?	3.17	Some of the Time
10. In the past 4 weeks, how often did you feel worthless?	3.12	Some of the Time
6. In the past 4 weeks, how often did you feel so restless you could not sit still?	3.09	Some of the Time
7. In the past 4 weeks, how often did you feel depressed?	3.01	Some of the Time
3. In the past 4 weeks, how often did you feel so nervous that nothing could calm you down?	2.94	Some of the Time
Grand Mean	**3.23**	**Likely to have a mild disorder**

4.24 – 5.00	All of the Time	Likely to have a severe disorder
3.43 – 4.23	Most of the Time	Likely to have a moderate disorder
2.62 – 3.42	Some of the Time	Likely to have a mild disorder
1.81 – 2.61	A Little of the Time	Likely to be well
1.00 – 1.80	None of the time	Very well

Table 3 shows the results of the Pearson Correlation analysis, testing the relationship between respondents' physical activity engagement and their psychological distress levels. It indicates the strength, direction, and statistical significance of the correlation between these two variables.

Table 3. Test of Relationship between the Respondents' Physical Activity Engagement and Psychological Distress

Variables	Pearson Correlation Coefficient	p-value	Interpretation α=0.05
Physical Activity Engagement and Psychological Distress	-.091**	.002	Statistically Significant

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Discussion

Respondents' Physical Activity Engagement

Table 1 shows the students' physical activity engagement levels among the 1,199 respondents. Of the total, 324 students (27.0%) reported low physical activity, 460 students (38.0%) engaged in moderate activity, and 415 students (35.0%) were highly active. This means that most students fall within the moderate activity range, while a significant portion still engages in minimal physical activity. This implies that a notable number of students are not fully maximizing the benefits of physical activity, potentially impacting their overall health and well-being.

The considerable number of students reporting low and moderate levels of physical activity raises concerns about the potential long-term effects on their physical and mental health. While nearly 35% of students report high activity levels, 27% in the low activity category and 38% in the moderate activity range suggest that many students may not achieve the recommended physical activity levels. This trend could indicate a gap in students' engagement with regular physical activity, which may be associated with poor physical fitness, higher stress, and emotional strain. Considering the underlying factors contributing to these activity levels is crucial, as they may significantly influence the students' health outcomes and academic performance.

These findings are consistent with other studies highlighting university students' low physical activity levels. Research found that many students fail to meet the recommended physical activity guidelines, contributing to sedentary lifestyles (Gothe et al., 2020b). Similarly, it was observed that young adults worldwide tend to inactivity, often due to academic pressures and limited access to physical activity opportunities (Zheng et al., 2022). Inadequate physical activity can also harm physical and mental health, further underscoring the importance of addressing this issue in student populations (Gapa & Tagare Jr, 2023).

Respondents' Psychological Distress

In terms of Table 2. Respondents' Psychological Distress, the statement "In the past 4 weeks, about how often did you feel tired out for no good reason?" received the highest mean of 3.63, with a verbal description of "Most of the Time." This means that respondents often experience feelings of fatigue without any clear physical reason. This

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implies that many students may be dealing with underlying mental or emotional strain, which can contribute to overall feelings of exhaustion. Frequent tiredness can negatively affect their daily activities, concentration, and productivity.

These findings align with previous studies that suggest high levels of psychological distress among students often manifest as chronic fatigue (Poblador & Tagare, 2022). A study found that fatigue is a common symptom of stress and anxiety in university populations (Veilleux et al., 2022). Similarly, it was observed that students dealing with academic pressure frequently report feelings of tiredness without a clear physical cause (Mcdermott et al., 2020). Furthermore, mental health challenges like depression and anxiety often lead to prolonged fatigue, which can significantly impair students' well-being (Smith & Emerson, 2021).

On the contrary, the statement “In the past 4 weeks, about how often did you feel so nervous that nothing could calm you down?” recorded the lowest mean of 2.94, with a verbal description of "Some of the Time." This means that while respondents did experience some degree of nervousness, it was not as frequent or intense as other symptoms of psychological distress. This implies that feelings of overwhelming nervousness are less common among the students, suggesting that anxiety might not be as pervasive a concern compared to other distressing emotions like fatigue. Nonetheless, even moderate anxiety can still affect students' emotional stability and academic performance.

Supporting these findings, the research noted that while anxiety is prevalent among students, it often manifests intermittently, as seen in the relatively lower mean score for nervousness (Sasso et al., 2016). Similarly, it was indicated that anxiety-related symptoms like nervousness were less frequent but still present in many university students, especially under academic pressure (Arvidsdotter et al., 2016). Furthermore, it was found that while anxiety symptoms may vary in intensity, they still contribute significantly to psychological distress, impacting students' mental health and coping abilities (Collin et al., 2020).

The grand mean for Psychological Distress was 3.23, with a verbal interpretation of “Likely to have a mild disorder.” This means that, on average, respondents are experiencing psychological distress at a level that suggests they may be facing mild

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mental health challenges. This implies that while the overall distress levels are not extreme, a significant portion of students may still be dealing with ongoing emotional or psychological strain. If persistent, mild distress can affect their emotional well-being, social relationships, and academic performance.

This finding is consistent with research that identified mild psychological distress as a common issue among university students, often linked to academic and personal pressures (Singh et al., 2023). Additionally, it was found that mild distress is widespread in student populations, potentially leading to more severe mental health issues if left unaddressed (Squires et al., 2021). Furthermore, it was emphasized that even mild psychological distress can significantly impact students' day-to-day functioning and long-term well-being (Sfendla & Hadrya, 2020).

Relationship between the Physical Activity Engagement and Psychological Distress

The relationship between Physical Activity Engagement and Psychological Distress yielded a statistically significant negative correlation, with a Pearson Correlation Coefficient of -0.091 and a p-value of 0.002. While this indicates an inverse relationship between the two variables, the effect size is notably weak, suggesting that the practical significance of the association is limited. This means that although psychological distress slightly tends to decrease as physical activity increases, the relationship is not strong enough to suggest a substantial predictive effect. The result implies that physical activity may play a modest role in reducing psychological distress, but other factors likely influence this outcome. Possible confounding variables—such as academic stress, social support, or sleep patterns—should be considered when interpreting this finding.

This finding is supported by previous studies, which emphasize the positive impact of physical activity on mental health. A study showed that physical exercise significantly reduces psychological distress, particularly in stressful student environments (Feyzbabaie et al., 2025). Similarly, it was found that regular physical activity was associated with lower levels of anxiety and depression among university students (Ilies et al., 2015). In line with these findings, it was also highlighted that even moderate physical activity can alleviate symptoms of mental strain (Park et al., 2022).

The significant negative correlation between physical activity engagement and psychological distress suggests that encouraging physical activity among students could

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play a key role in reducing mental strain (Canby et al., 2015). This implies that institutions may need to prioritize and promote physical activity as part of their wellness initiatives. Integrating more structured physical activity programs within educational settings could help mitigate the impact of psychological distress on students' mental health and academic performance. Such an approach could be beneficial in improving the overall well-being of students (Marsigliante et al., 2023).

Furthermore, these results highlight the importance of developing policies encouraging students to engage in regular physical activity, especially given its potential to alleviate stress and anxiety (Westerbeek & Eime, 2021). Universities could consider implementing fitness programs and wellness challenges or providing better access to recreational spaces to facilitate consistent engagement. This could lead to a more supportive environment where students are academically successful and mentally and physically healthy (Camariñas et al., 2022).

Conclusion

The respondents' physical activity engagement reveals varying participation, with many students engaging in moderate to low physical activity levels. This suggests that while some students prioritize physical fitness, many do not meet recommended activity levels. The findings underscore the importance of fostering a culture that encourages more consistent and widespread participation in physical activities. Increasing student engagement in physical activity may have long-term benefits for their physical and mental health.

The respondents' psychological distress levels indicate that many students experience mild to moderate psychological strain. Although the levels of distress are not extreme, the findings suggest that psychological challenges are present and may be affecting students' overall well-being. These levels of distress could impact academic performance, personal relationships, and social engagement. Understanding the scope of psychological distress is critical in addressing the mental health needs of students.

The significant relationship between physical activity engagement and psychological distress highlights the potential of physical activity to mitigate emotional and psychological strain. This connection reinforces the idea that promoting physical

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activity can protect against psychological distress among students. The findings suggest that integrating physical activity into students' routines could help alleviate mental health challenges. Ultimately, this relationship emphasizes the need for a holistic approach to student wellness, combining physical, cognitive, and emotional well-being strategies.

Limitations of the Study

This study is limited by its reliance on self-reported data, which may introduce response biases such as overreporting of physical activity or underreporting of psychological distress. It is also constrained by its cross-sectional design, which does not allow for conclusions about causality between physical activity engagement and psychological distress. Additionally, the research was conducted in a single academic institution, limiting the generalizability of the findings to other student populations or educational settings. External variables such as socio-economic status, academic workload, or support systems were not controlled, which may have influenced the outcomes. Despite these limitations, the study offers meaningful contributions to understanding student well-being in relation to physical activity.

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