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MENTAL HEALTH AND PHYSICAL BEHAVIOR: A NARRATIVE REVIEW ON THE PREVALENCE OF ANXIETY, DEPRESSION, STRESS, AND THEIR RELATIONSHIP WITH PHYSICAL ACTIVITY LEVELS IN UNIVERSITY STUDENTS ON PHYSICAL EDUCATION STUDENTS.

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ABSTRACT

Objective: This narrative review aims to synthesize evidence on the prevalence of anxiety, depression, and stress among university students-particularly in the field of Physical Education-and to analyze the relationship between these symptoms and physical activity levels. Materials and Methods: A narrative literature review was conducted, involving the selection and analysis of 34 scientific articles published in national and international journals. The search and selection process were guided by core themes: the prevalence of psychological symptoms in university students, the effects of physical activity on mental health, and the specific characteristics of Physical Education students regarding these topics. Results: The review confirmed a high prevalence of anxiety, depression, and stress among university students, a situation exacerbated by the pandemic. Physical activity acted as a protective factor through neurobiological mechanisms, improved sleep quality, and emotional self-efficacy. However, the "Physical Education paradox" was observed: in this group, high exercise volume did not necessarily correlate with mental protection, likely due to academic stressors and performance pressures that neutralize the expected benefits of exercise. Conclusion: Physical activity is an effective intervention for university mental health, but its application requires a contextualized understanding. The "Physical Education paradox" highlights the need to tailor future interventions to the specific stressors of each academic field, optimizing the physical activity experience to maximize student well-being.

Key words: Mental Health. Physical Activity. University. Physical Education.

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RESUMO

Saúde mental e comportamento físico: uma revisão narrativa sobre a prevalência de ansiedade, depressão, estresse e sua relação com o nível de atividade física em universitários estudantes de educação física

Objetivo: Este artigo de revisão narrativa visa sintetizar as evidências sobre a prevalência de ansiedade, depressão e estresse em estudantes universitários, especialmente na área de Educação Física, e analisar a relação desses sintomas com os níveis de atividade física. Materiais e Métodos: Foi realizada uma revisão narrativa da literatura, com a seleção e análise de 34 artigos científicos publicados em periódicos nacionais e internacionais. A busca e a seleção dos artigos foram guiadas pelos temas centrais: prevalência de sintomas psíquicos em universitários, efeitos da atividade física na saúde mental e características específicas da população de estudantes de Educação Física em relação a esses temas. Resultados: A revisão confirmou a elevada prevalência de ansiedade, depressão e estresse entre universitários, agravada pela pandemia. A atividade física atuou como fator protetor via mecanismos neurobiológicos, melhora do sono e autoeficácia emocional. Todavia, observou-se o "paradoxo da Educação Física": nesse grupo, o alto volume de exercício não correlacionou-se necessariamente com proteção mental, possivelmente devido a estressores acadêmicos e pressões de desempenho que neutralizam os benefícios do exercício. Conclusão: A atividade física é uma intervenção eficaz para a saúde mental universitária, mas sua aplicação requer uma compreensão contextualizada. O 'paradoxo da Educação Física' destaca a necessidade de adaptar futuras intervenções aos estressores específicos de cada curso, otimizando a experiência da atividade física para maximizar o bem-estar dos estudantes.

Palavras-chave: Saúde mental. Atividade física. Universitários. Educação física.

INTRODUCTION

The transition to higher education is a crucial phase in the lives of young adults, marked by significant socioeconomic, academic, and personal changes.

This period, while full of opportunities, is also associated with intense challenges that can negatively impact the mental health of university students.

Pressure to perform, distance from the family support network, financial difficulties, and adaptation to a new social environment are factors frequently reported as stressors.

Consequently, an increase in the prevalence of various mental disorders among students has been observed, making university mental health a growing global concern.

The scientific literature has consistently revealed high rates of symptoms of anxiety, depression, and stress in university students, exceeding, in many cases, those of the general population of the same age group.

Studies indicate that approximately one-third of university students may present some common mental disorder, demanding urgent attention.

This reality highlights the need for continuous monitoring and the implementation of strategies for promoting and preventing mental health in the academic environment.

The symptoms of anxiety, depression, and stress are not limited to individual suffering; They have a multifaceted impact on students' academic trajectory and quality of life.

Difficulties concentrating, reduced motivation, absenteeism, and, in more serious cases, dropping out of studies or developing suicidal ideation are direct consequences of the deterioration of mental health. Recognizing the magnitude of these impacts is fundamental to justifying the search for effective interventions.

In contrast, regular physical activity has been widely documented as a powerful protective factor against the development and exacerbation of mental disorders.

Its mechanisms of action are diverse, involving the release of neurotransmitters such as serotonin and dopamine, the reduction of inflammatory processes, and the improvement of self-esteem and socialization. Thus, physical activity emerges as a promising non-pharmacological strategy for promoting mental health in diverse populations, including university students.

Within the university context, students in the Physical Education course represent a population of special interest. It is expected that, due to the nature of their training and knowledge of the benefits of movement, these individuals will maintain a more active lifestyle and, consequently, exhibit better mental health.

However, the demanding curriculum, the pressure for physical performance, and the idealization of the "perfect body" can, paradoxically, lead to inadequate levels of physical activity and increased stress and anxiety (Silva, et al., 2023). This group, which will be a future health promoter, needs a deeper understanding of its own psychosocial reality.

Despite the growing attention to mental health in higher education and the role of physical activity, the literature still lacks a comprehensive synthesis that consolidates the evidence on this interrelationship, with a specific focus on Physical Education students.

Knowledge about the prevalence and association of these variables in such unique populations often remains scattered across isolated studies.

A systematic review of this body of knowledge is necessary to identify patterns, trends, and gaps, providing a clear overview of what is already known and what needs to be investigated.

Given this scenario, this text is justified by the following terms. Entering higher education represents a critical period of transition in the life cycle, often marked by a substantial increase in academic demands, autonomy, and social pressures.

The scientific literature has consistently pointed to a high prevalence of psychological distress in this population, characterizing the university environment as a vulnerable setting for the development or worsening of symptoms of anxiety, depression, and stress.

This panorama constitutes a public health challenge, given the potential interference of these disorders in academic performance, quality of life, and the future professional performance of students.

In parallel, regular physical activity is widely recognized as a non-pharmacological protective factor for mental health, capable of mitigating symptoms of mood disorders and reducing reactivity to stress.

In this context, the Physical Education student emerges as a population of unique interest. Theoretically, this student possesses knowledge about the benefits of human

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movement and, by extension, is expected to adopt an active lifestyle.

However, initial investigations suggest the existence of a possible paradox: the intense workload of theoretical and practical studies, combined with the pressure for exemplary physical performance, may lead to inactivity.

Physical activity and the consequent mental illness, creating a dissonance between "professional knowledge" and "personal practice."

Despite the existence of isolated studies addressing university mental health and motor behavior, the literature lacks an integrative synthesis that focuses specifically on the nuances of training in Physical Education.

Therefore, this narrative review is justified by the pressing need to map and critically analyze the state of the art on this topic. It is imperative to understand whether theoretical knowledge about health translates into self-care practices (physical activity) and mental health protection in this specific population.

The compilation and analysis of available evidence will not only organize the dispersed knowledge but will also provide a robust theoretical basis for institutional student support policies and to delineate gaps that justify future empirical investigations in specific local contexts.

Given this scenario, the main objective of this narrative review article is to synthesize the scientific evidence available in the literature on the prevalence of symptoms of anxiety, depression, and stress in university students, with an emphasis on those in the field of Physical Education, and to analyze the relationship between these mental health outcomes and the levels of physical activity practiced by this population. It is hoped that the findings of this review will contribute to a better understanding of the subject and to the development of future intervention and research strategies.

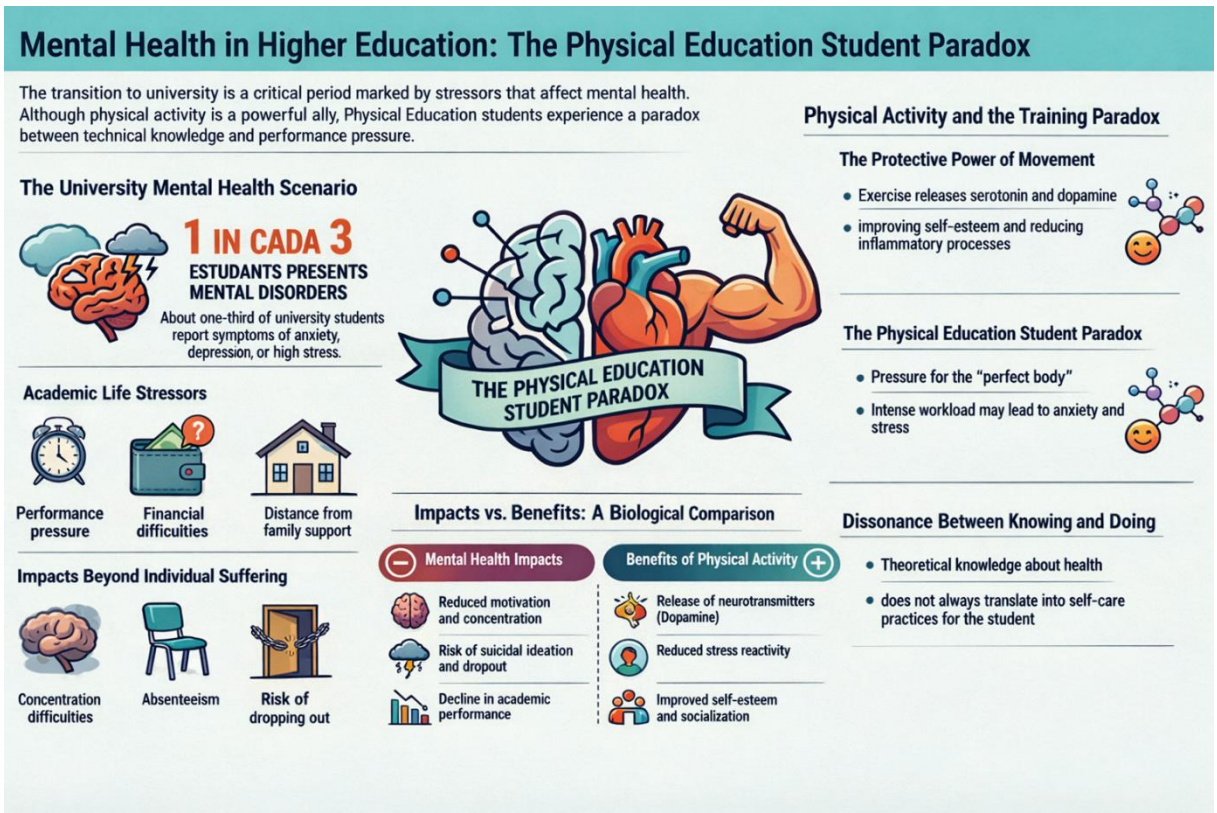

Figure 1 - Mental health in higher education: The paradox of the Physical Education student.

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MATERIALS AND METHODS

This study is characterized as a narrative literature review. This type of research allows for a broad and critical analysis of the scientific literature, enabling the synthesis of current knowledge on a given topic, the identification of gaps, and the theoretical foundation for future empirical investigations, without the rigid protocol of a systematic review, but maintaining rigor in the search for sources.

Search strategy and data sources

The bibliographic survey was conducted through electronic searches in national and international databases relevant to the areas of Health Sciences and Physical Education. The databases consulted were: MEDLINE via PubMed (National Library of Medicine), SciELO (Scientific Electronic Library Online), LILACS (Latin American and Caribbean Literature in Health Sciences) and, complementarily, Google Scholar to identify relevant grey literature or seminal articles not indexed in the main databases. The search was conducted between January and February 2025.

Descriptors and search terms

For the definition of the search strategy, controlled descriptors extracted from DeCS (Descriptors in Health Sciences) and MeSH (Medical Subject Headings) were used, in addition to free terms relevant to the theme. The terms were combined using the Boolean operators "AND" and "OR".

The search keys were adapted to the syntax of each database, combining three main axes:

Mental Health Outcomes: ("Mental Health" OR "Anxiety" OR "Depression" OR "Stress" / "Mental Health" OR "Anxiety" OR "Depression" OR "Stress");

Physical Behavior: ("Physical Activity" OR "Exercise" OR "Physical Activity Level" OR "Sedentary Behavior");

Target Population: ("University Students" OR "College Students" OR "Physical Education Students").

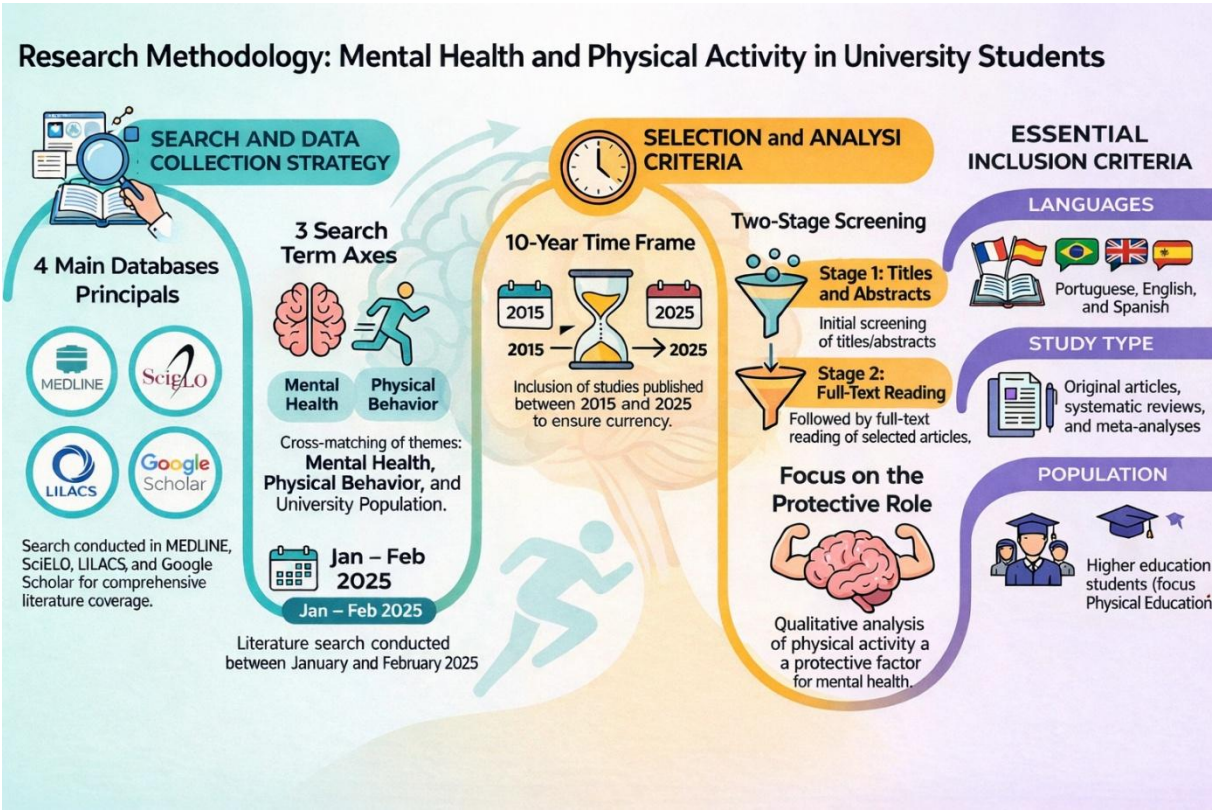

Figure 2 - Research Methodology: Mental Health and Physical Activity in University Students.

Eligibility Criteria

The following inclusion criteria were adopted for the selection of studies:
Study Types: Original articles (cross-sectional, longitudinal, clinical trials), systematic reviews, and meta-analyses published in peer-reviewed journals.
Language: Publications in Portuguese, English, or Spanish.
Time Frame: Studies published in the last 10 years, between 2015 and 2025, aiming to ensure the timeliness of epidemiological data and discussions.
Theme: Studies that directly addressed the prevalence of mental health symptoms (anxiety, depression, or stress) and/or their association with the practice of physical activity in the university population.
Excluded were: conference abstracts, editorials, letters to the editor, theses, dissertations not published in article format, and studies whose main focus was not higher education students.

Selection of studies and data analysis

The selection process began with reading the titles and abstracts of the references retrieved in the search. Potentially relevant articles were selected for full-text reading to confirm eligibility criteria.

The data analysis was qualitative. The information extracted from the selected studies was synthesized and organized into thematic axes to compose the discussion of the narrative review.

The main axes of analysis focused on the prevalence of mental disorders in the university environment, the profile of Physical Education students in relation to these issues, and the evidence on the role of physical activity as a protective or risk factor for mental health in this population.

RESULTS

Table 1 - Synthesis of scientific literature on mental health, physical activity and university students, by population and year.

Authors / Year / Location	Sample (Population)	Instruments	Main Results
PHYSICAL EDUCATION STUDENTS			
Barros (2017) Brazil (SC)	Physical Education students from UFSC.	Anxiety and Depression Instruments.	Significant prevalence of anxiety (49.5%) and depression (38.6%) in the sample. Identified academic and social stressors.
Maximiliano et al., (2020) Portugal/Brazil	Undergraduate students in Physical Education.	IPAQ Depression and Anxiety Scales.	Identified the prevalence of symptoms and their relationship with the Level of Physical Activity (LPA) in the Physical Education population.
Du and Liu (2022)	(PE Professionals) Physical Education Professionals (in training or already working).	Not specified in the title.	Physical Education positively influences the mental health of university students, acting as a protective factor.
Rezende et al., (2022) Brazil (GO)	Physical Education students from a private higher education institution.	IPAQ Depression, Anxiety and Quality of Life Scales.	71.9% with insufficient levels of Physical Activity. High prevalence of anxiety (54.4%) and depression (21.9%). Level of Physical Activity had a negative correlation with anxiety and depression.
Magalhães, Soares and Silva (2023) Brazil (MG)	36 Physical Education students (Bachelor's degree).	IPAQ (Short) DASS-21	High prevalence of symptoms (41% depression, 47% anxiety). 97% were active/very active. Paradox: There was no significant association between Level of Physical Activity and Depression/Stress, only for Anxiety.
UNIVERSITY STUDENTS IN THE HEALTH FIELD			
Iqbal et al., (2015) India	Medical university students.	Stress, Anxiety, and Depression Scales.	High prevalences of stress (73%), anxiety (60%), and depression (38%) in medical students, with sociodemographic correlations.

		DASS-21.	
Leão et al., (2018) Brazil	University students in the health field (including Physical Education).	Depression and Anxiety Scales.	High prevalence of depression (44.7%) and anxiety (50.5%). Stressors: academic, financial, and social life.
Pereira et al., (2021) Brazil (MG)	University students in the health field.	Proprietary questionnaire + validated scales.	The physically active group showed a lower prevalence of anxiety and depression, suggesting a protective effect of physical activity.
UNIVERSITY STUDENTS IN GENERAL (OR VARIOUS COURSES)			
Herbert et al., (2020)	University Students (Review/Large Study).	DASS-21 + Physical Activity Measures.	A 6-week aerobic exercise intervention significantly reduced stress and depression, but had a smaller effect on anxiety.
Grasdalsmoen et al., (2020) Norway	13,920 university students.	Questionnaires on Physical Activity, Mental Health, Suicide Attempts.	Low levels of physical activity were associated with mental health problems and a higher risk of suicide attempts among university students.
Mohammad et al., (2020) Saudi Arabia	University students (various courses).	DASS-21 + Sociodemographic Questionnaire.	High prevalences of depression (50.4%), anxiety (60.5%), and stress (34.9%). Associated factors: female sex, low income, use of social networks.
Ramón-Arbués et al., (2020)	1969 university students (various courses).	DASS-21 + Sociodemographic Questionnaire.	Prevalence: Depression (34.1%), Anxiety (60.4%), Stress (43.8%). Associated factors: female sex, less family support, unhealthy habits.
Song et al., (2021)	University students (Meta-analysis RCTs).	Various instruments for depressive symptoms.	Meta-analysis: Aerobic exercise, traditional Chinese exercises, and meditation are effective in reducing depressive symptoms in university students.
Santos et al., (2021) Brazil	Literature Review.	Several studies reviewed.	Points to the complex association between Brain-Derived Neurotrophic Factor (BDNF) and depressive disorder, with AF influencing its levels.
Rodríguez-Larrad et al., (2021) Spain	Spanish university students.	Physical Activity and Sedentary Behavior Questionnaire.	Impact of COVID-19 lockdown: significant reduction in Physical Activity and increase in sedentary behavior, with gender differences.
Cai (2022)	University students.	Not specified (Neural Network-based intervention).	Physical exercise intervention, optimized by neural network, demonstrated effectiveness in improving the mental health of university students.
Herbert (2022)	Review/Research programs.	Not applicable (program review).	Highlights the importance of research programs in physical activity and exercise to improve the mental health and well-being of university students, reviewing approaches and results.
Kong et al. (2022)	University students.	Exercise habits questionnaire, mental health scales, and life attitude.	Longer duration of exercise habits is associated with lower incidence of mental illness and better life attitude.
Li et al., (2022)	Anxious female university students.	Resistance training, HRV.	Resistance training improved heart rate variability (HRV) in anxious female university students, suggesting a benefit for mental health.
Luo et al., (2022)	University students (Systematic Review and Meta-analysis).	Various instruments evaluated.	Meta-analysis: Physical activity interventions are effective in reducing symptoms of anxiety and depression in university students during the COVID-19 pandemic.

Rosales-Ricardo and Ferreira (2022)	University students.	Burnout scales, Physical Activity questionnaires.	Physical exercise demonstrated beneficial effects in reducing Burnout Syndrome in university students.
Tang et al., (2022)	University students (post-pandemic).	Questionnaires on Physical Activity, negative emotions, self-efficacy in emotional regulation.	Physical exercise influences negative emotions in the post-pandemic era, with self-efficacy in emotional regulation as a mediator.
Hexsel et al., (2023) Brazil	University students (various courses).	Instruments for depressive symptoms.	High prevalence of depressive symptoms (approximately 40%). Associated factors: history of mental illness, academic pressure, dissatisfaction with social life.
Toreales et al., (2024) Paraguay	University students in general.	Mental Health Scales + Physical Activity	Significant inverse correlation: the higher the total level of physical activity, the lower the scores for depression (r=-0.167), anxiety, and stress.
Silva et al., (2023) Brazil	University students.	Anxiety, Depression, and Stress Scales (DASS-21).	Impact of the COVID-19 pandemic: High prevalence of anxiety (38.6%), depression (43.6%), and stress (34.2%), associated with factors such as fear of the disease and changes in academic routine.
Browne et al. (2024)	University students.	Qualitative (interviews).	Development of the "PEAK mood, mind, and marks" program for mental and cognitive health via physical exercise, using the Behavior Change Wheel.
Guidotti et al., (2024) Italy	University students (orthorexic vs. non-orthorexic).	Questionnaires on Physical Activity, stress, lifestyle, orthorexia.	Significant differences between groups: orthorexic students showed greater physical activity and higher levels of lifestyle-related stress.
Mu et al., (2024)	University students.	Physical Activity Questionnaires, negative emotions, sleep quality, self-reported health.	Physical exercise influences negative emotions, with sleep quality and self-reported health acting as chain mediators.
Zhao et al. (2024)	University students.	Physical Activity Scales, loneliness.	Chain-mediated model: physical exercise reduces loneliness, with specific mechanisms influencing this relationship.
Zhao and Yin (2024)	University students.	Physical Activity Scales, meaning of life.	Physical exercise influences the meaning of life of university students, with chain mediating effects.
Zhang et al. (2024)	University students (Systematic Review and Meta-analysis).	Various instruments for depressive symptoms.	Systematic Review and Meta-analysis: Physical exercise has a significant effect on reducing depression among university students.
Jarude and Gadelha (2025) Brazil (São Paulo)	University students (Systematic Review).	Reviewed articles used various scales. Systematic Review:	Emphasizes that regular physical exercise is effective in reducing symptoms of depression, anxiety, and stress, as well as improving academic performance in university students.
Xiao et al., (2025)	University students (Network meta-analysis).	Exercise interventions and depressive symptoms.	Network meta-analysis: Compared the effectiveness of different exercise interventions on depressive symptoms in university students.
ATHLETES			
Lukanović et al. (2020)	Active athletes (students?)	Mental health, self-esteem	Active athletes showed good levels of mental health and self-esteem, with differences depending on the level and type of sport.
ADOLESCENTS/HIGH SCHOOL			

Pereira (2022) Brazil (MG)	Adolescents/ High School (Transition).	The IPAQ + DASS-21	Found that insufficient levels of physical activity and high levels of sedentary habits were correlated with worse scores on the DASS-21

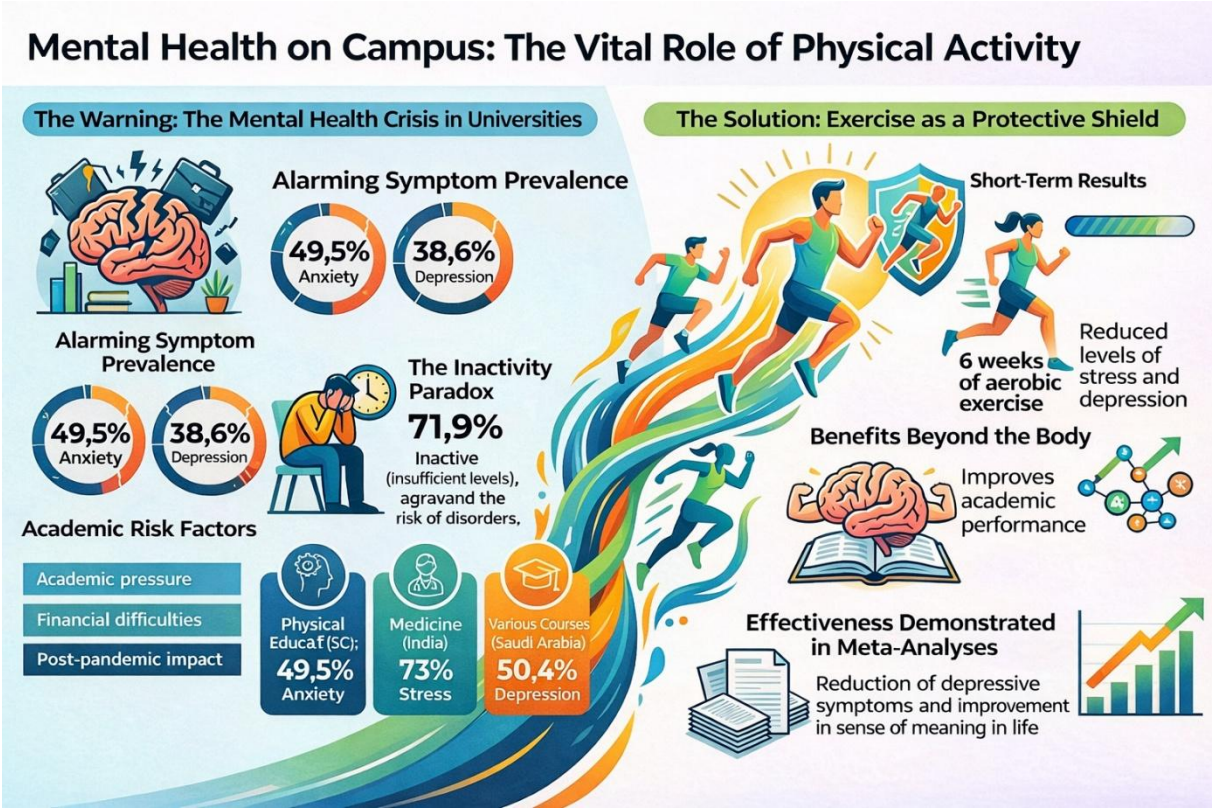

Figure 3 - Mental health on campus: The vital role of physical activity.

DISCUSSION

The mental health of university students has become a field of growing concern and research in recent decades. The transition to higher education is a period of great challenges and adaptations, which can predispose students to the development of various mental health problems. In parallel, physical activity has been widely recognized as a powerful protective and interventional factor.

However, particularities are observed when the focus shifts to Physical Education students, who frequently present high levels of physical activity but still report elevated psychological symptoms, a phenomenon we call the "Physical Education paradox".

Prevalence of psychological symptoms in higher education

International and national literature converges in pointing to a high prevalence of symptoms of anxiety, depression, and stress among university students, frequently exceeding the rates of the general population. In 2015, Iqbal et al., (2015) already reported alarming rates of stress (73%) and anxiety (60%) in medical students in India, a particularly susceptible group due to high academic demands.

In Brazil, Leão et al., (2018) identified in a large urban center in the Northeast that students in the health field (including Physical Education) presented a high prevalence of depression (44.7%) and anxiety (50.5%), associated with academic, financial, and social stressors.

Similarly, Barros (2017) observed significant prevalences of anxiety (49.5%) and depression (38.6%) in Physical Education students at UFSC.

Comprehensive international studies reinforce this scenario. Ramón-Arbués et al., (2020), with a sample of nearly 2,000 university students, reported prevalences of 34.1% for depression, 60.4% for anxiety, and 43.8% for stress, correlating them with factors such as

female sex and less family support. In the same year, Grasdalsmoen et al., (2020) in Norway, in a study with more than 13,000 students, not only identified mental health problems but also an association between low levels of physical activity and a higher risk of suicide attempts. Mohammad et al., (2020), in Saudi Arabia, showed even higher prevalences of depression (50.4%) and anxiety (60.5%), linked to sociodemographic factors and the use of social networks.

The impact of the COVID-19 pandemic exacerbated this scenario. Rodríguez-Larrad et al., (2021) in Spain documented a significant reduction in physical activity and an increase in sedentary behavior during lockdown.

Subsequently, Magalhaes, Soares, and Silva (2023) in Brazil observed high prevalences of anxiety (38.6%), depression (43.6%), and stress (34.2%) in university students, associating them with fear of illness and changes in academic routine. More recently, Hexsel et al., (2023) identified approximately a 40% prevalence of depressive symptoms in Brazilian university students, correlated with a history of mental illness and academic pressure.

Toreales and colleagues (2024) in Paraguay also confirmed the inverse correlation between physical activity and mental health, showing lower scores for depression, anxiety, and stress with higher levels of physical activity.

Physical activity as a protective factor

The vast majority of the literature endorses the protective and therapeutic role of physical activity in the mental health of university students.

Studies such as that of Pereira et al., (2021) have shown that the group of physically active health science students had a lower prevalence of anxiety and depression.

For the young population in transition, Pereira (2022) observed that insufficient levels of physical activity and high sedentary habits were correlated with worse scores for depression, anxiety, and stress.

Systematic reviews and meta-analyses provide high-level evidence of this relationship. Jarude and Gadelha (2025) emphasize that regular physical exercise is effective in reducing symptoms of depression, anxiety, and stress, and can also improve academic performance. Demonstrated that six-week aerobic exercise interventions significantly reduced stress and depression.

Luo et al., (2022) and Song et al., (2021), through meta-analyses, confirmed that physical activity interventions (including aerobic exercise, traditional Chinese exercises, and meditation) are effective in reducing these symptoms, especially during the pandemic period.

In a comprehensive manner, Zhang et al., (2024) and Xiao et al., (2025), in their meta-analyses, concluded that physical exercise has a significant effect on reducing depression in university students.

The mechanisms behind these benefits are complex and multifaceted. Santos et al., (2021) review the association between Neurotrophic Factor Dermatology Brain-developed neurotransmitter (BDNF) and depressive disorder, highlighting how physical activity positively influences BDNF levels, corroborating the benefits at the biological level. In addition, recent studies explore mediation chains: Mu et al., (2024) and Tang et al., (2022) point out that sleep quality, self-reported health, and self-efficacy in emotional regulation act as mediators between physical exercise and the reduction of negative emotions, respectively.

Zhao et al., (2024) and Zhao and Yin (2024) expanded this understanding by identifying that physical exercise can influence loneliness and meaning of life in university students, through chain mediating effects. The duration of the exercise habit is also crucial, with Kong et al., (2022) showing that longer maintenance of the habit is associated with a lower incidence of mental illness and a better life attitude.

Targeted interventions also demonstrate success. Li et al. (2022) showed that resistance training improved heart rate variability in anxious female university students, suggesting a direct physiological benefit. Rosales-Ricardo and Ferreira (2022) highlighted the beneficial effects of physical exercise in reducing Burnout Syndrome.

Herbert (2022) and Browne et al., (2024) emphasize the importance of developing exercise-based research and intervention programs, such as "PEAK mood, mind, and marks," to improve the mental and cognitive health of university students, while Cai (2022) proposed neural network-optimized interventions for mental health. Physical Education itself is seen as a protective factor,

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as Du and Liu (2022) point out, positively influencing the mental health of its students.

The Paradox in Physical Education

Despite the consolidated role of physical activity in promoting mental health, a particularity emerges when analyzing students in the Physical Education course. Although it is assumed that this population, intrinsically linked to the practice of physical activities, presents robustness in their mental health, some studies indicate a more complex scenario.

Rezende et al., (2022), in a study with Physical Education students in Goiás, found that 71.9% had insufficient levels of PA, but still reported a high prevalence of anxiety (54.4%) and depression (21.9%), with a negative correlation between PA and these symptoms. However, the "paradox" is evidenced more forcefully by Magalhães, Soares and Silva (2023) in their research with Physical Education students in Minas Gerais.

The authors found that, although 97% of the sample was classified as active or very active, the prevalences of depression (41%) and anxiety (47%) remained high. Most notably, no statistically significant association was observed between the level of physical activity and symptoms of depression and stress in this specific sample, suggesting that, for this group, regular physical activity may not be a sufficient buffer against academic and personal stressors.

Other studies with this population, such as those by Maximiliano et al., (2020) and Magalhães et al., (2023), have also explored the relationship between physical activity level and mental well-being in Physical Education students, contributing to the discussion about the particularities of this group.

A possible explanation for this paradox may lie in the quality or context of physical activity.

Guidotti et al., (2024), for example, in a study comparing orthorexic and non-orthorexic students, observed that, although orthorexics practiced more physical activity, they also presented higher levels of lifestyle-related stress.

This suggests that physical activity, when driven by dysfunctional patterns or under intense pressure, may not confer the same mental health benefits.

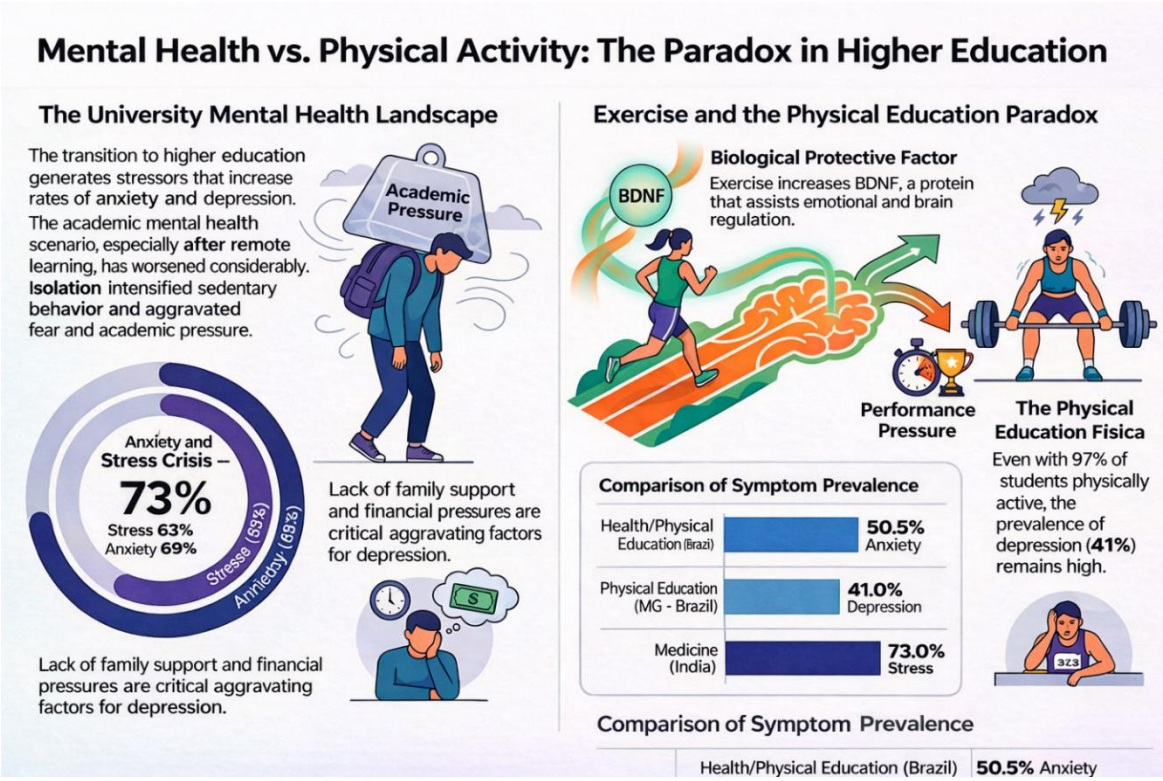

Figure 4 - Mental health versus physical activity: The paradox of higher education.

The inclusion of active athletes in the discussion, such as Lukanović et al., (2020), can provide important parallels. These authors observed that active athletes presented good levels of mental health and self-esteem, but with differences depending on the level and type of sport. This data may indicate that, for Physical Education students, physical activity, which is an intrinsic part of their course and profession, may be accompanied by a type of pressure (performance, evaluation, physical demands) that, instead of being purely beneficial, can become another stress factor.

In short, while physical activity is a fundamental pillar for promoting mental health in higher education, it is crucial to deepen the understanding of the nuances in specific populations such as those in Physical Education, seeking to understand whether the type, intensity, context, or even the motivation for practicing physical activity can influence the impact on mental health and thus unravel the observed "paradox".

CONCLUSION

In-depth analysis of the literature reveals that the contemporary university environment poses significant challenges to the mental health of students, manifesting in high prevalences of anxiety, depression, and stress. This scenario has even been exacerbated by recent global crises, such as the pandemic.

In contrast, physical activity emerges as a proven and multifaceted strategy to promote well-being and mitigate these psychological symptoms. Its benefits range from fundamental neurobiological mechanisms to improved sleep quality, sense of purpose, self-efficacy in emotional regulation, and reduced loneliness and burnout syndrome.

Different exercise modalities have demonstrated effectiveness, consolidating physical activity as a valuable resource for the mental health of university students.

However, this work highlighted a crucial point for reflection, the "Physical Education paradox." It is observed that, even in intrinsically active populations, such as Physical Education students, high adherence to physical activity does not always translate into absolute protection against psychological symptoms.

This finding suggests that contextual factors, specific course pressures, or even the nature of the relationship with exercise (whether due to obligation, performance, or dysfunctional patterns) can modulate its protective effects.

In view of this, it is imperative that future interventions and research in the field of university mental health adopt a more holistic and contextualized perspective.

It is essential to thoroughly investigate the specific stressors of each course and how physical activity can be integrated in order to optimize its psychological benefits.

The goal should not only be to encourage practice, but also to improve the quality of the exercise experience, adapting it to individual and collective needs so that it becomes a truly effective tool for promoting well-being for all higher education students.

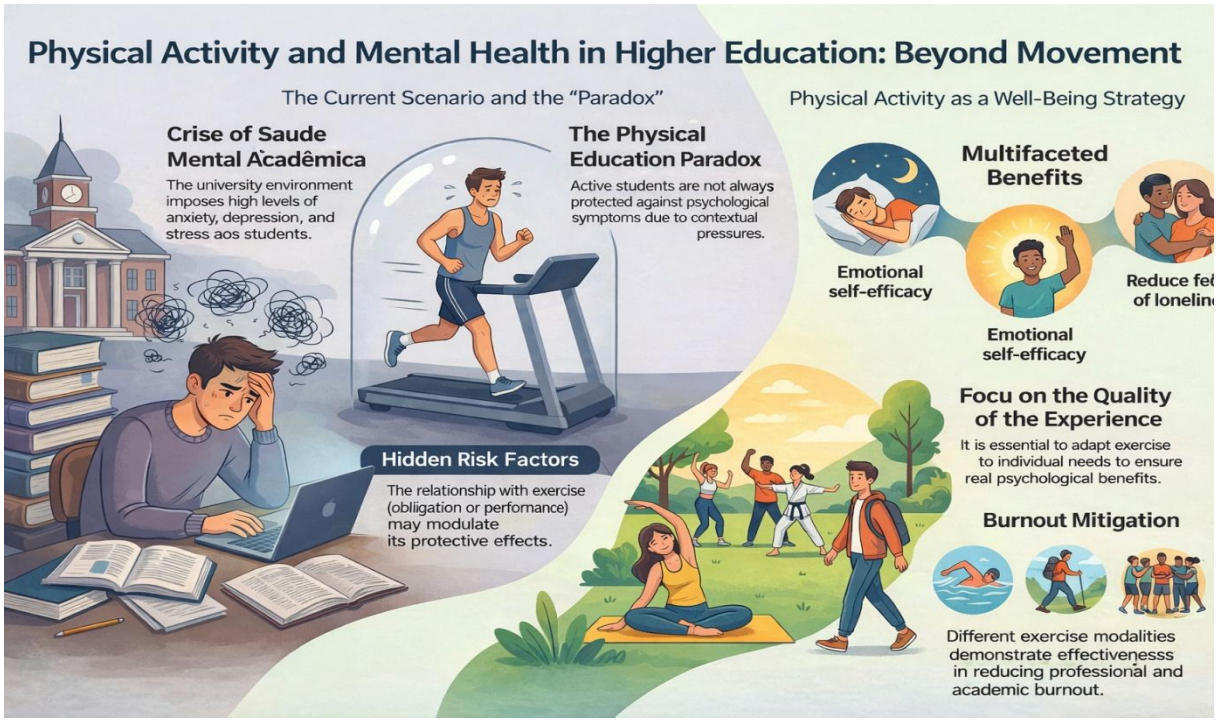

Figure 5 - Physical activity and mental health in higher education: Beyond movement.

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