

RELATIONSHIPS BETWEEN MENTAL HEALTH, EATING BEHAVIOR AND PHYSICAL ACTIVITY PRACTICE IN UNIVERSITY STUDENTS: A Narrative Review

RELAÇÕES ENTRE SAÚDE MENTAL, COMPORTAMENTO ALIMENTAR E PRÁTICA DE ATIVIDADE FÍSICA EM UNIVERSITÁRIOS: uma revisão narrativa

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Abstract

University life is a period of intense change that affects students' physical and emotional well-being. This study aimed to review scientific literature on the influence of anxiety and depression on food choices and physical activity among university students. The search was conducted in the PubMed database, using the population, concept, and context framework to structure the research question. MeSH descriptors and free terms were used in combination with the Boolean operators OR and AND. The studies were exported to *Rayaan* software, and titles and abstracts were screened for selection. Of the 79 articles retrieved, 14 studies published between 2018 and 2025 were included in this review, encompassing different study designs and sociocultural contexts. The results indicate that high levels of stress, anxiety, and depression are associated with disordered eating patterns, higher consumption of ultra-processed foods, and lower levels of physical activity. Emotional eating, body dissatisfaction, and a sedentary lifestyle were recurring themes, with emphasis on gender disparities. Methodological limitations were identified, such as the predominance of cross-sectional designs and self-reported instruments. The study concludes that integrating mental health, nutrition, and physical education is essential for developing intersectoral strategies to promote student health.

Keywords: Eating; Physical activity; University students; Anxiety; Depression.

Resumo

A vida universitária representa um período de intensas transformações que afetam o bem-estar físico e emocional dos estudantes. O presente estudo teve como objetivo revisar a literatura científica sobre as relações existentes entre os sintomas de ansiedade e depressão, prática de exercício físico e escolhas alimentares entre universitários. A busca foi realizada na base de dados PubMed, utilizando a população, conceito e contexto para estruturar a pergunta de pesquisa. Descritores MESH e termos livres foram utilizados para busca, juntamente com operadores booleanos OR e AND. Os estudos foram exportados para o software *Rayaan* e em seguida realizada a leitura de títulos e resumos para seleção. Do total de 79 artigos recuperados, foram incluídos 14 estudos nesta revisão, publicados entre 2018 e 2025,

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com diferentes delineamentos e contextos socioculturais. Os resultados indicam que altos níveis de estresse, ansiedade e depressão estão associados a padrões alimentares desorganizados, maior consumo de alimentos ultraprocessados e menor prática de atividade física. O comportamento alimentar emocional, a insatisfação corporal e o estilo de vida sedentário foram recorrentes, com destaque para as desigualdades de gênero. Identificaram-se lacunas metodológicas, como o predomínio de estudos transversais e o uso de instrumentos autorrelatados. Conclui-se que a integração entre saúde mental, nutrição e educação física é essencial para o desenvolvimento de estratégias intersetoriais de promoção da saúde estudantil.

Palavras-chave: Alimentação; Atividade física; Estudantes universitários; Ansiedade; Depressão.

1 INTRODUCTION

College life represents a period of intense change and adaptation that directly influences students' lifestyles. The transition to college involves not only academic demands but also the reorganization of routines, diet, physical activity, and social life - all elements that can significantly affect physical and mental health. This scenario becomes even more concerning given the rising rates of mental disorders among college students (Campbel *et al.*, 2022).

Among the most prevalent disorders in this context are anxiety and depression, whose impacts extend beyond the psychological realm, also affecting behavior and health-related choices. According to the World Health Organization (2022), more than 30% of university students worldwide report symptoms of anxiety and depression, which directly impact their cognitive, emotional, and behavioral functions.

These emotional conditions significantly influence both eating habits and motivation and adherence to regular physical activity. Students with anxiety or depression symptoms tend to demonstrate reduced self-care, with reports of changes in eating, sleeping, and exercise habits common after entering university (Muniz; Garrido, 2021). Qualitative research involving eight students highlighted that dietary changes, such as skipping meals or eating snacks, were combined with symptoms of stress, mental fatigue, lack of motivation, and feelings of isolation, exacerbating anxiety or depression.

Eating behavior in this population group is often impacted by negative emotions. Anxiety and stress have been associated with poor eating patterns, such as lower diet quality, including higher consumption of ultra-processed foods, and lower frequency of

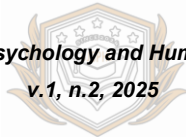
healthy meals. A study of British university students found a significant association between dietary quality and levels of anxiety and depression; those with poorer dietary quality had more adverse emotional symptoms (Solomou *et al.*, 2024).

Similarly, physical activity can also be compromised by symptoms of depression and anxiety. Depressed students often report reduced energy, a reduced desire to exercise, and a lack of interest in previously enjoyable activities. Anxiety can also lead to avoidance of social settings, such as gyms or group activities, and can increase mental rumination, making it difficult to maintain consistency and focus on exercise. Data from a cross-sectional study of 847 university students in Spain showed that lower levels of physical activity, especially in the leisure and commuting domains, are associated with worse mental health scores, as assessed by the GHQ - 12, while higher levels of activity demonstrated a protective effect against symptoms of anxiety and depression (Rodríguez-Romo *et al.*, 2022).

It is important to highlight that, while emotional disorders affect students' lifestyles, regular physical activity can act as an important protective and therapeutic factor. A recent meta-analysis included 36 randomized controlled trials with approximately 14,000 university students and demonstrated that prolonged exercise significantly reduces symptoms of both depression and anxiety, regardless of the type, frequency, or duration of the activity (Li *et al.*, 2025). These findings highlight that structured exercise programs can be effective strategies for promoting mental health in the university environment.

In this context, it's crucial to understand how anxiety and depression relate to dietary choices and physical activity in the university context. This understanding is essential for developing prevention and intervention strategies that integrate mental health, nutrition, and physical education initiatives within universities. Academic environments that promote emotional well-being and healthy lifestyles not only benefit academic performance but also the development of healthier, more conscientious professionals.

Therefore, this article aims to conduct a narrative review of scientific literature on the influence of anxiety and depression on dietary choices and physical activity among university students. The aim is to map the evidence, identify gaps in knowledge, and provide support for institutional policies to promote student health.



2 PROCEDURES AND METHODS

2.1 Defining the research question

This research was conducted based on a literature review using systematized search parameters. The search and selection of studies was guided by the definition of the research question based on the PCC mnemonic. Table 1 presents the structure of the research question.

Table 1 – Definition of the research question

P (Population)	university students
C (Concept)	anxiety, depression, food choices, physical activity
C (Context)	university environment

Source: Prepared by the authors, 2025

The guiding research question for this study was: What is the influence of anxiety and depression on food choices and physical activity among university students?

2.2 Search and selection of studies

PubMed database by two independent reviewers. The search strategy used standardized descriptors [MeSH], free terms, and Boolean operators AND and OR. The descriptors and search equations are described in Table 2. The retrieved articles were exported to the Rayaan reference management software to optimize the selection stage.

Table 2 - Article search equations and results of preliminary findings

Database	Search equations	Recovered studies
Pubmed /Medline	“students” [MeSH] AND “university” [MeSH] OR “university students” OR “college students” AND (“anxiety” [MeSH] OR “depression” [MeSH] OR “mental health” [MeSH]) AND (“feeding behavior” OR “eating behavior” OR “food choice”)	63
	"students" [MeSH] AND "university" [MeSH] OR "university students" OR "college students" AND ("anxiety" [MeSH] OR "depression" [MeSH] OR "mental health" [MeSH]) AND ("feeding behavior" OR "eating behavior" OR "food choice") AND "health outcomes"	4
	"students" [MeSH] AND "university" [MeSH] OR "university students" OR "college students" AND ("anxiety" [MeSH] OR "depression" [MeSH] OR "mental health" [MeSH]) AND ("feeding behavior" OR "eating behavior" OR "food choice") AND "physical activity"	12
TOTAL	79	

Source: Prepared by the authors, 2025

2.3 Inclusion criteria

Studies published in the last 10 years were included; studies with a sample of university students; studies relating mental disorders to diet or food choices;

epidemiological, observational, and cross-sectional studies; systematic reviews; quantitative, qualitative, or mixed methods studies; with no language restrictions.

2.4 Exclusion criteria

Duplicate studies were excluded; studies with non-university populations; case reports, letters to the editor; studies that addressed only specific eating disorders, unrelated to anxiety/depression, and vice versa; book chapters; theses and dissertations.

2.5 Data extraction and presentation of results

Data were extracted from a structured spreadsheet containing the following information: DOI, year, country, study objective, population/sample, method, instruments used, main findings, research gaps, and suggestions for future studies. The results of the searches and study selection were presented in a narrative summary, using a descriptive and interpretative approach.

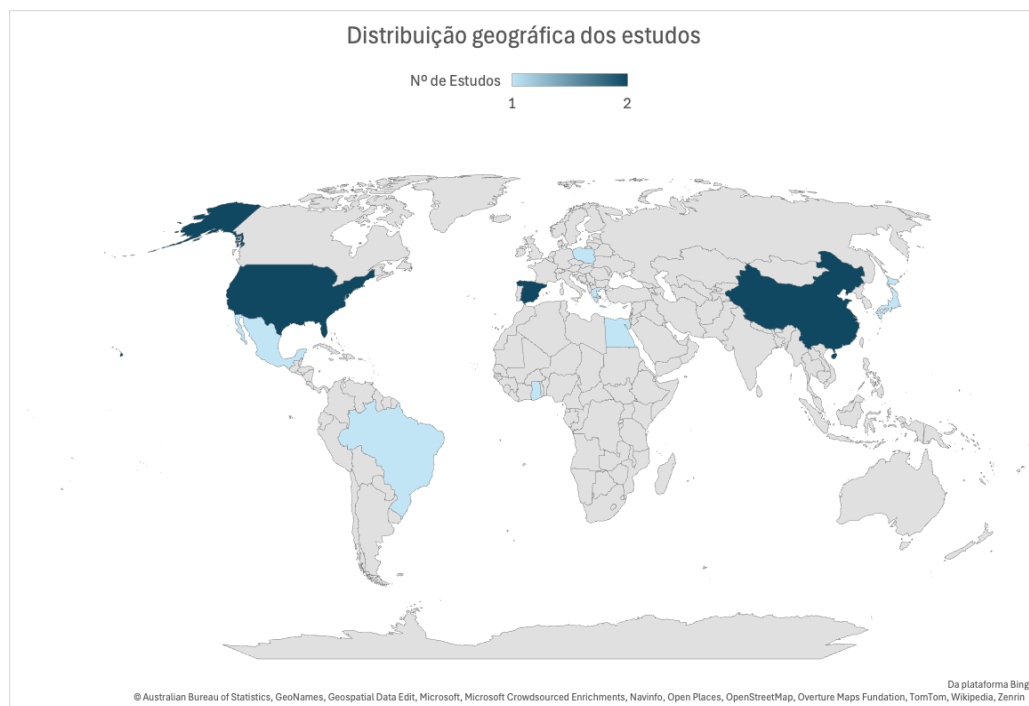
2.6 Discussion and data analysis

The studies were critically interpreted using an exploratory approach. The aim was to identify research gaps and future research recommendations, as well as propose practical applications for psychologists and nutritionists, as well as to promote the implementation of public mental health and nutrition policies in university settings.

3 RESULTS

Fourteen studies published between 2018 and 2025 were analyzed, extracted using the *Rayaan software*. Duplicate studies (17) and those that did not meet the eligibility criteria (48) were excluded. The included studies presented cross-sectional designs, systematic and narrative reviews, with populations from different countries, such as China, Brazil, Ghana, Spain, Japan, Poland, Mexico, Egypt, USA and Germany, which allows comparative analysis between distinct cultural and social contexts (Figure 1).

Figure 1 - Geographical distribution of included studies



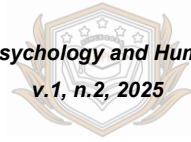
Source: Prepared by the authors, 2025

A summary description of the studies can be seen in Table 1. The narrative synthesis of the results was defined in analysis categories such as: (1) stress, anxiety and depression as factors associated with eating; (2) emotional eating behavior; (3) body dissatisfaction and sedentary lifestyle; (3) gender differences.

The findings demonstrate that students experiencing high levels of stress and symptoms of anxiety and depression are more likely to consume ultra-processed foods, fast food, and foods high in sugar and fat. Furthermore, disorganized eating patterns and excessive caloric intake were identified as emotional regulation strategies. Studies from China, Egypt, Mexico, and Brazil reinforce this association, suggesting that psychological distress is directly reflected in dietary choices.

Emotional eating has emerged as a central theme in studies from Ghana, China, and Greece. Students with negative emotional symptoms reported greater consumption of hyperpalatable foods and binge eating, particularly among overweight or obese women. The literature also points to emotional eating as a mediator between body dissatisfaction, depression, and low self-esteem.

Body image has been identified as a predictor of poor eating habits, with dissatisfaction related to unbalanced eating and a greater predisposition to depression.



A sedentary lifestyle exacerbates this scenario, hindering emotional balance and favoring compensatory eating patterns. Studies using structural equation modeling have highlighted the mediating role of physical exercise in the relationship between self-esteem, emotional eating, and depression. Women tend to have a higher prevalence of anxiety, depression, and emotional eating, while men demonstrate higher saturated fat consumption and lower vegetable intake in depressive contexts. These findings highlight the importance of gender-sensitive approaches in health promotion actions.

The methodological procedures reported in the studies were cross-sectional approaches using validated scales, such as DASS-21 (*Depression, Anxiety and Stress Scale*), HEI (*Healthy Eating Index*), CES-D (*Center for Epidemiologic Studies Depression Scale*), YFAS (*Yale Food Addiction Scale*) and TFEQ (*Three-Factor Eating Questionnaire*), structural equation modeling, logistic regression for analysis of associated factors and systematic reviews for the study of digital interventions.

The main gaps identified in the studies were: predominance of cross-sectional studies, lacking the ability to infer causality; use of self-reported instruments, with the possibility of bias; limited inclusion of representative samples and diversity among university students; lack of culturally adapted instruments for specific contexts; limited coverage of sociostructural factors, such as income, race/ethnicity, and access to services; and the need for greater integration of mental health, nutrition, and physical activity in interventions.

Based on the evidence analyzed, it is recommended that future research: develop longitudinal designs to monitor the evolution of eating behavior in relation to mental health; test integrated interventions (psychological and nutritional), especially through digital technologies; explore the role of social, economic, and cultural factors in the diet and physical exercise practice of university students; and evaluate institutional policies that promote healthy academic environments.

Table 1 - Extraction of results from included studies

DOI	Year	Country	Objective	Methodology	Main Findings	Research gaps	Future research
10.20960/nh.1500	2018	Mexico	Investigate depression and food consumption in Mexican university students	Cross-sectional study with 1104 students, CES-D instrument (<i>Center for Epidemiological Studies Depression Scale</i>) and food questionnaire	Depression associated with higher consumption of unhealthy foods in women	Little gender differentiation in the findings	To evaluate biological and hormonal mechanisms associated with depression
10.20960/nh.02641	2019	Spain	To assess the relationship between diet and psychological disorders in Spanish university students	Cross-sectional study with 1055 students, use of <i>Healthy Eating Index, Depression, Anxiety and Stress Scale</i> , and <i>Insomnia Index</i>	82.3% had an unhealthy diet; association with anxiety and depression	Limitations of self-report and lack of longitudinal follow-up	Developing combined interventions for eating disorders and anxiety
10.1080/10640266.2019.1610629	2019	Japan	To analyze mental health literacy about eating disorders among Japanese female university students	Cross-sectional study with Japanese university students	Low mental health literacy about eating disorders	Little research on mental health literacy in Japan	Invest in mental health and eating disorder literacy campaigns
10.1080/07448481.2019.1656216	2019	USA	Exploring anxiety sensitivity and food expectancies in American college students	Cross-sectional study with university students, analysis of sensitivity to anxiety	Increased sensitivity to anxiety linked to maladaptive eating expectations	Exclusive focus on psychological variables without evaluating dietary context	Explore the role of eating beliefs and social support
10.3390/nu12072061	2020	USA	To examine the role of anxiety and depression in food choices among American college students	Cross-sectional study with 225 students, path analysis	Depression linked to higher saturated fat intake in men	Need for larger sample and research in different regions	Expand sampling to different age groups
10.3390/nu13041352	2021	Spain	To investigate food addiction and lifestyle habits among nursing students in Spain	Questionnaire with 536 students, <i>YFAS (Yale Food Addiction Scale)</i> and predictive analytics	Food addiction associated with sedentary lifestyle, high BMI and emotional disorders	Focus only on nursing students, reducing generalization	Investigate other courses and include objective lifestyle measures
10.3390/nu14051106	2022	Poland	To investigate eating behaviors, depressive symptoms and lifestyle	Cross-sectional study with 227 students, using <i>TFEQ (Three -</i>	1/3 with depressive symptoms; low	Small sample limited to health students	Develop healthy lifestyle programs

			among university students in Poland	<i>Factor Eating Disorders) Questionnaire)</i> and food questionnaires	vegetable/fruit intake and sedentary lifestyle		for non-health students
10.3390/nu15061526	2023	Ghana	To describe eating behaviors and their associations with physical and mental health in Ghanaian university students.	Cross-sectional study with 129 students, using the TFEQ-18	Emotional eating linked to anxiety, poor sleep, and obesity in women	Lack of culturally adapted instruments for Ghana	Create culturally validated scales for the Ghanaian population
10.1177/02601060231151480	2023	Egypt	To examine the consumption of junk food and its relationship with stress, anxiety, and depression among Egyptian university students.	Cross-sectional study with 509 students, logistic regression	Daily consumption of junk food associated with high levels of stress, anxiety and depression	Study limited to a single university in Egypt	Expand the sample to include public and private universities
10.3389/fpubh.2024.1466700	2024	China	To analyze the mediation of anxiety in the relationship between stress and eating behavior in university students	Cross-sectional study with 1672 students, mediation analysis	Anxiety mediated the relationship between stress and inadequate nutrition	Need for longitudinal studies to assess causality	Include psychological support programs integrated with healthy eating
10.1186/s12889-025-23669-1	2025	Germany	Reviewing digital health interventions to promote mental and nutritional well-being in university students	Rapid review of 1132 articles with 24 included	42% of digital interventions showed a positive effect on mental health; 8% on nutrition	Many studies with moderate to high bias, low methodological quality	Implement randomized clinical trials with digital interventions
10.1371/journal.pone.0326856	2025	Brazil	To assess psychological symptoms and changes in eating habits during the pandemic among university students	Cross-sectional study with 771 students, structural equation modeling	High levels of anxiety and depression linked to the increase in hyperpalatable foods	Self-report and sample restricted to the context of the pandemic	Carry out longitudinal monitoring after the pandemic

10.1371/journal.pone.0322635	2025	China	To explore how body image, exercise, and emotional eating influence depression risk in Chinese students.	Study with 1714 Chinese students, structural modeling	Exercise mediated the impact of body dissatisfaction on depression and eating	Lack of objective measures of body image and exercise	Include gender and self-image moderation in future analyses
10.3390/medsci13020056	2025	Greece	Review the impact of emotional eating on the health of university students (literature review)	Narrative review of the scientific literature on emotional eating	Emotional eating linked to body mass index, anxiety, depression, social media, and lockdown	Predominantly cross-sectional and uncontrolled studies	Studies with longitudinal designs and mixed approach

Source: Prepared by the authors, 2025

4 DISCUSSION

The connection between mental disorders and eating has been increasingly explored in literature, highlighting a bidirectional relationship between mental health and eating behavior. Disorders such as anxiety, depression, and stress influence food choice and consumption, and are often aggravated by diets of poor nutritional quality (Jacka *et al.*, 2010; Marx *et al.*, 2017). Furthermore, negative emotional states favor behaviors such as emotional eating and disordered eating, often reinforced by sociocultural and environmental factors.

Emotion can be reflected in the perception of food consumption. An increase in food intake during emotional and psychological conditions can have a negative impact on human health (Ljubičić *et al.*, 2023). Despite advances in understanding this link, there is still a lack of robust studies that elucidate the mechanisms of this interaction, a fact that can limit prevention strategies, as well as interventions.

Physical exercise has emerged as an important mediator between mental health and eating behaviors. Evidence shows that regular physical activity is associated with reduced symptoms of depression and anxiety, as well as contributing to better dietary self-regulation and reduced consumption of ultra-processed foods (Schuch *et al.*, 2018). Rebar *et al.* (2015) conducted a meta-analysis of 49 studies and concluded that physically active people have a lower risk of developing depressive

symptoms. Regular physical activity acts as a protective factor against the development of mental disorders and is associated with healthier dietary choices.

The mechanisms involved include the release of neurotransmitters such as serotonin and dopamine, as well as improvements in self-esteem and body image (Wanjau *et al.*, 2023). However, the mediating role of exercise is commonly neglected in integrative approaches, and it is necessary to incorporate it more systematically into therapeutic strategies and public policies.

This review highlights gender issues involving mental disorders, diet, and physical activity among university students. Gender-sensitive approaches are essential for a deeper understanding of the relationships between mental disorders, diet, and physical activity. Women, for example, have a higher prevalence of eating disorders, depression, and anxiety, often related to sociocultural pressures on their bodies and eating behaviors. At the same time, men tend to underreport psychological symptoms and avoid mental health care, which can mask important relationships in studies (Stice *et al.*, 2000; Ray *et al.*, 2017).

This review informed us that integrated institutional policies are needed that articulate mental health, food and nutrition, and encourage physical activity in an interdisciplinary manner in settings such as universities. Such policies should be evidence-based and adapted to local realities, promoting healthy social environments that address prevention and comprehensive care.

Finally, we highlight the practical application of this study, the integrated work of health professionals, psychologists, and nutritionists. The multidisciplinary work of psychologists and nutritionists at universities is strategic for promoting students' mental health and nutritional quality, especially given the increasing incidence of conditions such as anxiety, depression, overweight, and obesity.

By recognizing the evidence regarding the interrelationship of these themes, psychologists can act by developing integrated support actions, therapeutic groups and interventions, while nutritionists can promote food and nutritional education, as well as individualized support and support within the scope of collective feeding.

The coordination between these areas allows for early identification of risk patterns, consideration of student diversity, and interdisciplinary action. Furthermore, digital interventions, such as the use of apps, institutional social media, screening platforms, and remote monitoring, can broaden the reach of these actions, especially in contexts of high demand and staff shortages.

5 FINAL CONSIDERATIONS

The relationship between mental health, nutrition, and physical exercise among university students is complex and multifactorial, permeated by emotional, behavioral, and contextual aspects. The prevalence of emotional eating, the impact of psychological disorders on dietary choices, sedentary lifestyles, and gender inequalities highlight the need for intersectoral strategies - gaps that cannot be addressed in isolation. Such strategies must consider the specificities of the university population, adopt diversity-sensitive approaches, and be evidence-based to foster healthier, more inclusive, and equitable academic environments.

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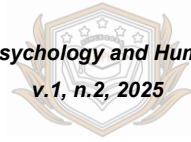
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