

QUALITY-OF-LIFE, PHYSICAL ACTIVITY, AND ACADEMIC PERFORMANCE: a cross-sectional study in university students

Qualidade de vida, atividade física e desempenho acadêmico: um estudo transversal em estudantes universitários

Calidad de vida, actividad física y rendimiento académico: un estudio transversal en estudiantes universitarios

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RESUMO

Introdução: o desempenho acadêmico é influenciado por múltiplos fatores demográficos, socioeconômicos, comportamentais e de qualidade de vida. No entanto, poucos estudos avaliaram essas variáveis de forma integrada entre estudantes universitários brasileiros. **Objetivo:** Avaliar a associação entre o desempenho acadêmico e fatores demográficos, socioeconômicos, comportamentais e de qualidade de vida entre estudantes de graduação.

Método: Este estudo transversal incluiu 347 estudantes de graduação de uma universidade privada no sul do Brasil. Os dados foram coletados por meio de um questionário online, incluindo características demográficas, socioeconômicas e comportamentais, bem como a qualidade de vida avaliada utilizando o WHOQOL-BREF. O desempenho acadêmico foi o desfecho e foi autorrelatado e categorizado como "bom" ou "ruim". Regressão logística com um modelo hierárquico foi utilizada para examinar as associações. Os resultados foram interpretados usando odds ratio (OR) e intervalo de confiança de 95% (IC 95%). **Resultados:** A média de idade foi de 22,28 anos [Desvio Padrão (DP) 5,05]. Nos modelos ajustados, as estudantes do sexo feminino foram mais propensas a relatar um bom desempenho acadêmico (OR 2,55; IC 95% 1,30–4,98), assim como aquelas que praticavam atividade física (OR 2,11; IC 95% 1,07–4,16). Maiores escores no domínio psicológico também foram associados a um melhor desempenho acadêmico (OR 1,04; IC 95% 1,01–1,07).

Conclusão: Mulheres, praticar atividade física regularmente e um bem-estar psicológico foram positivamente associados ao desempenho acadêmico. Esses achados destacam a necessidade de estratégias institucionais que promovam o bem-estar estudantil, particularmente no domínio psicológico, como forma de apoiar o sucesso acadêmico.

Palavras-chave: Desempenho acadêmico; Qualidade de vida relacionada à saúde; Exercício físico; Integridade psicológica.

ABSTRACT

Introduction: academic performance is influenced by multiple demographics, socioeconomic, behavioral, and quality-of-life factors. However, few studies have assessed these variables in an integrated manner among Brazilian university students. **Objective:** To assess the association between academic performance and demographic, socioeconomic, behavioral, and quality-of-life factors among undergraduate. **Method:** This cross-sectional study included 347 undergraduate students from a private university in southern Brazil. Data were collected through an online questionnaire, including demographic, socioeconomic, and behavioral characteristics, as well as quality of life assessed using the WHOQOL-BREF. Academic performance was the outcome and was self-reported and categorized as "good" or "poor." Logistic regression with a hierarchical model was used to examine associations. The results were interpreted using the odds ratio (OR), and 95% confidence interval. **Results:** The mean age was 22.28 years [Standard Deviation (SD) 5.05]. In the adjusted models, female students were more likely to report good academic performance (OR 2.55; 95% CI 1.30–4.98), as were those engaging in physical activity (OR 2.11; 95% CI 1.07–4.16). Higher psychological domain scores were also associated with better academic performance (OR 1.04; 95% CI 1.01–1.07). **Conclusion:** Female sex, regular physical activity, and better psychological well-being were positively associated with academic performance. These findings highlight the need for institutional strategies that promote student well-being, particularly in the psychological domain, as a means of supporting academic success.

Keywords: Academic routine; Health-related quality of life; Exercise; Psychological Wellness.

RESUMEN

Introducción: el rendimiento académico está influenciado por múltiples factores demográficos, socioeconómicos, conductuales y de calidad de vida. Sin embargo, pocos estudios han evaluado estas variables de manera integrada entre estudiantes universitarios brasileños. **Objetivo:** Evaluar la asociación entre el rendimiento académico y los factores demográficos, socioeconómicos, conductuales y de calidad de vida entre estudiantes de pregrado. **Método:** Este estudio transversal incluyó a 347 estudiantes de pregrado de una universidad privada en el sur de Brasil. Los datos se recolectaron a través de un cuestionario en línea, incluyendo características demográficas, socioeconómicas y conductuales, así como la calidad de vida evaluada con el WHOQOL-BREF. El rendimiento académico fue la variable de resultado y fue autoinformado, categorizado como "bueno" o "pobre". Se utilizó la regresión logística con un modelo jerárquico para examinar las asociaciones. Los resultados se interpretaron utilizando el odds ratio (OR) y un intervalo de confianza del 95% (IC 95%). **Resultados:** La edad media fue de 22,28 años [Desviación Estándar (DE) 5,05]. En los modelos ajustados, las estudiantes del sexo femenino fueron más propensas a reportar un buen rendimiento académico (OR 2,55; IC 95% 1,30–4,98), al igual que aquellas que practicaban actividad física (OR 2,11; IC 95% 1,07–4,16). Los puntajes más altos en el dominio psicológico también se asociaron con un mejor rendimiento académico (OR 1,04; IC 95% 1,01–1,07). **Conclusión:** El sexo femenino, la actividad física regular y un mejor bienestar psicológico se asociaron positivamente con el rendimiento académico. Estos hallazgos resaltan la necesidad de estrategias institucionales que promuevan el bienestar de los estudiantes, particularmente en el dominio psicológico, como un medio para apoyar el éxito académico.

Palabras clave: Rendimiento académico; Calidad de vida asociada a la salud; Ejercicio físico; Confort psicológico.

INTRODUCTION

Motivation to achieve academic goals can be a decisive factor for both performance during undergraduate studies and future employability. Strong academic performance can mediate the motivation for success and enhance students' ability to enter the job market.^{1,2} However, academic performance depends not only on motivational and intellectual aspects but is also influenced by a set of variables that include students' socioeconomic, demographic, behavioral, and quality-of-life conditions.³⁻¹⁰

Studies have shown that women, across different educational levels, often outperform men in academic achievement.^{4,11} Moreover, behavioral, health, and well-being factors have also proven to be relevant to academic performance. Regular physical activity may be associated with cognitive benefits, such as improved concentration, memory, and decision-making ability, which can enhance students' educational outcomes.^{6,7} In addition to its direct cognitive benefits, physical activity serves as a protective factor against the negative effects of stress and anxiety, conditions frequently linked to declines in academic performance among university students.^{12,13} Similarly, better quality of life, particularly in the physical and psychological domains, contributes to a more stable and productive mental state,¹⁴⁻¹⁶ fostering greater engagement in academic activities, improved concentration, and enhanced performance in assessments.^{14,15}

Despite the extensive investigation of factors associated with academic performance, most previous studies have investigated these factors in isolation, whereas the present study proposes an integrated analysis combining demographic, socioeconomic, behavioral, and quality-of-life dimensions within a single analytical model. Understanding how these factors interact may provide valuable insights for educational strategies and interventions aimed at promoting academic success. In addition, most Brazilian studies on academic performance focus on public universities in major metropolitan areas, leaving private institutions in smaller southern Brazilian cities underrepresented, despite their large share of undergraduate enrollments. Therefore, this study aimed to assess the association between academic performance and demographic, socioeconomic, behavioral, and quality-of-life factors among undergraduate students at a private university in the northern region of Rio Grande do Sul, Brazil.

METHOD

Study design and setting

This was a cross-sectional study conducted with undergraduate students from a private university in Brazil (Universidade Regional Integrada do Alto Uruguai e das Missões – Campus Erechim).

Participants

Eligible participants were regularly enrolled students in on-campus undergraduate programs during the academic years 2021 to 2024, aged 18 years or older. Students enrolled in distance-learning programs and/or short-term courses (technical, technological, specialization, and MBA) were excluded, as their objectives and/or instructional modalities differ from those of traditional undergraduate programs.

Variables and data sources

Data collection was carried out through an anonymous online questionnaire created and distributed via the Google Forms platform. Students were invited to participate by phone and institutional email. The questionnaire included demographic variables (e.g., gender, age), socioeconomic variables (e.g., race/skin color, monthly family income), and behavioral characteristics (e.g., use of licit and illicit substances, physical activity, extracurricular activities).

Quality of life was assessed using the World Health Organization Quality of Life – BREF,¹⁷ a shortened version of the WHOQOL-100 developed by the WHO Quality of Life Group. This instrument consists of 26 items divided into four domains: physical, psychological, social relationships, and environment, with responses rated on a 5-point Likert scale. For statistical analysis, items 3, 4, and 26 were reverse-coded. Domain scores were calculated and transformed into a 0–100 scale to facilitate comparisons, with higher scores indicating better quality of life.¹⁸

Academic performance was the outcome variable and was assessed with the question: “How do you consider your academic performance?” Response options were: very poor; poor; neither good nor poor; good; or very good. For statistical purposes, responses were categorized into “poor” (very poor, poor, neither good nor poor) and “good” (good, very good).

Bias

A convenience sample was used. To minimize nonresponse, undergraduate program coordinators were contacted and asked to assist with student recruitment through emails and institutional announcements.

Study size

Sample size was calculated considering a total of 3,000 students enrolled at the institution, an expected prevalence of 50% of poor quality of life (adopted as a conservative estimate to maximize sample size when true prevalence is unknown), a 95% confidence level, and a 5% margin of error (chosen to ensure adequate precision while maintaining feasibility). A finite population correction was applied, resulting in an estimated sample of 341 participants.

Statistical methods

Data were analyzed using STATA version 18.0. Descriptive statistics were calculated, including absolute and relative frequencies, means, and standard deviations (SD). Unadjusted and adjusted logistic regression analyses were performed to assess the association between predictor variables and academic performance. A hierarchical modeling approach, based on previous literature,¹⁹ was applied: Model 1 included demographic and socioeconomic variables; Model 2 included behavioral variables; and Model 3 included quality-of-life variables. Variables with $p < 0.25$ in the unadjusted analysis were included in the adjusted models. Results were expressed as odds ratios (OR) with 95% confidence intervals (CI), adopting a 5% significance level.

Ethical considerations

The study was approved by the Research Ethics Committee of URI Erechim CAAE: 43905921.0.0000.5351. All participants provided informed consent before participation.

RESULTS

A total of 347 undergraduate students participated in the study, with a mean age of 22.28 years (SD 5.05). Most participants (75.50%) were female and self-identified as White (89.94%), with a mean family income of R\$10,521.44 (SD 13,493.98). Approximately 47% of the participants did not engage in extracurricular activities; most did not use licit or illicit drugs, consumed alcohol, and practiced physical activity. The mean overall quality-of-life score was 64.21 (SD 13.25), with similar averages across domains; however, the lowest mean score was observed in the psychological domain (mean 58.69, SD 16.53). When asked about their academic performance, 84.68% reported having good academic performance (Table 1).

Table 1. Descriptive analyses of the sample. Erechim, Brazil.

	n (%)	Mean (Standard Deviation)
Gender		
Male	85 (24.50)	
Female	262 (75.50)	
Age		22.28 (5.05)
Race		
White	313 (89.94)	
Others	35 (10.06)	
Monthly family income		10521.44 (13493.98)
Participates in some extracurricular activity		
No	182 (52.45)	
Yes	165 (47.55)	
Alcohol		
No	111 (32.17)	
Yes	234 (67.83)	
Smoking		
No	314 (90.75)	
Yes	32 (9.25)	
Drug		
No	249 (71.55)	
Yes	99 (28.45)	
Physical activity		
No	141 (40.75)	
Yes	205 (59.25)	
Quality of life – physical health domain		66.68 (15.35)
Quality of life - environment domain		66.76 (14.03)
Quality of life – social relationships domain		64.61 (19.91)
Quality of life – psychological health domain		58.69 (16.53)
Quality of life		64.21 (13.25)
School performance		
Poor	53 (15.32)	
Good	293 (84.68)	

Table 2 presents the hierarchical logistic regression model for academic performance and predictor variables. In Model 1, female students were 2.55 times more likely (95% CI 1.30–4.98, $p = 0.006$) to report better academic performance compared to males. In Model 2, students who engaged in physical activity were 2.11 times more likely (95% CI 1.07–4.16, $p = 0.030$) to report better academic performance compared to those who did not. In Model 3, higher scores in the psychological domain of quality of life were associated with better academic performance (OR 1.04, 95% CI 1.01–1.07, $p = 0.014$).

Table 2. Adjusted analyses with hierarchical logistic regression model for academic performance and predictor variables.

	Academic performance OR (95% IC)							
	Unadjusted	p-value	Model 1	p-value	Adjusted Model 2	p-value	Model 3	p-value
Gender								
Male	1		1	0.006	1	0.004	1	<0.001
Female	3.06 (1.65-5.68)	<0.001	2.55 (1.30-4.98)		2.80 (1.37-5.71)		4.44 (1.99-9.89)	
Age	0.96 (0.91-1.01)	0.224	0.98 (0.93-1.04)	0.593	0.98 (0.93-1.04)	0.558	0.96 (0.90-1.02)	0.225
Race		0.419						
White	1							
Others	0.69 (0.28-1.68)							
Monthly family income	1.00 (0.99-1.00)	0.067	1.00 (0.99-1.00)	0.072	1.00 (0.99-1.00)	0.148	1.00 (0.99-1.00)	0.298
Participates in some extracurricular activity		0.073				0.450		0.178
No	1				1		1	
Yes	1.74 (0.94-3.19)				1.31 (0.64-2.65)		1.68 (0.78-3.58)	
Alcohol		0.917						
No	1							
Yes	1.03 (0.55-1.94)							
Smoking		0.036				0.154		0.159
No	1				1		1	
Yes	0.40 (0.17-0.94)				0.50 (0.19-1.29)		0.48 (0.17-1.32)	
Drug		0.475						
No	1							
Yes	1.27 (0.65-2.50)							
Physical activity		0.008				0.030		0.189
No	1				1		1	
Yes	2.25 (1.23-4.10)				2.11 (1.07-4.16)		1.61 (0.79-3.28)	
Quality of life – physical health domain	1.03 (1.01-1.05)	0.001					1.02 (0.99-1.06)	0.068
Quality of life - environment domain	1.03 (1.01-1.05)	0.006					0.98 (0.95-1.01)	0.298
Quality of life – social relationships domain	1.01 (1.00-1.03)	0.016					0.98 (0.97-1.01)	0.366

Quality of life – psychological health domain	1.04 (1.02-1.06)	<0.001	1.04 (1.01-1.07)	0.014
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OR: odds ratios; CI: confidence intervals

DISCUSSION

This study aimed to evaluate the association between academic performance and demographic, socioeconomic, and behavioral factors, as well as quality of life among undergraduate students from a private university. It was found that academic performance was significantly higher among female students, those who reported regular physical activity, and those who had a better quality of life in the psychological domain.

Although men and women demonstrate similar levels of intellectual ability, women often outperform men in grades and in obtaining educational qualifications in greater numbers,^{5,11,20,21} and several factors may contribute to this higher performance among women. Literature data indicate that female students tend to show higher levels of academic motivation, in addition to demonstrating greater agreeableness and conscientiousness, personality traits associated with more consistent study habits and meeting deadlines.⁴ In contrast, men often report greater emotional stability and pursue their studies for personal satisfaction without the need for rewards. These characteristics, however, did not translate into better academic achievement, suggesting that other behavioral or contextual aspects may be influencing this process.⁴

Furthermore, socialization patterns and sociocultural expectations may exert a relevant influence on academic behavior. Some studies indicate that women are often encouraged by their families and society to pursue careers considered stable, secure, and socially valued.⁴ This encouragement, combined with the pressure to demonstrate competence and achieve recognition, may contribute to greater commitment to studies, reflected in more responsible attitudes and superior academic performance.²² It is also important to highlight that women's better academic performance at different educational levels is not related to choosing easier subjects or courses, but rather to the skills and competencies they demonstrate across various fields of knowledge. This reinforces that their higher school performance reflects both social factors and individual attributes.²³

Numerous studies corroborate the findings of this work by indicating a positive relationship between regular physical activity and academic performance. Physically active individuals tend to show improvements in cognitive skills such as decision-making, content assimilation, concentration, memory, and effectiveness.^{6,7,24,25} These effects can be attributed to the physiological and psychological impact of physical activity on the brain, enhancing executive functions essential for the learning process. Given that physical exercise is recognized as a protective factor against the detrimental effects of stress, regular physical activity is understood to contribute to a mental environment more conducive to learning. Studies demonstrate that increased sedentary time is associated with higher levels of stress, anxiety, and depression among university students,¹² reinforcing the importance of healthy habits for emotional balance. Thus, promoting physical activity in the university context can be an effective strategy not only for students' overall well-being but also for improving their academic outcomes.

The undergraduate period represents a phase in which students are particularly exposed to various psychosocial influences that may trigger stressful situations with potential negative repercussions on their health and quality of life.²⁶ Over recent decades, the relationship between stress and academic performance has intensified, especially in higher education, being strongly associated with declines in well-being and mental health indicators among university students.²⁷⁻²⁹ Students in health-related programs tend to experience particularly demanding routines, marked by long hours, task overload, theoretical and practical demands, as well as mandatory internships. This scenario contributes to high stress levels, burnout symptoms, and poorer quality of life, factors that together negatively impact academic performance.⁸⁻¹⁰

Several studies have demonstrated that a better quality of life is directly related to more satisfactory academic performance. Moreover, this relationship is reciprocal, as good academic achievement also contributes to students' psychological and emotional well-being.¹⁴⁻¹⁶ Similarly, other research has identified a negative association between stress, academic performance, and quality of life among university students, evidence that supports the results observed in the present study.^{30,31} Given this significant influence, it is essential that higher education institutions adopt effective mental health promotion strategies. Creating more supportive academic environments, providing accessible psychological support services, and encouraging physical activity can mitigate the effects of emotional overload and consequently promote greater engagement and academic achievement throughout the course.

This study presents some limitations. The sample was drawn from only one private university in southern Brazil, limiting the generalizability of the findings to other regions or public institutions. As a cross-sectional study, our findings may be subject to temporal bias, since behavioral variables, quality of life, and academic performance can vary over time. Its cross-sectional design does not allow causal or directional inferences regarding the relationship between academic performance, quality of life, and physical activity. These variables may exhibit bidirectional or codependent relationships, as students with greater intellectual, cultural, or health-related awareness may be more likely to adopt healthier behaviors while also achieving better academic outcomes. Therefore, it is not possible to determine whether higher levels of physical activity and better quality of life lead to improved academic performance, or whether students with better academic performance are more predisposed to engage in healthier lifestyles. Longitudinal studies are needed to clarify the directionality and causality of these associations. The sample was predominantly composed of female students, which may limit the external validity of the findings and their generalizability to populations with a more balanced gender distribution. The outcome was collected through student self-report, which may reduce information accuracy. Despite these limitations, our findings support the proposal of institutional strategies such as physical activity programs, accessible mental health resources, and optimized learning environments to directly improve student well-being and academic success. Additionally, our multifactorial analyses offer a replicable model for universities seeking evidence-based approaches to improve outcomes in diverse student populations.

CONCLUSION



Our findings conclude that female students, those who regularly engage in physical activity, and those reporting better psychological quality-of-life domain scores demonstrate superior academic performance.

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