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Determinants of academic adaptation and quality of life of university students in the Brazilian Amazon region

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This study aimed to identify the determinants of academic adaptation and quality of life in university students. Through a cross-sectional design, 90 university students participated in the research, responding to a questionnaire focused on sociodemographic, academic, and health-related variables. The Academic Life-Experiences Questionnaire and the Medical Outcomes Study 36-Item Short-Form Health Survey were used to evaluate academic adaptation and quality of life, respectively. Multiple linear regressions were performed to identify positive and negative predictors of these outcomes. The results showed that high scores in the physical and mental components of quality of life, living in the same city as the university, and receiving some types of scholarship were positive predictors of academic adaptation, while not performing physical activities was a negative predictor. The positive predictors of the physical component were income of more than two minimum wages, having no comorbidities, and being students of Black race. In contrast, the negative predictors were stressful factors such as the teaching method, evaluation method, and experiences during the internship. The mental component had only positive predictors, such as having no intention of dropping out and having no minor mental disorders. Academic adaptation was positively correlated with physical and mental components of quality of life. The findings of this study showed that university students' academic trajectories have diverse influencing factors related to sociodemographic, academic, and health-related determinants.

KEYWORDS

university students, higher education, quality of life, academic adaptation, mental health

1 Introduction

The transition to higher education represents a challenging period in the students' trajectory that involves adjusting to increased academic demands and dealing with greater autonomy to manage their studies (Coertjens et al., 2017; Oliveira Silva et al., 2023). In addition, the pressure to navigate a new social environment, manage time effectively, and often cope with being away from home for the first time can be overwhelming (Mthimunye and Daniels, 2019; Oliveira Silva et al., 2021), especially when combined with the need to maintain physical and mental wellbeing (Campbell et al., 2022).

These challenges require strong organizational skills, resilience, and support from peers, family, and university resources to ensure a successful adjustment to university life (San and Guo, 2023). Factors such as social skills, social problem-solving, self-monitoring, self-efficacy, and coping contribute significantly to greater student adaptation to the university context (Monteiro and Soares, 2023), in addition to other influencing factors resulting in academic success, such as academic achievement, attainment of learning objectives, acquisition of desired skills and competencies, satisfaction, persistence, and postcollege performance (York et al., 2015).

Furthermore, the quality of life (QoL) plays a crucial role in the academic trajectory of university students. Scientific literature has shown that positive and balanced QoL, encompassing physical health, mental wellbeing, and social connections, significantly influences students' academic performance and retention (Carpi et al., 2022; Baalmann, 2024). Moreover, physical activities and relaxation and concentration techniques help prevent burnout and promote a sustainable study routine (Bóo et al., 2020; Vorontsova-Wenger et al., 2020). These findings highlight the need to prioritize and support the QoL of university students, given its role to contribute to better academic outcomes, higher retention rates, and overall student satisfaction (Tavakoly Sany et al., 2023; Baalmann, 2024).

In addition, the high rates of depressive symptoms in university students are related to low QoL (Fernandes et al., 2023), in addition to academic failure and an increase in dropout rates (Abbas et al., 2023). These mental health issues can lead to difficulties in concentration, impaired memory, and decreased motivation, which in turn hinder academic performance (Duffy et al., 2020; Mahdavi et al., 2021). Students struggling with anxiety and depression may experience higher levels of absenteeism, incomplete assignments, and lower grades (Fernandes et al., 2023).

Thus, the comprehension of the factors associated with this process can provide important reflections on how to develop effective support systems and interventions to promote academic success. Despite the growing body of research on university students' adaptation processes (Soares et al., 2019; Martínez-Monteagudo et al., 2020; Shamionov et al., 2020; Wunsch et al., 2021; Sheng et al., 2022; Monteiro and Soares, 2023; Ateş-Ös and Bulut-Serin, 2024), there is a gap in studies focusing on the specific determinants of academic adaptation and what is the role of QoL in this trajectory, in addition to how these variables are related and how they contribute to academic success.

Despite the democratization of access to higher education in the past decades in Brazil, there is an important discussion on how this is not a guarantee of retention or academic success (Matta et al., 2017). In addition, the Amazon region is characterized by its vast and remote geography and diverse cultural landscape, with universities presenting different levels of infrastructure and resources (de Figueiredo, 2020), representing a unique context for university students. Thus, there is a lack of studies investigating academic adaptation and QoL of these students, highlighting the importance of investigating the specific challenges and opportunities they face. The aim of this study was to identify the determinants of academic adaptation and quality of life in university students.

2 Conceptual framework

The academic adaptation framework of Soares et al. (2006) was adopted in this study, in which five dimensions are established to explain the construct: personal, interpersonal, career, study, and institutional. The personal dimension is related to the students' abilities and perceptions to maintain physical and mental wellbeing. The interpersonal dimension is related to students' abilities to develop intimate and significant relationships with peers, colleagues, and other people in the university environment. The career dimension is related to the students' perceptions of the choice and satisfaction with the course and future professional projects. The study dimension is related to individual and curricular aspects that influence the students' commitment to academic activities/tasks. The institutional dimension is related to how the students navigate the institution flows and the adaptability with the institution services.

Thus, the model explains the influence of the students' competencies (critical thinking, self-regulation, study administration, and motivation) on learning achievement and integration into the university context (Soares et al., 2006, 2019). Therefore, considering the multidimensional aspects of academic adaptation, health factors can play an important role in this outcome (Shamionov et al., 2020), especially considering the impact of low QoL on the academic path of university students (Fernandes et al., 2023), which is the aim of the investigation in this study.

3 Methods

3.1 Design and scenario

This is a cross-sectional study with an analytical approach focused on identifying the determinants of academic adaptation and quality of life among university students at a public university in Northern Brazil, located in the Amazon region. While it encompasses a significant portion of Brazil's territory, the Northern region encompasses the smallest percentage of the population (8.3%; 17,349,619 inhabitants) (Instituto Brasileiro de Geografia e Estatística, 2024). In terms of the Human Development Index (HDI), the Northern states generally exhibit lower levels (0.667) compared to the national average (0.760), with disparities in access to education, healthcare, and infrastructure (de Figueiredo, 2020; Pereira, 2020). Despite these challenges, efforts have been made to improve educational opportunities, including the establishment of universities across the region, receiving annually 150,000 new students in higher education levels, representing 11.9% of the national total (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira, 2023).

The present study was carried out at a public university that is part of the initiative to bring higher education to the interior of the country (Júnior, 2018), being an important hub for receiving students from different states in the northern region. The campus offers undergraduate courses in different areas, such as Nursing, Physical Education, Mathematics, Geography, Letters, Pedagogy, Philosophy, Natural Sciences/Chemistry, and Natural Sciences/Biology. This study was reported according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement guidelines (von Elm et al., 2014).

3.2 Participants

The study was conducted with university students enrolled in the undergraduate courses offered on the campus. Considering that the

study was carried out during the period of the COVID-19 pandemic, a low circulation of students in-person on campus was expected due to hybrid teaching through Digital Information and Communication Technologies (<50%). All the students present on the campus were invited to participate. Considering a confidence interval of 95%, statistical power of 80%, plus 10% losses, a sample size of 88 students was estimated. After a face-to-face invitation, 90 students agreed to participate in the study, representing an acceptance rate of 90%.

3.3 Instruments

The data collection instrument was divided into three sections, in which Section 1 consisted of sociodemographic, academic, and health-related information (independent variables), Section 2 consisted of the Academic Life-Experiences Questionnaire (ALEQ-r), and Section 3 consisted of the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36). Thus, this instrument evaluates sociodemographic variables, such as gender, age, color/race, marital status, work, income, and residence; academic variables, such as living in the same city as the university, entry method, academic failures, perception of academic performance, positive teacher–student relationship, to receive some type of scholarship, have shown intention to drop out of the course at some point during their academic career, and stressful factors lived during college; and health-related variables, such as health access, to perform sports, comorbidities, and minor mental disorders (self-related anxiety and depression).

The dependent variables were the academic adaptation, measured by the ALEQ-r, and the physical and mental components of QoL, measured by the SF-36. The ALEQ-r, a 55 five-point Likert question instrument developed in Portugal (Almeida et al., 1999) and validated in Brazil (Granado et al., 2005) with excellent reliability (Cronbach's $\alpha = 0.908$), was used to evaluate academic adaptation in five dimensions: personal, interpersonal, course/career, study, and institutional. In this study, the instrument presented excellent reliability (Cronbach's $\alpha = 0.925$).

The SF-36 was developed by Ware and Sherbourne (1992) and validated in Brazil (Laguardia et al., 2011) with good reliability in all domains (Cronbach's $\alpha > 0.7$). The instrument evaluates eight domains of QoL, namely, functional capacity, physical aspects, pain, general health status, vitality, social aspects, emotional aspects, and mental health. Although the instrument does not provide an overall score of QoL, it is possible to evaluate two summary measures related to the physical (Physical Component Summary—PCS) and mental (Mental Component Summary—MCS) aspects of QoL. The PCS comprises the domains functional capacity, physical aspects, pain, and general health status, while the MCS comprises the domains vitality, social and emotional aspects, and mental health (Taft et al., 2001). In this study, the instrument presented good reliability (Cronbach's $\alpha = 0.838$).

3.4 Procedures

The research project was approved by the research ethics committee from the Federal University of Tocantins (number 4,459,254), and all stages of the study were carried out according to the Declaration of Helsinki.

Through a non-probabilistic sampling method, the data collection process was performed between September and October 2021 with students present in-person on campus and considered for enrollment in the research's including criteria (active enrollment in an undergraduate course and older than 18 years of age). The questionnaire was structured on an online platform, and the link was provided by the researcher. After signing the consent form, the students responded to the questionnaires in a private room to avoid discomfort or interruptions. The researcher was present to provide any additional information or support due to emotional distress.

3.5 Data analysis

Statistical analysis was performed in the statistical program R version 4.4.1 (R Core Team, Vienna, Austria). The variables were described in absolute and relative frequencies, as well as means and standard deviations. Shapiro–Wilk test was used to evaluate the normality of the quantitative variables. Student's *t*-test for independent samples and analysis of variance (ANOVA) were used to compare the mean difference between the groups for data with normal distribution, while Wilcoxon test (rank-sum) and Kruskal–Wallis test were used for data with non-normal distribution. In addition, correlations between the dependent variables were performed through the Spearman correlation coefficient (ρ).

Multiple linear regressions were performed using the stepwise method to identify predictors of academic adaptation and physical and mental components of QoL. Variables with $p < 0.2$ in the bivariate analysis were included in the multiple regression. Considering that academic adaptation was the dependent variable in this study, the physical component (PCS) and mental component (MCS) were included in the first multiple regression model to identify the relation between academic adaptation and QoL. Participants with missing information were excluded in multiple regressions. The Akaike criterion (AIC) was used to define the inclusion or exclusion of variables in the final model and to assure quality (Akaike, 1974). Models with lower AIC values were considered a better fit. The R 'performance' package was used to evaluate the models' performance (Lüdecke et al., 2021) and was considered a statistically significant analysis with a *p*-value of <0.05.

4 Results

4.1 Sociodemographic, academic, and health-related characteristics

A total of 90 university students were included in this study; most of them were women, with a mean age of 22.4 ± 4.9 years, brown skin color, single, not working, with an income of up to two minimum wages per family, and living with parents, spouses, or children. Considering the academic trajectory, most of the students were not living in the same city as the university, traveling daily to participate in the classes. The majority of students accessed the university through a wide competition selective process format, without academic failures, and had a regular perception of academic performance, with a positive perceived teacher–student relationship. A small percentage of the students received scholarships, such as scientific initiation to develop research or permanence scholarships provided to those students who need financial

support to study. A considerable percentage of students at some point in the course had the intention to drop out, and the biggest stressful factor during their graduation course was the dedication workload. Regarding the health-related variables, most of the students accessed the public Brazilian health system, performed sports, had no comorbidities, and had no minor mental disorders (Table 1).

4.2 Bivariate analysis

In the bivariate analysis, the highest academic adaptation scores were found among students who were living alone or in other conformations, such as living with colleagues, practicing sports, with excellent perception of academic performance, who never had the intention to drop out, and who had the distance from family as stressful factor during the graduation. Students with more than two minimum wages per family, and without comorbidities, had higher PCS scores, while the highest MCS scores were found among male students with a good perception of academic performance, who never had the intention to drop out, and without minor mental disorders (Table 1).

4.3 Correlations between academic performance and QoL

Spearman's correlations were performed to measure the correlation between academic performances and the physical and mental components of QoL. A weak positive correlation was found between the ALEQ-r and PCS scores ($\rho = 0.21$; $p = 0.046$) (Figure 1). A moderate positive correlation was found between the ALEQ-r and MCS scores ($\rho = 0.47$; $p < 0.001$) (Figure 2).

4.4 Multiple linear regressions

In the multiple linear regressions, the physical and mental components of QoL, to live in the same city as the university, and receive some type of scholarship, were positive predictors of academic adaptation, while not performing any type of physical activity was a negative predictor. The model explained 40.1% of the variation of the academic adaptation. The positive predictors of PCS were color/race black, income more than two minimum wages, and having no comorbidities. In contrast, the negative predictors were stressful factors such as the teaching method, evaluation method, and experiences during internship, explaining 26.6% in the variation of PCS. The MCS had only positive predictors, such as not having the intention to drop out and not having minor mental disorders, explaining 22.7% of the variation of MCS (Table 2).

5 Discussion

There are still few studies on the university context in the Amazon region, especially from the students' perspective, demonstrating the challenges they face (Resende et al., 2022). The findings of the present study help to elucidate the university student's QoL related to main topics in academic trajectory, showing a diversity of positive and negative determinants of academic adaptation and physical and mental components of QoL, in addition to presenting these components as important predictors of academic adaptation. These findings are similar to the results of other studies conducted with university students from other regions of Brazil (Carleto et al., 2018; Oliveira Silva et al., 2021; da Silva et al., 2021; Soares et al., 2021), reinforcing the importance of the relationship between academic adaptation and psychosocial factors. However, longitudinal studies are still scarce and do not explore the nature of this relationship.

Regarding academic adaptation, PCS and MCS were positive predictors, showing the role of QoL in the students' academic trajectory. The PCS reflects the physical health of the students, containing aspects related to the ability to perform daily physical activities, existing physical limitations, pain, and general health perception (Taft et al., 2001). This component is highly related to the impacts of physical functional capacity in the students' lives.

Similarly, the MCS reflects the mental and emotional health of the students, contemplating aspects related to energy and fatigue, physical and emotional health in social activities, limitations related to emotional problems in daily activities, and mental wellbeing, evaluated in the presence of mental health disorders, such as anxiety and depression (Taft et al., 2001). The presence of these mental disorders has been consistently associated with lower QoL scores, particularly in the mental component, which encompasses factors such as emotional wellbeing, social interactions, and energy levels (Abdullah et al., 2021; Jenkins et al., 2021).

These mental health disorders can impair students' ability to concentrate, reduce motivation, and lead to academic disengagement, increasing the likelihood of absenteeism, incomplete coursework, and, ultimately, academic failure (Fauzi et al., 2021; Oliveira Silva et al., 2021). Given that academic adaptation requires effective coping mechanisms, emotional resilience, and the ability to navigate institutional challenges, students with mental health issues may struggle to integrate successfully into the university environment (Fullerton et al., 2021). This highlights the need for universities to implement mental health support strategies, such as counseling services, peer support programs, and stress management interventions, to mitigate the negative impact of anxiety and depression on students' academic experiences.

Thus, the findings of this study showed that the higher the scores in the PCS and MCS, which represents a good QoL, the more adapted the students were to the university context, especially in the interpersonal dimension for PCS and personal, career, study, and institutional dimensions for MCS. In accordance with these findings, a study conducted with university students during a 2-year follow-up showed that participation in extracurricular activities was a positive predictor of PCS and MCS, demonstrating that the students were well-adapted to the university context (Yao et al., 2023).

From a psychological perspective, the Self-Determination Theory (Adams et al., 2017) provides a useful framework for understanding the impact of mental health on academic adaptation. This theory posits that individuals have three fundamental psychological needs—autonomy, competence, and relatedness—that must be fulfilled to foster intrinsic motivation and wellbeing (Deci and Ryan, 2012). Anxiety and depression can significantly hinder these needs by reducing students' perceived competence in handling academic challenges, increasing feelings of isolation, and limiting their sense of autonomy due to overwhelming stress (Wolters et al., 2023).

When students struggle with mental health issues, their ability to engage in self-regulated learning, a key component of academic

TABLE 1 Bivariate analysis of sociodemographic, academic, and health-related determinants of academic adaptation and physical and mental components of QoL.

Variables	*n*	%	ALEQ-r		PCS		MCS	
			Mean ± SD	*p*-value[a]	Mean ± SD	*p*-value[a]	Mean ± SD	*p*-value[c]
Sociodemographic variables								
Gender (*n* = 89)								
Female	65	73.03	3.12 ± 0.54	0.132	49.26 ± 8.43	0.074	29.51 ± 11.26	0.027*
Male	24	26.97	3.33 ± 0.64		52.81 ± 7.62		36.87 ± 14.25	
Age								
Up to 20 years	33	36.67	3.21 ± 0.48	0.619	51.50 ± 8.48	0.232	30.79 ± 13.24	0.563
More than 20 years	57	63.33	3.15 ± 0.62		49.32 ± 8.21		31.83 ± 12.05	
Marital status								
Single	80	88.89	3.28 ± 0.59	0.729	50.03 ± 8.66	0.775	31.75 ± 12.35	0.476
Married/stable union	10	11.11	3.11 ± 0.35		50.83 ± 5.24		29.09 ± 13.48	
Color/race								
Brown	51	56.67	3.26 ± 0.58	0.079[b]	49.39 ± 8.06	0.148[b]	33.68 ± 12.67	0.255
White	21	23.33	3.00 ± 0.53		50.55 ± 8.63		27.68 ± 11.18	
Black	11	12.22	3.31 ± 0.53		54.91 ± 8.28		30.08 ± 13.18	
Yellow	7	7.78	2.81 ± 0.43		46.59 ± 7.94		28.68 ± 12.05	
Income (*n* = 87)								
Up to 2 minimum wages	72	82.76	3.18 ± 0.61	0.864	49.52 ± 7.81	0.048*	32.19 ± 12.37	0.145
More than 2 minimum wages	15	17.24	3.15 ± 0.41		54.20 ± 10.15		27.47 ± 12.37	
Work								
Yes	19	21.11	3.07 ± 0.55	0.369	51.48 ± 10.55	0.423	29.27 ± 13.21	0.323
No	71	78.89	3.20 ± 0.58		49.75 ± 7.68		32.04 ± 12.25	
Residence (*n* = 86)								
Parents/spouse/children	51	59.30	3.07 ± 0.58	0.041*	49.85 ± 8.32	0.990	31.61 ± 13.41	0.561
Alone/others	35	40.70	3.33 ± 0.57		49.83 ± 8.44		31.56 ± 10.91	
Academic variables								
Live in the same city of university (*n* = 77)								
Yes	36	46.75	3.06 ± 0.46	0.079	51.23 ± 7.67	0.313	31.12 ± 11.42	1.000
No	41	53.25	3.29 ± 0.68		49.29 ± 8.98		31.77 ± 13.61	
Entry method (*n* = 89)								
Wide competition	62	69.66	3.11 ± 0.55	0.229	49.93 ± 8.77	0.763	30.75 ± 12.01	0.607
Affirmative action (Law No. 12,711/12)*	27	30.34	3.26 ± 0.57		50.51 ± 7.55		32.06 ± 12.61	
Academic failures								
Yes	21	23.33	3.16 ± 0.63	0.948	51.84 ± 6.17	0.281	32.64 ± 13.69	0.653
No	69	76.67	3.17 ± 0.56		49.60 ± 8.85		31.09 ± 12.11	
Perception of academic performance (*n* = 89)								
Excellent	9	10.11	3.52 ± 0.69	0.012*[b]	53.65 ± 7.62	0.447[b]	34.30 ± 12.40	0.014*[d]
Good	29	32.58	3.33 ± 0.67		50.43 ± 7.68		36.71 ± 13.11	
Regular	43	48.31	3.07 ± 0.44		48.84 ± 8.57		28.71 ± 11.23	
Poor	8	8.99	2.77 ± 0.45		50.16 ± 9.02		25.14 ± 10.80	
Positive teacher–student relationship (*n* = 89)								
Yes	83	93.26	3.20 ± 0.59	0.206	50.04 ± 8.48	0.595	31.86 ± 12.48	0.446
No	6	6.74	2.89 ± 0.23		51.93 ± 6.90		27.34 ± 12.57	
Receive some type of scholarship								
Yes	21	23.33	3.41 ± 0.55	0.031	49.53 ± 9.05	0.712	33.35 ± 11.96	0.311
No	69	76.67	3.10 ± 0.57		50.30 ± 8.16		30.87 ± 12.60	
Intention to drop out of graduation								
Yes	59	65.56	3.01 ± 0.52	<0.001*	50.06 ± 8.87	0.921	27.93 ± 10.28	<0.001*[d]

(Continued)

TABLE 1 (Continued)

Variables	*n*	%	ALEQ-r		PCS		MCS	
			Mean ± SD	*p*-value[a]	Mean ± SD	*p*-value[a]	Mean ± SD	*p*-value[c]
No	31	34.44	3.47 ± 0.55		50.24 ± 7.34		38.16 ± 13.69	
Stressful factors during graduation (*n* = 88)								
Dedication workload	24	27.27	3.18 ± 0.39	0.029*[b]	51.67 ± 7.95	0.052[b]	29.17 ± 10.64	0.114
Knowledge complexity	11	12.50	3.20 ± 0.44		52.05 ± 5.82		30.16 ± 13.99	
Distance from family	15	17.05	3.51 ± 0.76		51.49 ± 6.98		38.87 ± 13.85	
Teaching method	18	20.45	3.21 ± 0.51		50.68 ± 8.34		32.81 ± 11.97	
Interpersonal/institutional relationships	9	10.23	2.70 ± 0.41		48.91 ± 9.42		27.15 ± 11.53	
Evaluation method	7	7.95	2.90 ± 0.55		43.73 ± 9.99		24.13 ± 5.39	
Experiences during internship	4	4.55	3.07 ± 1.28		41.12 ± 9.59		27.44 ± 11.06	
Health-related variables								
Health access (*n* = 89)								
Brazilian public health system (SUS)	80	89.89	3.18 ± 0.60	0.849	50.62 ± 7.96	0.120	31.97 ± 12.41	0.273
Private health insurance	9	10.11	3.14 ± 0.35		46.04 ± 11.04		27.85 ± 13.14	
Performs physical activities								
Yes	49	54.44	3.34 ± 0.60	0.002*	51.32 ± 7.90	0.136	32.95 ± 13.30	0.305
No	41	45.56	2.98 ± 0.48		48.69 ± 8.70		29.67 ± 11.22	
Comorbidities								
Yes	25	27.78	3.10 ± 0.56	0.481	46.39 ± 8.85	0.007*	27.24 ± 10.76	0.058
No	65	72.22	3.20 ± 0.58		51.56 ± 7.72		33.08 ± 12.72	
Minor mental disorders (*n* = 88)								
Yes	18	20.45	3.05 ± 0.49	0.302	48.44 ± 11.73	0.434	23.77 ± 8.05	0.002*
No	70	79.55	3.21 ± 0.60		50.75 ± 7.28		33.54 ± 12.77	

*$p < 0.05$. ALEQ-r, Academic Life Experiences Questionnaire reduced; PCS, Physical Component Summary; MCS, Mental Component Summary; SD, standard deviation.
[a]Student's t-test.
[b]ANOVA.
[c]Wilcoxon (rank-sum) test.
[d]Kruskal–Wallis test.

success, is compromised (Hadwin et al., 2022). Educational institutions can apply this theory by creating supportive environments that enhance students' autonomy through flexible learning strategies, strengthen their sense of competence with academic mentorship, and foster relatedness by promoting peer interactions and mental health-inclusive policies (Harra and Vargas, 2024). These approaches could mitigate the negative effects of mental health disorders, thereby improving both quality of life and academic adaptation.

From an educational standpoint, Vygotsky's Sociocultural Theory (Vygotsky, 2015; Tzuriel, 2021) emphasizes the role of social support and mediated learning in cognitive and emotional development. According to this theory, students learn and adapt more effectively when they can access social interactions and institutional support systems that scaffold their development. In the context of higher education, this means that mental health support should not only be reactive (e.g., crisis intervention) but also embedded in the academic culture through proactive educational practices (Vygotsky, 2015). Faculty training on mental health awareness, peer mentoring programs, and structured academic advising can serve as essential scaffolds to help students navigate their academic journey while managing psychological distress.

In addition, fostering collaborative learning environments where students can share experiences and strategies for coping with stress can enhance their sense of belonging, reducing the psychological burden of higher education (Fernandez-Perez and Martin-Rojas, 2022). By integrating mental health awareness into pedagogical practices, universities can create learning environments that not only accommodate students' academic needs but also nurture their psychological wellbeing, leading to better educational outcomes and long-term success (Qureshi et al., 2023).

In line with what the literature has discussed (Oliveira Silva et al., 2023), living in the same city as the university also represents an important determinant of academic adaptation. Even though, for the most part, the students who participated in the study live in cities close to the campus and travel daily to participate in academic activities, the present analysis showed that living in the same city can be a facilitator for academic adaptation, potentially because with more time not spent on traffic, students can better manage their academic activities.

Students who received some type of scholarship presented higher scores in the QVA-r, showing the role of financial support provided by the university in the students' academic trajectory. This type of support is provided by the federal universities since 2007, with the establishment of the National Student Assistance Program (in Portuguese: *Programa Nacional de Assistência Estudantil—PNAES*), a public policy destined to provide resources to university students overcome challenges related to low academic achievement, that can be used to housing, transport, food, culture, and leisure, called *Bolsa Permanência* (da Costa Brito et al., 2019). There is evidence that this policy is an important way to avoid

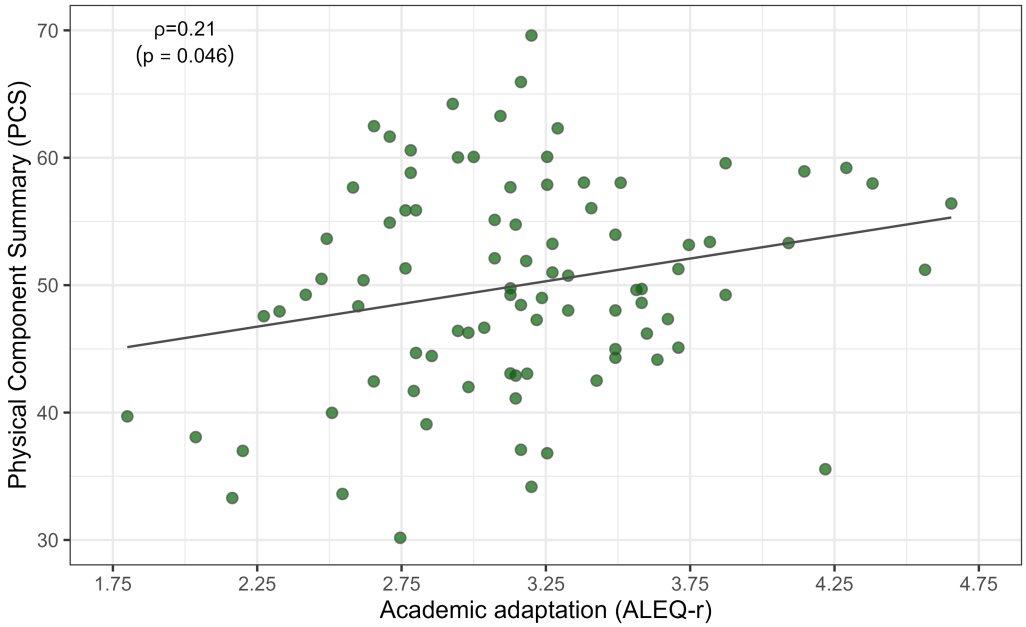

FIGURE 1
Correlation between academic adaptation and physical components of QoL.

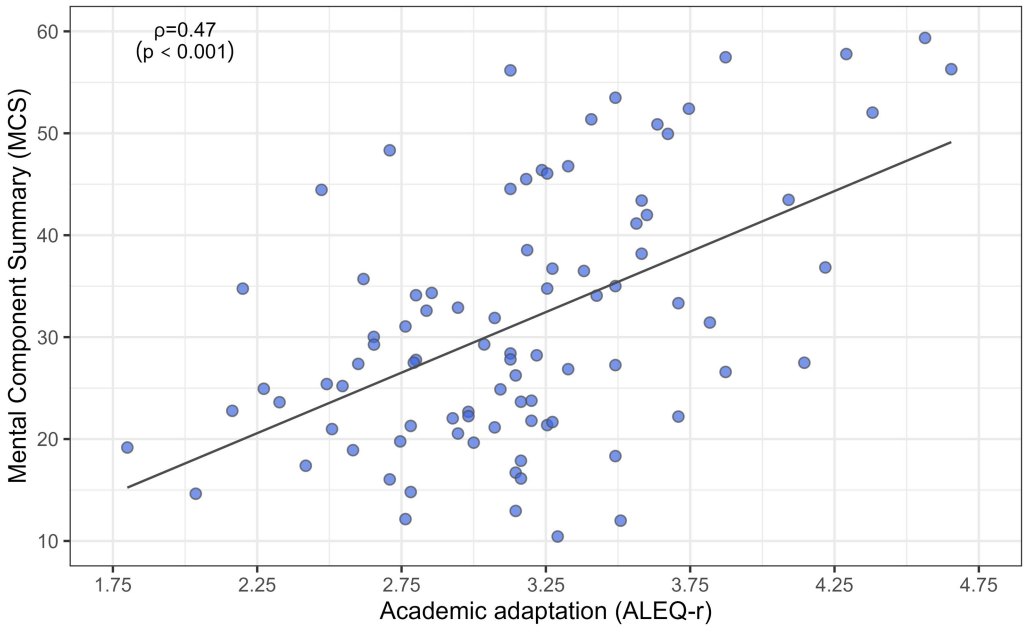

FIGURE 2
Correlation between academic adaptation and mental components of QoL.

dropouts in higher education, considering that comparing students who did not receive any type of support to those who received, the dropout rates were higher (Saccaro et al., 2020).

In addition, the Institutional Scientific Initiation Scholarship Program (in Portuguese: *Programa Institucional de Bolsa de Iniciação Científica*—PIBIC) also supports students financially, but in this modality, the given scholarships are directed to students interested in participating in research projects, an important program with impact in their education by research (Lopes and do Nascimento, 2021). Students in the present study participated in one or both programs, highlighting that even with a small prevalence of students receiving scholarships, they were better adapted to the university context, especially in the study and institutional dimensions of academic adaptation, supporting the effectiveness of these public policies.

TABLE 2 Multiple linear regression of sociodemographic, academic, and health-related determinants of academic adaptation and physical and mental components of QoL.

Models	Variables coefficients		
	β	SE	p-value
ALEQ-r[a]			
Intercept	1.492	0.361	<0.001*
MCS	0.020	0.004	<0.001*
PCS	0.019	0.006	0.006*
Live in the same city of the university (Yes)	0.169	0.079	0.037*
Receive some type of scholarship (Yes)	0.284	0.129	0.031*
Performs physical activities (No)	−0.186	0.080	0.023*
PCS[b]			
Intercept	45.393	3.510	<0.001*
Color/race			
Brown	3.330	3.213	0.303
White	4.756	3.471	0.174
Black	9.885	3.880	0.012*
Yellow	Ref.		
Income (more than 2 minimum wages)	3.289	1.614	0.045*
Stressful factors during graduation			
Dedication workload	Ref.		
Knowledge complexity	−0.375	2.736	0.891
Distance from family	0.574	2.792	0.837
Teaching method	−1.442	3.208	0.015*
Interpersonal/institutional relationships	−1.543	2.935	0.600
Evaluation method	−7.927	3.208	0.015*
Experiences during internship	−11.865	4.056	0.004*
Comorbidities (No)	3.449	1.284	0.008*
MCS[c]			
Intercept	28.013	1.776	<0.001*
Gender (Male)	5.141	2.781	0.068
Intention to drop out of graduation (No)	5.733	1.804	0.002*
Comorbidities (No)	2.865	1.931	0.142
Minor metal disorders (No)	5.034	2.104	0.019*

*$p < 0.05$. ALEQ-r, Academic Life Experiences Questionnaire reduced; PCS, Physical Component Summary; MCS, Mental Component Summary.
[a]Model coefficients: $R^2 = 0.444$, adjusted $R^2 = 0.401$, $p < 0.001$, AIC = 100.72.
[b]Model coefficients: $R^2 = 0.370$, adjusted $R^2 = 0.265$, $p < 0.001$, AIC = 348.07.
[c]Model coefficients: $R^2 = 0.264$, adjusted $R^2 = 0.227$, $p < 0.001$, AIC = 399.46.

Students who did not perform any type of physical activity also presented lower scores of academic adaptation, especially in the career and study dimensions. The literature has shown that the university environment can be overwhelming due to academic demands and difficulty managing time efficiently (Coertjens et al., 2017; Oliveira Silva et al., 2023). On the other hand, practicing physical activities can be an important way to significantly improve motivation and self-regulation and increase academic performance (Sáez et al., 2021; Slavinski et al., 2021). Thus, these findings support the need of actions to stimulate students to have a healthy routine and to practice physical activities.

Regarding the predictors found in this analysis, the literature has demonstrated the importance of students having sufficient income to carry out their activities with stability and how this has an important impact on the physical components of QoL (Rosa Moritz et al., 2016; Kaymaz et al., 2022). In addition, the presence of comorbidities is related to PCS impairment, showing the role of wellbeing in the maintenance of a good QoL (Jenkins et al., 2021). Furthermore, the stress related to the teaching and evaluation methods adopted by the professors, in addition to the challenging experiences lived during the internship, were negatively associated with the PCS, which highlighted the role of perceived good and

bad experiences in the students' perception of QoL (Jenkins et al., 2021).

The MCS only had positive predictors, in which students who had no intention to drop out of minor mental disorders had a better perception of QoL in this domain. Other studies have shown that students with anxiety and depression have more risk of dropping out, being an important predictor of this outcome (Abbas et al., 2023). Considering that in low-and middle-income countries there is a high prevalence of depression (24.4%) in university students, these findings suggest the need for interventions to promote students' wellbeing in the university context (Akhtar et al., 2020).

5.1 Practical implications

The findings highlight the critical need for universities to implement comprehensive mental health support systems, such as counseling services, peer mentoring programs, and faculty training in psychological wellbeing. In addition, institutional policies that promote financial support—such as scholarships, emergency aid, and affordable student housing—can play a crucial role in improving students' quality of life and academic adaptation. Given that similar barriers to academic success exist globally, these recommendations are relevant for universities in diverse socio-economic and cultural settings. However, specific implementation strategies may need to be adapted to the local context, considering factors such as access to healthcare, cultural attitudes toward mental health, and variations in higher education structures. By fostering environments supporting academic and personal wellbeing, universities worldwide can enhance student retention, performance, and overall success.

5.2 Limitations

Although the results of the present study draw attention to the university context scenario in the Amazon region, some limitations must be considered, such as the inclusion of students of only one university, which makes it difficult to generalize the data; the difficulties to trace cause and consequence relationships between variables due to the study design, which makes it difficult to understand whether academic adaptation is impacted by psychosomatic factors or whether these factors harm students' adaptation; the small sample size; and self-report limitations, which may result in an overestimation or underestimation of the investigated outcomes. Future studies can investigate predictive models of academic adaptation through longitudinal monitoring of students.

6 Conclusion

The findings of the present study showed that the MCS, PCS, living in the same city as the university, and receiving some type of scholarship were positive predictors of academic performance, while not performing physical activities was a negative predictor. Regarding the predictors of QoL, the PCS had as positive predictor students from race/color black, with familiar income more than two minimum wages, and without comorbidities, while the negative predictors were to feel stressful due to the teaching and evaluation methods of the professor, and with bad experiences lived during the internship. The MCS only had positive predictors related to the absence of intention to drop out and minor mental disorders.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by Comitê de Ética em Pesquisa da Universidade Federal do Tocantins. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

GO: Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. PC: Conceptualization, Data curation, Methodology, Project administration, Writing – original draft, Writing – review & editing. NA: Writing – original draft, Writing – review & editing. LN: Conceptualization, Methodology, Project administration, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that no Gen AI was used in the creation of this manuscript.

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