



Psychological Assessment

Academic adaptation in university students: Associations with stress and sleep quality


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Abstract

This study aimed to analyze the relationships between sleep quality, stress, and academic adaptation of university students, characterize sleep quality indicators, and analyze differences in the instrument factors according to demographic variables. A total of 489 university students participated, with a mean age of 22.46 years (SD=5.648), 78.1% of whom were female. The students answered the Academic Experience Questionnaire, Perceived Stress Scale, and Pittsburgh Sleep Quality Index online. The data were submitted to inferential statistics. The results indicated that 72.4% of the participants presented a poor classification concerning sleep quality, and 23.9% had some sleep disorder – better rates of adaptation to the university correlated with better sleep quality and lower sleep quality stress levels. The importance of developing positive emotional aspects in university students favoring the processes of academic adaptation is evident.

Keywords: higher education; academic experiences; mental health; psychological assessment.

ADAPTAÇÃO ACADÊMICA EM UNIVERSITÁRIOS: ASSOCIAÇÕES COM ESTRESSE E QUALIDADE DO SONO

Resumo

Este estudo teve como objetivos analisar as relações entre qualidade do sono, estresse e adaptação acadêmica de estudantes universitários, caracterizar os indicadores de qualidade do sono e examinar diferenças de médias nos fatores dos instrumentos a partir de variáveis demográficas. Participaram do estudo 489 estudantes universitários, com idade média de 22,46 anos (DP = 5,648), sendo 78,1% do sexo feminino, que responderam de forma *on-line* ao Questionário de Vivências Acadêmicas, à Escala de Estresse Percebido e ao Índice de Qualidade de Sono de Pittsburgh. Os dados foram submetidos a estatísticas inferenciais, e os resultados indicaram que 72,4% dos participantes apresentaram classificação ruim em relação à qualidade do sono e 23,9% tinham algum distúrbio do sono. Melhores índices de adaptação à universidade estiveram correlacionados à melhor qualidade de sono e a menores níveis de estresse. Evidencia-se a importância de se trabalhar o desenvolvimento de aspectos emocionais positivos em universitários para favorecer os processos de adaptação acadêmica.

Palavras-chave: ensino superior; vivências acadêmicas; saúde mental; avaliação psicológica.

ADAPTACIÓN ACADÉMICA EN ESTUDIANTES UNIVERSITARIOS: ASOCIACIONES CON ESTRÉS Y CALIDAD DEL SUEÑO

Resumen

El objetivo de este estudio fue analizar las relaciones entre la calidad del sueño, el estrés y la adaptación académica de los estudiantes universitarios, así como caracterizar los indicadores de la calidad del sueño y analizar las diferencias en los factores de los instrumentos en función de las variables demográficas. Participaron un total de 489 estudiantes universitarios, con una edad media de 22,46 años ($SD = 5,648$), de los cuales el 78,1% eran mujeres que respondieron en línea al Cuestionario de Experiencia Académica, la Escala de Estrés Percibido y el Índice de Calidad del Sueño de Pittsburgh. Los datos se sometieron a estadísticas inferenciales y los resultados indicaron que el 72,4% de los participantes tenían una mala clasificación en relación con la calidad del sueño y el 23,9% tenía algún trastorno del sueño. Las mejores tasas de adaptación a la universidad se correlacionaron con una mejor calidad del sueño y menores niveles de estrés. Es evidente la importancia de trabajar en el desarrollo de aspectos emocionales positivos en los estudiantes universitarios favoreciendo los procesos de adaptación académica.

Palabras clave: educación superior; experiencias académicas; salud mental; evaluación psicológica.

1. Introduction

Academic adaptation is understood as a multifaceted process and refers to the student's adjustment to the educational institution, encompassing the standards, values, and intrapersonal and interpersonal resources required from the beginning to the end of the course (Oliveira, Wiles, Fiorin, & Dias, 2014). These resources are related to the development of the social and emotional skills and psychological aspects necessary for the student to bond with the institution and present satisfactory performance (Lima, Soares, & Souza, 2019). Therefore, academic adaptation consists of how university students interact and incorporate the experiences provided by the insertion into the academic environment and how they deal with transitions in the social, vocational, and personal spheres with the entry into the university. Among the changes that take place during this period, leaving their family homes, establishing new interpersonal relationships, adapting

to the new teaching format, managing time, and preparing for the world of work can be mentioned (Matta, Lebrão, & Heleno, 2017).

Positive adaptation to the university context is related to good interpersonal relationships, as these reinforce emotional skills, facilitate the establishment of a bond with the institution and make the performance more satisfactory (Oliveira et al., 2014). In addition to the relational aspects, being clear about the career project and taking the desired degree course can facilitate the adaptation (Ambiel & Barros, 2018). The physical structure of the higher education institution is also considered important for academic adaptation, with more accessibility and availability of resources being related to better student adaptation. Similarly, the offer of projects and extracurricular activities that provide expansion of knowledge and professional training contribute to adequate adjustment (Oliveira, Santos, & Dias, 2016).

Not all students have the necessary resources to deal with the emotional and situational issues experienced during the graduation course and may be affected by higher levels of loneliness, stress, anxiety, and depression. Therefore, the inability to resort to effective ways of coping may imply the emergence of somatic symptoms. When the person cannot face, elaborate, and express their emotions in conflict situations through an act or verbalization, bodily manifestations can be triggered. In addition, difficulties related to mental health, such as psychological stress or lack of confidence in performance skills, sleep problems, and psychosomatic disorders can also be triggered in this training period (Vizzotto, Jesus, & Martins, 2017).

Specifically concerning stress, this can be part of the experiences of individuals, with stressors present at interdependent levels that can be biological, social, and psychological. Stress levels are mediated by psychosocial aspects such as the family environment, anxiety levels, and the lifestyle adopted by the person (Leonard et al., 2015). Stress can be interpreted and experienced differently for each person, whether positive or negative, depending on how the individual mentalizes the stress experienced or a specific stressful situation. The extent to which it transforms into a potentializing aspect of the person's life or causes damage to their health can be comprehended as positive or negative. The individual way of dealing with stress influences the motivational level for daily activities, well-being, productivity, learning, and performance (Peixoto, Rocha, Franco, & Bueno, 2019).

Higher education imposes on the student the need to adapt to different situations, whether at a personal, interpersonal, professional, or academic level. New skills are required to adapt to the demands of the graduation course, which are configured as stressors that trigger difficulties, and occur at the levels of the organization of the study practice, interpersonal relationships, and psychological aspects. The organization in relation to the new study methodology, relationships with colleagues and professors, evaluation periods, and carrying out activities, in general, is of paramount importance to guarantee the quality of the training and student well-being (Almeida & Castro, 2016). Since stress can interfere with the learning process and professional training (Delara & Woodgate, 2015), it is important to investigate its development and associated variables in order to develop preventive strategies for better levels of well-being. In addition to stress, other variables can impair academic adaptation and students' mental health, such as sleep disorders (Barros, Lima, Ceolim, Zancanella, & Cardoso, 2019).

Sleep disorders are understood as changes in the ability to sleep properly, and they result in disturbances in the social, professional, or academic spheres of those who have them. Symptoms present themselves as difficulties in the quality, duration, and quantity of sleep, resulting in a certain degree of suffering for the individual and/or impairment of their activities during the day (American Psychiatric Association [APA], 2014). Therefore, having good sleep quality is of paramount importance for the maintenance of physical and mental health, as well as for a good performance in university activities (Ge et al., 2019). If the sleep quality is unsatisfactory, it can affect the performance and the time used to carry out academic activities (Baraldi et al., 2015; Santos, Mussi, Pires, Santos, & Paim, 2020).

In the assessment of sleep disorders, biological aspects and the individuals' daily routine must be considered. In the case of university students, the distribution of time or the amount of time they have and allocate to carry out academic activities influences the quantity and quality of sleep, subsequently reflecting on their academic performance and their general health status. Sleep hygiene can therefore be impaired by inadequate routine habits, such as poor time management in performing tasks, excessive consumption of caffeine, nicotine, or alcohol in the final six hours before bedtime, heavy meals, and stressful physical or psychological activities close to the usual sleep time (Wilson et al., 2014).

Studies on sleep quality with university students indicate students of the evening period present greater somnolence and worse sleep quality indices when compared to students of the daytime period. In addition, sleep quality can be one of the reasons for academic dissatisfaction among university students and may impair concentration and performance in student activities (Baraldi et al., 2015). Studies on the subject identified that students in the health and exact science areas presented poor sleep quality (Carvalho et al., 2013); that morning students had shorter sleep duration compared to others (Felden et al., 2015), both in Brazil and other countries; and that university students sleep less than the general population (Araújo et al., 2013). An exception to this last data was found by Ge et al. (2019) in relation to Chinese students who reported sleeping more than eight hours a day.

Understanding that university life is not always performed appropriately to maintain physical and mental well-being (Madzhe, 2017; Vizzotto et al., 2017); the research extracts proposed here provide answers, even if initial, for the gaps in the scientific production regarding the themes that have addressed each construct (stress, sleep quality and adaptation) in isolation, considering the issue of psychological distress in Higher Education students. Therefore, the aims were to analyze the relationships between sleep quality, stress, and the academic adaptation of university students, characterize sleep quality indicators, and analyze mean differences in the factors of the instrument according to demographic variables.

2. Method

2.1 Participants

A total of 489 university students aged between 17 and 56 years ($M=22.46$; $SD=5.648$) participated in this study, of whom 78.1% ($n=382$) were female and 21.9% ($n=107$) male; enrolled in higher education courses of the humanities and social ($n=277$; 56.6%), exact ($n=72$; 14.7%) and biological and health ($n=140$; 28.6%) science areas; in private ($n=127$; 26%) and public ($n=362$; 74%) universities; with the majority residing in a medium-sized city in the state of São Paulo. Regarding the year of the course, 22.5% ($n=110$) were in the first year, 27.8% ($n=136$) in the second year, 21.9% ($n=107$) in the third year, 19.8% ($n=97$) in the fourth year, 7.8% ($n=38$) in the fifth year and one person in the sixth year (0.2%). Regarding professional choice, 57.7% ($n=282$) reported that the course they were

attending had been their first professional choice and 89.4% of them (n=438) were satisfied with the course. Of the sample total, 9.4% (n=46) lived alone, 75.7% (n=370) lived with their families, and 14.9% (n=73) in houses shared by students. This was a convenience sample.

2.2 Instruments

- *Demographic questionnaire* (developed for this study): to collect data regarding sex, age, socioeconomic level, course, and the period of graduation enrolled.
- *Academic Experiences Questionnaire* – short version (Almeida, Soares, & Ferreira, 2002 version adapted by Granado, Santos, Almeida, Soares, & Guisande, 2005): it aims to describe attributes and experiences regarding the entrance of students into the university, their thoughts, and feelings. The instrument consists of five dimensions: personal (14 items; $\alpha=.84$), interpersonal (12 items; $\alpha=.82$), career (12 items; $\alpha=.86$), study (9 items; $\alpha=.78$) and institutional (8 items; $\alpha=.87$), with the items answered on a Likert-type scale ranging from 1 (nothing to do with me) to 5 (everything to do with me).
- *Perceived Stress Scale* (PSS-10) (Cohen & Williamson, 1988 adapted by Dias, Silva, Maroco, & Campos, 2015): it consists of 10 items ($\alpha=.78$) and is intended to efficiently discriminate according to how much the subject evaluates that they lived in an unpredictable, uncontrollable and overloaded way in the month prior to the evaluation. It analyzes the presence of specific agents that would trigger stress, and the physical and psychological symptoms of stress, and a general comprehension of stress unrelated to a cause. The instrument consists of 10 items answered on a Likert-type scale ranging from 1 (Totally disagree/never happens) to 5 (Totally agree/happens very often).
- *Pittsburgh Sleep Quality Index* (PSQI) (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989 adapted by Bertolazi et al., 2011): it assesses an individual's sleep quality based on the month before the study. It uses open-ended questions to qualitatively and quantitatively obtain information through 19 self-report questions, which form a set of seven components ($\alpha=.73$). These components assess subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disorders, use of sleep medication, and daytime dysfunction, according to a 0-3 weight scale. The scores for these

components are added together to establish an overall score, ranging from 0 to 21. The higher the score, the lower the subject's sleep quality.

2.3 Procedures

The study was approved by the Research Ethics Committee of the University of Western São Paulo (CAAE 08029119.8.0000.5515) and complied with Resolutions 446/12 and 510/16 of the National Health Council. The collection protocol was designed on the Google Forms platform and contained the consent form, demographic questionnaire, Academic Experiences Questionnaire (reduced version), PSS-10, and the PSQI. The protocol access link was disclosed on online social networks and through the institutional e-mail available on the educational institutions' platforms. Only participants that agreed with the consent terms had access to the instruments. The collection took place between March and July 2019.

2.4 Data Analysis

Analyses were performed using the SPSS software (version 23), with descriptive statistics used to characterize the sample and frequency of sleep disorders and the use of inferential statistics. Student's t-test (with simple sampling) was used to compare the means in the instruments as a function of gender, type of institution, and satisfaction with the course; and analysis of variance (ANOVA) with Tukey's *post hoc* test for the year of graduation and course area variables. To assess the associations between the constructs, Pearson's correlation was performed between the instruments' components; and the coefficients were interpreted based on the criteria of Duffy, McLean, and Monshipouri (2011).

3. Results

Initially, the aim was to characterize the frequency of the sleep-related indicators according to all dimensions of the Pittsburg Sleep Quality Index. The distribution of participants was analyzed in relation to the levels of each component, as well as the final classification of sleep disorders. The results are presented in Figure 3.1.

Figure 3.1. Sleep-related indicators.

Component	Classification	F	%
Subjective sleep quality	Very good	46	9.4
	Good	175	35.8
	Poor	225	46.0
	Very poor	43	8.8
Sleep latency	Very good	79	16.2
	Good	142	29.0
	Poor	169	34.6
	Very poor	99	20.2
Sleep duration	Very good (>7 hours)	203	41.5
	Good (6 to 7 hours)	163	33.3
	Poor (5 to 6 hours)	87	17.8
	Very poor (<5 hours)	36	7.4
Habitual sleep efficiency	Very good	283	57.9
	Good	53	10.8
	Poor	22	4.5
	Very poor	131	26.8
Sleep disorders	Very good	12	2.5
	Good	218	44.6
	Poor	216	44.2
	Very poor	43	8.8
Use of sleeping medication in the week	Not once	389	79.6
	Less than once	34	7.0
	1 to 2 times	31	6.3
	3 times or more	35	7.2
Dysfunction during the day	None	40	8.2
	Slight	175	35.8
	Moderate	186	38
	A lot	88	18
General classification	Good	18	3.7
	Poor	354	72.4
	Presence of disorder	117	23.9

Regarding the subjective sleep quality, more than half of the participants indicated that the quality of sleep was poor or very poor, as well as scored poor or very poor in relation to sleep latency, an aspect that indicates that the students take more than an hour to get to sleep after going to bed at a frequency of 3 or more times a week. With regard to the number of hours slept, 74.8% reported sleeping six hours or more, while 25.2% reported sleeping five hours or less. Sleep efficiency was high for most participants, while the presence of disturbances (waking up during sleep, snoring, coughing, among others) affected 53.0% of the respondents.

It was also observed that the use of medication to sleep was a practice performed by a small portion of the participants and that 18.0% reported much difficulty in staying awake during the day while performing other tasks (dysfunctions during the day). Finally, most participants had a poor classification in relation to the general quality of sleep (72.4%), with the possible presence of sleep disorders being observed in 23.9% of the sample. When analyzing the prevalence of disorders in relation to the course areas, it was found that 27.4% (n=76) of the students in the Humanities and Social, 11.8% (n=8) in Exact and 23.6% (n=33) in Biological and Health sciences achieved scores indicative of a possible classification of sleep-related disorders.

Subsequently, comparisons of means were performed as a function of the demographic variables. Considering gender, in a statistically significant way, the women presented higher means when compared to the men in the Habitual sleep efficiency ($t=2.405$; $p<.05$), Sleep disorders ($t=3.980$; $p<.001$), General PSQI classification ($t=2.929$; $p<.05$), Personal adaptation ($t=2.069$; $p<.05$) and General stress factor ($t=3.940$; $p<.001$) components. When analyzing the type of university, the students from public institutions presented higher means in Dysfunction during the day ($t=2.169$; $p<.05$) and Personal adaptation ($t=3.198$; $p<.05$), while the students from private institutions obtained higher means in Institutional adaptation ($t=-6.108$; $p<.001$).

When analyzing differences in the means as a function of the first choice, of course, it was observed that those respondents that said the course they were taking was not their first choice presented higher means in Personal adaptation ($t=-4.246$; $p<.001$), while those that were in their first choice presented higher means in Career adaptation ($t=6.527$; $p<.001$). With regard to satisfaction with the

course, the satisfied students had significantly higher means in Subjective Sleep Quality ($t=1.983$; $p<.05$), Personal adaptation ($t=-24.246$; $p<.001$), Interpersonal adaptation ($t=3.596$; $p<.001$), Career adaptation ($t=6.527$; $p<.001$), Study adaptation ($t=2.405$; $p<.05$), and Institutional adaptation ($t=2.405$; $p<.05$), while those that were not satisfied had higher means in Sleep Duration ($t=-2.576$; $p<.05$), PSQI General Classification ($t=-2.234$; $p<.05$), and General Stress Factor ($t= -4.673$; $p<.001$). Subsequently, comparisons of means were performed according to the year and areas of the courses through ANOVA with Tukey's *post hoc* test, and the statistically significant results are shown in Figure 3.2.

Figure 3.2. Comparisons of means according to the year and area of the course.

Variable	df	F	P	Category	Subsets	
					1	2
Sleep duration	3	3.027	.02	1 st year	0.68	
				3 rd year	0.93	0.93
				2 nd year	0.98	0.98
				4 th year		1.01
Dysfunction during the day	3	4.009	.00	1 st year	1.43	
				4 th year	1.65	1.65
				2 nd year		1.76
				3 rd year		1.78
PSQI general factor	3	3.200	.02	1 st year	8.01	
				2 nd year	8.87	8.87
				4 th year		8.92
				3 rd year		8.93
Personal adaptation	3	6.811	.00	1 st year	41.97	
				4 th year	44.64	44.64
				2 nd year		47.25
				3 rd year		47.48

continues

Figure 3.2. Comparisons of means according to the year and area of the course.

Variable	df	F	P	Category	Subsets	
					1	2
Study adaptation	3	4.553	.00	4 th year	28.19	
				3 rd year	29.34	29.34
				2 nd year	29.81	29.81
				1 st year		31.25
Institutional Adaptation	3	2.545	.05	4 th year	29.01	
				3 rd year	29.45	
				1 st year	29.81	
				2 nd year	30.30	
General stress factor	3	6.830	.00	1 st year	30.60	
				4 th year	31.85	31.85
				3 rd year		33.20
				2 nd year		33.28
Habitual sleep efficiency	2	3.403	.03	Exact	0.69	
				Biological and health	0.91	0.91
				Human and social		1.12
PSQI general factor	2	2.976	.05	Exact	7.97	
				Human and social		8.82
				Biological and health		8.84
Personal adaptation	2	4.176	.01	Human and social	44.26	
				Exact	45.28	
				Biological and health	47.53	
Study adaptation	2	2.879	.05	Exact	28.50	
				Biological and health	28.91	
				Human and social	30.20	

Considering that higher scores in the PSQI equate to worse sleep quality indicators, first-year students presented the lowest scores, differing from the others, indicating that they had longer sleep duration when compared to students from the fourth year who typically slept less than five hours a night and had the

highest rates of daytime disturbances and overall PSQI score. The Human and Social Sciences students presented lower habitual sleep efficiency, and the Biological and Health Sciences students obtained the worst global classifications in the PSQI.

From the scores in the QVA-r (*Questionário de Vivências Acadêmicas*), the 3rd year and Biological and Health Sciences students had the highest scores in Academic Adaptation, with the 1st year students indicating greater difficulty in this dimension. Study adaptation was more endorsed by students of the Humanities and Social Sciences and 1st year students, differing from those that were in the 4th year. Regarding stress, the 1st year students presented the lowest means, with an increase in the scores over the years. Finally, Pearson's correlation analysis was performed between the instrument factors, and the results are shown in Figure 3.3.

Figure 3.3. Pearson's correlations between the instrument factors.

	Personal QVA-r	Interpersonal QVA-r	Career QVA-r	Study QVA-r	Institutional QVA-r	General stress factor (PSS)
Subjective sleep quality	-.30**	.04	.08	.18**	.07	-.39**
Sleep latency	.22**	.00	-.06	-.09*	-.11*	.24**
Sleep duration	.13**	-.08	-.06	-.18**	-.02	.19**
Habitual sleep efficiency	.02	-.05	-.02	.00	-.02	-.02
Sleep disorders	.34**	-.07	-.11**	-.21**	-.07	.32**
Use of sleeping medication	.18**	.07	-.01	.01	.01	.16**
Dysfunction during the day	.47	-.07	-.18**	-.32**	-.12**	.49**
Overall classification (PSQI)	.35**	-.06	-.12**	-.19**	-.09*	.32**
General stress factor (PSS)	.70**	-.13**	-.22**	-.33**	-.17**	1

Note: * $p < .05$; ** $p < .001$

Except for the Interpersonal adaptation dimension, all others presented statistically significant correlations with the sleep quality components, most being negative and magnitudes ranging from weak to moderate. Regarding Personal

adaptation, the more it increased, the lower the rates of sleep disturbances (snoring, waking during the night, among others) and the lower the scores in the general score of the PSQI. Study adaptation, Career adaptation, and Institutional adaptation had higher correlations with dysfunctions during the day, indicating that the difficulties in staying awake during the day were greater when these factors increased.

Stress was significantly correlated with all the dimensions of adaptation. Except for the Personal dimension, all correlations were negative, indicating that the greater the adaptation, the lower the perception of stress. The correlations between the general stress factor and sleep quality components were significant, and the associations were all positive.

4. Discussion

The correlations between the factors of the instruments showed that the less adapted the students were, the higher the stress levels. These data indicate the importance of developing strategies to integrate the student into the academic environment as a means of contributing to the learning process and to better levels of mental health (Padovani et al., 2014). Accordingly, the social support network (family, friends, and institutional) can be an important basis for strengthening the positive aspects of adaptation and performance throughout the course, as well as for reducing stress (Pascoe, Hetrick, & Parker, 2019).

Regarding the correlations between academic adaptation and sleep quality, longer sleep duration was related to greater Personal adaptation and less Study adaptation. Therefore, it is crucial to consider that oversleeping is also not healthy for individuals (Felden et al., 2015) and can harm students' organization of their study routines. In addition, the data indicated that adequate Career and Study adaptation were correlated with fewer dysfunctions during the day, reinforcing the importance of career planning actions, conscious course choice, management of the academic routine, and adequate sleep in order to increase the motivation and involvement with the university demands (Ambiel & Barros, 2018; Barros et al., 2019).

Regarding stress and sleep quality, it was observed that lower sleep quality indices equated to higher stress levels. Considering that the academic environment by itself already presents a series of stressors (Almeida & Castro, 2016), if the student has problems with sleep, there may be an intensification in the perception

of the stressors and in the coping actions, demanding greater physical and psychological efforts (Madzhie, 2017) and impairing academic performance and adaptation. Therefore, considering that sleep quality directly affects the health of individuals much more than the number of hours slept (Wallace, Boynton, & Lytle, 2017), interventional actions are important for better sleep management in order to prevent high levels of stress and possible consequences in psychological disorders or physical illnesses.

When analyzing the mean differences in the academic adaptation factors, it was observed that the Personal Adaptation factor was the one that most differentiated the participants, indicating that the perceptions of physical and psychological well-being were higher for women, students taking second choice courses, those in public institutions, satisfied with the course, and in the biological and health sciences areas. Similarly, the satisfaction with the course variable was also the one that most differentiated the participants in terms of adaptation factors, with satisfied students presenting the highest means in all factors compared to the others. This result reinforces the results highlighted by Ambiel and Barros (2018) that satisfaction directly influences adaptation and constitutes an important variable to be considered in the school-university transition and throughout the graduation course.

Considering the indicators related to sleep, it was observed that, although most participants reported adequate sleep duration and efficiency without the use of sleep-inducing medication, sleeping more than 6 hours a day, most also identified the subjective sleep quality as poor or very poor (54.8%), causing daytime dysfunctions (56.0%), having an overall classification as very poor (72.4%) and presenting possible sleep-related disorders (23.9%). These results are similar to previous studies that identified a low perception of subjective sleep quality in the university student population (Araújo et al., 2013; Carone et al., 2020).

These findings require attention and indicate the importance of clinical investigations in this population since dissatisfaction with sleep can be a better indicator of pathologies than insomnia itself (APA, 2014). Furthermore, the general sleep quality indicator was worse for women, students dissatisfied with the course, students enrolled in the 3rd year, and in biological and health sciences. The data suggest that, within the university population, there are groups that appear to demonstrate greater risks for the presence of sleep disorders and that would benefit

from interventions to develop better sleep hygiene practices. Interventions can reduce the negative impacts of inadequate sleep on academic development and individuals' health aspects (Baraldi et al., 2015).

Regarding the assessment of stress, it was observed that female participants, students dissatisfied with the course, and students in the 2nd year presented higher means when compared to the others. Concerning gender and dissatisfaction with the course, these results may be associated with poor sleep quality, considering that women and dissatisfied students also had worse overall indices in the PSQI. Accordingly, in addition to good sleep hygiene (Baraldi et al., 2015) for better levels of well-being, other issues can contribute to reducing stress, such as adequate career planning in order to construct an academic trajectory and satisfactory employment (Ambiel & Barros, 2018). Also, changes in the environment can reduce psychosocial stressors that affect specific groups such as women and students starting the courses (Leonard et al., 2015).

5. Final considerations

Considering the impact of sleep quality on levels of physical and mental health, as well as on the learning and adaptation process of university students (Barros et al., 2019), this study aimed to analyze the relationship between sleep quality, stress, and academic adaptation and to verify the specificities regarding sleep quality and differences in the means of the instruments' factors according to demographic variables. Stress and sleep quality were negatively correlated with academic adaptation, with better-adapted university students presenting lower stress and better sleep quality indices. These findings are significant, as they can influence aspects such as academic performance, integration and satisfaction with the course, the institution, and colleagues.

In this study, it was possible to identify groups that showed worse indicators in relation to sleep and stress, with female participants, students dissatisfied with the course, and students in an earlier period of the graduation course (up to the 3rd year) presenting greater impairments in the overall quality of sleep and higher levels of stress. Dissatisfied students also had lower means in adaptation, and women presented greater adaptation only in relation to the personal dimension. The results can contribute to the development of specific actions in higher education institutions, aiming to integrate the student, provide adequate support for

problem-solving, and identify students at greater risk of developing illnesses or inefficient adaptation and that may potentially drop out of the system.

The comprehension and identification of stress symptoms and poor sleep quality among university students can contribute to the prevention and adequate treatment of symptoms while simultaneously facilitating the academic adaptation process. Based on these results, the importance of working on the development of positive emotional aspects in university students should be considered, as their potentization could also favor academic adaptation processes. The promotion of mental health in higher education institutions contributes to better engagement and academic development of young people and adults. Following this premise, it is recommended that future studies could investigate interventional models that enable the development and maintenance of actions that promote well-being in higher education. Furthermore, to overcome the limitations of this study, it is suggested that studies be carried out, with a more representative sample of the Brazilian diversity, and investigations with qualitative methodologies with a clinical approach to the phenomena be analyzed.

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