Revista O Mundo da Saúde

Sleep quality and anxiety levels among university students

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Abstract

The present article seeks to describe the quality of sleep and excessive daytime sleepiness of university students and to verify the levels of trait anxiety (A-Trait) and state anxiety (A-State) presented by them. A sample, composed of undergraduate students from daytime courses, responded to an online form, containing the following questionnaires: Sociodemographic; Epworth Sleepiness Scale; Pittsburgh Sleep Quality Index; and State-Trait Anxiety Inventory. A descriptive analysis of the data was then performed. The mean age of the 305 participants was 22 ± 2.99 years, 51.37% were female, 98.03% were non-smokers, 52.8% consumed alcohol, and 54.1% practiced physical activity. The majority demonstrated an absence of excessive daytime sleepiness (62.3%), poor sleep quality (72.4%), and moderate levels of A-Trait (56.4%) and A-State (47.2%). The main findings of this study reveal that the volunteers have poor sleep quality with a moderate level of state-trait anxiety. The results also indicate that the profile of the students who answered the questionnaire was composed of young adults who did not have an employment relationship and were single. There was poor sleep quality among university students. In addition, state trait anxiety scores were at moderate levels.

Keywords: Sleep. Sleep Deprivation. Sleep Disorders from Excessive Sleepiness. Students. Anxiety.

INTRODUCTION

A growing part of the adult population has reduced the amount of hours of sleep. This reduction in hours of sleep can be due to changes in lifestyle, an increase in working hours and an increase in the presence of new communication technologies, such as the excessive use of cell phones and computers, representing a major threat to health with several harmful effects[1].

University students are among the individuals who have significant changes in sleep. This is partly due to high academic pressure, stress from studying and other curricular activities, in addition to the daily tasks of life[2,3]. Furthermore, during graduation, most university students have some type of psychiatric disorder, with depression and anxiety increasing, and most of them do not seek treatment[4].

Several endogenous and exogenous factors can alter the sleep-wake cycle. Among the endogenous factors, there are, for example, disorders related to depression and anxiety[5], as well as pain processes[6]. On the other hand, stressful situations to which the indivi-

DOI: 10.15343/0104-7809.202246247254

dual is submitted are considered exogenous factors[5,6].

Anxiety, in turn, would be the unpleasant emotional state or condition, including the experiential, physiological, and behavioral components, resulting from a situation of danger[7]. The Anxiety State (A-state) is a temporary and conscious emotional condition of tension and apprehension. The Anxiety Trait (A-trait) is defined individually, when each individual has a different reaction to a certain circumstance that threatens their integrity[8].

From the points discussed, the questions arise concerning the characteristics of anxiety in university students and how their sleep quality is. Although the literature has already addressed this issue, specific areas are highlighted[9–13]. Thus, expanding the observations to a greater number of courses and student profiles may, consequently, expand the actions to a greater number of university students.

Given the demands that university students face, the present article seeks to verify the levels of state-trait anxiety presented by them, in addition to describing the quality of sleep and excessive daytime sleepiness.

MATERIALS AND METHODS

This study was approved by the Research Ethics Committee of the State University of Southwest Bahia (Brazil), with its decision registered under number 513.572 and all participants signed the Informed Consent Form.

Students were invited to carry out the survey in the classroom and when they signed the Informed Consent Form (ICF), the link to the online form (Google Forms) was sent by email to all students actively enrolled at the educational institution. If the participant did not respond to the form within five days, a new message was sent, repeating the process for a maximum of three times.

This is a descriptive study, with a sample of university students from a public university in the interior of the state of Bahia (Brazil), of both sexes, aged 18 years or over, and enrolled in daytime courses in: Biological Sciences, Nursing, Pharmacy, Literature, Theater, Dance, Dentistry, Physiotherapy, Information Systems, Physical Education, and Medicine.

The online form was divided into three blocks. The first one with questions related to sociodemographic characteristics. The second consisted of the Epworth Sleepiness Scale (ESS)[14,15], with eight questions scored from 0 to 3 points, totaling 24 points. Individuals with a result above 10 points on this scale are considered to have Excessive Daytime Sleepiness. Also in this block was the State-Trait Anxiety Inventory (STAI)[8], which is a self-administered form, in which each item has scores ranging from 1 ("almost never") to 4 ("almost always"). The sum of the scores on this form varies from 20 to 80 for each scale[11]. An anxiety assessment gradient is considered, which is established at 4 levels for the scores obtained: low anxiety level (20 to 34); moderate level (35 to 49); high (50 to 64); and very high (65 to 80)[16].

In the third block, the Pittsburgh Sleep Quality Index (PSQI)[17] which assesses sleep quality in the last month was applied. It has nineteen questions, grouped into seven components (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disorders, use of sleeping medication, and daytime dysfunction), with weights distributed from 0 to 3. The score of the 7 components is then added to produce a global score, which varies from 0 to 21, where: from zero to four

is translated as good sleep quality; from five to ten as poor quality; greater than ten as a sleeping disorder.

Data were analyzed using descriptive statistics and are presented as mean and standard deviation, as well as relative and absolute frequencies were obtained for descriptive purposes.

RESULTS

A total of 305 university students participated in the study, with a mean age of 22 ± 2.99 years. Most participants were single, unpaid and non-smokers (Table 1). University students reported an average sleep time of 6 hours and 12 minutes ± 1 hour and 14 minutes.

Regarding sleep quality, the global average obtained by the PSQI assessment was 7 (±2.6) points. The Epworth sleepiness scale revealed the absence of excessive daytime sleepiness, with a percentage of 62.3%. Through the STAI scores, it was observed that the global mean of A-State scores was 38.7 (±10.3), while the overall mean of A-Trait scores was 41.9 (±9.3), both indicating moderate levels of anxiety. Table 2 describes in detail the results found in each questionnaire.

Table 1 – Sociodemographic data of participating university students.

Variables	n	%
Sex		
Female	157	51.5
Male	148	48.5
Marital status		
Single	288	94.5
Married	15	4.9
Widower	01	0.3
Divorced	01	0.3
Paid Occupation		
Yes	59	19.4
No	246	80.6
Cigarette consumption		
Does not consume	299	98.1
Consumes	06	1.9
Alcohol consumption		
Does not consume	144	47.2
Consumes	161	52.8
Practice of physical activity		
Practices	165	54.1
Does not practice	140	45.9

Source: survey data. Jequié, Bahia, Brazil, 2022.

Table 2 – Distribution of individuals according to sleepiness, sleep, trait-anxiety and state-anxiety characteristics.

Variables	n	%
ESS		
Absence of sleepiness	190	62.3
Light sleepiness	106	34.7
Moderate sleepiness	8	2.7
Severe sleepiness	1	0.3
PSQI		
Bad	221	72.5
Good	50	16.4
Sleeping disorder	34	11.1
STAI (A-Trait)		
Moderate	172	56.4
Low	71	23.3
Elevated	57	18.7
High	5	1.6
STAI (A-State)		
Moderate	144	47.2
Low	116	38
Elevated	40	13.1
High	5	1.7

Source: survey data. Jequié, Bahia, Brazil, 2022.
ESS: Epworth Sleepiness Scale; PSQI: Pittsburgh Sleep Quality Index; STAI: State-Trait Anxiety Inventory; A-Trait: Anxiety-Trait; A-State: Anxiety-State.

DISCUSSION

The main findings of this study reveal that the volunteers have poor sleep quality with a moderate level of trait and state anxiety. The results also showed that the profile of students who answered the questionnaires was composed of young people who are not currently employed and are single. The Pittsburgh Sleep Quality Index was mostly poor in a well-distributed sample between males and females. As for the Epworth Sleepiness Scale, most of the sample did not experience excessive daytime sleepiness.

These findings corroborate with several studies[18-21]. Although in our analysis we did not compare a group of women with that of men, it can be observed that both have poor sleep scores. Among the main factors associated with poor sleep quality in university students are: not having breakfast, internet addiction, poor social support[6], living away from the family[22], perceived stress, and having classes early in the morning[23]. Moreover, the restriction of hours of sleep can lead to cognitive changes and an increase in symptoms of stress and anxiety[24].

On the other hand, the results of this study were contrary to those of another study[24] in which it was found that even with changes in life habits and the use of technologies, students of the physical therapy and medicine courses did not present problems with regards to quality of sleep and hours of sleep per night. However, a study carried out in Kuwait[25] found similar data to the present study, with a PSQI lower than 7. This suggests that the reduction in sleep quality is a global phenomenon among young adults.

Daytime students had a very diverse schedule of classes, within a period of 7:30 am to 6:00 pm, a fact that forces them to adapt to meet academic demands, changing their own routine and their sleep-wake cycle. A study[26] observed that medical students have poor sleep quality and have stress, as they have a reduced sleeping period, compensated with extra hours of studying, especially during exams. It is recommended that universities develop sleep education programs with intervention and prevention strategies helping students to adopt practices that improve sleep quality as well as academic performance.

Although sleep education for university students is still a poorly studied subject, it has been recommended[25.] It is observed that sleep hygiene should already be introduced to children and adolescents, since a reduction in sleep time and the emergence of sleeping disorders since childhood have been observed[27]. The association between sleep-related problems and academic performance has also been identified[27].

On the other hand, one of the consequences of sleep deprivation is excessive daytime sleepiness. A plausible hypothesis for our findings on the absence of excessive daytime sleepiness is the fact that, possibly, the students who participated in the study had already adapted to the routine of waking up early in the morning and were able to stay alert during the day. Another factor that could influence the absence of excessive daytime sleepiness is that, although the day shift refers to the entire day, students do not necessarily have classes throughout this period. Therefore, there may be breaks during the day that would allow them to take a daytime nap. Another example of this type of compensation is social "jet lag", that is, sleep deprivation during school days and increased sleep time during free days[28]. This behavior is observed among university students.

Students are very interested in the subject

of "sleep"; however, ignoring the implications for sleep hygiene and the behaviors used to improve sleep quality, they adopt habits that compromise the quality of sleep itself[19–24,27]. Furthermore, poor sleep quality is often related to interpersonal stress, and is characterized by negative experiences in social life. It may, thus, appear in situations where the individual places a high degree of importance on relationships and also to prevent them from being rejected, which increases the risks of developing anxiety, depression, and low self-esteem[21]. The most alarming factor is that individuals themselves often do not realize that they have poor sleep[29].

Both the trait and the state of anxiety of the students participating in the study were found to be at a moderate level. However, trait anxiety approached higher levels, while state anxiety approached lower levels. These results may suggest that despite the demands currently found regarding professional career development, the level of anxiety of individuals is more correlated to the individual than to the demands of the university. Despite presenting anxiety as a trait of their own personality, at the time they were answering the questionnaire, they did not display anxious characteristics.

Most of the participants involved in this study are from courses within the biomedical field, an area that, in the studies, presents higher scores compared to other areas, due to the high demands required for these individuals[30,31]. This question, together with the high score of poor sleep quality, may suggest why both scores (trait and state) are at moderate levels.

According to data from the World Health Organization (WHO)[32], depression and anxiety are the psychiatric diseases that most affect the world population. Brazil is in the ranking with the highest prevalence of people with anxiety disorders and ranks fifth in depression rates. The estimated number of the population living with anxiety disorder is 264 million people worldwide, with a greater predominance of females. This figure in 2015 reflects an increase of 14.9% since 2005[32].

In a study[33] they observed that the academic environment has registered a high number of students with anxiety disorders, with the outstanding example of Social Anxiety Disorder (SAD) and Generalized Anxiety Disorder (GAD). That is why the mental health of this group has become the target of specialists, as well as society in general, since their emotional suffering impacts their own lives and also those of people in their social groups. This happens mainly with Health Sciences students, who are often not prepared to deal with their own mental health during their undergraduate period and, therefore, are subject to the development of anxiety disorders. Other studies[34,35] have pointed to the fact that university students are exposed to stressful situations such as tension when dealing with tests and grades, heavy academic workload, lack of free time, a high degree of competitiveness, financial difficulties, pressure from professors or of their parents, and concern for the future. All these factors end up being harmful to their quality of life and, consequently, the main triggers of anxiety in this population group.

In recently published studies[36,37], the authors observed that poor sleep quality and anxiety feed into each other. Although these two situations collectively directly impair academic performance, their implications for the student's general health draw considerable attention. In our study, moderate values of anxiety and poor sleep quality were observed, which corroborates the relationship between these variables already found in research[37].

Some limitations of this study can be found in the fact that no investigation was carried out on the exact period of the possible daytime interval in which students can nap, in order to confirm whether or not there is

a relationship between the arguments presented above about the high number of individuals who did not experience excessive daytime sleepiness. Another limiting factor is the heterogeneity of the courses that the study used to collect the data, taking into account mainly the fact that there are courses where the student attends classes in a single period, such as the Information Systems course, which had the results compared to those of the Biomedical area, which is comprised of fulltime periods, may have interfered with the results. However, this heterogeneity shows us an overview of the academic environment.

CONCLUSION

University students had poor sleep quality, elevated trait and state anxiety symptoms, indicating a possible correlation/association between them, despite not having excessive daytime sleepiness.

Currently, a high number of mental disorders and sleep disorders have been identified in young adults who will soon enter the job market. Calling students' attention to the panorama presented by them, carrying out interventions in faculties such as guidance on sleep, the importance of scheduled naps, living spaces, lectures, and educational programs focused on the topic should be encouraged in the academic environment.

FUNDING: Scientific Initiation Scholarship funded by the State University of Southwest Bahia.

CRediT author statement

Conceptualization: Pithon, KR; Barreto, DM. Methodology: Pithon, KR; Barreto, DM. Validation: Silva, DN; Lima, AD; Pithon, KR; Barreto, DM. Statistical analysis: Lima, AD. Formal analysis: Silva, DN; Lima, AD; Santos, LA; Pithon, KR; Barreto, DM. Investigation: Silva, DN; Lima, AD; Santos, LA. Resources: Silva, DN; Lima, AD; Santos, LA; Pithon, KR; Barreto, DM. Writing-original draft preparation: Silva, DN; Lima, AD; Pithon, KR; Barreto, DM. Writing-review and editing: Silva, DN; Pithon, KR. Visualization: Silva, DN; Lima, AD; Santos, LA; Pithon, KR; Barreto, DM. Supervision: Barreto, DM. Project administration: Pithon, KR.

All authors have read and agreed to the published version of the manuscript.

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Submitted: 25 august 2021.
Approved: 15 june 2022.
Published: 10 august 2022.