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ORIGINAL ARTICLE

EVALUATION OF SLEEP QUALITY OF POST-GRADUATION NURSING STUDENTS AVALIAÇÃO DA QUALIDADE DO SONO DE PÓS-GRADUANDOS DE ENFERMAGEM EVALUACIÓN DE LA CALIDAD DEL SUEÑO DE POST-GRADUANDOS DE ENFERMERÍA

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ABSTRACT

Objective: to evaluate the duration and quality of sleep of post-graduate nurses (Masters and Doctorate students). **Method:** this is a quantitative, descriptive, observational and analytical study with a convenience sample of 32 students who completed the Pittsburgh Sleep Quality Index (PSQI), and the Epworth Sleepiness Scale (ESS), evaluating the activity and wakefulness by the actigraphy. The Wilcoxon test and the Student's Ttest were performed to verify if there were differences among sleep quality, levels of excessive drowsiness and measures of the actigraph. It was analyzed the significant differences of the qualitative variables by the Chi-square test and presented the results in the form of tables. **Results:** sleep disorders (PSQI> 5) were present in 68.75% of the participants. The total time of sleep was 368.8 minutes, being lower in those who drank alcoholic beverages (p = 0.01). **Conclusion:** post-graduate students should be educated about the importance of adequate sleep duration for prevention of future problems. **Descriptors:** Sleep; Nursing Students; Circadian Rhythm Sleep Disorders; Actigraphy; Sleep Initiation and Maintenance Disorders; Nursing.

RESUMO

Objetivo: avaliar a qualidade e a duração do sono de enfermeiros pós-graduandos de mestrado e doutorado. *Método*: trata-se de um estudo quantitativo, descritivo, de natureza observacional e analítica, com amostra constituída por conveniência, com 32 estudantes que preencheram o questionário Índice de Qualidade do Sono de Pittsburgh (PSQI), a escala de Sonolência de Epworth (ESE), avaliando-se a atividade e a vigília pela actigrafia. Realizou-se o Teste t e de Wilcoxon para verificar se existiam diferenças entre a qualidade de sono, os níveis de sonolência excessiva e as medidas do actígrafo. Analisaram-se as diferenças significativas das variáveis qualitativas pelo teste Qui-quadrado e apresentaram-se os resultados em forma de tabelas. *Resultados*: exibiram-se, por 68,75% dos participantes, distúrbios do sono (PSQI> 5). Constatou-se o tempo total de sono com média de 368,8 minutos, sendo menor em quem faz uso de álcool (p=0.01). *Conclusão*: devem-se educar, a partir disso, os pós-graduandos sobre a importância da duração adequada do sono para a prevenção de riscos. *Descritores*: Sono; Estudantes de Enfermagem; Transtornos do Sono-Vigília; Actigrafia; Distúrbios do Início e da Manutenção do Sono; Enfermagem.

RESUMEN

Objetivo: evaluar la calidad y la duración del sueño de enfermeros post graduados de maestría y doctorado. **Método:** es un estudio cuantitativo, descriptivo, de naturaleza observacional y analítica, con muestra constituida por conveniencia, con 32 estudiantes que llenaron el cuestionario Índice de Calidad del Sueño de Pittsburgh (PSQI), la escala de Sonolencia de Epworth (ESE), evaluándose la actividad y la vigilia por la actigrafía. Se realizó la prueba t y de Wilcoxon para verificar si existían diferencias entre la calidad del sueño, los niveles de somnolencia excesiva y las medidas del actígrafo. Se analizaron las diferencias significativas de las variables cualitativas por el test Chi-cuadrado y se presentaron los resultados en forma de tablas. **Resultados:** se exhibieron, por el 68,75% de los participantes, disturbios del sueño (PSQI> 5). Se constató **el** tiempo total de sueño con promedio de 368,8 minutos, siendo menor en quien hace uso de alcohol (p = 0.01). **Conclusión:** se debe educar, a partir de eso, a los postgraduados sobre la importancia de la duración adecuada del sueño para la prevención de riesgos. **Descriptores:** Sueño; Estudiantes de Enfermería; Trastornos del Sueño-Vigilia; actigrafía; Trastornos del Inicio y del mantenimiento del sueño; Enfermería. **Descritores:** Sueño; Estudiantes de Enfermería; Trastornos del Sueño-Vigilia; Actigrafía; Trastornos del Inicio y del Mantenimiento del Sueño; Enfermería.

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INTRODUCTION

Sleep is considered fundamental for the human being, since it has the functions of restoring, conserving energy and protecting the immunological system. It may also be defined as a set of behavioral and physiological changes that occur together and in association with characteristic cerebral electrical activities.¹

The period of drowsiness and wakefulness circadian endogenous "clocks" by controlled2, the circadian rhythm being constituted by 24 hours that coordinate the internal time according to the influences of the external world - like light and dark - being its behavior generated bv molecular endogenous clocks and its interruption has important consequences for health, leading not only to cognitive deficits but also to the metabolic syndrome and to psychiatric diseases.2-3

It has been shown in studies that ruptures of this rhythm and/or poor sleep quality are associated with the derangement of some physiological functions. It is explained that, although sleep quality is considered a highly subjective issue, varying from individual to individual, some aspects can be measured quantitatively, as is the case of duration, sleep latency and the number of awakenings.⁴

It is common sense that university students are particularly vulnerable to sleep disorders due to multiple environmental factors that can directly influence their sleep-wake behavior, such as: many academic demands, economic stresses, and increasing hours of work and/or time spent in extracurricular activities.⁴

In recent years, the importance of sleeping for memory consolidation has been demonstrated, and how sleep deprivation can have negative consequences for both memory and cognitive function and for the health of university students.⁵

Plus, a study with Brazilian university students had almost all of their sample classified as "bad sleepers", mostly due to behaviors adopted by university some students, such as irregular scheduling of sleeping hours, prolonged naps during the day, alcohol use before bedtime and study in bed;6 all habits that are common among college students and that make them vulnerable to rupture of the circadian cycle deterioration of sleep quality.6

This problem is even more serious among health workers, whose activity is naturally stressful, which favors the increase in the Evaluation of sleep quality of post-graduation...

occurrence of changes in sleep quality,⁵⁻⁷ and this can be attributed to the fact that they perform activities that require attention and often involve activities with high level of difficulty and responsibility; besides having a fast pace at work and excessive and consecutive hours of work and shift work.⁷⁻⁸ In this group, a frequency of sleep quality deficiency of 65.1% was identified, associated to shift work, age, with an age group of 40 years and the gender, with predominance of women in the field of health.⁸

Therefore, it feels timely to bring to scientific discourse the importance of sleep-wake patterns appropriate to the improvement of the health and academic performance of professional nurses so that, through them, they offer the professionals' quality of life and better care for patients cared for by them. Thus, the question of this research was raised: "What is the standard of quality and sleep duration of nursing undergraduate students?".

Then, it was set as an objective to evaluate the quality and duration of sleep of postgraduate nurses of masters and doctorates.

OBJECTIVE

• To evaluate the quality and duration of sleep of nurses who are postgraduate students in masters and doctorates.

METHOD

This is a study of an observational and analytical nature, with a quantitative approach. The sample of this research was selected by convenience, because of the conditions that facilitated the speed in obtaining the data and the amount of available actigraphs. There were attempts to obtain, despite not using statistical criteria, greater diversification when approaching postgraduate students of both master's and doctoral courses, regardless of the period, without prior scheduling day or time.

A federal university located in the State of Rio de Janeiro was selected as the research field. The collection of data was from May to August 2017. The inclusion criteria for the research was the following: to be duly enrolled in the Stricto sensu postgraduate course (Masters or Doctorate) in Nursing. Those who dropped out of the course during the research were excluded. The eligible participants included 142 students in the Stricto sensu postgraduate course in Nursing, and of these 32 postgraduate students were part of the sample study.

Instruments

The following instruments were used for data collection:

- Form containing the following information: gender, age, BMI, postgraduate course period, marital status, whether he/she works concurrently with the postgraduate course, how many work hours, weekly hours and drinks this person has;
- Pittsburgh Sleep Quality Index (PSQI), that was already tested and validated in Brazil⁹, to evaluate sleep quality in the last month based on issues that include seven components: subjective sleep quality; sleep latency; duration of sleep; habitual sleep efficiency; sleep disturbances; the use of sleeping medication; daytime sleepiness; and disorders during the day. The instrument has a maximum score of 21 points, where scores higher than five points are classified as poor sleep quality;⁹
- Epworth Sleepiness Scale (ESS): evaluates excessive daytime sleepiness (EDS), which was created in 1990¹⁰ and translated and validated for use in Brazil by some authors.¹¹ The scale questions include the possibility of sleeping in eight different situations that vary according to activity and environment, and the score is the sum of the eight items and ranges from zero to 24, a score below ten means "no drowsiness" and above ten is considered pathological;¹¹
- Actigraph: instrument used for accurate sleep analysis, it is similar to a wristwatch that records activity and rest; and is able to detect small interruptions of sleep that are often not perceived.¹²

In this study, the motor activity of the student was recorded for 24 hours, with a one-minute interval between the registers. The subjects used the actigraph on the nondominant arm and they were instructed to keep the device on the wrist even during bathing or other activities in water. As a standard of measurement, ActTrust actigraphs of the Condor Instrument brand were chosen. The data were extracted, exported and analyzed by the actStudio software. The following variables were evaluated through the actigraph: subjective sleep latency (the time the student took to fall asleep); WASO (wake after sleep onset - time agreed in minutes after initiating nocturnal sleep); total sleep time in minutes (TTSNM); sleep efficiency (percentage of time sleeping at night until final awakening -% sleep).

The data obtained by the various instruments were typed in an Excel spreadsheet, then analyzed with the help of

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the R commander program, version 3.4.1, with a free license available online.

For the statistical analysis, the Student's T-test and the Wilcoxon test were used in order to evaluate if there were significant differences between sleep quality scores, excessive drowsiness and the measures of the actigraph. The chi-square test was used to search for significant differences among the qualitative variables obtained from the Pittsburgh Sleep Quality Index. The value of p <0.05 was considered statistically significant.

The study was approved on April 19, 2017, by the Research Ethics Committee (CEP) of UNIRIO, with the report No. 2,022,926 and the CAAE number: 65395917.0.0000.5285. The requirements contained in Resolution 466/12 were fulfilled to guarantee the willingness and anonymity of the participants.

RESULTS

The study sample was constituted by 32 postgraduate students in masters and doctoral courses, which represents 22.53% of the university. There was a predominance of women (75%), with an average age of 33.5 years for females and 42.8 years for males, and the large majority being married and employed. It can be comproved, in table 1 that the majority is composed of married (46.88%) and workers (81.25%).

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Table 1. Profile of research participants (N=32). Rio de Janeiro (RJ), Brazil, 2017.

N	%	Mean	DP*	Median
24	75 %			
8	25%			
		26,3	4,9	26,2
		27,8	2,8	27,8
18	56,25%			
14	43,75%			
40	24 250/			
	,			
	•			
1	3,12%			
	0.4.050/			
6	18,75%			
15	57 69%			
	-			
	24 8	24 75% 8 25% 18 56,25% 14 43,75% 10 31,25% 15 46,88% 3 9,38% 3 9,38% 1 3,12% 26 81,25% 6 18,75%	24 75% 8 25% 26,3 27,8 18 56,25% 14 43,75% 10 31,25% 15 46,88% 3 9,38% 3 9,38% 1 3,12% 26 81,25% 6 18,75% 15 57,69%	24 75% 8 25% 26,3 4,9 27,8 2,8 18 56,25% 14 43,75% 10 31,25% 15 46,88% 3 9,38% 3 9,38% 1 3,12% 26 81,25% 6 18,75% 15 57,69%

^{*}Pattern deviation, **Body/Mass Index.

It was found that 14 students (43.75%) were classified as having excessive daytime sleepiness on the Epworth scale, 22 students (68.75%) were classified as having poor sleep quality from the PSQI index, which includes

the analysis of seven components (Table 2), and that 13 students (40.6%) were identified by the two scales as having sleep dysfunction, according to table 2.

Table 2. Epworth Sleepiness Scale (ESS) and Pittsburgh Sleep Quality Index (PSQI) of the study participants. Rio de Janeiro (RJ), Brazil, 2017.

DIAZI, 2017.		
ESS*	N	%
Normal (scores < 10)	18	56,25%
Abnormal/Excessive daytime sleepiness (scores ≥	14	43,75%
10)		
Total	32	100%
PSQI**	N	%
Good quality sleep (score ≤ 5)	10	31,25%
Poor quality sleep (score >5)	22	68,75%
Total	32	100%

^{*} Epworth Sleepiness Scale; ** Pittsburgh Sleep Quality Index.

Table 3 presents the responses of the first semi-open questions of the questionnaire, with frequency and percentage of items. Among the results, some of the items included: more than half (56.25%) of the sample reported taking more than 30 minutes to sleep; 20 (62.50%) wake up in the middle of the night or very early, and 18 (56.25%) get up to go to the bathroom; in addition, 12 (70.59%) reported other reasons for presenting sleep problems during the past month, highlighting concerns, respiratory disease, finding comfortable sleeping position, childcare and work.

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Table 3. Frequency of responses to PSQI semi-open questions. Rio de Janeiro (RJ), Brazil, 2017.

Questions	Not once last month	Less than once a week	Once, twice or more per week
5a) Takes over 30min to sleep	10 (31,25%)	4 (12,50%)	18 (56,25%)
5b) Wake up in the middle of the night or early morning	5 (15,62%)	7 (21,88%)	20 (62,50%)
5c) Get up to go to the bathroom	8 (25%)	6 (18,75%)	18 (56,25%)
5d) Difficulty breathing	23 (71,88%)	X (9,38%)	6 (18,75%)
5e) Cough or snore very loudly	22 (68,75%)	5 (15,62%)	5 (15,62%)
5f) Feel very cold	18 (56,25%)	10 (31,25%)	4 (12,50%)
5g) Feel very hot	15 (46,88%)	10 (31,25%)	7 (21,88%)
5h) Have bad dreams or nightmares	18 (56,25%)	10 (31,25%)	4 (12,50%)
5i) Had pain 5j) Other reasons	23 (71,88%) 3 (17,65%)	6 (18,75%) 2 (11,76%)	3 (9,38%) 12 (70,59%)

It should be noted that among the 15 students who work more than 40 hours, ten were classified as having excessive daytime sleepiness and all reported their unwillingness or lack of enthusiasm to perform their daily activities (question 9 of the PSQI). Meanwhile, from those who work less than 40 hours per week, only seven reported this type of problem, and the chi-square test revealed a statistically significant difference (p = 0.01).

It was observed that, regarding sleep duration obtained by the PSQI instrument, post-graduate students reported a mean of 335.6 minutes and a median of 360.0 per night for the last month, and no statistical differences were found when performing the Wilcoxon test between the average sleep duration of students considered to be of good sleep quality and poor sleep quality (p = 0.3). It was also verified that 22 (68.75%) postgraduates of the sample were overweight. It was found that those with excess weight reported a shorter sleep duration, with a median of 330 minutes, than the students

with what is considered "normal" weight (360 minutes); however, when performing the Wilcoxon test, a significant sample was not found (p = 0.2).

When analyzing the TTSNM, in the analysis of the 24 hours of sleep with the actigraph, a TTSNM with a mean of 368.8 minutes. The TTSNM of the students considered with good quality of sleep (367.7) and poor quality of sleep (368.9) were similar and, when performing the Student's T-test, no significant statistical differences were found (p = 0.9).

Plus, it was revealed that, with regard to the use of alcoholic beverages, 18 postgraduate students (56.25%) stated that they had a TTSNM of 349.5 minutes and that the population that did not use alcohol had a average time of 402.0 minutes (Graph 1). Statistically significant difference (p = 0.01) was observed in the Student's T-test, according to table 3.

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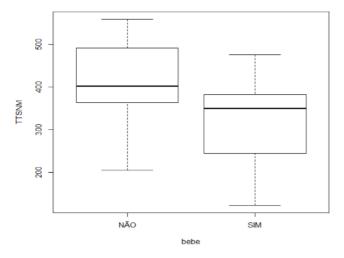


Figure 1. Total nocturnal sleep time in minutes (TTSNM) of research participants that drink alcoholic beverages. Rio de Janeiro (RJ), Brazil, 2017.

Table 4 shows that post-graduate students with children had a lower TTSNM than the population without children (p = 0.01), and the TTSNM measured by the actigraph also revealed higher numbers among women,

since, among women, TTSNM reached 390.7 \pm 93.7 minutes, while among males this number was of 303.0 \pm 99.3 minutes, showing a significant difference (p = 0.04) between genders (Table 3).

Table 4. Total Sleep Time in Minutes (TTSNM) of survey participants. Rio de Janeiro (RJ), Brazil, 2018.

Variables	TTSNM**	p>0,05
Use of alcoholic beverages		0.01*
Yes	349.5	
No	402.0	
Has children		0.01*
Yes	349.5	
No	407.0	
Made use of sleeping pills		0.4*
Yes	395	
No	366	
Difference between		0,04*
genders		
Women	390.7	
Men	303.0	
BMI		0.4
Excessive weight	358.2	
"Normal" weight	391.9	

*Student's T-test, ** Total sleep time in minutes

DISCUSSION

It can be inferred from the study that 22 (68.75%) of the 32 postgraduate students in Nursing have poor quality sleep (PSQI> 5), and this is associated with typical factors of postgraduate students weekly jouney, such as irregular sleep cycles, work more than 40 hours a week, use of alcohol and being overweight. This observation is supported by another study that sought to assess sleep deprivation and cognitive performance of nurses working in a hospital in India, noting that 69% of nurses were affected with sleep deprivation, ² and another study on quality sleep of nursing professionals also found a deficiency on the high quality of sleep: 65.1%

In this study, it was shown that the sleep duration of 335.6 minutes (5 hours and 59

minutes) verified by the PSQI, as well as the TTSNM, measured by the actigraph, was of 368.8 minutes (six hours and 14 minutes) of average, that is, both smaller than the recommended for "sufficient sleep", which represents a risk factor for several health problems.¹³

The author is corroborated¹³, even when it is pointed out that it is not clear whether the amount of sleep - related to quality, regularity and adequate time - depends only on the individual or depends on the context in which he or she lives. The origin of this relationship is unknown; however, several organizations have published guidelines for healthy sleep.¹⁴

It is reported that the American Academy of Sleep Medicine and Sleep Research Society guidelines have jointly stated that adults should have at least seven hours of sleep¹⁴.

Since then, the Centers for Disease Control and Prevention has used this criterion as a cutoff, less than this being considered as "insufficient sleep." ¹³⁻⁵

Some possible "consequences" of short sleep stand out: incident obesity; hypertension; dyslipidemia and elevated levels of systemic inflammatory markers. ¹³ They may also result in attention deficit and impaired decision-making power, which may lead to an increase in the number of accidents and injuries. ¹⁵

According to the results, it is believed that, considering the population of this study is characterized by nurses during a qualifying process, that the damages arising from short sleep can be strengthened on two fronts: in the first, the victims would be the patients' care for these individuals, since the attention deficit of health professionals has been a factor preponderant for the patient's (in)safety, whether at the moment of a procedure, in the administration medication, in the established communication or even in the capacity to observe situations of health, and (dis)comfort of the hospitalized patient.^{2,16} However, it is noted that the attention deficit, most certainly, could affect the performance of this nurse classroom, which proportionately deleterious, since the only "victim" himself. 17

It is reported that, when questioned about the frequency of sleep problems during the last month, 62.50% of the participants stated that they had their sleep fractioned because: 56.25% got up at night to go to the bathroom; 18.75% had difficulty breathing; 15.62% coughed or snored very loudly; 21.88% felt hot; and 70.59% reported other reasons, highlighting: worries, respiratory illness, trouble finding comfortable sleeping position, taking care of children and waking up in the middle of the night to sort things out of work.

This view is corroborated by the author¹⁸ who showed in his study that 61% of the sample, composed of nurses, predicted comfort as a state of "well-being", considering both the intrinsic conditions - body temperature, food, sleep and rest - as well as extrinsic conditions - personal relationships and adaptation to the environment. It is evident in the report of the post-graduate students that the absence of "well-being" conditions directly influenced the quality and quantity of sleep.

It was revealed from the data that 81.25% of the sample work as nurses; of these, 57.69% have a weekly working journey with more than 40 hours, and it is reasonable to state,

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based on the data presented, that these nurses are exposed to a high workload, resulting from the sum of the working day, which guarantees their livelihood and that of their family, with the academic activities in or outside the classroom, notoriously, impairing both quality and duration of sleep. However, it was not the objective of this study to show which of the journeys is the most deleterious.

Although, it is believed that both shift work and extended hours of work, common among nurses, interrupt the circadian cycle, causing diurnal dysfunction² that can be evidenced in this study due to a lack of enthusiasm in carrying out its activities, more frequent in the students who work more than 40 hours a week.

The quality and quantity of sleep are interrupted by shift work, which results in an increased risk of chronic diseases, ¹⁸ cognitive problems, resulting in an increased risk of work-related accidents and a decrease in the performance of the professional in daily activities.^{2,15} It was observed that in a study² performed with a Nursing team in rotating work schedules - at the day shift for one month and the same team relocated for the night shift next month - that the nurses had the quality of your sleep and your cognitive ability affected due to prolonged work shifts or irregular cycles of sleep.

In this study, an overweight population appeared, with a mean BMI of 26.75. It is corroborated by the author¹⁹ when it is stated that "it is considered overweight, BMI 25 to 29.9 kg / m² and obesity, BMI greater than or equal to 30 kg/m² and overweight, BMI greater than or equal to 25 kg /m² (including obesity)". This result can be explained by the shorter sleep duration and TTSNM presented by overweight postdoctoral students in this study, since short sleep is related to the higher incidence of obesity.¹³ In some studies, that sleep loss can lead to changes in food choices, making individuals to choose foods with a high caloric content.^{13,20}

The majority of post-graduate students (56.25%) were allowed to drink alcoholic beverages and, in the objective analysis of sleep, a lesser total nocturnal sleep time was evidenced in these participants. lt recommended that people with sleep disorders do not drink alcoholic beverages in order to maintain adequate sleep hygiene, since alcohol consumption can cause sleep fragmentation, not repairing it, besides the risk of developing addiction. It is also related to the use of alcoholic beverages with insomnia disorder.21

It is known that although alcohol is seen as a sleep-inducing substance, its consumption is related to insufficient or poor quality sleep, ²¹⁻² and may result in negative consequences such as falling asleep during class, impaired cognitive, motor and emotional functioning .¹⁹ It is also related by some authors, - in their studies, the poor quality of sleep with increased alcohol consumption among college students, since many use it as a mechanism to mitigate anxiety and stress.

It can be inferred that it is not possible to affirm in this research that the reduced TTSNM is directly related to the alcohol intake in the night of the use of the actigraph. Nonetheless, the literature points to this relation and the use of alcohol, since it was listed by the majority of participating postgraduate students as a behavioral practice.

The importance of aspects that encompass sleep, such as duration and quality, became more and more evident throughout the work, especially when discussing the subject thinking about the postgraduate student, who is a nurse and is exposed, in most of the time, to a high work load and shift work.

It is noted that imbalances in sleep structures are part of the spectrum of disorders that make up the whole considered as "absence of health", and that poor sleep quality may ultimately lead to impairments in academic performance and increase errors in health professionals.

CONCLUSION

Firstly, it is of fundamental importance to show that there were no studies that explored sleep among Stricto sensu post-graduate students, specifically nurses. It is inferred that studies that exist, however, suggest that both university students and nurses have poor sleep quality, which corroborates the findings of this study.

As a limitation of this study, it is necessary to carry out future longitudinal studies with the actigraph in order to try to understand if these sleep patterns tend to undergo changes during the days of use with the device, better exploring the data provided by the actigraph. It is related to the importance of a study with a longer stay with the wrist actigraph, not only 24 hours, aiming at a better correlation with the variables and data of research already published.

The literature that correlates poor sleep quality among post-graduate nurses with problems related to alcohol consumption, Evaluation of sleep quality of post-graduation...

excessive work hours and overweight is supported and promoted by the results of this study, which can be modified by means of information viability.

It is intended to alert postgraduates students, in view of the results of this study, who are also health professionals who often deal with a strenuous workload, coupled with academic obligations, on the need to adopt healthy hygiene practices of sleep to improve the quality of sleep, because it is common sense that risk factors cited here can be modified by raising awareness about the importance of comforting sleep.

Also, it is recommended that there should be a commitment on the part postgraduates to modify sleep habits within universities, encouraging teachers to plan classes and extracurricular activities with a certain regularity of schedules, considering the periods of daytime sleepiness and of higher alert to postgraduate students; and to promote the development of preventive programs to guide students about the importance of sleep in educating the public as they are also health care providers about the importance of adequate sleep duration for occupational risk prevention.

In conclusion, it was understood that the main limitations were the size of the sample, which reduced the possibilities of the better elaborated statistical treatment, being configured in a first experiment and requiring replication with a more representative number, as well as the time of 24 hours for the objective measurement of sleep with the actigraph, since the researchers had only five units.

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