ORIGINAL RESEARCH

# Sleep quality of Brazilian nursing students: A cross-sectional study

Andréia Ferreira dos Santos[1], Fernanda Carneiro Mussi*[1], Cláudia Geovana da Silva Pires[1], Melissa Almeida Santos Paim[2], Fernanda Michelle Santos e Silva[1], Rodrigo Marques da Silva[3]

[1] *Nursing Department, Universidade Federal da Bahia, Salvador, Bahia, Brazil*
[2] *Nursing Department, Dante Pazzanese de Cardiologia. São Paulo, São Paulo, Brazil*
[3] *Nursing Department, Faculdade de Ciências e Educação Sena Aires, Valparaíso de Goiás, Goiás, Brazil*

**Received:** July 28, 2019 **Accepted:** August 25, 2019 **Online Published:** September 16, 2019
**DOI:** 10.5430/jnep.v10n1p11 **URL:** https://doi.org/10.5430/jnep.v10n1p11

## ABSTRACT

**Objective:** To describe the sleep quality of nursing students according to the Pittsburgh Sleep Quality Index.
**Methods:** This is a cross-sectional study conducted with 286 nursing students from a public institution in Salvador, Bahia. Data gathering instruments were applied in classrooms and data were assessed in absolute and relative frequencies, means and standard deviation.
**Results:** The mean age of participants was 23.48 years (SD = 4.421). Most of students were female (90.2%), single with partner (90.9%), afro descendent (87.8%), unemployed (81.5%), total Family income below than four minimum wages (47.2%), enrolled between 6th and 10th semester (54.5%), attending academic activities in two or three shifts (80.8%). Sample showed poor sleep quality (86.4%), especially due to the sleep duration, sleep disturbances and daytime disfunction.
**Conclusions:** Poor sleep quality was prevalent in the sample, what rises the need of further analysis of the associated factors and interventions to change this reality.

**Key Words:** Sleep, University students, Risk factors

## 1. INTRODUCTION

The poor sleep quality is an important cardiovascular health index because it is a risk factor for health diseases development[1] and its aggravation,[2] being the inflammatory mechanism the physiological response most expected.[1]

The inflammatory process related with poor sleep quality cause significant changes in the regulation mechanics of heart function, such as venous endothelial dysfunction, increased resting sympathetic nervous system activity, altered autonomic reflex control, increased blood pressure and body temperature, hyperphagia with decreased peripheral sign of satiety leading to obesity, insulin resistance, headache, changes in lipid metabolism as elevation of serum triglyceride levels, among others.[3] In addition, poor sleep quality affects lung function, by promoting inflammation of the airways, which increases the predisposition to snoring and apnea.[2] The sleep has an special importance due to the effect of sleep deprivation on the quality of life, which has been pointed out as cause of several neuro-behavioral deficits, such as mood alteration; memory lapses; reduction of cognitive performance, vitality and sensation of happiness.[4]

Among the social groups vulnerable to changes in the sleep pattern, the most noteworthy are university students who, upon starting the course, interact with several factors that

*Correspondence: Fernanda Carneiro Mussi; Email: femussi@uol.com.br; Address: Nursing Department, Universidade Federal da Bahia, Salvador, Bahia, Brazil.

may be associated with their sleep deprivation. Among these factors, the most important are those associated with the time dedicated to academic activities;[5–10] working in the other shift;[11] excessive use of social media, mobiles and television;[12] consumption of alcoholic beverages;[13] and demographic factors, such as sex, age and marital status conjugal.[6, 14]

Although the existence of investigations on sleep quality in nursing students confirm they are poor sleepers,[5, 6, 15] these researches were conducted in a few Brazilian states, with small samples that considered only the two first semesters students[15] or incoming and outgoing students.[5]

In a literature review conducted in the Virtual Health Library Regional Portal, using the descriptors "sleep" and "student of nursing" and "risk factors", in Portuguese, Spanish and English languages, we found a scarce number of studies focusing on the sleep pattern in university nursing students. Seven investigations were identified and four of them assessed sleep in university students.

Knowing the students' sleep quality provide information to the high degree institutions in order to assess this lifestyle index, their causes and deprivation risks in the academic environment.[5] These data on sleep quality also provides the development of support measures to the students, what might be contribute to the mental, cognitive and physical health of these future health professionals.

Based on the foregoing, we aimed to describe the sleep quality of nursing students according to the Pittsburgh Sleep Quality Index(IQSP).

## 2. METHOD

This is a descriptive and cross-sectional study conducted with nursing degree students from a public institution placed in Salvador, Bahia, Brazil. The inclusion criteria of the main project titled "Cardiovascular Risk in Nursing students: implications for healthcare" were applied to all participants. In this sense, we included students from both sexes, enrolled from the first to 10th semester of nursing degree and aged at least 18 years old. Students in exchange or who locked the course were excluded.

The number of students enrolled in each semester during the data gathering was: 48 in the first semester; 39 in the second; 18 in the third; 32 in the fourth; 34 in fifth; 34 in the sixth; 39 in the seventh, 29 in the eighth, 36 in the ninth and 44 in the tenth, totalizing 353 college students. From these, 286 accepted to attend the research.

Data gathering was held from February 2016 to March 2017. Students were initially approached in classrooms for the main researcher after previous scheduling with Collegium of the nursing degree. In this occasion, researchers presented themselves and sensitized students for the study's aims and importance. All the research instruments were filled in classrooms after voluntary acceptance upon the signature of the Free and Informed Consent Term. Students who did not accept to attend were free to stay out of classrooms during the data gathering that was not over 30 minutes.

We applied instruments composed for ended and ended-open questions to gather the sociodemographic and academic information based on earlier forms published.[16]

The Pittsburgh Sleep Quality Index was translated, adapted and validated for Brazilian reality. It was validated to assess subjective Sleep Quality in consecutive patients who were submitted to overnight polysomnography with clinical suspicion of obstructive sleep apnea syndrome or insomnia.[17] It represents a valid measure that may be easily applied for health workers.[18] The PQSI is composed for 19 items organized in seven domains: Subjective sleep quality(individual perception of sleep quality), Sleep latency (how much time is needed to fall asleep); Sleep duration (how much time the person sleeps); Usual sleep efficiency (Relation between number of hours slept and time spent on bed–not really sleeping); Sleep disturbances (presence of situations that compromise the sleep time); Use of medication to sleep; and Daytime sleepiness and disorders (It refers to the changes in disposition and enthusiasm for daily activities).

The scores of the seven domains are summed to produce the PSQI's total score, that ranges from 0 to 21. Sleep quality is classified as good (score 0-4) or poor (score $\geq$ 5). The higher the score, the worse the quality of sleep. University students scored above five points are classified as poor sleepers because it indicates that they have major dysfunctions in at least two domains, or moderate dysfunction in at least three.

Gathered data were checked, typed and saved in the Statistical Package of Social Science (SPSS), version 20.0, and analyzed for a statistical professional Categorial variables were presented in absolute and relative frequencies and age in mean and standard deviation.

This research was approved for the Ethical Council (report n$^o$ 353.038), being granted for the CNPQ, process number 309092/2015-9, and achieved the Brazilian and international ethical requirements for researches involving human beings.

## 3. RESULTS

The mean age of participants was 23.48 years (SD = 4.421). There were a prevalence of females (90.2%), single with

partners (90.9%), afro descendent (87.8%), who lives with 2 or 3 persons (55.6%). Most of students are unemployed (81.5%) and their families receive less than four minimum wages (47.2%), what was reported as insufficient for subsistence (65%). The monthly minimum wage at the time of data gathering was R$ 937.00 (Approximately U$ 48.54).

About the academic features, 54.5% of students were enrolled from 6th to 10th semesters; most of them had a semesterly academic time load of 401 to 500 hours (59.1%) and took classes in two or three shifts (80.8%). In Table 1, we demonstrate the assessment of sleep quality in nursing students according PSQI's domains.

Based on the PSQI analysis, most of students (86.4%) were defined as poor sleepers. Regarding the subjective sleep quality domain, 49% rated their sleep pattern as good, followed by bad (33.9%). In the latency domain, the most frequent sleep time was less than or equal to 15 minutes (45.1%) followed by 16 to 30 min (36.4%). In the last month, 31.8% never spent more than 30 minutes to fall asleep. In the sleep duration domain, we found a predominance of 5 to 6 hours (31.1%), followed by persons who take less than 5 hours sleeping (30.4%).

As for sleep efficiency, 87.8% achieved a score greater than 85%. In the medication use domain, 83.2% reported not using it. In the Daytime Sleep Disorders domain, 43% of the sample never presented difficult to stay awake in the last month, while 47.6% reported indisposition or lack of enthusiasm to take daily activities less than once a week.

In the analysis of the sleep disorder domain, 43.7% woke up in the middle of the night or early less than once a week; 36.0% never woke up at night to go to the bathroom in the last month; 75.2% could breathe satisfactorily in the last month; 81.2% had never coughed or snored loudly in the past month; 58.1% never felt very cold in the last month; 35.3% were very hot less than once a week; 38.8% had bad dreams less than once a week, 63.4% never had pain in the last month, and 60.5% reported sleep problems for other causes.

## 4. DISCUSSION

Most of nursing students are young (23.48 years old, on average), female (90.2%), single with partner (90.9%), afro descent (87.8%), unemployed (81.5%), total Family income below than four minimum wages (47.2%), enrolled between 6th and 10th semester (54.5%), attending academic activities in two or three shifts (80.8%). Sample showed poor sleep quality (86.4%), especially due to the sleep duration, sleep disturbances and daytime disfunction. These set of findings helps to understand better the social and academic features of these students and how they may affect their lifestyle and sleep behavior during the nursing degree. Based on this, we can understand why nursing students get unhealthy habits that affect their health during the course.

**Table 1.** Assessment of sleep quality in nursing students according PSQI's domains. Salvador, 2017

| Domains | Classification | n (%) |
|---|---|---|
| **Subjective sleep quality** | Very good | 24 (8.4) |
| | Good | 140 (49.0) |
| | Bad | 97 (33.9) |
| | Very bad | 25 (8.7) |
| **Sleep latency** | | |
| Time needed to fall asleep | ≤ 15 minutes | 124 (45.1) |
| | 16 to 30 minutes | 104 (36.4) |
| | 31 to 60 minutes | 44 (15.3) |
| | > 60 minutes | 9 (3.1) |
| Over 30 minutes took to fall asleep | Never in last month | 91 (31.8) |
| | Less than once a week | 83 (29.0) |
| | Once to twice a week | 34 (11.9) |
| | More than 3 times a week | 78 (27.3) |
| **Sleep duration** | > 7 hours | 37 (12.9) |
| | 6 a 7 hours | 73 (25.5) |
| | 5 a 6 hours | 89 (31.2) |
| | < 5 hours | 87 (30.4) |
| **Sleep efficiency** | > 85% | 251 (87.8) |
| | 75 a 84% | 26 (9.1) |
| | 65 a 74% | 2 (0.7) |
| | < 65% | 7 (2.4) |
| **Use of medication to sleep** | Never in last month | 238 (83.2) |
| | Less than once a week | 24 (8.4) |
| | Once to twice a week | 14 (4.9) |
| | More than 3 times a week | 10 (3.5) |
| **Daytime Sleepness and Disorders** | | |
| Difficulty to stay awake in the last month | Never in last month | 123 (43.0) |
| | Less than once a week | 82 (28.7) |
| | Once to twice a week | 31 (10.8) |
| | More than 3 times a week | 50 (17.5) |
| Indisposition and lack of enthusiasm to perform daily activities | Never in last month | 34 (11.9) |
| | Less than once a week | 136 (47.6) |
| | Once to twice a week | 31 (10.8) |
| | More than 3 times a week | 85 (29.7) |
| **Sleep Disturbances** | | |
| You woke up in the middle of the night or early in the morning | Never in last month | 66 (23.1) |
| | Less than once a week | 125 (43.7) |
| | Once to twice a week | 28 (9.8) |
| | More than 3 times a week | 67 (23.4) |
| You had to get up at night to go to the bathroom | Never in last month | 103 (36.0) |
| | Less than once a week | 88 (30.8) |
| | Once to twice a week | 34 (11.9) |
| | More than 3 times a week | 61 (21.3) |
| You could not take a satisfactory breath | Never in last month | 215 (75.2) |
| | Less than once a week | 46 (16.1) |
| | Once to twice a week | 10 (3.5) |
| | More than 3 times a week | 15 (5.2) |
| You showed coughing or snoring loudly | Never in last month | 232 (81.2) |
| | Less than once a week | 26 (9.1) |
| | Once to twice a week | 17 (5.9) |
| | More than 3 times a week | 11 (3.8) |
| You felt very cold | Never in last month | 166 (58.1) |
| | Less than once a week | 80 (28.0) |
| | Once to twice a week | 28 (9.8) |
| | More than 3 times a week | 12 (4.2) |
| You felt very hot | Never in last month | 94 (32.9) |
| | Less than once a week | 101 (35.3) |
| | Once to twice a week | 25 (8.7) |
| | More than 3 times a week | 65 (22.9) |
| You had nightmares | Never in last month | 105 (36.6) |
| | Less than once a week | 111 (38.8) |
| | Once to twice a week | 51 (17.8) |
| | More than 3 times a week | 19 (6.6) |
| You had pain | Never in last month | 181 (63.4) |
| | Less than once a week | 47 (16.4) |
| | Once to twice a week | 37 (12.9) |
| | More than 3 times a week | 21 (7.3) |
| Frequency of sleep issues for other causes | Never in last month | 173 (60.5) |
| | Less than once a week | 50 (17.5) |
| | Once to twice a week | 19 (6.6) |
| | More than 3 times a week | 44 (15.4) |
| **Total Score of Sleep Quality** | Good (< 5 points) | 39 (13.6) |
| | Poor (≥ 5 points) | 247 (86.4) |

The investigated sample was mostly composed for females, corroborating with investigations involving university students,[5,8,9,12,14,19] especially on nursing field[6,7,15] which has been characterized as a female profession once the notable number of women working in nursing.[20]

Regarding the age range, there was a prevalence of young adults and single students, what was also verified in other investigations with nursing students[6,12] and in university students from other courses.[5,8–10,12,14,21,22] Most of sample has reported themselves as afro descent, what may be related to theirs afro descendent heritage, especially in Salvador, Brazil.[23] Few studies performed in Northwest Brazil also highlighted the predominance of afro descendent students.[10,12] In the same context, another study[10] found the predominance of unemployed students, what may be related with the age range and how many times students go to the university. In addition, most of students had a monthly family income of less than four minimum wages, which was considered insufficient by students to cover the monthly costs.

Most of students were enrolled from 6th to 10th semesters, took classes in two or three different shifts and had an semesterly academic load of 401 to 500 hours. These data demonstrates the specific features of nursing degrees that follows the national curriculum guidelines.

About the sleep quality, those students scored five points or above prevailed, what means that poor sleepers were more prevalent in the sample. Several researches involving students from different fields of knowledge found the same results.[5,13,24] The same was found in studies with health area students[8–12,14,15,21,22,25] and nursing students.[6,7,15]

Although they were classified as bad sleepers, in the domain individual perception related to sleep quality, university students assessed it as good, followed by bad, which corroborates with another investigation.[6] The fact of students classify themselves as "good sleepers" in this specific domain may reveal their difficulty in identifying their individual needs of sleep.

Regarding the sleep latency domain, most had no difficulty in initiating sleep. It was also found in a study conducted with medical students.[19] In addition, the sample showed a good score in sleep efficiency, what was attested in other research involving nursing students.[7]

There was a prevalence of sleep duration lower than 6 hours daily. Students who sleep six hours or less daily tend to report more sleepiness in relation to those who sleep more hours daily. Also, health students, compared to those from another areas, showed the worst sleep habits, including sleep later and wake up earlier, experiencing longer waking hours.[8] This situation cause cognitive performance modifications, once the inadequate sleep decreases the general alertness and attention.[21]

However in this study, on the daily disturbances, most students never had difficulty to stay awake in the last month, differently of results found in an investigation took with nursing students and those from other areas.[9] Also, most of them reported indisposition or lack of enthusiasm to perform daily activities.

We found the predominance of university students who did not use medication to sleep, what corroborate with findings from several studies.[6,7,9,25] Regarding the sleep disturbances, the factor that most interfered on this domain were: waking up in the middle of night or early, feeling very hot and having nightmares. It may be related to the site where these students live- the northwest of Brazil. This region usually presents high daily temperatures, with maximum values between 28th and 31th centigrade, on average, during the year.

Among all domains, the Sleep duration, Daytime Disorders e Sleep Disturbances had a greater impact on the total score of poor sleep quality. Changes in these domains may affect the individuals' waking state and cognitive performance.[8]

This investigation demonstrates the importance of assessing the factors associated to sleep quality in university students that may guide the development of support measures to promote a better sleep pattern in this individuals.

As study limitations, we stand out the sampling for accessibility and the self-reported instrument used to measure sleep quality- what may lead to interpretation errors during the response process. Also this tool only assess the sleep quality for the last month, which implies a memory bias.

## 5. Conclusion

Poor sleep quality was prevalent in nursing students. The domains sleep duration, sleep disturbances and daytime disfunction were the factors that most affected to this outcome. We suggest the enlargement of this investigation to another fields of knowledge with students from the same university and private institutions, as well the assessment of the poor sleep quality associated factors.

## Conflicts of Interest Disclosure

The authors declare that there is no conflict of interest.

## REFERENCES


[1] Laks J, Telles LL. Insônia e doença cardiovascular: marcadores inflamatórios e risco aumentado de cardiopatias. J Bras Med. 2014; 102(2): 15-19.

[2] Sabanayagam C, Shankar A. The association between active smoking, smokeless tobacco, second-hand smoke Exposure and insufficient sleep. Sleep Med. 2011; 12(1): 7-11. PMid:21144798 https://doi.org/10.1016/j.sleep.2010.09.002

[3] Tufik S. Medicina e biologia do sono. São Paulo: Manole; 2008.

[4] Felden EPG, Ferrari GJ, Andrade RD, et al. Fatores associados à baixa duração do sono em universitários ingressantes. R bras Ci e Mov. 2015; 23(4): 94-103. https://doi.org/10.1016/j.rpped.2015.10.007

[5] Ferreira SC, Jesus TB, Santos AS. Qualidade do sono e fatores de risco cardiovasculares em acadêmicos de enfermagem. Rev Eletrônica Gest Saúde. 2015; 6(1): 390-04.

[6] Benavente SBT, Silva RM, Higashi AB, et al. Influência de fatores de estresse e características sociodemográficas na qualidade do sono de estudantes de enfermagem. Rev. Esc. Enferm. USP. 2014; 48(3): 514-20. https://doi.org/10.1590/S0080-623420140000300018

[7] Carvalho TMCS, Silva Junior II, Siqueira PPS, et al. Sleep Quality and Daytime Sleepiness in University Students. Rev neurociênc (Impr). 2013; 21(3): 383-87. https://doi.org/10.4181/RNC.2013.21.854.5p

[8] Pascotto AC, Santos BRM. Avaliação da qualidade do sono em estudantes de ciências da saúde. J Health Sci Inst. 2013; 31(3): 306-10.

[9] Vasconcelos HCA, Fragoso LVC, Marinho NBP, et al. Correlação entre indicadores antropométricos e a qualidade do sono de universitários brasileiros. Rev Esc Enferm USP. 2013; 47(4): 852-9. PMid:24310682 https://doi.org/10.1590/S0080-623420130000400012

[10] Fernandes AA, Melo PM, Fernandes R, et al. Prevalência da má qualidade do sono e suas repercussões entre os acadêmicos que estudam no período noturno e trabalham durante o dia e os que não trabalham. Ensaios e Ciência: C. Biológicas, Agrárias e da Saúde. 2013; 17(3): 59-70.

[11] Araújo MFM, Vasconcelos HCA, Marinho NBP, et al. Níveis plasmáticos de Cortisol em universitários com má qualidade de sono. Cad saúde colet. 2016; 24(1): 105-11. https://doi.org/10.1590/1414-462X201600010227

[12] Kenney SR, Paves AP, Grimaldi EM, et al. Sleep Quality and Alcohol Risk in College Students: Examining the Moderating Effects of Drinking Motives. J Am Coll Health. 2014; 62(5): 301-08. PMid:24588270 https://doi.org/10.1080/07448481.2014.897953

[13] Araújo MFM, Lima ACS, Alencar AMPG, et al. Avaliação da qualidade do sono de estudantes universitários de Fortaleza-CE. Texto & contexto enferm. 2013; 22(2): 352-60. https://doi.org/10.1590/S0104-07072013000200011

[14] Banks S, Dinges D. Behavioral and physiological consequences of sleep restriction. J Clin Sleep Med. 2007; 3(5): 519-28.

[15] Araújo MAN, Fabi FWP, Bortolon R, et al. Padrão do sono em estudantes de enfermagem de Universidade Pública Federal. Rev Cuba Enferm. 2016; 32(2): 162-70.

[16] Pires CGS, Azevedo SQR, Mussi FC. Fatores de risco cardiovascular em est de enfermagem: elaboração de procedimentos de avaliação. Rev baiana enferm. 2014; 28(3): 294-302.

[17] Bertolazi AN. Tradução, adaptação cultural e validação de dois instrumentos de avaliação do sono: Escala de sonolência de Epworth e Índice de qualidade de sono de Pittisburgh. [dissertation]. [Porto Alegre(RS)]: Universidade Federal do Rio Grande do Sul; 2008. 93p.

[18] Buysse DJ, Reynolds CF, Monk TH, et al. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res. 1989; 28(2): 193-213. https://doi.org/10.1016/0165-1781(89)90047-4

[19] Mirghani HO, Mohammed OS, Almurtadha YM, et al. Good sleep quality is associated with better academic performance among Sudanese medical students. BMC Res Notes. 2015; 23(8): 706. PMid:26597849 https://doi.org/10.1186/s13104-015-1712-9

[20] Splendor VL, Roman AR. A mulher, a enfermagem e o cuidar na perspectiva de gênero. Rev Contexto & Saúde. 2003; 2(4): 31-44. https://doi.org/10.21527/2176-7114.2003.04.31-44

[21] Zeek ML, Savoie MJ, Song M, et al. Sleep Duration and Academic Performance Among Student Pharmacists. American Journal of Pharmaceutical Education. Am J Pharm Educ. 2015 Jun 25; 79(5): 63. PMid:26396272 https://doi.org/10.5688/ajpe79563

[22] Araújo MFM, Roberto RWJF, Lima ACS, et al. Indicadores de saúde associados com a má qualidade do sono de universitários. Rev. Esc. Enferm. USP. 2014; 48(6): 1085-92.

[23] Smolen JR, Araújo EM. Race/skin color and mental health disorders in Brazil: a systematic review of the Literature. Ciênc Saúde Colet. 2017; 22(12): 4021-30. PMid:29267719 https://doi.org/10.1590/1413-812320172212.19782016

[24] Quick V, Shoff S, Lohse B, et al. Relationships of eating competence, sleep behaviors and quality, and overweight status among college students. Eat Behav. 2015; 19: 15-9. PMid:26164670 https://doi.org/10.1016/j.eatbeh.2015.06.012

[25] Castilho CP, Limas LMD, Monteiro ML, et al. Sleep deprivation in medicla students in service at the basic health units and its consequences. Rev Med. 2015; 94(2): 113-9. https://doi.org/10.11606/issn.1679-9836.v94i2p113-119