

Stressful life events and insomnia complaints among nursing assistants from a university hospital in Rio de Janeiro: The Pro-Saude Study

Abstract

Objective: To evaluate the association between stressful life events (SLE) and insomnia complaints (IC). **Methods:** Cross-sectional data from 695 certified nursing assistants from a university hospital, participants of the Pro-Saude Study – a cohort of university employees in Rio de Janeiro – were analyzed. Information was obtained through a self-administered multidimensional questionnaire, which evaluated the occurrence of SLE in the previous 12 months, socioeconomic and demographic variables, and IC. Insomnia complaints were analyzed as a polythomic outcome (frequent, occasional, and absent). Crude and adjusted odds ratios were calculated through multinomial logistic regression. **Results:** Total prevalence of IC was 45.8% (frequent 16.7%, and occasional 29.1%). After adjusting for sex, age, marital status, *per capita* family income, and work hours, the SLE associated with frequent IC were: “breakup of a love relationship” (OR = 3.32; 95%CI 1.90-5.78), “having had severe health problems” (OR=2.82; 95% CI 1.73-4.58), “severe financial problems” (OR=2.38; 95%CI 1.46-3.88), and “forced change of residence” (OR=1.97; 95%CI 1.02-3.79). Occasional IC was associated only with “breakup of a love relationship” (OR=2.30; 95%CI 1.42-3.74) and “severe financial problems” (OR=1.87; 95%CI 1.27-2.75). **Conclusions:** Given the responsibility over human lives taken on by nursing assistants during their work hours, our findings may contribute to more effective actions to be taken by health services toward workers in this category, helping them better deal with stress.

Keywords: Insomnia. Sleep. Insomnia Complaints. Stressful Life Events. Occupational Health. Nursing Assistants. Epidemiology.

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Introduction

Insomnia is the most frequently sleep disorder found in the general population, being recognized by the WHO as a public health problem¹ due to its negative impact on physical and mental health, social activity, capacity to work, and on the individual's quality of life²⁻⁵. Nonetheless, this theme has not usually received proper attention by health professionals, and the insomniacs themselves, in most cases, do not seek qualified professional assistance^{2,6,7}.

A literature search on this topic shows great variation in the prevalence estimates for insomnia, as observed by Rocha and Costa (2000)³, and Souza and Reimão (2004)⁸. Among the methodological factors to which authors attribute such variability, the criteria for defining insomnia (symptom presence, severity level, frequency, or duration), the amplitude of responses, age strata, and the sampling process are given special emphasis. Morin et al. (2006)⁷ observed lower prevalences when more restrictive criteria for the definition of insomnia are used.

The greater prevalence of insomnia among women is the most consistent finding in the literature regarding sleep disorders⁹⁻¹¹. The increase in prevalence as one ages has also been observed¹¹.

The WHO recommends that researches be conducted aimed at the identification of the prevalence of this disorder in developing countries, as well as its association with demographic variables¹. Such studies are still scarce in Brazil. Rocha et al. (2002)¹², in the city of Bambuí, state of Minas Gerais, found a prevalence of 35.4% of insomnia in the population older than 18, considering the reports regarding the month prior to the interview. In São Paulo, about 50% of those interviewed reported some complaint of insomnia occurring at least once in the week¹³. A research conducted in Campo Grande, in the state of Mato Grosso do Sul,

with a representative sample of the general population older than 18, showed a prevalence of insomnia of 19.1%, according to the definition adopted by the American Sleep Disorders Association (ASDA)¹⁴.

The occurrence of stressful life events is among the factors associated with insomnia¹⁵⁻¹⁸. According to Monti (2000)¹⁹, most cases of primary insomnia (that with an etiology not related to another mental disorder, medical condition, or chemical dependency), may be induced by stressful situations, such as the distancing of a family member, loss of employment, economic difficulty, surgical intervention, etc.

The identification of sleep-related complaints among nursing professionals is relevant, since this category work in an environment in which even minor mistakes may place at risk the lives of people under their care. The evaluation of the relation between stressful life events and insomnia complaints may, eventually, subsidize activities in the area focused on dealing with stress, as part of initiatives for the health of hospital workers.

The objective of this study is to estimate the prevalence of insomnia complaints, and to evaluate their association with stressful life events among nursing assistants from a university hospital.

Material and Methods

Study design and population

This work is part of the Phase-1 (1999) of the Pro-Saude Study²⁰, a cohort study aimed at investigating the role of biological and sociocultural determinants in the health and morbidity patterns of technical-administrative workers at a state university in the state of Rio de Janeiro. The present work utilizes a sectional delineation in order to evaluate the association between stressful life events (SLE) and insomnia complaints.

The target population of this study is all of the nursing assistants in activity at the university hospital. After exclusion of the workers in non-medical leave, retired, and

on loan to other institutions, the population eligible to participate in the study was composed of 4,177 employees, of which 4,030 (90.4%) answered the questionnaire. Following the exclusion of the individuals who did not answer the questions regarding insomnia complaints (5.95%), the final study population amounted to 695 nursing assistants.

Instruments

Self-reported questionnaires²¹ were utilized to evaluate questions related to insomnia complaints, socioeconomic, demographic, and work-related data, and stressful life events.

Insomnia complaints: In this study, we employed the variable “insomnia complaint” instead of “insomnia”, in view of the fact that in the questionnaire utilized, the questions relating to sleep did not follow the criteria of the main classification systems for the diagnosis of insomnia, namely the Diagnostic and Statistical Manual of Mental Diseases (DSM-IV, 1994)²², the International Classification of Sleep Disorders (AASM, 2001)²³, and the International Classification of Diseases, version 10, ICD-10 (WHO, 1997)²⁴.

The evaluation of insomnia complaints is based on criteria of frequency, which is the most utilized in the literature (Ohayon, 2002)²⁵, derived from the following questions: “In the LAST TWO WEEKS, how often did you have difficulty falling asleep?” and “In the LAST TWO WEEKS, how often did you wake up in the middle of your sleep, and had difficulty falling asleep again?” A Likert-type scale was utilized in order to evaluate the answers to these questions (always, almost always, sometimes, hardly ever, or never).

The variable was categorized in:

- “Frequent complaints of insomnia”, when the respondent answered “always” and/or “almost always” in at least one of the questions;
- “Occasional complaints of insomnia”, when the respondent answered “so-

metimes” to both questions relating to insomnia, or “sometimes” to one of the questions and “hardly ever” or “never” to the other; and

• “No complaints of insomnia”, when the answers were “hardly ever” and/or “never” to both questions.

Socioeconomic, demographic, and work hours-related variables:

The following socioeconomic and demographic variables were evaluated: sex, age, marital status, schooling, and *per capita* family income, calculated in multiples of the legal monthly minimum wage. The question regarding income was originally structured in value strata expressed in the Brazilian currency (“Reais”, symbol “R\$”), with the mean value from each category divided by the legal monthly minimum wage at the time (R\$136.00, the equivalent to about US\$75 at the time). The question relating to the work regimen was evaluated based on the question “Currently, do you work during any night shift or for a 24-hour shift, at the university hospital, university campus, or outside of the university?” The option to answer yes or no yielded a variable with two categories: “works nights”/ “does not work nights”.

Stressful Life Events (SLE): Simple and short questions were utilized, which composed the so-called “stressful life events”, according to the procedure described by Lopes and Faerstein (2001)²⁶ and Lopes et al. (2003)²⁷. The time of reference for the occurrence of the event was the 12 months prior to completing the questionnaire. The SLE evaluated were: health problems which hindered the fulfillment of normal activities (work, study, or recreation) for more than a month; admittance into a hospital for one night or more due to sickness or accident; death of any close relative (father, mother, spouse, partner, child, or sibling); financial difficulties more severe than usual; forced change of residence (for example, due to an increase in rent); breakup of loving relationship, including divorce or separation; mugging or robbery, i.e., having had money

or other goods taken, through use or threat of violence; having been a victim or some sort of physical aggression^{26,27}.

Ethical aspects

The research was submitted to and approved by the Ethics Committees of both the university in which the study was conducted, and that of the university hospital.

Data analysis

In the first phase, a general description of the data was conducted through the examination of the frequency distribution for each study variable. All analyses were conducted considering the outcome being studied (insomnia complaints) as polythomic (three categories), as follows: frequent, occasional, and with no complaint of insomnia.

Bivariate analyses were performed in order to evaluate the association between the explanatory variables (SLE) and the dependent variable (insomnia complaints). The association between the dependent variable with the explanatory variables was expressed through the odds ratios (OR) and their respective 95% confidence intervals. In order to evaluate the statistical significance of the associations, Pearson's chi-square tests were employed.

The multivariate analysis was done through multinomial logistic regression, with calculations of the simple and adjusted odds ratios (OR). Included in the models were the variables that showed a simple association with an outcome with $p \leq 0.25^{28}$. If this criterion led to the exclusion of relevant variables, according to what is found in the relevant literature, their inclusion was considered. The independent variables that maintained association with the outcome after adjustment ($p \leq 0.05$) remained in the model, according to the likelihood ratio test.

Results

The study population was comprised of 695 nursing assistants, of which 140 (20.1%)

were male and 555 (79.9%) were female. A greater percentage of nursing assistants presented age between 30 and 49 years (80.2%). A bit more than half of the population was married (55.7%), while 20.7% were single, and 19.8% were separated/divorced. About 44% of the sample was in the second stratum of *per capita* family income (earning between 3 and 6 times the minimum wage). About half of the population presented a formal schooling level that is at or higher than a GED/High School Diploma (51.5%). A percentage of 43.5% worked during night shifts.

The distribution of the individuals in the sample by the socioeconomic and demographic variables, and those related to work hours, according to the pattern of insomnia complaints, is described on Table 1. We observed a higher prevalence of insomnia complaints, both frequent and occasional, among women, among those with lower *per capita* family income (up to 3 times the minimum wage), and among those who are separated/divorced. The workers who reported working during night shifts presented a higher prevalence of "occasional", but not "frequent" insomnia complaints.

The prevalence of insomnia complaints according to the report of stressful life events is described on Table 2.

The differences between the groups were statistically significant ($p < 0.05$) in relation to most of the events, except for being admitted into a hospital, having been a victim of a mugging or robbery, or of physical aggression.

After adjusting for sex, age, marital status, *per capita* family income, and work hours, it was observed that those with a history of breakup of a loving relationship, health problems, serious financial difficulties, and forced change of residence presented a significantly higher prevalence of frequent insomnia complaints when compared to those who did not report exposition to the SLE investigated. Having been a victim of physical aggression and having been admitted into a hospital showed marginally significant associations with insomnia complaints. However, when the comparison is

Table 1 - Prevalence of insomnia complaints according to socioeconomic and demographic characteristics and work hours among nursing assistants from a university hospital in Rio de Janeiro, Brazil. The Pro-Saude Study, 1999.

	No insomnia complaints n (%)	Insomnia complaints		p-value
		Occasional n (%)	Frequent n (%)	
	377 (54.2)	202 (29.1)	116 (16.7)	
Sex				
Male	94 (67.1)	27 (19.3)	19 (13.6)	0.002
Female	283 (51.0)	175 (31.5)	97 (17.5)	
Age				
20-29 years	27 (58.7)	13 (28.3)	6 (13.0)	0.037
30-39 years	181 (59.7)	85 (28.0)	37 (12.2)	
40-49 years	129 (50.8)	73 (28.7)	52 (20.5)	
50 years or more	40 (43.5)	31 (33.7)	21 (22.8)	
Per capita family income				
Up to 3 times the minimum wage	107 (46.7)	76 (33.2)	46 (20.1)	0.044
Between 3 and 6 times the minimum wage	173 (49.9)	78 (27.0)	38 (13.1)	
More than 6 times the minimum wage	76 (56.3)	37 (27.4)	22 (16.3)	
Schooling level				
Did not complete primary school (8th grade)	7 (58.3)	3 (25.0)	2 (16.67)	0.059
Completed primary school (8th grade)	85 (45.2)	63 (33.5)	40 (21.3)	
Completed high school	199 (56.2)	95 (26.8)	60 (16.9)	
Graduated college or graduate school	80 (60.1)	40 (30.1)	13 (9.8)	
Marital status				
Married/ living together	211 (57.6)	96 (26.2)	59 (16.1)	0.048
Separated/ divorced	54 (41.5)	45 (34.6)	31 (23.8)	
Single	76 (60.0)	42 (28.0)	18 (12.0)	
Widowed	15 (55.9)	7 (30.9)	3 (13.2)	
Works night shifts				
Yes	178 (59.9)	69 (23.2)	50 (16.8)	0.019
No	197 (51.0)	127 (32.9)	62 (16.1)	

The totals may vary due to ignored answers.

made between the group that reports occasional insomnia complaints with the group that does not present insomnia complaints, only a breakup of a loving relationship and serious financial difficulty maintained a statistically significant association with insomnia. Death of a close relative showed a marginally significant association with occasional insomnia (Table 2).

Discussion

The 45.8% prevalence rate of insomnia complaints – 16.7% and 29.1% for frequent and occasional complaints, respectively – was high, if compared to another study with nursing professionals, such as the one by Kageyama et al. (2001)²⁹, in which the estimate of insomnia prevalence equals 29.2%.

Table 2 - Prevalence of insomnia complaints and crude and adjusted odds ratios (OR) and respective 95% confidence intervals (95% CI) for the association between stressful life events and insomnia complaints among nursing assistants from a university hospital in Rio de Janeiro, Brazil (n=695). The Pro-Saude Study, 1999.

SLE	No insomnia complaints	Insomnia complaints					
		Occasional			Frequent		
	n (%)	n (%)	Crude OR (95% CI)	Adjusted OR* (95% CI)	n (%)	Crude OR (95% CI)	Adjusted OR* (95% CI)
Serious health problems	78 (44.1)	51 (28.8)	1.28 (0.85–1.91)	1.12 (0.71 - 1.75)	48 (27.1)	2.68 (1.71 – 4.19)	2.82 (1.73 - 4.58)
Admission into a hospital	36 (50.7)	18 (25.4)	0.91 (0.50–1.66)	0.89 (0.47 - 1.68)	17 (23.9)	1.63 (0.88 – 3.03)	1.74 (0.90 - 3.35)
Death of a close relative	38 (41.8)	32 (35.2)	1.66 (1.00 – 2.75)	1.59 (0.94 - 2.70)	21 (23.1)	1.98 (1.11 – 3.53)	1.61 (0.86 - 3.02)
Serious financial difficulty	185 (46.4)	132 (33.1)	1.93 (1.35 – 2.74)	1.87 (1.27 - 2.75)	82 (20.6)	2.46 (1.57 – 3.86)	2.38 (1.46 - 3.88)
Forced change of residence	32 (42.7)	24 (32.0)	1.46 (0.84 – 2.56)	1.16 (0.63 - 2.15)	19 (25.3)	2.13 (1.15 – 3.92)	1.97 (1.02 - 3.79)
Breakup in loving relationship/ Divorce	47 (35.6)	49 (37.1)	2.28 (1.46 – 3.55)	2.30 (1.42 - 3.74)	36 (27.3)	3.18 (1.93 – 5.23)	3.32 (1.90 - 5.78)
Victim of mugging or robbery	51 (51.0)	30 (30.0)	1.13 (0.70 – 1.85)	1.05 (0.62 - 1.80)	19 (19.0)	1.26 (0.71 – 2.24)	1.26 (0.68 - 2.35)
Victim of physical aggression	15 (45.5)	8 (24.2)	1.00 (0.42 – 2.41)	0.90 (0.38 - 2.55)	10 (30.3)	2.30 (1.00 – 5.27)	2.27 (0.92 - 5.56)

* adjusted for sex, age, marital status, *per capita* family income, and work hours.

The fact that our population was comprised predominantly of females (79.9%) may partially explain the high prevalence of insomnia complaints in our study. On the other hand, as it has already been emphasized by other authors, the utilization of less rigid criteria to define insomnia may have contributed to the overestimation of the prevalence. For example, Morin et al. (2006)⁷ indicate that the estimation that one-third of the general adult population experiences insomnia symptoms (difficulty falling asleep or maintaining sleep) comes down to about 10% when the day-time consequences of insomnia are considered (e.g., fatigue).

Four out of eight SLE showed a statistically significant association with insomnia complaints: “breakup of a loving relationship”, “serious health problems”, “having undergone financial difficulties” and “forced change of residence”, even after adjusting

for socioeconomic, demographic, and work hours variables. It is observed, therefore, that it is not only the presence of stress, but the type of event experienced, as observed by Tjekkema (2005)³⁰ in a representative sample of the Canadian population. Our results corroborate those of Healey et al. (1981)¹⁵, according to which the people who complain of insomnia report a greater number of undesirable events, particularly those related with losses or illnesses. Research of the National Sleep Foundation, in conjunction with the Gallup Organization⁶, conducted with adult Americans who suffered of occasional insomnia shows that among the events mentioned as causes for sleep difficulties are the stress at work (28% of the individuals), the family-related stress (20%), and death of relatives (12%).

It must be emphasized that the factors related to the stress which may contribute to the appearance of primary insomnia

are usually not taken into account when the patient seeks medical assistance. The medicine-based treatments act upon the symptom (insomnia) without, however, acting on the cause of the problem, which, if persisting, may cause the insomnia to become chronic. In a population-based study, Kim et al. (2000)¹⁶ mention the difficulty in dealing with stress as a factor associated with the higher prevalence of insomnia. In this context, the observation of Morin et al. (2003)³¹ is worthy of mention, that it is not the number of stressful events *per se* that enhance the vulnerability to insomnia, but the perception of a lack of control over those events.

An aspect to be considered here is that the study sample is different from the population in general, since it is comprised by state university workers, i.e., a population of workers whose job security is backed by law in Brazil, representing thus a slice of the population which enjoys a more elevated socioeconomic condition. We know that the unemployed populations, with a lower socioeconomic condition, or with work instability are even more subject to stressful life events, and also to a higher occurrence of insomnia complaints¹⁶, thus making it impracticable the generalization of these results to other groups or populations.

Given that this is a sectional study, the results relating to one of the SLE items – se-

rious health problems – may emerge from a reverse causality, since insomnia complaints could lead to serious health problems. However, the fact that the reference period for the SLE was the twelve months prior to the completion of the questionnaire, while the evaluation of insomnia complaints was based upon the two weeks prior, partially minimizes this possibility, since probably only a small share of these events happened during the period evaluated by the questions addressing insomnia complaints. Conversely, since we do not possess the information regarding the duration of insomnia complaints, there is the possibility that another share of these complaints may be a marker for chronic insomnia, or at least of longer duration, what would lead to not discarding the hypothesis of reverse causality.

The results of the present study show that the history of stressful live events during the twelve previous months is associated with a higher prevalence of frequent insomnia complaints among the nursing assistants. The importance of identifying the main factors associated to insomnia complaints among nursing assistants is the fact that this category has, during its working hours, a responsibility over human lives, in an environment where even a minor accident may put in risk the lives of the people under their care.

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