Original Article

Quality and sleep duration among public health network users
Qualidade e duração de sono entre usuários da rede pública de saúde
Calidad y duración del sueño en usuarios del sistema de salud pública

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Abstract
Objective: To assess the quality and sleep time between public health network users and associated factors.
Methods: A cross-sectional study of 775 individuals of both genders in a city in the Center-West region of Brazil. A semi-structured questionnaire was used to assess the sociodemographic characteristics, life habits, health conditions, binge drinking, and quality and sleep duration assessed by the Pittsburgh Sleep Quality Index. Poisson regression was used to identify the factors associated with poor sleep quality and sleep duration (short and long).
Results: In the multiple analysis, the factors associated with poor sleep quality were female gender (prevalence ratio: 1.10, 95% Confidence Interval and 95%CI 1.05-1.16, p <0.00), binge drinking (prevalence ratio: 1.08; 95%CI 1.03-1.13; p <0.01), illegal drug use (prevalence ratio: 1.06, 95%CI 1.00-1.12, p=0.03), angina (prevalence ratio: 1.07, 95%CI 1.03-1.18, p <0.01) and depression (prevalence ratio: 1.07 95%CI 1.00-1.14, p=0.02). Obesity was associated with short sleep duration (prevalence ratio: 1.10 95%CI 1.02-1.17, p <0.01). Age> 55 years was associated with long sleep duration (prevalence ratio: 1.39; 95%CI: 1.00-1.92; p=0.04).
Conclusion: Being a woman, being over 55 years old, consuming alcoholic beverages, using illegal substances, angina, obesity and depression were risk factors for changes in quality and sleep duration. The results of the present study reinforce the need for the development of actions aimed at the prevention of diseases related to sleep disorders in the study population.

Resumo
Objetivo: Avaliar a qualidade e tempo de sono entre usuários da rede pública de saúde e fatores associados.
Métodos: Estudo transversal, realizado com 775 indivíduos de ambos os sexos, em um município da região Centro-Oeste do Brasil. Aplicou-se questionário semiestruturado para avaliar as características sociodemográficas, os hábitos de vida, as condições de saúde, o *binge drinking* e qualidade e duração do sono, avaliadas pelo Índice de Qualidade de Sono de Pittsburgh. Aplicou-se a regressão de Poisson para identificação dos fatores associados à qualidade do sono ruim e à duração de sono (curta e longa).
Resultados: Na análise múltipla, os fatores associados à qualidade de sono ruim foram sexo feminino (razão de prevalência: 1,10; intervalo e confiança de 95% – IC95% 1,05-1,16; p<0,00), *binge drinking* (razão de prevalência: 1,08; IC95% 1,03-1,13; p<0,01), uso de substâncias ilícitas (razão de prevalência: 1,06, IC95% 1,00-1.12; p=0,03), angina (razão de prevalência: 1,10;, IC95% 1,03-1,18; p<0,01) e depressão (razão de prevalência: 1,07 IC95% 1,00-1,14; p=0,02). A obesidade associou-se à curta duração do sono (razão de prevalência: 1,10 IC95% 1,02-1,17; p<0,01). Idade > 55 anos associou-se à longa duração do sono (razão de prevalência: 1,39, IC95% 1,00-1,92; p=0,04).
Conclusão: Ser mulher, ter idade >55 anos, consumir bebida alcoólica, usar substâncias ilícitas, angina, obesidade e depressão foram fatores de risco para alterações na qualidade e duração de sono. Os resultados do presente estudo reforçam a necessidade do desenvolvimento de ações voltadas para a prevenção dos agravos relacionados às alterações no sono na população estudada.

Resumen
Objetivo: evaluar la calidad y tiempo de sueño en usuarios del sistema de salud pública y factores asociados.
Métodos: estudio transversal, realizado con 775 individuos de ambos sexos, en un municipio de la región Centro-Oeste de Brasil. Se aplicó un cuestionario semiestructurado para evaluar las características sociodemográficas, los hábitos de vida, las condiciones de salud, el *binge drinking* y la calidad y duración del sueño, evaluadas mediante el Índice de Calidad del Sueño de Pittsburgh. Se aplicó la regresión de Poisson para identificar los factores asociados a la mala calidad del sueño y a la duración del sueño (corta o larga).
Resultados: en el análisis múltiple, los factores asociados a una mala calidad del sueño fueron sexo femenino (razón de prevalencia: 1,10; intervalo de confianza de 95% – IC95% 1,05-1,16; p<0,00), *binge drinking* (razón de prevalencia: 1,08; IC95% 1,03-1,13; p<0,01), uso de sustancias ilícitas (razón de prevalencia: 1,06, IC95% 1.00-1.12; p=0,03), angina (razón de prevalencia: 1,10;, IC95% 1,03-1,18; p<0,01) y depresión (razón de prevalencia: 1,07 IC95% 1,00-1,14; p=0,02). La obesidad se asoció a una corta duración del sueño (razón de prevalencia: 1,10 IC95% 1,02-1,17; p<0,01). La edad > 55 años se asoció a una larga duración del sueño (razón de prevalencia: 1,39, IC95% 1,00-1,92; p=0,04).
Conclusión: ser mujer, tener >55 años, consumir bebida alcohólica, usar sustancias ilícitas, angina, obesidad y depresión fueron factores de riesgo para alteraciones en la calidad y duración del sueño. Los resultados del presente estudio refuerzan la necesidad de desarrollar acciones orientadas hacia la prevención de los perjuicios relacionados con las alteraciones del sueño en la población estudiada.

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Introduction

It is estimated that the quality and sleep duration have suffered losses in the last decades due to the demands of modern life, with a short duration (less than 8 hours) and poor sleep.[1] Literature has pointed out that over a period of 20 years, half of adults did not present satisfactory sleep duration, and one sixth showed hypersomnia.[2] Unsatisfactory sleep adversely affects human health and, if untreated, can result in serious illness.[3]

Several studies have revealed the physiological mechanisms of sleep and its alterations.[4,5] Disorders arising from sleep occur when its duration and quality are altered, which has been associated with chronic diseases and morbidity and mortality, besides being an influencing factor in social relations.[6,7] Sleep quality, in contemporaneity, stems from rapid economic and social transformations, and exposes the individual to a poor quality sleep. These are: stress events, work at long hours, irregular meals, lack of physical exercise, smoking habits, alcoholic beverage intake and chronic diseases.[4,8]

At the same time, quality sleep of individuals who suffers socio-cultural influences,[9,10] having as risk factors emotional disorders, comorbidities and age, is more prevalent in women.[11] Thus, sleep quality impairments have been associated with: absence of physical activity, smoking and alcohol consumption, sedentary behavior and psychological distress.[11]

Although sleep is often investigated in the population,[1,2,4] actions of health care services focused on their care are often neglected. In this sense, sleep disorders have received attention in the field of public health, since good sleep quality provides better health and well-being, and represents a primordial biological process for physical and mental health.[12]

Given the above, and the relevance of the theme for the promotion and prevention of chronic health problems, the present study aimed to assess the quality and sleep duration among public health network users and associated factors.

Methods

This is a cross-sectional study with health devices uses carried out in a medium-sized municipality, reference in health care for 11 other municipalities, located in the Center-West region of Brazil. Data were collected between March and October of 2016, in Primary Health Care in three Family Health Units (FHU), two Basic Health Units (BHU) and one Emergency Care Unit (ECU 24h); in the Attention of Medium Complexity to the health it was comprised two general hospitals and a Maternal and Child hospital.

For sample calculation, it was considered the population of 67 thousand inhabitants in the municipality of the investigation within the chosen age range, according to the inclusion criteria, the anticipated prevalence of poor sleep quality of 38%,[13] the statistical power of 80% (β=20%), the significance level of 5% (α=0.05) and the design effect of 3.0, 10% increase for possible losses and totaling a probabilistic sample of 777 individuals. Patients aged ≥18 years of age, of both genders, living in the municipality, local public health system users, and without previous medical diagnosis of sleep disorder were included. Individuals in an apparent state of mental confusion were excluded after a brief physical examination.

Prior to data collection, the pilot test was performed with ten individuals who were in the health services, but not residents in the city. Data collection was conducted by face-to-face interview in a private environment provided by the health services managers. A semi-structured tool was applied, which included sociodemographic information, life habits and health conditions. Sleep quality was assessed by the Pittsburgh Sleep Quality Index, validated in Brazil in 2011. This index assesses sleep quality in the last month, consisting of 19 self-rated questions and five questions directed to spouses or room partners. The initial 19 questions are classified into seven components, which score from zero to three: subjective sleep quality, sleep latency, sleep duration, habitual sleep, sleep disorders, sleeping medication use, and daytime dysfunction. The final score ranges from zero to 21 points. Score> 5

indicates poor sleep quality.[14] Three dependent variables from the Pittsburgh Sleep Quality Index were considered: "poor sleep quality", with a score of> 5; "Short sleep duration", defined as 6 or fewer hours of daily sleep; and "long sleep duration", understood as more than 8 hours of sleep per day.[14]

The following variables were considered as independent variables: gender (male and female); age (≤55 and> 55 years); marital status (without partner and companion); schooling (> 8 and ≤8 years); family income classified in economic strata: C1= R$ 2,705.00 (R$ refers to "*reais*", the Brazilian currency) (> 2,705.00 and ≤ 2,705.00), among others (A= R$ 20,888.00, B1= R$ 9,254.00, B2= R$ 4,852.00, C2= R$ 1,625.00, DE= R$ 768.00);[15] have children (not yes); skin color (white rather than white); employment (formal and informal); live with friends (no yes); live only with children (no and yes); attendance at the Secondary Health Care Unit (no and yes); and report of binge drinking (no and yes). Binge drinking refers to excessive alcohol consumption, being ≥4 doses of alcohol for females and, for males, ≥5 on the same occasion,[16] besides illegal drug use (no and yes) and the presence of non-transmissible chronic conditions and conditions (angina, increased cholesterol and self-reported hypertension).

Obesity was verified by the calculation of body mass index. Individuals with a Body Mass Index >30kg/m².[17] The weight was measured by means of a digital scale and the height was identified through the stadiometer. Having anxiety variable was obtained through the question "Have you ever had treatment or received the medical diagnosis of anxiety? And depression, have you ever had treatment or been diagnosed with depression?"

The data were typed in spreadsheet in double entry and later analyzed with support of STATA software version 12.0. Quantitative variables were analyzed by mean, 95% Confidence Interval (95%CI) and standard deviation; the categorical variables, in absolute numbers, prevalence and 95%CI. In the bivariate and multiple analyzes, Poisson regression was applied, and the measure of effect was the prevalence ratio. The chi-square test verified the differences between the proportions in the bivariate analysis. The independent variables that presented in the crude analysis p <0.10 were submitted to the multiple model. In this study, the variables with p <0.05 were considered associated.

The research is part of a matrix project entitled "*Doenças relacionadas ao coração e outros agravos à saúde entre fumantes no sudeste goiano*", and was approved by the Research Ethics Committee of the *Universidade Federal de Goiás*, under Opinion 2,331,604 and respected the ethical principles of Resolution 466/2012 of the Brazilian Health Board *(Conselho Nacional de Saúde)*.

Results

775 individuals participated in the study. There was a loss of two individuals, with no impact, as this was within the possibility of sample losses. More than half of the sample (53.9%; 95%CI 50.1-57.6) was female. Regarding participants' age, the mean was 39.7 years (95%CI, 38.61-40.77, standard deviation of 14.8). The mean educational level was 9.7 years (95%CI: 9.40-10.06, standard deviation of 4.5). The average income found was R$ 2,777.33 (95%CI 2,559.49-3,024.97, standard deviation R$ 2,947.64). The prevalence of poor sleep quality by the Pittsburgh Sleep Quality Index score was 57.4% (95%CI: 53.8-60.9). The prevalence for short sleep duration was 9.3% (95%CI 7.4-11.1) and long sleep duration was 24.9% (95%CI 21.8-28.4). Factors associated with the study-dependent variables in the bivariate analysis are shown in table 1.

In bivariate analysis, variables associated with outcome of poor sleep quality were female; live with children; binge drinking; illegal drug use; angina; increased cholesterol; hypertension; depression and anxiety. As for the variable outcome short sleep duration, they were associated with age> 55 years; schooling ≤ 8 years; have children and obesity. Age> 55 years; schooling ≤8 years; income ≤ R$ 2,705.00; white skin color; hypertension and depression were associated with the variable long sleep duration. Table 2 presents the multiple analysis of the factors associated with the dependent variables of this study.

Table 1. Bivariate analysis of dependent variables related to sleep quality and duration with independent sociodemographic variables, life habits and health condition

Variables	All*	Poor sleep quality		p-value	Short sleep duration		p-value	Long sleep duration		p-value
		n(%)	PR (95%CI)		n(%)	PR (95%CI)		n(%)	PR (95%CI)	
Gender										
Male	359	178 (49,6)	1.0		89 (24.8)	1.0		96 (26.7)	1.0	
Female	416	267 (64.2)	1.10 (1.05-11.16)	0.00	104 (25.0)	1.01 (0.97-1.05)	0.40	109 (26.2)	0.97 (0.77-1.23)	0.86
Age, years										
≤55	650	380 (58.5)	1.0		176 (27.1)	1.0		155 (23.9)	1.0	
>55	125	65 (52.0)	0.95 (0.90-1.02)	0.19	17 (13.5)	0.89 (0.84-0.94)	0.00	50 (39.7)	1.66 (1.28-2.14)	0.00
Marital status										
Without partner	395	224 (56.7)	1.0		104 (26.3)	1.0		110 (27.8)	1.0	
With partner	377	220 (58.4)	1.01 (0.96-1.05)	0.64	88 (23.4)	0.97 (0.93-1.02)	0.35	93 (24.7)	0.89 (0.70-1.19)	0.33
Schooling, years										
>8	478	264 (55.2)	1.0		134 (28.0)	1.0		111 (23.2)	1.0	
≤8	297	181 (60.9)	1.03 (0.99-1.08)	0.11	59 (19.9)	0.93 (0.89-0.98)	0.00	94 (31.6)	1.36 (1.07-1.72)	0.00
Family income, R$										
>2,705.00	315	192 (60.9)	1.0		87 (27.6)	1.0		69 (21.9)	1.0	
≤2,705.00	460	253 (55,0)	0.96 (0.92-1.00)	0.09	106 (23.0)	0.96 (0.91-1.01)	0.15	136 (29.6)	1.34 (1.04-1.73)	0.02
Children										
No	257	139 (54.1)	1.0		77 (30.0)	1.0		58 (22.6)	1.0	
Yes	518	306 (59.1)	1.03 (0.98-1.08)	0.19	116 (22.4)	0.94 (0.89-0.99)	0.02	147 (28.4)	1.25 (0.96-1.63)	0.09
Skin color										
Not White	541	305 (56.4)	1.0		128 (23.7)	1.0		154 (28.5)	1.0	
White	234	140 (59.8)	1.02 (0.97-1.07)	0.36	65 (27.7)	1.03 (0.97- 1.08)	0.24	51 (21.7)	0.76 (0.57-1.00)	0.05
Employment										
Formal	318	194 (61.0)	1.0		82 (23.8)	1.0		81 (25.5)	1.0	
Informal	457	251 (54.9)	0.96 (0.92-1.00)	0.09	111 (24.3)	0.98 (0.94-1.03)	0.63	124 (27.1)	1.06 (0.83-1.35)	0.60
Living with friends										
No	743	432 (58.1)	1.0		187 (25.1)	1.0		200 (26.9)	1.0	
Yes	32	13 (40.6)	0.88 (0.78-1.00)	0.06	6 (18.7)	0.94 (0.84-1.06)	0.37	5 (25.6)	0.58 (0.25-1.31)	0.19
Living with children										
No	711	401 (56.4)	1.0		174 (24.5)	1.0		191 (26.9)	1.0	
Yes	64	44 (68.7)	1.07 (1.00-1.15)	0.03	19 (29.7)	1.04 (0.95-1.14)	0.37	14 (21.9)	0.81 (0.50-1.31)	0.40
SHCU service										
No	432	236 (54.9)	1.0		115 (26.5)	1.0		113 (26.1)	1.0	
Yes	343	209 (61.0)	1.04 (0.99-1.08)	0.07	78 (22.8)	0.97 (0.92-1.01)	0.22	92 (26.9)	1.03 (0.81-1.30)	0.80
Binge drinking										
No	423	221 (55.2)	1.0		100 (23.6)	1.0		121 (28.6)	1.0	
Yes	352	224 (63.6)	1.07 (1.02-1.12)	0.00	93 (26.4)	102 (0.97-1.07)	0.37	84 (23.9)	0.83 (0.65-1.06)	0.13
Illegal drug use										
No	671	375 (55.9)	1.0		161 (24.0)	1.0		180 (26.8)	1.0	
Yes	104	70 (67.3)	1.07 (1.01-1.12)	0.00	32 (30.8)	1.05 (0.98-1.13)	0.15	25 (24.0)	0.89 (0.62-1.28)	0.55
Angina										
No	723	404 (55.9)	1.0		175 (24.2)	1.0		193 (26.7)	1.0	
Yes	52	41 (78.8)	1.14 (1.07-1.22)	0.00	18 (34.6)	1.08 (0.98-1.19)	0.11	12 (23.1)	0.86 (0.51-1.44)	0.57
High cholesterol rates										
No	699	394 (56.4)	1.0		175 (25.1)	1.0		185 (26.5)	1.0	
Yes	76	51 (67.1)	1.06 (0.99-1.14)	0.05	18 (23.4)	0.98 (0.90-1.06)	0.74	20 (26.0)	0.97 (0.65-1.45)	0.92
Hypertension										
No	525	348 (55.7)	1.0		160 (25.6)	1.0		149 (23.9)	1.0	
Yes	150	97 (64.7)	1.05 (1.00-1.11)	0.03	33 (21.8)	0.96 (0.91-1.03)	0.32	56 (37.1)	1.55 (1.20-1.99)	0.00
Obesity†										
No	645	363 (56.3)	1.0		149 (23.1)	1.0		178 (27.6)	1.0	
Yes	121	78 (64.5)	1.05 (0.99-1.11)	0.08	42 (34.7)	1.09 (1.02-1.17)	0.01	27 (22.3)	0.80 (0.56-1.15)	0.24
Depression										
No	697	384 (55.1)	1.0		178 (25.6)	1.0		177 (25.4)	1.0	
Yes	78	61 (78.2)	1.14 (1.08-1.21)	0.00	15 (19.0)	0.94 (0.87-1.02)	0.17	28 (35.4)	1.39 (1.00-1.92)	0.04
Anxiety										
No	718	406 (56.5)	1.0		180 (25.0)	1.0		192 (26.7)	1.0	
Yes	57	39 (68.4)	1.07 (0.99-1.16)	0.05	13 (22.8)	0.98 (0.89-1.07)	0.69	13 (22.8)	0.85 (0.52-1.39)	0.52

* Number of valid answers; † individuals with a body mass index> 30kg m². PR - Prevalence Ratio; 95%CI - 95% Confidence Interval; SHCU - Secondary Health Care Unit

Table 2. Multiple analysis of factors associated with quality-dependent variables and altered sleep duration

Variables	Adjusted PR (95%CI)*	p-value
Poor sleep quality		
Gender	1.10 (1.05-1.16)	0.00
Family income	0.96 (0.92-1.01)	0.13
Work	0.96 (0.92-1.00)	0.08
Living with friends	0.90 (0.80-1.02)	0.11
Living with children	1.02 (0.95-1.10)	0.53
SHCU service	1.02 (0.98-1.07)	0.28
Binge drinking	1.08 (1.03-1.13)	0.00
Illegal drug use	1.06 (1.00-1.12)	0.03
Angina	1.10 (1.03-1.18)	0.00
High total cholesterol rates	1.01 (0.94-1.08)	0.76
Hypertension	1.02 (0.97-1.09)	0.34
Obesity	1.03 (0.97-1.09)	0.27
Depression	1.07 (1.00-1.14)	0.02
Anxiety	1.01 (0.93-1.09)	0.74
Short sleep duration		
Age, years	0.96 (0.91-1.01)	0.19
Living with children only	0.96 (0.91-1.01)	0.18
Obesity	1.10 (1.02-1.17)	0.00
Long sleep duration		
Age, years	1.39 (1.00-1.92)	0.04
Schooling	1.09 (0.83-1.42)	0.52
Family income	1.27 (0.98-1.63)	0.06
Living with children only	0.99 (0.73-1.33)	0.95
Skin color	0.81 (0.61-1.07)	0.15
Hypertension	1.29 (0.98-1.70)	0.06
Depression	0.85 (0.52-1.39)	0.52

* PR - Prevalence Ratio; 95% CI - 95% Confidence Interval; SHCU - Secondary Health Care Unit

In multiple analysis, factors associated with poor sleep quality were female gender, binge drinking, illegal drug use, angina, and depression. Short sleep duration was associated with obesity. Age was associated with long sleep duration.

Discussion

This study assessed the quality and sleep duration by measuring its quality and sleep duration per day, with notes of associated factors, testing sociodemographic, behavioral variables and health-disease process history in a population of devices users, which make up the health care network of a municipality in the Central Region of Brazil.

Although it presents some limitations, as in its delineation that precludes the cause-effect relation, this investigation innovated when considering the geographic space of the region and when revealing data on the intrinsic and extrinsic factors, that predisposes the individual to sleep disturbances. Also,

it innovates when assessing behavioral variables of psychoactive substances use of the population served in the public network of the Central Region of Brazil, that can interfere negatively the quality and sleep duration. The prevalence of poor sleep quality of the present study was 57.4%. The prevalence of poor sleep is varied and divergent from that pointed out in this study, and much is due to the locality and population investigated. In a study carried out in the city of São Paulo, poor sleep quality was 46.7%;[18] in two other cohort studies from Germany, the percentage found was 38%[13] and in Helsinki, 72.9%.[19] However, associated variables were similar: obesity, female gender and age equal to or above 60 years,[18] as well as depressive symptoms and mood alteration.[13,19]

Considering gender, it was verified that the female was more prone to poor sleep quality (prevalence ratio 1.08, 95%CI 1.03-1.14, p=0.00). Regarding these findings, women are more likely to have problems with sleep quality, which is explained by sociodemographic factors such as cultural, racial and social factors.[9,18] They are also made more vulnerable by genetic and physiological factors such as hormonal physiological changes, from menstruation and menopause, to the eventual decline in estrogens, as well as ovarian estradiol, which interferes with the disposition and ability to maintain daily activities, with implications for poor sleep quality.[20,21] This propensity is potentiated when a woman has as a lifestyle to be a smoker, frequent drug use and abuse.[9]

In this research, binge drinking was a risk factor for poor sleep quality. This compulsive behavior by alcohol can be adopted by some people with difficulties to fall asleep; substance use is then observed to remedy such limitation.[22] On the other hand, alcoholic beverages can alter the functioning of the circadian timing system, with altered brain waves, reduced sleep time in the Rapid Eyes Movement (REM) phase and the onset of episodes of insomnia, as well as disrupting the latent period of sleep. Likewise, there are other effects related to alcohol use, such as impairment of memory, in addition to the diuretic effect of the substance, which also causes sleep interruptions, making it fragmented.[23]

In this context, alcohol consumption and illegal drug use also affect the circadian timing system, since most known zeitgebers (external synchronizers) of the circadian rhythm are impaired during the acute or chronic use of these psychoactive substances.[24] A study conducted in China showed a prevalence of 68.5% for poor sleep quality in individuals who used illegal drugs.[25] The illegal substance acts on the central nervous system and therefore alters the release of neurotransmitters that control the sleep-wake cycle.[4,25] This finding corroborates the results of this investigation, since the illegal drug use was associated to the variable poor sleep quality.

Association between angina and poor sleep quality, verified in the present study, is in agreement with the findings of other studies. Canadians with high angina scores had a 3.27-fold higher chance of poor sleep quality.[26] In addition, a cohort pointed out that individuals with short sleep duration or poor sleep quality are more likely to develop cardiovascular disease (angina: 1.62% in the Netherlands, 8.11% Suriname in South Asia, 5.4% in Africa, 5.14% in Ghanaians, 10.1% in Turkey and 7.35% in Morocco, as well as intermittent claudication and myocardial infarction), among other findings that accompanied other health-disease situations such as obesity, hormonal changes and stresses, identified as risk factors for irregular sleep.[27]

In the psychic dimension, the association found in this study has been identified as a risk factor for changes in sleep patterns. A cross-sectional study conducted in Portugal, Spain and Brazil found associations between poor sleep quality and stress, anxiety and depression.[28] Sleep quality may be related to socioeconomic and cultural factors of the population.[28] As for the mechanism of the relationship between sleep disturbance and depression, some studies suggest that psychological and behavioral changes aggravate sleep,[13,29] such as depression.[8,30] In this same perspective, it was pointed out that the intrinsic affinity between sleep and depressive disorders, coupled with stress, ie difficulty sleeping, leads to nocturnal wakefulness, prone to intrusive thoughts. Therefore, it has been shown that the inability to adapt to stressful events and the effects of cognitive excitation and altered nocturnal wakefulness are responsible for the onset of depression.[30]

This eventuality is also related to hormonal factors, especially to melatonin, responsible for the circadian timing system of the sleep-wake cycle. Changes in the levels of this hormone are associated with depressive symptoms, since people with psychological disorders are more likely to have decreased sleepiness, hypersomnia or even insomnia.[5]

The obesity variable was associated with the sleep dependent variable short. Corroborating the findings of this research, several studies[18,31] evidence the association between lower sleep time (<6 hours), high body mass index, obesity and chronic diseases.[32,33] It is suggested that hormones responsible for energy balance during sleep, such as leptin, insulin, glucose, adiponectin, cortisol and ghrelin, present altered levels in individuals with short sleep duration, stimulating the cortical regions to desire foods with high caloric content and poor nutritional quality, predisposing them to obesity.[34]

In relation to age, individuals over 55 years of age are more likely to present long sleep duration. Corroborating this finding in cross-sectional research conducted in Philadelphia, older individuals presented greater satisfaction regarding the long sleep duration. Justifications can occur because they have more time to sleep, fewer children at home, work less and have less stress. However, physiologically, as individuals age, their bodies will require less sleep time for their satisfaction and quality.[21,35]

Furthermore, it is necessary to mention some limitations of the present study, as already mentioned, cross-sectional design, prevented estimating the cause-effect relationship between occurrences and recruitment for convenience, so that data provided by individuals may have memory bias during the self-report in interviews. The questions directed to bed/room mates of the Pittsburgh Sleep Quality Index were no longer applied, since most of the time they were not in the interview. In addition, literature lacks research[21] that analyzed the variables studied in the present study as associated factors, a fact that limited the inferences of the findings, leading to a similar discussion regarding associated factors.

Conclusion

Irregularities in sleep characteristics were closely related to their quality, duration of daily sleep, as well as other associated factors, such as female gender, binge drinking, illegal drug use, angina, depression, obesity, and age. Such irregularity of sleep, along with associated factors, are fed back and potentiated. Thus, they increase the vulnerability of chronic damage to the health of individuals who, daily, present themselves in the demands of health services. Finally, it is necessary that the workers of the sector attend to this phenomenon in the attention to the health needs of users.

Collaborations

All authors, Simões ND, Monteiro LHB, Lucchese R, Amorim, TA, Denardi, TC, Vera, I, Silva, GC, Sverzut, declare that they contributed to the study design, data analysis and interpretation, article writing and approval of the final version to be published.

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