



SLEEP QUALITY IN LONG-LIVING BRAZILIANS

KEYWORDS

aged, sleep, depression.

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ABSTRACT

Introduction: At present, more than 15 million Brazilians are 60 years old or above, and the increase in lifespan is related to the technological advances in health, that contributed to decrease mortality rates. **Objective:** To assess sleep quality and depression in long living elderly. **Methods:** This is a cross-sectional study where sleep quality and depression level in long-living elderly. Sleep quality was assessed through Pittsburgh Sleep Quality Index (PSQI) and depression through Beck Depression Inventory (BDI) in 103 individuals ageing more than 74,3 years old (females) or 73 years old (males) distributed into three groups according to sleep quality. **Results:** 20% of the sample presented sleep disturbance, it was observed that individuals who presented depression had OR 9.3 than the ones without depression. Risk for sleep disturbance was not statistically significant in the following conditions: women vs. men OR 1.3; living alone vs. living with someone OR 1.8; having history of NCCD (non-communicable chronic diseases) vs. no history of NCCD OR 1.6; being a widower vs. being married OR 1.5. Less smoking history variables than three years packet, sleep before 22pm, waking up before 6 am, not be stressed were considered significant for longevity. **Conclusion:** Depression is an important risk factor that predisposes the individual to a worse sleep quality, including worse sleep latency and shorter sleep duration. These alterations, in the long term, might expose the individual to insomnia, which is a predisposing factor to NCCD. It is worth noting the importance of more research aiming at the relationship between sleep disturbances and the onset of NCCD.

INTRODUCTION

Life expectancy in Brazil is estimated to reach 74,3 years old in 2025. At present, more than 15 million Brazilian citizens are older than 60 years, and participation of people from this age group in the total Brazilian population doubled in the last 50 years. Besides, the population of very old individuals, above 80 years of age, is also increasing¹. It seems that reaching an advanced age is no longer privilege of a few people. This increase in lifespan is associated to technological advances in health, which assisted the reduction of mortality rates².

Sleep is a vital physiological process, characterized by two phases: NREM, where there is muscle relaxation and presence of basal tonicity; and REM, deep sleep with presence of muscle atony, in other words, motor inhibition and phase switch^{3,4}. Among the main diseases related to poor sleep quality in elderly, some must be highlighted: depression, mood changes and anxiety, heart diseases, diabetes, chronic obstructive pulmonary disease, chronic pain, gastrointestinal disease, Alzheimer and Parkinson^{5,6,7}.

Anxiety and depressive disorders are frequent alterations in the elderly, resulting in a major public health problem due to the high morbidity and mortality rates^{8,9}. According to Minghelli et al¹⁰, between 2005 and 2006, 183.428 elderly persons presented or had already presented depression. It is known that this disease has been

twice more diagnosed in women due to a higher frequency of clinical consultations and adhesion to health treatments, which consequently leads to a better detection of these cases^{11,12}.

In the elderly, these elements and also falls are relevant factors as they can convey to incapacity, injury and death¹³⁻¹⁷. In a transversal study with 1.952 participants ageing from 60 to 97 years old, apnea patients presented increased risk of fall twice or more when compared to the ones without apnea. Thus, sleep problems are highly related to morbidities that may conduct to premature death, and this contributes to the reduction of longevity¹⁸. Therefore, it is important to assess sleep quality and depression level in long-living elderly, in order to identify factors that influence sleep quality and consequently, health/disease in these individuals.

OBJECTIVE

To assess sleep quality and depression level in long-living elderly individuals.

METHODS

This is a cross-sectional study where sleep quality and depression level in long-living elderly were assessed. The age of the sample was above the Brazilian life expectancy. Data were collected in the residence of participants. Students from two undergraduation courses in a private university of Sao Paulo (Brazil) were asked to

indicate a relative or neighbor that filled inclusion criteria. Researchers then headed to participant's residence and administered the questionnaires.

Participation in this study required the individual to reside in the south region of Sao Paulo, to have conditions to answer the questionnaires and to be aged over 74.3 years old in the case of the female gender and over 73 years old in the case of the male gender. Elderly people with neurological diseases and the bedridden ones whose limitations would prevent assessment were excluded from the study.

One hundred and three long-living individuals were evaluated first individuals answered a questionnaire to characterize the sample after they responded to two questionnaires. To assess sleep quality, Pittsburgh Sleep Quality Index (PSQI), an instrument which validity and reliability has been previously tested, was employed. This questionnaire has a sensibility of 89.6% and 86.5% specificity. When translated to Portuguese, PSQI maintains its high sensibility (80%), however a slightly lower specificity (68.8%)¹⁹. The instrument comprises 19 items, grouped into seven components, each of them having a score range from 0 to 3. Components are: (1) subjective sleep quality; (2) sleep latency; (3) sleep duration; (4) habitual sleep efficiency; (5) sleep disturbances; (6) use of sleep medications; and (7) daytime dysfunction. Scores of the seven components are added up to a global score of PSQI, ranging from 0 to 21. Scores from 0-4 indicate a good sleep quality, from 5-10 a poor sleep quality, and scores over 10 indicate sleep disturbance.

Beck Depression Inventory (BDI) was administered to participants in order to assess depression level. The instrument was originally developed by Beck, Ward, Mendelson, Mock and Erbaugh (1961). It is a self-reporting scale designed to evaluate the intensity of depressive symptoms^{20,22}. BDI contains 21 items and estimates of reliability were obtained from six psychiatric samples ranging from 0.79 and 0.90. Classification was performed as follows: scores <15 = no depression; 15-20 = dysphoria; 20-30 = moderate to severe depression; 30-63 = severe depression.

STATISTICAL ANALYSIS

For the analysis, Graphpad Prism v.6 was used. Quali-quantitative variables were described as means and percentage, and results were presented in tables and graphs. Symptom risks were analyzed through odds ratio, and proportions were compared through chi-square test, the comparison between groups was performed by analysis of variance, the variables that could influence to achieve longevity was analyzed by means of multivariate regression test, considering p<0.05 as a statistically significant difference.

RESULTS

Mean age of the 103 individuals sample was 76.8 ± 4.8 years old, and 31% of them were male. Individuals were distributed into three groups according to the classification of sleep quality, assessed by PSQI.

The, Group I (good sleep quality) and II (poor sleep quality) were composed by 19 and 49 individuals respectively; and in both the prevalence of women, married, with family interaction and without chronic diseases was observed. Conversely, group III (sleep disturbance) was composed by 22 individuals, mostly widowers and with chronic diseases. Sample characteristics are shown in table 1.

Figure 1 shows the analysis of the seven components of PSQI for the three groups. Group III had the worse sleep quality, latency, efficacy, sleep disturbances, and used more medication when compared to groups I and II. Sleep duration in patients from group III was significantly shorter than in patients from group II. Group II in turn, had a shorter period of sleep and significantly more dysfunction than the other groups.

In figure 2, it is clearly demonstrated that group III presented a significantly higher depression risk than group I (16.0 ± 6.6; CI 95%:12.4 to 19.6 vs. 9.8 ± 8.6; CI 95%: 5.6 to 14.1) and group II (11.8 ± 6.8; CI 95%: 9.9 to 13.7) (p=0,02).

When establishing the risk for sleep alterations, it was observed that individuals who presented depression had an OR 9.3 times higher risk (CI 95% 1.1 to 74.3) than the ones without depression. Risk for sleep disturbance was not statistically significant in the following conditions: women vs. men (OR 1.3; CI 95%: 0.3 to 3.1), living alone vs. living with someone (OR 1.8; CI 95%: 0.8 to 4.5), having history of NCCD (non-communicable chronic diseases) vs. no history of NCCD (OR 1.6; CI 95%: 0.5 to 5.2), being a widower vs. being married (OR 1.5; CI 95%: 0.4 to 4.9) (figure 3).

In the multivariate regression model the less smoking history than three years packet, sleep before 22pm, waking up before 6 am, not being stressed were considered significant for longevity. However drink alcohol and coffee, do physical activities less than three times per week, educational status and financial income were not significant factors.

Table 1- Socio-demographic characteristics of the sample.

Variable	Group I (n=19)	Group II (n= 49)	Group III (n=22)
Gender (M/F) %	36.8/57.8	34.6/61.2	36.3/54.5
Not declared	5.2	4.0	9.0
Age	76.2 ± 3.3	76.6 ± 5.3	77.6 ± 3.4
Marital status %			
Married	57.8	46.9	40.9
Widowed	26.3	24.4	45.4
Divorced	5.2	0	4.5
Single	0	6.1	0
Not Declared	10.5	22.4	9.0
Number of children	2.8 ± 1.1	4.0 ± 3.7	4.1 ± 0.9
Place of Living %			
Family	57.8	69.3	63.6
Alone	21.0	2.0	9.0
Asylum	5.2	4.0	18.1
Not Declared	15.7	24.4	9.0
Chronic Diseases %			
Yes	26.3	22.4	45.4
No	63.1	44.8	40.9
Not Declared	10.5	32.6	13.6
Depression	9.8 ± 8.6	11.8 ± 6.8	16.0 ± 6.6

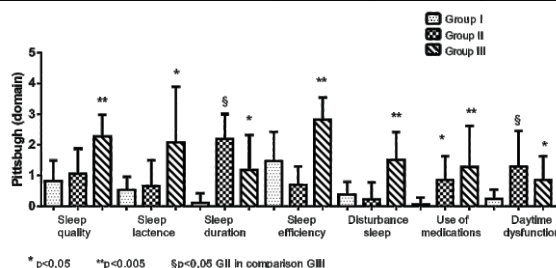


Figure 1 - Analysis of the amount of sleep in each domain of PSQI for the three groups.

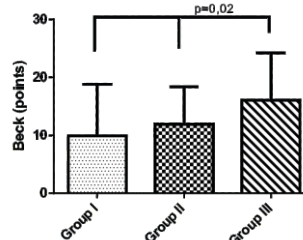


Figure 2 - Depression risk assessed by BDI for the three groups.

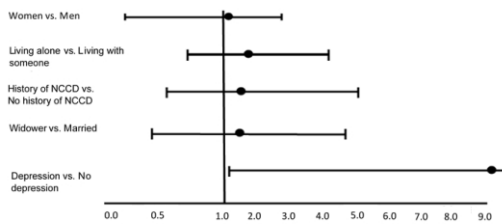


Figure 3 - Relative risk of factors influence sleep in the elderly.

DISCUSSION

The aim of this study was to assess sleep quality and depression in long-living individuals. Among the main results, around 20% of them presented sleep disturbances. The risk of sleep disturbances was higher among individuals who had depression. Among the ones who presented sleep disturbances, the prevalence of NCCD was higher, and less smoking history than three years packet, sleep before 22pm, waking up before 6 am, not be stressed were considered significant for longevity.

Sleep quality has been studied in several populations. It has already been established that a poor sleep quality represents an increased risk factor to some diseases, mainly in the elderly. According to Araujo et al.²³, mortality for common causes in the elderly, such as cardiovascular disease, cerebrovascular accident and cancer are twice more frequent in people with sleep disturbances than in the ones who present a good sleep quality.

Longevity is a synonym of long life duration. It seems to be related to a time of living that reaches or surpasses life expectancy of a certain generation. In this context, it is a semantic statement that long-living individuals in Brazil are the ones who exceed the present life expectation, over 74.6 years of age²⁴.

From the biological point of view, points out that, with ageing, alterations in several organs and systems are expected, and they are directly related to factors such as posture, eating habits, genetic inheritance, physical activity or sedentary living (among others), which vary from person to person. These factors together reflect and individual's lifestyle, that will contribute to the determination of longevity or premature death.

Normal ageing process brings about changes in the amount and quality of sleep, which affect more than half of the persons over 65 years old who live at home and 70% of the institutionalized ones, causing a negative impact in their quality of life²⁵. This allows us to affirm that sleep and resting are necessary restoring functions to life preservation²⁶.

According to Floyd²⁷, one of the factors that contribute to sleep disturbances in the old age is the alteration of sleep pattern. This includes a shorter duration and longer latency of nocturnal sleep. This finding was highlighted in the present study, where groups I and II, representing 80% of the sample, presented better sleep latency, quality and efficacy in relation to group III.

The onset of depressive disease involves the participation of several factors, such as lower education level and socioeconomic status, presence of chronic and disabling diseases, social abandonment and isolation, lack of physical activity and marital status^{11,28-30}. Studies confirm that the absence of a spouse might increase the prevalence of depressive symptoms^{11,28,29,31,32}. This fact was endorsed by a recent study that, through logistic regression analysis verified that being alone increases in up to 8 times the probability to develop signs of anxiety and/or depression¹⁰.

In the present study, an increased risk for sleep disturbances was observed in individuals who lived alone. Similar data were shown by

Minghelli, et al.¹⁰, where 59.7% of the individuals were single or widowers and presented a probable case of anxiety or depression and consequent sleep disturbance.

According to Drager et al.³³, sleep disturbances predispose to the onset of NCCD (such as systemic arterial hypertension). Consequences and co-morbidities of sleep disturbances are related to reduced duration of sleep, which is classified as insomnia. Its diagnosis is linked to daytime symptoms that include tiredness, irritability, difficulty in concentration and memory, headache and depression. The latter has a direct connection with coronary artery disease risk, which affects the control of risk factors to NCCD, including obesity, sedentary behavior and smoking³⁴. This mechanism might explain the result of the present study, in which the prevalence of NCCD was higher in individuals with sleep disturbances.

In a comparative transversal study with a 203 individuals sample where 17.7% used medication to sleep, it was observed that they presented a delay of 31 to 60 minutes do fall asleep. They also referred 6 to 7 hours of sleep per night, as the ones who did not use medication presented a mean of 16 to 30 minutes delay to fall asleep, and referred more than 7 hours of sleep per night. The ones who used medication to sleep presented higher stress levels and more prejudice (such as waking up frequently during sleep, daytime sleepiness, fatigue in the first working hours, shorter duration and longer latency of sleep) than the others³⁵. This study confirms our data, where the use of medication to sleep was predominant in group III, the group that presented higher latency and worse sleep quality when compared to groups I e II.

CONCLUSION

Depression is an important risk factor that predisposes the individual to a worse sleep quality, including worse sleep latency and shorter sleep duration. These alterations, in the long term, might expose the individual to insomnia, which is a predisposing factor to NCCD. It is worth noting the importance of more research aiming at the relationship between sleep disturbances and the onset of NCCD.

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