



CHRONIC DISEASES AND EXCESSIVE DAYTIME SLEEPINESS IN OLDER ADULTS

Doenças crônicas e sonolência diurna excessiva em pessoas idosas

Enfermedades crónicas y somnolencia diurna excesiva en mayores

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ABSTRACT

Objective: To assess the level of Excessive Daytime Sleepiness (EDS), Obstructive Sleep Apnea Syndrome (OSAS) and health conditions in older adults. **Methods:** This is a quantitative cross-sectional study carried out with older adults enrolled in the Family Health Strategy in a municipality in Rio Grande do Norte, Brazil, from September 2015 to January 2016. A sociodemographic questionnaire (with questions related to: sex, marital status, type of housing, address, income, education and profession) and a health conditions questionnaire (with questions related to presence of diseases, sequelae and use of medications) were used. Excessive daytime sleepiness (EDS) was measured using the Epworth scale and sleep apnea obstructive syndrome (OSAS) was measured using the Berlin questionnaire. **Results:** Participants were 61 older adults with a mean age of 68.5 years, 46 of whom were women (75.4%). In all, 56 (91.8%) participants reported having some disease, with systemic arterial hypertension (SAH) being the most common (57.4%; n=35), followed by type 2 diabetes (24.6%, n=15), and arthritis or arthrosis (34.4%, n=21). There was a positive correlation between SAH and OSAS ($p=0.001$), DM and OSAS ($p=0.018$) and between EDS and respiratory diseases ($p=0.010$). **Conclusion:** The most prevalent diseases in the older adults analyzed were systemic arterial hypertension and diabetes mellitus. The majority did not present excessive daytime sleepiness, and some presented very low levels of such condition. Despite that, there was a positive association of chronic diseases with obstructive sleep apnea syndrome and excessive daytime sleepiness.

Descriptors: Disorders of Excessive Somnolence; Primary Health Care; Chronic Disease; Aged.

RESUMO

Objetivo: Avaliar o nível de sonolência diurna excessiva (SDE), a síndrome de apneia obstrutiva do sono (SAOS) e as condições de saúde em idosos. **Métodos:** Trata-se de um estudo transversal e quantitativo, realizado com idosos cadastrados nas Estratégias de Saúde da Família de um município do Rio Grande do Norte, Brasil, de setembro de 2015 a janeiro de 2016. Utilizou-se um questionário sociodemográfico (com perguntas relativas ao: sexo, estado civil, tipo de moradia, endereço, renda, escolaridade e profissão) e de condições de saúde (com perguntas relativas à presença de doenças, a sequelas presentes e ao uso de medicamentos). A sonolência diurna excessiva (SDE) foi medida pela escala de Epworth e a síndrome de apneia obstrutiva do sono (SAOS), pelo questionário clínico de Berlin. **Resultados:** Participaram do estudo 61 idosos, com idade média de 68,5 anos, sendo 46 do sexo feminino (75,4%). Dentre eles, 56 (91,8%) relataram ter algum tipo de doença, sendo a hipertensão arterial sistêmica (HAS) a mais frequente (57,4%; n=35), seguida pela diabetes mellitus (DM) (24,6%; n=15) e artrite ou artrose (34,4%; n=21). Observou-se correlação positiva entre HAS e SAOS ($p=0,001$), DM e SAOS ($p=0,018$) e entre SDE e doenças respiratórias ($p=0,010$). **Conclusão:** As doenças mais prevalentes entre os idosos avaliados foram hipertensão arterial sistêmica e diabetes mellitus. A maioria não apresentou sonolência diurna excessiva e, quando observada, foi principalmente em grau leve.



Apesar disso, observou-se associação positiva entre doenças crônicas, síndrome de apneia obstrutiva do sono e sonolência diurna excessiva.

Descritores: Distúrbios do Sono por Sonolência Excessiva; Atenção Primária à Saúde; Doença Crônica; Idoso.

RESUMEN

Objetivo: Evaluar el nivel de Somnolencia Diurna Excesiva (SDE), el Síndrome de Apnea Obstrutiva del Sueño (SAOS) y las condiciones de salud de mayores. **Métodos:** Se trata de un estudio transversal y cuantitativo realizado con mayores inscritos en la Estrategia de Salud de la Familia de un municipio de Rio Grande do Norte, Brasil, entre septiembre de 2015 y enero de 2016. Se utilizó un cuestionario sociodemográfico (con preguntas sobre el sexo, el estado civil, el tipo de vivienda, la dirección, la renta, la escolaridad y la profesión) y de las condiciones de salud (con preguntas sobre la presencia de enfermedades, las secuelas y el uso de medicamentos). La Somnolencia Diurna Excesiva (SDE) fue medida por la escala de Epworth y el Síndrome de la Apnea Obstrutiva del Sueño (SAOS) por el cuestionario de Berlín. **Resultados:** Participaron del estudio 61 mayores con media de edad de 68,5 años y 46 eran del sexo femenino (75,4%). De entre ellos, 56 (91,8%) relataron algún tipo de enfermedad y la hipertensión arterial sistémica (HAS) ha sido la más frecuente (57,4%; n=35) seguida por la diabetes mellitus (DM) (24,6%; n=15) y artritis o artrosis (34,4%; n=21). Se observó una correlación positiva entre la HAS y el SAOS ($p=0,001$), la DM y el SAOS ($p=0,018$) y entre la SDE y las enfermedades respiratorias ($p=0,010$). **Conclusión:** Las enfermedades más frecuentes en los mayores evaluados fueron la hipertensión arterial sistémica y la diabetes mellitus. La mayoría no presentó somnolencia diurna excesiva y, si hubo, ha sido las de grado leve. A pesar de ello, se observó una asociación positiva entre las enfermedades crónicas, el síndrome de la apnea obstrutiva del sueño y la somnolencia diurna excesiva.

Descritores: Trastornos de Somnolencia Excesiva; Atención Primaria de Salud; Enfermedad Crónica; Anciano.

INTRODUCTION

Aging is characterized by a dynamic process that is influenced by biopsychosocial, environmental and genetic factors. As the population ages, there is a large number of older adults in the world and the birth rate declines. Improvements in socioeconomic systems have influenced this demographic transition⁽¹⁾. The epidemiological changes resulting from this transition also imply an increase in chronic noncommunicable diseases (NCDs), since the older adults are the ones mostly affected by this set of diseases and disorders. This process occurs because the aging process itself brings with it limiting vulnerabilities⁽²⁾.

In 2010, cardiovascular diseases were the leading cause of mortality in Brazil⁽³⁾. Data of a survey on the Brazilian Surveillance System for Risk and Protective Factors for Chronic Diseases by Telephone Inquiry (VIGITEL), conducted in 2016, shows the advancement of favorable conditions for development of chronic diseases, such as excess weight, which increased from 42.6% in 2006 to 53.08% in 2016. Moreover, cases of obesity showed a great increase, going from 11.8% to 18.9% in the same period. The survey evidenced that, within a decade, the number of diabetics increased by 61.8%, while the number of hypertensive individuals had an increase of 14.2%⁽⁴⁾. Other risk factors, such as obesity, smoking and insufficient physical activity, negatively influence the individuals' quality of life^(5,6).

A study conducted in the State of Rio Grande do Norte, in 2014, pointed out that NCDs are the leading causes of death among the older people. Between 2001 and 2011, 32.76% of deaths among older adults between 60 to 69 years old were due to diseases of the circulatory system, whereas, among the older adults aged 80 years or more, this percentage amounts to 35.26%. The same study also indicated a high rate of deaths due to neoplasms⁽⁷⁾.

Among the major NCDs, hypertension is characterized by elevated and sustained blood pressure levels, which compromise organs such as the heart, brain, kidneys, and blood vessels⁽⁸⁾, and its predominance occurs in the older female population, with low levels of education⁽⁹⁾. Along with NCDs, it is common for older people to report sleep disorders, which directly affect their quality of life⁽⁵⁾.

Therefore, sleep is one of the aspects that deserves to be highlighted in the health of older persons, as some of its characteristics go through changes over the years, showing: global decrease in nocturnal sleep time; increase in sleep onset latency; the advancement of the circadian rhythm, going to bed earlier and waking up early at night; sleep fragmentation with several interruptions and daytime sleepiness. In the literature, studies have shown that other signs and symptoms are associated with somnolence, such as dizziness and vertigo, which decrease the functional performance, significantly increasing the risk of falls^(10,11).

Excessive daytime sleepiness (EDS) suggests sleep disturbances and alterations, and is a strong signal for obstructive sleep apnea (OSA), a usually underdiagnosed condition that increases cardiovascular risks, depression and obesity, and varies according to age and sex⁽¹²⁻¹⁴⁾.

Continuous use of medications by older adults with chronic NCDs can negatively influence sleep patterns and quality, thus demanding other non-pharmacological treatment approaches, such as sleep hygiene, which consists in guiding changes in harmful habits, promoting the improvement of the quality of sleep and health of this population⁽¹⁵⁾.

Considering the increase in the older population and NCDs, and the need to know of the sleep quality in this population, the objective of this study is to assess the level of excessive daytime sleepiness, the obstructive sleep apnea syndrome and sleep conditions in the older adults population.

METHODS

This is a cross-sectional study, with a quantitative approach, developed from November 2015 to January 2016, in the Family Health Strategies (ESF) of the districts Dner, Paraíso I and Cônego Monte in the municipality of Santa Cruz, Rio Grande do Norte, Brazil. The sample was selected for convenience and formed by older adults enrolled in these FHS.

Users were invited to participate in the study, including those aged 60 years or older who had preserved cognitive functions or mild cognitive impairment, as evidenced by a lower-than-expected score in the immediate memory domain, according to the level of schooling of the mini-mental status examination⁽¹⁶⁾. Those who refused to respond to the evaluation instruments or who did not attend on the days scheduled for the interviews were excluded.

Data was collected through a semi-structured questionnaire, developed by the researchers responsible for the study, with questions addressing clinical conditions, such as the presence of diseases, sequelae and use of medications, and sociodemographic issues, including sex, marital status, type of residence, address, income, schooling and profession. Schooling was classified as low (up to complete elementary school), medium (complete high school) and high (complete higher education). The interviews took place in the residences of the older adults and in the headquarters of the Faculty of Health Sciences of Trairi (*Faculdade de Ciências da Saúde do Trairi - FACISA*).

In order to evaluate the EDS, the study used the Epworth Sleepiness Scale (ESE-BR), translated and validated for Brazil⁽¹²⁾. This is a self-administered questionnaire that assesses the likelihood of falling asleep in eight situations during the day: sitting and reading; watching TV; sitting inactive in a public place; as a passenger on a train, car or bus for an hour, non-stop; lying down to rest in the afternoon; sitting and talking to someone; sitting quietly, after a lunch without alcohol; as a driver, sitting in a stationary car for a few minutes in heavy traffic⁽¹²⁾.

The value found by summing up the eight daily situations generates a score between 0 and 24 points, being able to classify the sleepiness of the individual into: from 0 to 9, the normality limit; from 10 to 14, mild; 15 to 20, moderate; and above 20, severe. For assessment, the individual should provide a score from zero to three, quantifying their likelihood to fall asleep: at no chance = 0; small = 1; moderate = 2; and high chance of dozing = 3. The answers reach maximum values of 24 and minimum of 0 points, 10 being the normality divisor⁽¹²⁾.

Aiming at investigating the risk for obstructive sleep apnea syndrome (OSAS), which presents one of the symptoms referred to EDS, the Berlin clinical questionnaire⁽¹⁷⁾ was used to verify the presence of OSAS in the older adults with type 2 diabetes and SAH.

The simple descriptive statistical analysis was performed using the Statistical Package for Social Sciences (SPSS), version 20.0, and presented in tables with means, medians and standard deviation for the quantitative variables, while the categorical variables were expressed using percentage values. To verify the statistical correlation between SAH or type 2 diabetes with OSAS, the Fisher's exact test was used. To verify the correlation between respiratory diseases and EDS, the Pearson correlation test was used. For both associations, 95% confidence intervals were used, and $p < 0.05$ was considered statistically significant.

The present study was approved by the Research Ethics Committee of the Federal University of Rio Grande do Norte – UFRN (Approval No. 1.116.397) and complied with the ethical norms required by Resolution 466/2016 (National Health Council). After receiving full clarification about the research, the older adults who accepted to participate signed the Informed Consent Form (ICF).

RESULTS

The sample consisted of 61 elderly people living in communities, with a mean age of 68.5 (± 7.4) years. Of the participants, 46 were female (75.4%) and 15 were male (24.6%). As for the marital status, 52.5% (n=32) of the older adults were married and 29.5% (n=18) were single. When analyzing the schooling, 35 (57.4%) were illiterate or had low schooling, and 26 (42.6%) had high or medium schooling. In relation to income, 52 (85.2%) reported retirement with source of income. With regard to the type of residence, 58 (95.1%) lived in their own house and all were residents of the urban area. As for their occupation, 19 (31.1%) were homemakers, 16 (26.2%) were farmers, 13 (21.3%) were self-employed, 8 (13.1%) were civil servants, and 5 (8.2%) were seamstresses (Table I).

Table II shows the health conditions of the studied population, in which 56 (91.8%) had some type of disease. SAH was the most prevalent, in 35 (57.4%) older adults, followed by diabetes mellitus (DM) in 15 (24.6%), and arthritis or arthrosis in 21 (34.4%).

Table I - Distribution of the older adults according to sociodemographic variables. Santa Cruz, Rio Grande do Norte, Brazil, 2016.

Characteristics	n	%
Sex		
Female	46	75.4
Male	15	24.6
Marital status		
Married	32	52.5
Single	18	29.5
Widowed	7	11.5
Divorced	4	6.6
Level of education		
Illiterate and low schooling	35	57.4
Medium and high schooling	26	42.6
Income		
Retirement	52	85.2
Retirement + Pension	9	14.8
Type of residence		
Own	58	95.1
Rented	3	4.9
Place of residence		
Urban area	61	100.0
Countryside	0	0.0
Profession		
Homemaker	19	31.1
Farmer	16	26.2
Self-employed	13	21.3
Civil servant	8	13.1
Seamstress	5	8.2
Total	61	100.0

Table II - Distribution of the older adults according to health conditions. Santa Cruz, Rio Grande do Norte, Brazil, 2016.

Characteristics	n	%
Disease		
Yes	56	91.8
No	5	8.2
Systemic arterial hypertension		
Yes	35	57.4
No	26	42.6
Diabetes Mellitus		
Yes	15	24.6
No	46	75.4
Arthritis or arthrosis		
Yes	21	34.4
No	40	65.6
Depression		
Yes	12	19.7
No	49	80.3
Respiratory diseases		
Yes	5	8.2
No	56	91.8
Osteoporosis		
Yes	3	4.9
No	58	95.1
Heart diseases		
Yes	3	4.9
No	58	95.1
Self-perception of health		
Very good	2	3.3
Good	27	44.3
More or less	28	45.9
Bad	2	3.3
Do not know	2	3.3
Total	61	100.0

Table III shows the data on the evaluation of excessive daytime sleepiness with use of the Epworth Sleepiness Scale (ESE-BR). It was observed that 36 (59%) older adults were classified as normal, 17 (27.9%) had a mild level of excessive daytime sleepiness, 7 (11.5%) presented moderate level and 1 (1.6%) presented severe level.

A positive correlation was observed between the presence of SAH and OSAS ($p=0.001$) and also a positive correlation between DM and OSAS ($p=0.018$). In addition, the correlation between EDS and respiratory diseases was significant through Pearson's correlation ($p=0.010$). The other variables did not present a significant correlation value (Table IV).

Table III - Distribution of the older adults according to the Epworth Sleepiness Scale (ESE-BR). Santa Cruz, Rio Grande do Norte, Brazil, 2016.

Epworth Sleepiness Scale	n	%
Normal	36	59.0
Mild	17	27.9
Moderate	7	11.5
Severe	1	1.6
Total	61	100.0

Table IV - Association between chronic diseases and sleep disorders in older adults. Santa Cruz, Rio Grande do Norte, Brazil, 2016.

Disease	Sleep evaluation	p-value
Respiratory diseases	OSAS	0.010*
Systemic arterial hypertension	EDS	0.001**
Diabetes mellitus	EDS	0.018**

* Pearson's correlation; ** Fisher's exact test; OSAS: Obstructive sleep apnea syndrome; EDS: Excessive daytime sleepiness

DISCUSSION

Of the 61 older persons evaluated in the present study, the majority were female, married, with low schooling, who lived in their own home and had retirement as their main source of income. The most prevalent diseases among the older adults were SAH and diabetes mellitus. Moreover, most of them did not present EDS and, when observed, it was mainly at the lightest level. Nevertheless, there was a positive association between chronic diseases and sleep disorders, such as EDS and OSAS, which point to the need to seek protective measures for the health of these older persons. Research indicates that poor sleep quality decreases physical capacity and increases the risk of falls in older adults, as well as diminishes cognitive abilities^(18,19).

In Brazil, in 2006, the National Health Policy for the Elderly was launched, with the aim of improving health actions and access for this growing population. In addition to other objectives, this policy was intended to investigate the basic health needs of the elderly for a good quality of life⁽²⁰⁾.

In the current study, a greater percentage of women were observed in the sample, which corroborates a study that shows the increase in female life expectancy and the feminization process of aging. Some factors contribute to these results, such as less exposure to risk factors, greater incentive for women's public health policies, and social and cultural barriers to men's access to health systems⁽²¹⁾.

Among the most prevalent diseases, hypertension was highlighted as the most reported by the older adults in the current research. Additionally, there was a positive correlation between the presence of SAH and OSAS ($p=0.001$). SAH is one of the most common conditions in the older population; however, there is still a large number of patients who are not followed up, increasing the risks of aggravating conditions⁽²²⁾. Moreover, it is part of cardiovascular diseases with multifactorial origin, and the main cause of morbidity and mortality in the world. The literature has already shown a correlation between sleep disorders, sudden death and SAH. Therefore, the determination of risk factors contributes to prevention, since they can be minimized with adequate treatment⁽²³⁾.

In addition to SAH, diabetes mellitus was the second most prevalent condition among the older adults evaluated in the study, and a positive correlation was observed between DM and OSAS ($p=0.018$). In four years, there was a high mortality rate due to acute complications of DM in the North and Northeast regions of Brazil⁽²⁴⁾, and factors such as male gender and SAH are clinical predictors among patients with type 2 diabetes for the onset of sleep-related disorders⁽²⁵⁾.

Sleep is a complex biological process that presents changes intercalated with wakefulness and hormone-modulated conditions. These processes alter the body temperature, cardiac work and hormone production, and are a primordial neurological restorative state for the proper functioning of the organism⁽²⁶⁾. Thus, sleep disorders are responsible for worsening other clinical conditions in this population, with strengthening of depression and functional disability. Furthermore, older adults who present with decreased sleep time or latency tend to evaluate their health in a negative way⁽²⁷⁾.

The comorbidities studied in the present study also show interaction among themselves, since excessive daytime sleepiness should serve as a clinical warning for other possible etiologies, such as narcolepsy, misuse of medications and obstructive sleep apnea⁽²⁸⁾.

EDS is the second most frequently reported complaint by individuals seeking sleep labs⁽²⁹⁾. In the present study, the association between EDS and respiratory diseases was significant ($p=0.010$), and among the main respiratory diseases cited in the research is asthma. In the literature, there are negative associations between asthma and EDS and quality of life, and the polymedication and the presence of associated comorbidities, usually common in older adults, exacerbate existing problems related to sleep disorders⁽³⁰⁾.

The prevalence of EDS in older users of the primary health care is closely related to depression, obesity and poor health perception⁽³¹⁾. In the evaluation of a study, it was noticed that a large portion was in its levels of normality, although the studies showed that patients of age equal or superior to 60 years, separated and with body mass index above 30 present greater chances of referring drowsiness⁽¹²⁾.

The mild level of EDS, followed by moderate, were the most recurrent in the sample of the present investigation. A study carried out in São Paulo in the year 2015 already showed that female subjects with low educational level are more exposed to EDS⁽³²⁾, and their symptoms are always associated with neurological and clinical disorders⁽³³⁾. Diseases such as DM, anxiety and depression states, and chronic tobacco use increase the chances of an individual suffering from EDS. This process has serious consequences for health and well-being, affecting all areas of the individual, with repercussions on employment, relationships and cognition^(34,35).

Based on the findings of the current study, it is necessary to carry out further studies that show other problems, relating sleep to its impacts on the health of older adults in primary care, considering that this is the main environment for health promotion of the population. In addition, measures to promote the health of older adults need to be adopted. The practice of physical exercises is indicated as a protection factor, being able to reduce the effects of aging, preserve cognitive functions and extend the autonomy of older adults^(36,37).

The questionnaires used in the present study are important for the ease of application by health professionals in the population, thus contributing to the evaluation of sleep complaints, so that they can be an instrument for an initial evaluation of sleep, screening the most common sleep disorders and, therefore, helping to construct strategies for confrontation such as sleep hygiene, promoting the health of the older population. Some limitations were found, such as: reduced number of older adults; the use of few questionnaires and scales in sleep assessment; and lack of polysomnography, the gold standard in sleep assessment. Nevertheless, they point to the diagnosis of and warning about sleep disorders and contribute to the health promotion of the investigated population.

CONCLUSION

The most prevalent diseases among the elderly were systemic arterial hypertension and diabetes mellitus. The majority did not present excessive daytime sleepiness and, when observed, it was mainly in mild degree. Despite that, there was a positive association between chronic diseases, obstructive sleep apnea syndrome and excessive daytime sleepiness.

CONTRIBUTIONS

José Felipe Costa da Silva and **Thaiza Teixeira Xavier Nobre** contributed in the conception and design of the study; data acquisition, analysis and interpretation; and the writing and revision of the manuscript. **Edson Mendes Marques** contributed in the writing and revision of the manuscript. **Isaac Newton Machado Bezerra** contributed in the writing and revision of the manuscript and in data analysis. **Jônia Cybele Santos Lima** contributed in the revision of the manuscript and data analysis and interpretation.

CONFLICTS OF INTEREST

The authors of this article declare that they have no conflicts of interest, whether of financial, commercial, political, academic or personal nature.

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