Factors associated with the sleep quality in older adults and the risk of functional loss and frailty

Fatores associados à qualidade do sono em idosos e ao risco de perda funcional e fragilidade

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ABSTRACT

This study aims to analyze the associated factors with the sleep quality of older adults at risk of functional loss and frailty, during social isolation due to the COVID 19 pandemic. The study included 68 older adults at risk of functional loss and frailty, living in a city in the interior of Rio Grande do Sul-RS state, Brazil. The outcome variables were: risk of functional loss and frailty, assessed by PRISMA 7 and sleep quality assessed by a questionnaire included in Comprehensive Geriatric Assessment Questionnaire. Data were analyzed with the support of descriptive statistics, absolute frequency distributions and measures of central and inferential tendency. The chi-square test was used to identify the association between the variables studied, (p ≤0.05). More than 40% of men and more than 50% of women had sleep quality disturbance. There was a statistically significant association (p = 0.041) between the presence of one comorbidity and sleep quality, that is, there are more elderly people with associated comorbidities presenting sleep disorders (67.7%) compared to older people who have only one comorbidity (32.3%). It is concluded that the presence of comorbidities is significantly associated with poor sleep quality.

Keywords: Aging; Comorbidity; Sleep Quality; COVID-19.
RESUMO
Este trabalho tem por objetivo analisar os fatores associados à qualidade do sono de idosos com risco de perda funcional e fragilidade, durante o isolamento social devido a pandemia da COVID 19. Participaram do estudo 68 idosos com risco de perda funcional e fragilidade, residentes em um município do interior do estado do Rio Grande do Sul-RS, Brasil. As variáveis desfecho foram: risco de perda funcional e fragilidade, avaliadas por meio do PRISMA 7 e qualidade do sono investigada por meio de questionário presente na Avaliação Geriatrica Ampla. Os dados foram analisados com o apoio da estatística descritiva, distribuições de frequências absolutas e medidas de tendência central e inferencial. O teste Qui-quadrado foi utilizado para identificar a associação entre as variáveis estudadas, (p ≤0,05). Mais de 40% dos homens e mais de 50% das mulheres apresentaram distúrbios na qualidade do sono. Observou-se associação significativa (p = 0,041) entre a presença de comorbidades e a qualidade do sono, ou seja, há mais idosos com comorbidades associadas apresentando distúrbio do sono (67,7%) em relação aos idosos que apresentaram somente uma comorbidade (32,3%). Concluiu-se que a presença de comorbidades está significativamente associada a má qualidade do sono.

Palavras-chave: Envelhecimento; Comorbidade; Qualidade do Sono. COVID-19.
INTRODUCTION

Older people experienced a great impact during the COVID-19 pandemic. They went to home isolation, due to greater risk of being infected by the virus of the coronavirus family, designated as Severe Acute Respiratory Syndrome Coronavirus-2 (Sars-Cov-2). The records of this disease began in 2019, but the identification of the causative agent and the consequences of this infection only occurred in 2020 (BRASIL, 2020). At this time, it was necessary to protect the older people, preventing them from going out, and being in social isolation. According to Aprahamian and Cesari (2020), this period also brought risks to the physical and mental health of this group.

The coronavirus and its more severe symptoms especially appear in older people who have some chronic illness (Chen et al., 2019). Scientists from China evaluated all confirmed cases of this respiratory infection that were admitted between January 1 and 20, 2020, at a hospital in Wuhan, the likely outbreak epicenter. 55% of these cases had some chronic health problem, like diabetes, cardiovascular disease, digestive or respiratory ailments, and cancer. The mean age of these patients was 55 years and 37% were over 60 years old (Chen et al., 2019). According to Chen et al., (2019), this would occur because aging and these diseases tend to decrease immunity against infections in general. In addition to the elderly having a certain decrease in immunity, and becoming more prone to infections, other factors affect the life of this population, and sleep quality may be one of them (Chen et al., 2019).

Studies (Mota et al., 2021; Bezerra et al., Ferreira et al., 2018) indicate that there is a significant change in the sleep quality of the older adults, and this is due to different issues associated with cellular and cognitive aging. Being single, divorced or widowed (Mota et al., 2021), acting as caregivers for their spouses, associated to the context of high social vulnerability, marked by the scarcity of cultural, recreational, financial, social and health resources (Mota et al., 2021; Bezerra et al., Ferreira et al., 2018), being women, associated with aspects such as occupation, falls, physical pain, and performance (Mota et al., 2021; Ferreira et al., 2018) are related to poor sleep quality, as well, factors such as anxiety and depression are also associated with this condition (Mota et al., 2021). Furthermore, older people who have low mastery of verbal fluency sleep fewer hours at night than the individuals with greater mastery (Alves et al., 2020). Other aspects, such as chronic pain (Hammerschmidt; Santana, 2020), and depressive symptoms, are also associated with poor sleep quality (Krug; Lopes; Mazo, 2015).
In addition to the factors above, the pandemic showed difficulties in various aspects of life, among them, economic, social, health, cultural, ethical, and moral difficulties (Royal College of General Practitioners, 2017), which may also have negatively influenced the sleep quality of the older people. It is also considered the accentuated rhythm in which the Brazilian population is aging, making the attention to the health of this population a topic of the highest relevance. In this way, in this study, we aim to analyze the associated factors with the sleep quality of the older people at risk of functional loss and fragility during social isolation due to the COVID-19 pandemic. With this study, it will be possible to analyze the results found by the authors and contribute to a better understanding of why elderly people have difficulty sleeping and what are the characteristics and causes that lead them to present these limitations, as well as providing an alert for a better sleep hygiene, health care, medication intake and sleep habits as also as quality of life betterment.

METHOD

This is a descriptive, cross-sectional, quantitative epidemiological study, whose empirical data were taken from the database of a broader project entitled "Health care for the older people: a proposal for evaluation and intervention through the action plan therapy” (VIVER60+), which aims to track and identify older people at risk of functional loss and frailty, offering preventive monitoring and analyzing the impacts of this monitoring on their health (krug, 2020).

This project is developed in partnership with a private health plan that has an aged portfolio with 1608 older people. Of these, 535 were counted and interviewed by telephone survey to identify the risk of functional loss and frailty, using the PRISMA 7 instrument. Of the 535, 159 answered yes to more than three PRISMA 7 questions, which characterized them as older people at risk of functional loss and frailty. Of these, 118 were resident in Cruz Alta-RS. Of the 118, 68 agreed to receive the project's multidisciplinary team at home for more detailed assessments of their health and constituted the present study sample.

The inclusion criteria were older people, who benefit from the health plan, residents of Cruz Alta-RS, who answered "yes” to three or more questions on the PRISMA 7 instrument and who agreed to take part in the study. The ones who didn’t want to participate in the study were excluded. The PRISMA 7, developed by the Royal
College of General Practitioners – RCGP in Canada in 2008, used in the VIVER 60+ project, is an instrument with good acceptance and easy application for screening and identifying people aged 60 years and over, at risk of functional loss and frailty.

All information was obtained through Comprehensive Geriatric Assessment Questionnaire, considered the gold standard for geriatric assessment in Brazil (Lourenço; Perez; Sanchez, 2011): a) sociodemographic data and habits: age, sex, education (illiterate; 1 to 4 years; 5 to 8 years; more than 8 years), occupation (retired with occupation; retired without occupation; domestic work; pensioner), marital status (single, divorced, married/stable union; widowed), use of tobacco and alcohol, the practice of physical activities (inactive; walking; weight training; water aerobics); b) health data: the presence of diseases (one or more comorbidities), visual and hearing difficulties and sleep quality (normal sleep; sleep disorder).

The questionnaire was carried out during a home visit by five members of the multidisciplinary team of the VIVER60+ project (nurse, physiotherapist, and physiotherapy, physical education, and biomedicine academics). Each visit was carried out by two previously trained team members. Data were analyzed with the support of descriptive statistics, absolute frequency distributions, and measures of central and inferential tendency. Differences between groups were verified using the Chi-square test for groups with a sample greater than five and Fisher's Exact Test for smaller groups, considering significant values p ≤ 0.05. The study complies with Resolution nº. 466/2012 and Resolution nº. 510/2016 and all participants signed the Free and Informed Consent Term and the study was approved by the Research Ethics Committee - CEP, opinion nº. 4,396. 548.

RESULTS

68 older people participated in the study, with mean age of 84.55 ± 6.24 years, with minimum of 69 maximum of 96 years old. 42 (61.8%) were female and 26 (38.2%) were male. Initially, they were characterized in terms of the variables of marital status, occupation, education
Table 1 – Marital status, occupation, and education of the elderlies at risk of functional loss and frailty, participants in the VIVER60+ project (N=68). Cruz Alta, Rio Grande do Sul, Brazil, 2021

<table>
<thead>
<tr>
<th>Variables</th>
<th>Men f (%)</th>
<th>Women f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>0 (00,0)</td>
<td>4 (9,8)</td>
</tr>
<tr>
<td>Divorced</td>
<td>2 (7,7)</td>
<td>0 (00,0)</td>
</tr>
<tr>
<td>Married</td>
<td>20 (76,9)</td>
<td>11 (26,8)</td>
</tr>
<tr>
<td>Widow(er)</td>
<td>4 (15,4)</td>
<td>26 (63,4)</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retired with an occupation</td>
<td>14 (53,8)</td>
<td>12 (29,3)</td>
</tr>
<tr>
<td>Retired without an occupation</td>
<td>12 (46,2)</td>
<td>26 (63,4)</td>
</tr>
<tr>
<td>Housework</td>
<td>0 (00,0)</td>
<td>1 (2,4)</td>
</tr>
<tr>
<td>Pensioner</td>
<td>0 (00,0)</td>
<td>2 (4,9)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>00 (0,0)</td>
<td>1 (2,4)</td>
</tr>
<tr>
<td>1 – 4 years</td>
<td>9 (34,6)</td>
<td>21 (50,0)</td>
</tr>
<tr>
<td>5 – 8 years</td>
<td>12 (46,2)</td>
<td>15 (35,7)</td>
</tr>
<tr>
<td>Higher than 8 years</td>
<td>5 (19,2)</td>
<td>5 (11,9)</td>
</tr>
</tbody>
</table>

*Chi-square.  **Fischer’s exact
Source: the authors

Table 1 shows a prevalence of married or in a stable relationship among older men and, most widows among older women, this difference is statistically significant (p ≤ 0.05). It can also be observed that and, most widows among older women, this difference is statistically significant (p ≤ 0.05). It can also be observed that this population are mostly retired, with most women having no other occupation. Almost all have some education level, however, among women, the majority completed only the first years of primary education and among men, most completed primary education.

Table 2 shows the variables results of: physical activity practice, sleep quality and presence of comorbidities.
In the present study it is observed that the majority of older people, both men (84.6%) and women (80%), were physically inactive. Considering the average age of the participants in this study, the characteristic of being older people at risk of frailty and functional loss, it was expected to be the predominance of physically inactive subjects. Regarding health conditions, most had comorbidities, highlighting the presence of systemic arterial hypertension, in 46.2% of men and 63.4% of women.

Table 3 shows that more than 40% of men and more than 50% of women had sleep quality disorders. There was a significant association (p = 0.041) between the presence of comorbidities and sleep quality, that is, there are more elderly people with comorbidities presenting sleep disorders (67.7%) when compared to older people who have only one comorbidity (32.3%).
DISCUSSION

When analyzing the results of marital status, occupation, and education at Table 1, we observed that most men had a partner and most women were widowed. Which makes us consider that women live longer and, therefore, possibly present themselves in greater numbers as widows, or men remarry/rejoin a partner more often than women and that could justify the findings.

Following, in an excerpt from the Fibra study, which investigated the sociodemographic, cognitive and frailty profile of Brazilian older people in the state of São Paulo, in follow-up and baseline measurements, carried out in 2016-2017 and 2008-2009, found that in the evaluation of follow-up, the older people who died were proportionally more numerous among men (Lourenço, Perez, Sanchez, 2011). This is one of the possible explanations for the result found. A cohort study in Asia identified that not having a partner is associated with a high risk of mortality, and this risk persists despite health conditions and is more pronounced among men and people under 65 years old (Leung et al., 2022). It is clear, therefore, that marital status has an impact on the relationship with health, hence the interest in knowing it. Although it is not the subject of this article, it is worth calling attention to this topic, in order to stimulate the planning of actions and strategies aimed at the older people in situations that are unfavorable to health.

It is important to highlight that the population studied were at risk of functional loss and frailty, which accentuates the probability of several common comorbidities incidences, as it was possible to observe our results (Table 3) where 81% had two to three comorbidities. Among the comorbidities reported by the study participants, the presence of systemic arterial hypertension (SAH), which is the main cardiovascular disease and is associated with a high mortality rate, predominated. SAH is present all over the world, with high prevalence in low- and middle-income countries, with unbalanced diet and physical inactivity as the main risk factors (Villafuerte et al., 2020; Mills; Stefanescu, 2020). Although pharmacological treatment is the main way to control this pathology, authors such as Bischoff-Ferrari et al. (Bischoff-Ferrari et al., 2020), argue that changes in diet, D vitamin and omega 3 supplementation, combined with strength training programs, can be important resources in monitoring and maintaining blood pressure in the older people.

The association of factors such as physical inactivity, chronic disease, sarcopenia process and the risk of falls influence older people to have a negative self-perception of
health (Santos et al., 2018), since such conditions tend to impair performance in activities of daily living (Oliveira et al., 2019). In this sense, specific health promotion strategies for this target audience are extremely necessary. Among the actions to be planned, we point to physical exercise programs, considering that the majority of the older people in this study, 84.7% of men and 80.0% of women, reported being physically inactive, which is worrying when considering that low levels of physical activity are associated with a high risk of mortality and cardiovascular diseases (Kleinke, 2020), such as SAH, found in the present study, among the most prevalent. Our study also showed an association between physical inactivity and cardiovascular diseases, specifically SAH, that is, 61.1% of the elderly with SAH were physically inactive (p = 0.047).

Therefore, physical activity is an essential health education strategy that must be urgently implemented as a public health policy. In addition to the various benefits of physical exercise for older people's health, it's positively related to a possible prevention of COVID 19. According to Araújo et al. (2013) aging is accompanied by changes in the immune system, a process known as immunosenescence. In general, a restructuring of the immune system occurs during aging, with some reduced parameters, unchanged or even increased.

Although our results did not show an association between physical inactivity and sleep disorders, it was noticed that a significant percentage (47.1%) of the older people with sleep disorders were physically inactive. In a similar study (Canever, et al., 2022), carried out with Brazilian older people, an association was found between sedentary behavior and sleep problems, that is, it was observed that those who spent more than six hours in front of television and three hours in sedentary behavior were more likely to have, also, problems with sleep Canever et al., 2022).

In the present study, the percentage of older people with comorbidities was high, 69.2% and 83.3% for males and females respectively (Table 3) and we also found an association with sleep disorders, that is, the majority (67.7%) of the ones who had sleep disorders were among the older people who also had more than one pathology.

The aging process, by itself, brings with it changes in the regular pattern of sleep, leading to a decrease in its quality. Sleep is classified as a physiological factor of extreme importance for life and it’s reduction in quality for a sustainable time becomes a factor that contributes to the emergence of comorbidities such as cognitive and cardiovascular diseases, as well as their aggravation (Miner; Kryger, 2017).
While some studies detect the impact of comorbidities on sleep quality, such as the one cited by Alves, Aves e Melo (2020), others suggest that sleep insufficiency and sleep disorders can develop pathological processes and lead to diseases (Kwork, et al., 2018). Evidence in this sense is more consistent in relation to cardiovascular diseases (Kwork, et al., 2018; Lao et al., 2018), as observed in the present study, an association between SAH and sleep quality.

Gulia and Kumar (2018) also found evidence on the presence of diseases/comorbidities as an important factor that impacts negatively the sleep perception in the elderly. Diseases that cause chronic pain, gastroesophageal reflux, increased urination and dyspnea by congestive heart failure are related to worse sleep quality (Yaremchuk, 2018). In addition, the medications used to treat these diseases also contribute to the development of sleep problems in old age (Gulia; Kumar (2018). The decrease in sleep quality in aging also occurs due to the decrease in the melatonin hormone production, whose functions influence the circadian rhythm, interfering with both the quality and quantity of sleep. The melatonin peak is decreased due to inefficiency in the suprachiasmatic nucleus in the hypothalamus, weakening the circadian cycle (Palma, 2007).

Sleep deprivation decreases the production of defense cells and the metabolism of free radicals, that is, it affects immunity and increases inflammatory processes which, in response, releases too much glucocorticoid that exerts an immunosuppressive action in the human body. Nevertheless, current studies associate chronic insomnia with immunological alterations, due to the reduction of CD3, CD4 and CD834 cells. Prather et al. (2015) reinforce that sleep deprived people are four and a half times more likely to develop colds and flu compared to those who sleep at least eight hours a night.

It is also worth mentioning that the shortening of the study population from initially 159 members to 68 represents a possible limitation of the study, since the sample of older people is small and may not represent large numbers when compared to a study carried out with more individuals, however, it should be noted that the exclusion methods were applied so that the remaining older people in the sample were specifically the individuals who would best present the results and assist in understanding and observing the issue analyzed by the authors. In other words, despite the sample population being small, significant results could still be obtained for the study.
CONCLUSION

This cross-sectional epidemiological study points out that there was a significant association between the presence of comorbidities and the sleep quality of the older people at risk of functional loss and frailty during social isolation due to the COVID-19 pandemic. Maintaining healthy habits such as physical activity, adequate nutrition and sleep hygiene practices are important allies in maintaining sleep quality and, consequently, the general state of health and well-being.
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REFERÊNCIAS


