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ORIGINAL ARTICLE

# Insomnia symptoms, daytime naps and physical leisure activities in the elderly: FIBRA study Campinas\*

SINTOMAS DE INSÔNIA, COCHILOS DIURNOS E ATIVIDADES FÍSICAS DE LAZER EM IDOSOS: ESTUDO FIBRA CAMPINAS

LOS SÍNTOMAS DE INSOMNIO, SIESTAS Y ACTIVIDADES FÍSICAS RECREATIVAS EN ADULTOS MAYORES: ESTUDIO FIBRA CAMPINAS

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## ABSTRACT

The practice of physical activities contributes to reducing the risk of chronic diseases and improves sleep patterns in the elderly. This research aimed to investigate the association between insomnia symptoms and daytime nap and the participation in physical leisure activities in elderly community residents. Data from the Studies Network of the Fragility in Brazilian Elderly (Campinas site), were used. Information from 689 elderly was analyzed, regarding sociodemographic characterization, physical leisure activity, occurrence of daytime napping and its duration, symptoms of insomnia and use of sleep medication. A significant association was found between the practice of walking and the daytime nap of short duration. Studies indicate that a short nap can benefit the quality of sleep and health of the elderly. Therefore, promoting the practice of walking can be a nursing intervention that favors the sleep patterns of the elderly.

## DESCRIPTORS

Aged  
Sleep  
Circadian rhythm  
Motor activity  
Health of the elderly  
Geriatric nursing

## RESUMO

A prática de atividades físicas contribui para redução do risco de doenças crônicas e melhora do padrão de sono em idosos. Esta pesquisa buscou verificar a associação entre sintomas de insônia e cochilo diurno e a participação em atividades físicas de lazer em idosos residentes na comunidade. Utilizaram-se dados extraídos da Rede de Estudos da Fragilidade em Idosos Brasileiros, polo Campinas. Foram analisados dados de 689 idosos quanto à caracterização sociodemográfica, prática de atividades físicas de lazer, ocorrência de cochilo diurno e sua duração, sintomas de insônia e uso de medicação para dormir. Encontrou-se associação significativa entre a prática de caminhada e o cochilo diurno de curta duração. Estudos indicam que o cochilo de curta duração pode trazer benefícios à qualidade do sono e à saúde dos idosos. Portanto, promover a prática de caminhada pode constituir-se em uma intervenção de enfermagem que favorece o padrão de sono das pessoas idosas.

## DESCRIPTORIOS

Idoso  
Sono  
Ritmo circadiano  
Atividade motora  
Saúde do idoso  
Enfermagem geriátrica

## RESUMEN

La actividad física contribuye a reducir el riesgo de enfermedades crónicas y mejorar la calidad del sueño en adultos mayores. Este estudio tuvo como objetivo investigar la asociación entre los síntomas de insomnio, la siesta y la participación en actividades físicas recreativas de adultos mayores insertos en la comunidad. Se utilizaron los datos de la Red de Estudios de Fragilidad en adultos mayores brasileños, de la ciudad de Campinas, Brasil. Se analizaron los datos de 689 adultos mayores con respecto a las características sociodemográficas, práctica de actividades físicas recreativas, siestas y su duración, los síntomas de insomnio y el uso de medicamentos para dormir. Se encontró una asociación significativa entre la práctica de caminata y la siesta de corta duración, la cual puede ser beneficiosa para la calidad del sueño y la salud de los adultos mayores. Por consiguiente, promover la práctica de caminar puede consistir en una intervención de enfermería que favorezca el patrón de sueño de las personas mayores.

## DESCRIPTORIOS

Anciano  
Sueño  
Ritmo circadiano  
Actividad motora  
Salud del anciano  
Enfermería geriátrica

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## INTRODUCTION

Population aging is a phenomenon of impact in several countries, including Brazil, which can be explained by a decrease in birth rates and increased life expectancy<sup>(1)</sup>.

The proportion of elderly in the Brazilian population increased from 9.1% to 11.3%<sup>(1)</sup> between 1999 and 2009, representing about 21 million people aged over 60 years<sup>(2)</sup>. The estimate of the World Health Organization is that in 2025 there will be 32 million elderly in Brazil, which will then be the sixth country in the world with more elderly<sup>(2)</sup>.

The elderly are considered healthy when they are autonomous, active and participative in society, and maintain functional and rehabilitation capacities, although having one or more chronic diseases<sup>(1,3)</sup>.

The quality of life of the elderly can be influenced by several biological factors such as the presence of chronic diseases, functional capacity (i.e. the power to perform everyday tasks with ease)<sup>(4-5)</sup> and circadian rhythms. This rhythm is established cyclically and endogenously 24 hours a day, combined with changes between light and dark<sup>(6-7)</sup>. Among its functions are the variations in hormone secretion, the control of metabolism and of rhythms of body temperature, the feeding and the sleep-wake cycle<sup>(6)</sup>.

The routine that each senior sets has a close relationship with their circadian rhythms<sup>(6-7)</sup>. Naturally, human activities are concentrated in the daytime, however, due to work schedules, exercise practice and even by sleep disorders or deprivation, changes in this pattern may occur, initially leading to changes in sleep, feeding and in other activities<sup>(6-7)</sup>.

In the elderly, the alteration of circadian rhythms may have greater intensity due to other changes that occur with aging and contribute to changes in the sleep-wake cycle<sup>(8)</sup>. At this stage of life, the sleep becomes lighter, less durable and easily interrupted by awakenings<sup>(8-9)</sup>.

These changes become cause for complaints among the elderly, who may have sleepiness and naps throughout the day, in addition to nighttime sleep interruptions, resulting in symptoms of insomnia and a fragmented pattern of the sleep-wake cycle<sup>(9)</sup>.

The elderly are among the most likely groups to develop insomnia due to the sleep changes with aging and changes in circadian rhythms<sup>(9)</sup>. Among the symptoms of insomnia are the prolonged latency, early awakening, fragmented sleep, short sleep duration and poor sleep quality<sup>(9)</sup>.

A possible strategy for improving sleep patterns in aging is establishing a routine for the daily life of the elderly that contemplates daytime activities, such as practice of physical leisure activities and others that will assist in the regulation of circadian rhythms, and consequently, in improvement of sleep quality<sup>(6-7,9)</sup>.

These actions are important because studies show that changes in circadian rhythms, especially sleep-related, increase the risk for developing diabetes mellitus and cardiovascular disease, as well as for increased mortality<sup>(6)</sup>.

Focused on promoting healthy aging and therefore in maintaining functional capacity, the Ministry of Health created the National Policy of Attention to the Health of Elderly (Política Nacional de Atenção à Saúde da Pessoa Idosa - PNSPI)<sup>(3-4,10)</sup>. Part of the program is the incentive for the practice of physical activities aimed at this population<sup>(3)</sup>.

Regular physical activity practice brings many health benefits, and among the elderly, promotes healthy aging, decreasing the medicalization, the risk for chronic diseases and institutionalization<sup>(10-11)</sup>. And if not performed in aging, it favors the loss of functional capacity<sup>(5)</sup>.

Health facilities are an important place where the elderly are concentrated because of chronic diseases present in this age group, and subsequent monitoring in healthcare services<sup>(4)</sup>. Health services may also act through groups that will help to establish a routine in the life of the elderly, assisting in the regulation of circadian rhythms and perhaps improving sleep patterns.

It is interesting that this population chooses the activities of greater predilection to improve adherence to the practice, thus occupying their free time with a pleasurable and healthy action. Among these options is the physical leisure activity, which is one of the possibilities for the elderly to be physically active, and hence have better quality of life<sup>(10,12)</sup>.

The work with health promotion and involvement in programs such as PNSPI are part of the scope of nursing, and a means to consolidating the work of this profession and at the same time ensuring the rights of patients<sup>(13)</sup>. It is important that the nurse plans science-based actions for the promotion of health.

Considering the negative impact of the disruption of circadian rhythms - especially the sleep/wake cycle on the health of the general population, and the elderly in particular - strategies that contribute to the restructuring of this rhythm should be part of the objects of study of nursing. One of these strategies would be to promote regular physical leisure activities for this population. To this end are necessary studies that discuss the relationship between these activities and sleep quality in this age group.

This research project aims to support the work of health professionals by identifying physical leisure activities that have association with sleep quality in the elderly. This way, it can contribute to health promotion by minimizing the impact and consequences of poor sleep quality, such as increased morbidity and mortality<sup>(6)</sup>.

The hypothesis of this study is that there is a significant association between the participation of the elderly

in physical leisure activities, fewer complaints of insomnia symptoms, and a shorter duration of daytime napping.

This study is important due to the increasing number of elderly in the country and the lack of studies that focus on the contribution of physical leisure activities for the health, the quality of life and the sleep quality in the Brazilian elderly population<sup>(14)</sup>.

The aim of the study was to investigate the association between the reports of insomnia symptoms, daytime nap and the participation in physical leisure activities in elderly community residents.

## METHOD

This study is part of a research of multicenter, multidisciplinary and populational character on the health and well-being conditions of the elderly, called Rede de Estudos da Fragilidade em Idosos Brasileiros - FIBRA (Studies Network of the Fragility in Brazilian Elderly), supported by the Conselho Nacional de Pesquisa (CNPq) and approved by the Committee of Ethics in Research of the Faculty of Medical Sciences of the Universidade Estadual de Campinas (Unicamp) under number 208/2007. The study was carried out by researchers from four poles linked to Brazilian universities: Unicamp, Universidade de São Paulo in Ribeirão Preto, Universidade Federal de Minas Gerais and Universidade Estadual do Rio de Janeiro. Professionals and students from diverse areas of health worked to recruit and interview the elderly<sup>(15)</sup>.

The FIBRA study was carried out in 17 Brazilian cities, including Campinas, SP. The data for this research were taken from the database of this municipality.

The sample to be studied in Campinas was set to at least 601 elderly. A surplus of 25% was estimated to compensate for losses totaling the 750 desired elderly. The calculation of the minimum sample size was performed using the formula in which was assumed the significance level of 5% and the following values:  $z=1.96$ , for a confidence interval of 95%;  $p=0.5$ ;  $d=0.4$ <sup>(15)</sup>.

A case of simple random sampling was carried out with the urban census tracts of Campinas, in which the number of selected tracts corresponded to the ratio of the desired sample size and the total number of urban census tracts (which was 835). In this process 90 tracts were drawn<sup>(15)</sup>.

The elderly were recruited from 88 of these 90 tracts, in family homes, by trained recruiters. In most households belonging to the two remaining tracts it was not possible to access the elderly. The total number of recruited seniors exceeded by more than 50% the calculated sample size, and in each sector were interviewed between six and 15 individuals<sup>(15)</sup>.

Seniors aged 65 and over who understood the instructions and resided permanently in the household and census tracts were selected for data collection. We excluded the following: those with severe cognitive impairment and suggestive of dementia; with the use of a wheelchair or bedridden; with severe sequelae of stroke, with localized loss of strength and/or aphasia; with Parkinson's disease at severe or unstable stage; with severe impairments of hearing or vision, and in terminal stage<sup>(15)</sup>.

When inviting the elderly to participate in the FIBRA study, recruiters clarified information on the survey and provided this information in printed form (leaflet). The seniors recruited in Campinas - 900 in total - participated in the data collection in one session lasting between 40 and 150 minutes, on scheduled dates and locations near their homes, such as health centers, community centers, social clubs and church halls. The recruiters invited and scheduled the interview in a week and in the other, they actually conducted the interview<sup>(15)</sup>.

In the initial part of the protocol, seniors signed the Informed Consent Form and completed a questionnaire of sociodemographic identification and characterization designed by the researchers of the FIBRA study. Then the elderly were evaluated by the Mini Mental State Examination (MMSE) and subsequently subjected to other following tests: measurement of blood pressure, anthropometric measurements, blood sampling, oral assessment and fragility evaluation<sup>(15)</sup>.

In the second part of the study there was the interview with the elderly whose cutoff score on the MMSE indicated lack of cognitive impairment, according to pre-established criteria in the literature<sup>(16)</sup> and adjusted to the study<sup>(17)</sup>. In this phase, the questions on symptoms of insomnia were performed and 689 seniors participated.

The present study is part of the FIBRA study, carried out with variables extracted from the database of Campinas municipality, referring to the 689 seniors who had no evidence of cognitive impairment according to the MMSE. The focus of this research is on the relationship between the sleep variables (insomnia symptoms and use of sleep medication), naps (occurrence and duration) and physical leisure activities susceptible of being encouraged by a nurse at a Health Center.

This project used the variables of the FIBRA study, relevant to the analysis of the relationship between physical leisure activities and symptoms of insomnia, as well as variables characterizing the population. The elected physical activities were likely to be encouraged and practiced by nurses in communities and health centers, which, in most cases, have a limited space that does not accommodate sports like volleyball and soccer. The following variables were selected:

- Sociodemographic: gender, age, marital status, employment status, education, family income and characteristics of family arrangements and housing (descriptive variables).

- Practice of physical leisure activities in the previous 12 months, selected in accordance with the purposes of this study (walking, ballroom dancing, gymnastic at home, gym); questions extracted from the Minnesota Leisure Activity Questionnaire, validated for use in Brazil<sup>(18-19)</sup> (independent variables).
- Occurrence of daytime nap in the previous 12 months: question extracted from the Minnesota Leisure Activity Questionnaire, validated for use in Brazil<sup>(18-19)</sup>. In this study, the report of naps of any duration was considered affirmative response (dependent variable).
- Duration of the daytime nap in the previous 12 months: question extracted from the Minnesota Leisure Activity Questionnaire<sup>(18-19)</sup>. This variable was divided according to the duration of the nap informed by the elderly - less than 90 minutes and equal to or greater than 90 minutes - and was considered as indicative of problems related to sleep<sup>(20)</sup> (dependent variable).
- Symptoms of insomnia in the previous 12 months (difficulty initiating sleep, difficulty maintaining sleep, early awakening and non-restorative sleep); questions extracted from the Nottingham Health Profile, validated for use in Brazil<sup>(21)</sup>. The components were analyzed separately and in group. The report of any of the symptoms was considered as "symptoms of insomnia in general" (dependent variables).
- Use of medication to sleep in the previous 12 months: question extracted from the Nottingham Health Profile, validated for use in Brazil<sup>(21)</sup> (dependent variable).

Data were analyzed using descriptive analysis (absolute numbers and proportions, means, standard deviation and medians, depending on the nature of the variables). The association between the following categorical variables: symptoms of insomnia in general, difficulty initiating sleep, difficulty maintaining sleep, early awakening, non-restorative sleep, use of sleep medication, occurrence of daytime nap, duration of daytime nap and physical leisure activities, was analyzed by the Chi-square test and Fisher's exact test. The age of the subjects who practiced physical leisure activities and the ones that did not practice was compared by the nonparametric Mann-Whitney test. The analysis was performed with the Statistical Analysis System (SAS) version 9.2 and the statistical support of the institutional affiliation of the authors. It was considered a 5% significance level.

This research project was submitted to the Committee of Ethics in Research of the Faculty of Medical Sciences of the Universidade Estadual de Campinas through the Plataforma Brasil, and approved under number 326.133, in 07/07/2013. It is noted that the coordinator of the FIBRA study authorized the present study and the use of variables extracted from the database of the FIBRA study.

## RESULTS

The results found in the descriptive analysis of the data from 689 elderly are presented below. Table 1 shows the sociodemographic profile of the study population. Table 2 shows the physical leisure activities and in Table 3 are the reports of insomnia symptoms, occurrence and duration of daytime nap and use of sleep medication.

**Table 1** – Sociodemographic characteristics of the elderly participating in the FIBRA study - Campinas, SP, 2008-2009

	Sociodemographic characteristics	Seniors N (%)
Gender	Female	474 (68.8%)
	Male	215 (31.2%)
Marital status*	Single	37 (5.4%)
	Married	378 (55.1%)
	Widowed	220 (32.1%)
	Divorced	51 (7.4%)
Education	Never been to school	114 (16.6%)
	Primary school	367 (53.3%)
	Middle school	88 (12.8%)
	Secondary school	47 (6.8%)
	Adult education program	17 (2.5%)
	University	54 (7.8%)
Retired*	Post-graduation	2 (0.3%)
	Yes	481 (70.1%)
Family arrangement†	No	205 (29.9%)
	Living alone	107 (15.6%)
	Living with relatives	534 (78.1%)
Housing	Living with others (non-relatives)	43 (6.3%)
	Is the house owner	575 (83.5%)
	Is not the house owner	114 (16.5%)

\*three seniors did not respond †five seniors did not respond Note: (n=689)

Study participants were mostly female, married, had completed primary school, nonworking, lived with relatives and were home owners (Table 1). The reported age was on average 72.2 years (SD= 5.3 years and Me= 72 years), and the informed family income was of 4.4 minimum wages

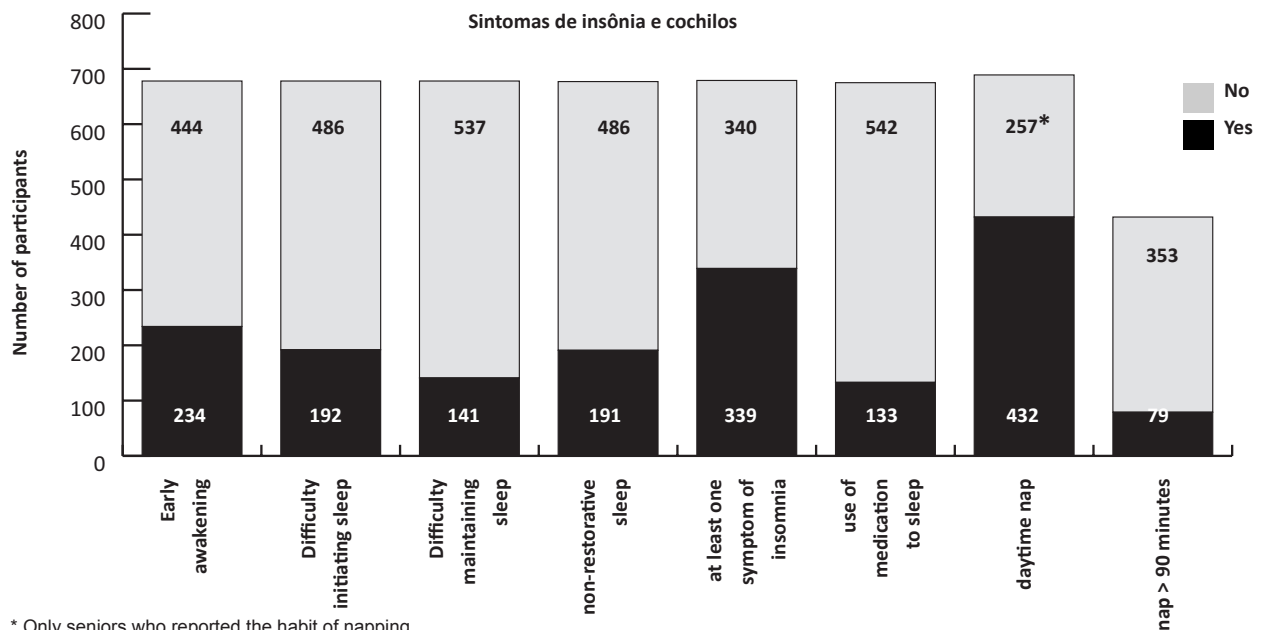
on average (SD= 4.9 and Me= 3.2), which ranged between R\$415.00 and R\$465.00 at the time of data collection<sup>(22)</sup>.

Regarding the practice of physical leisure activities, most seniors reported to practice at least one of the studied activities, and walking was the most prevalent (Table 2).

**Table 2** – Practice of physical leisure activities reported by the elderly participating in the FIBRA study - Campinas, SP, 2008-2009

Reported physical leisure activities	Yes N (%)	No N (%)
Walking*	315 (45.8%)	373 (54.2%)
Gymnastics at home*	135 (19.6%)	553 (80.4%)
Gym†	128 (18.6%)	559 (81.4%)
Ballroom dance*	29 (4.2%)	659 (95.8%)
At least one of the activities above *	426 (61.9%)	262 (38.1%)

\*a senior did not respond †two seniors did not respond Note: (n=689)



\* Only seniors who reported the habit of napping

**Figure 1** – Symptoms of insomnia, use of sleeping medications, occurrence and duration of naps in the previous 12 months – FIBRA study - Campinas, SP, 2008-2009

Nearly half of seniors reported at least one symptom of insomnia. The most frequent were early awakening and difficulty initiating sleep. The use of sleep medication was reported by 20% of participants. The majority affirmed to nap during the day, and among these, approximately 20% said the duration of the nap was equal to or greater than 90

minutes (Figure 1). The average duration of the nap was 48.1 minutes (SD of 35.6 minutes).

The result of analysis of the association between the practice of physical leisure activities and symptoms of insomnia, use of sleeping medications, the naps and its duration are shown in Table 3. Only significant results are presented.

**Table 3** – Significant association between variables related to sleep and physical leisure activities in the elderly participating in the FIBRA study - Campinas, SP, 2008-2009

Physical leisure activities		Duration of the nap				p-value*
		Less than 90 minutes		Equal to or greater than 90 minutes		
		N	%	N	%	
Walking	Yes	179	86.89	27	13.11	0.0078
	No	174	76.99	52	23.01	

\*Chi-squared test. There was no significant difference in age of the subjects who practiced physical leisure activities or not (p=0.643 in the Mann-Whitney test). Note: (n=689)

## DISCUSSION

In Brazil, the elderly population is mostly composed of women (55.8%) with less than four years of education (50.2%) and retired (66.0%)<sup>(1)</sup>. In the present study, the data showed to be very similar, as were also collected between 2008 and 2009, with elderly community residents. Thus 68.8% were women, 53.3% had completed primary school and 70.1% were retired.

Regarding the practice of physical leisure activity, 61.9% of seniors reported practicing it, which is a significantly higher proportion compared to that found in other studies with the elderly in the state of São Paulo, where prevalence was 12.5%<sup>(12)</sup> and 15.1%<sup>(23)</sup> of seniors who practiced physical leisure activities.

There are studies in which the most prevalent practice of physical activity in the elderly is walking (87.7% of men and 63% women), followed by gymnastics (about 30% of women and 10% of men)<sup>(12,23)</sup>. There were similar findings in this research, where the most prevalent physical leisure activities were walking (45.8%), gymnastics at home (19.6%) and the gym (18.6%).

An important factor is the report of at least one symptom of insomnia by almost 50% of the elderly in this study, and the use of sleep medication by a significant proportion, around 20%. Insomnia is the most prevalent sleep disorder in the elderly<sup>(9)</sup> population and probably contributes to the overuse of medication to sleep, because this pharmacological method has been widely used to solve this problem<sup>(11,24)</sup>. Considering the undesirable effects of these drugs in the elderly, such fact has led to the search for non-pharmacological alternatives to improve the quality of sleep and reduce insomnia symptoms in this age group.

A non-pharmacological intervention to promote good sleep quality is the regular practice of physical activity. Authors attribute the observed improvement to the fact that sleeping is a biological function directed at the conservation of energy and replacement of the everyday use of tissues, which is known to increase with physical activity practice<sup>(24)</sup>. This would reduce insomnia symptoms - early awakening, difficulty in initiating sleep and non-restorative sleep - that were found in between 20 and 30% of the elderly in this study, a high proportion, which deserves the attention of health professionals.

Insomnia symptoms, however, were not associated with physical activity (or lack thereof) in the present study. In contrast, a study carried out in Finland with workers aged between 40 and 60 years found a significant association between insomnia symptoms and lack of physical activity<sup>(25)</sup>. It can be assumed that the activities practiced by the elderly in this study were not sufficient to provide this beneficial effect, or that the elderly have differences regarding non-elderly adults in this aspect, what may be the subject of investigation for future studies.

The occurrence of naps was reported by 62.6% of participants in this study, while in another study with the elderly, the nap was reported by 54%. However, the average duration of the nap in this study (48.1 minutes, SD 35.6 minutes) was slightly below the average obtained by other authors (55 minutes, SD 41.2 minutes).

The nap seems to be a common practice among the elderly, not necessarily associated with disorders of the quality or duration of sleep<sup>(26)</sup>. However, in this regard, it should be noted that the long-lasting naps are considered harmful to the health of the elderly, as will be discussed below. Therefore, the relevance lies in studying not only the occurrence, but primarily the duration of this habit.

The practice of walking was significantly associated with the duration of naps, and the long-lasting ones (90 minutes or more) were more prevalent in the elderly who did not practice this activity. Studies indicate that the long-lasting daytime nap is quite common in sedentary elderly<sup>(26)</sup>.

The nap lasting less than 90 minutes proved to be beneficial, leading to improved mood and cognitive performance as well as reducing the risk of coronary heart disease<sup>(26)</sup>. However, the nap duration greater than or equal to 90 minutes can be harmful, leading to increased latency to sleep onset, fragmentation and reduction of its duration<sup>(20)</sup>.

Moreover, in some studies the long-lasting daytime nap was associated with increased mortality in the elderly, especially in the male gender, when comparing genders<sup>(27-29)</sup>. A study carried out only with older women found that those who napped for longer periods were more likely to all-cause mortality, compared to those who napped for less time. When considering only cardiovascular mortality this probability increased<sup>(30)</sup>. Another study carried out in Japan found a beneficial association for aging when combining naps lasting less than 90 minutes and physical activity<sup>(31)</sup>.

## CONCLUSION

Walking was the most prevalent practice of physical leisure activity among the elderly participating in the study, and this practice was significantly associated with the duration of the nap. The prevalence of naps that last less than 90 minutes was higher among the elderly who practiced the walking. No association was found between the practice of physical leisure activity and insomnia symptoms nor with use of sleep medications. This finding is relevant in light of studies that point to the deleterious nature of the long lasting nap and to the beneficial character of a short nap for the elderly.

With the increasing number of elderly people in Brazil, also increase the concerns of the country regarding

healthy aging, hence the implementation of public policies targeting this population. One of the guidelines is the stimulation of physical activity.

This study proposes the physical leisure activity as a method of regulation of circadian rhythms in order to improve the sleep quality of the elderly and, especially, to reduce potentially harmful habits, such as long-lasting naps. The walking could be an easy-to-use tool for this purpose.

It is noteworthy the benefit and importance of encouraging the practice of physical leisure activity with the local health services as appropriate places of guidance to

that end, given the large number of seniors who use them because of the increase of chronic diseases in aging. This guidance can be used by nurses as an intervention, considering the other health aspects of the elderly and contributing to a healthy aging.

A limitation of this study is the fact of being cross-sectional, in which it was not possible to explore the causal relationships between variables. Due to the relevance of the findings, it is suggested that further studies with longitudinal design are carried out, seeking to elucidate these aspects.

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