DOI: 10.1590/S0080-623420130000400014

Association between insomnia and rheumatoid arthritis in elderly*

ASSOCIAÇÃO ENTRE SINTOMAS DE INSÔNIA E ARTRITE REUMATÓIDE EM IDOSOS

ASOCIACIÓN ENTRE SÍNTOMAS DE INSOMNIO Y ARTRITIS REUMATOIDEA EN ANCIANOS

Denise Cuoghi de Carvalho Veríssimo Freitas[1], Thalyta Cristina Mansano-Schlosser[2], Ariene Angelini dos Santos[3], Anita Liberalesso Neri[4], Maria Filomena Ceolim[5]

ABSTRACT

This study aimed to assess symptoms of insomnia in elderly residents in the community and its association with rheumatoid arthritis. Descriptive and cross-sectional study, part of a multicentre research project entitled *Fragility in Brazilian elderly*. A total number of 689 elderly (68.9% female, average age of 72.2 years) were interviewed using a questionnaire on sociodemographic data and clinical conditions. Two tools to identify symptoms of insomnia (the Nottingham Health profile) and to screen cognitive impairment (Mini Mental State Examination) were also applied. For data analysis, we used descriptive statistical techniques and multiple logistic regression, considering a 5% significance level. The association between insomnia symptoms and rheumatoid arthritis was found to be significant in the multivariate analysis; other associated factors were a very poor subjective evaluation of health, being retired, and the presence of depression. Health professionals should investigate carefully the sleep quality in elderly with rheumatoid arthritis, considering its high prevalence in this population.

DESCRIPTORS

Aged
Sleep
Sleep disorders
Arthritis, rheumatoid

RESUMO

Esse estudo objetivou avaliar sintomas de insônia em idosos residentes na comunidade e sua associação com a artrite reumatóide. Estudo descritivo, de corte transversal, recorte do projeto multicêntrico *Fragilidade em Idosos Brasileiros.* Foram avaliados 689 idosos (68,9% mulheres, média de idade 72,2 anos) utilizando-se questionário sociodemográfico e sobre condições clínicas, questões sobre sintomas de insônia (Perfil de Saúde de Nottingham) e teste de rastreio para alterações cognitivas (Mini-exame do Estado Mental). Utilizou-se análise descritiva e análise de regressão logística múltipla, com nível de significância de 5%. A associação entre sintomas de insônia e artrite reumatóide manteve-se significativa na análise multivariada; outros fatores associados foram avaliação subjetiva da saúde muito ruim, não ser aposentado e apresentar depressão. Os profissionais da área da saúde devem investigar cuidadosamente a qualidade do sono noturno dos idosos acometidos por artrite reumatóide, dada sua elevada prevalência nessa população.

DESCRITORES

Idoso
Sono
Transtornos do sono
Artrite reumatóide

RESUMEN

Este estudio tuvo como objetivo evaluar los síntomas de insomnio en ancianos residentes en la comunidad y su asociación con la artritis reumatoidea. Estudio descriptivo, transversal, que utilizó parte de los datos del proyecto multicéntrico *Fragilidad en Ancianos Brasileños*. Fuero evaluados 689 ancianos (68,9% mujeres, con edad promedio de 72,2 años). Fue utilizado un cuestionario sobre condiciones sociodemográficas y clínicas, preguntas sobre síntomas de insomnio (Perfil de Saúde de Nottingham) y prueba de cribado para el deterioro cognitivo (Mini Examen del Estado Mental). Se utilizó el análisis descriptivo y análisis de regresión logística múltiple, con un nivel de significación del 5%. La asociación entre síntomas de insomnio y artritis reumatoidea se mantuvo significativa en el análisis multivariado; otros factores asociados también fueron: evaluación subjetiva de la salud como muy mala, no ser jubilado y tener depresión. Los profesionales de la salud deben investigar cuidadosamente la calidad del sueño nocturno de los ancianos con artritis reumatoidea, dada su alta prevalencia en esta población.

DESCRIPTORES

Anciano
Sueño
Trastornos del sueño
Artritis reumatoide

* Paper is part of the thesis, "Sintomas de insônia e sono diurno associados à ocorrência de hipertensão e diabetes mellitus em idosos", Graduate Program in Nursing, State University of Campinas School of Nursing, 2013.

[1] Physical Therapist, Doctorate in Health Sciences, State University of Campinas School of Nursing, Campinas, São Paulo, Brazil. denisecuoghi@ig.com.br [2] Nurse, Doctoral student in Health Sciences, State University of Campinas School of Nursing, Campinas, São Paulo, Brazil. thalyta@fcm.unicamp.br [3] Nurse, Doctoral student in Health Sciences,State University of Campinas School of Nursing, Campinas, São Paulo, Brazil. arieneangelini@yahoo.com.br [4] Psychologist, Doctorate in Psychology. Full professor, State University of Campinas School of Education, Campinas, São Paulo, Brazil. anitalbn@uol.com.br [5] Nurse, Doctorate in Nursing. Associate Professor, State University of Campinas School of Nursing, Campinas, São Paulo, Brazil. fceolim@fcm.unicamp

Português / Inglês
www.scielo.br/reeusp

Received: 08/18/2012
Approved: 02/03/2013

INTRODUCTION

The aging of the population is a worldwide phenomenon, highlighting the significant increase in the population aged 70 years and older. In 2009, the results of the National Household Sample Survey indicated a total of 11.3 million in this age group. The decrease of the children and youth and the consequent increase in adult population and elderly is related to the continued decline in the fertility and mortality rate combined with an increased life expectancy[1].

Simultaneously, the most prevalent diseases among elderly are also changing, with a sharp decline in the morbidity and mortality from infectious and contagious diseases and an increase in chronic non-communicable diseases (CNCDs)[2]. With aging, the probability of acquiring CNCD increases while functional capacity and body reserves decrease, leading to a greater susceptibility to these diseases and other health problems[3]. Thus, there may be a direct association between the demographic and epidemiological transition.

According to the Brazilian Institute of Geography and Statistics, in 2008, the most prevalent diseases in seniors were: high blood pressure (53.3%), back pain (35.1%), rheumatoid arthritis or rheumatism (24.2%), heart diseases (17.3%), diabetes mellitus (16.1%) and other diseases (20.9%)[1]. The CNCDs may result in losses in the overall health and functionality of the elderly, negatively affecting their quality of life, including the standard and quality of sleep[4].

Aging by itself can bring changes in the usual pattern of sleep, such as quantitative reduction of deep sleep stages and increase in the light sleep stages, nocturnal sleep disruption, increased sleep onset latency, reduced duration of nocturnal sleep, and more frequent transitions between the sleep stages during the night. The prevalence of sleep-disordered breathing and disorders related to increased nocturnal myoclonic activity are also more common over 60 years of age, so that the complaints of insomnia symptoms are most frequent among the elderly[4-5].

There are four essential symptoms for the diagnosis of sleep disorders and insomnia: difficulty falling asleep, difficulty staying asleep, early awakening and non-restorative sleep. Various international classification manuals for sleep disorders shared these criteria, including the *Research Diagnostic Criteria of the American Academy of Sleep Medicine* (RDC), the *International Classification of Sleep Disorders* (ICSD-2) and the *International Classification of Diseases Organization of the World Health Organization* (ICD 10)[6].

Changes in sleep patterns and insomnia symptoms in seniors may occur as a consequence of CNCDs. Other prevalent diseases in this age group may influence sleep quality, among them, we highlight depression, bladder weakness and neurological problems, such as Parkinson's disease and stroke[7-8]. In addition, lifestyles changes that are often linked to aging, such as retirement and widowhood, may contribute to these sleep modifications[9].

Among the examples of CNCDs, rheumatoid arthritis represents an important cause of reduced independence among older adults, once joint pain impairs mobility and performance of daily life activities, resulting in difficulties to self care and quality of life losses, also affecting the quality of sleep[7,10]. The prevalence of rheumatoid arthritis at age 65 is six times higher than the prevalence at age 25[11 -12].

The subjective self-evaluation of health is an important indicator of well-being and life expectancy of the elderly[13], and despite the presence of CNCDs, also seems to influence the quality of sleep. A poor evaluation of seniors of their own health was associated with higher prevalence of insomnia symptom complaints[14]. To provide comprehensive care, health professionals need to conduct an early detection of these problems, triggering actions aimed to improve sleep quality in elderly with rheumatoid arthritis. The detection of the symptoms of insomnia and the data on its prevalence in these patients should contribute to the awareness and concern of health professionals about this theme, with the development of interventions to minimize or avoid such problems.

There are four essential symptoms for the diagnosis of sleep disorders and insomnia: difficulty falling asleep, difficulty staying asleep, early awakening and non-restorative sleep.

Given the above, this study aimed to evaluate the association between insomnia symptoms and the presence of rheumatoid arthritis in elderly residents in the community.

METHOD

This is a cross-sectional study, with a descriptive and quantitative approach, part of a multicenter research project entitled, *Fragility in Brazilian elderly* – FIBRA, conducted by researchers from four Brazilian universities (Federal University of Minas Gerais, UFMG; University of São Paulo – Ribeirão Preto, USP-RP; State University of Campinas. UNICAMP; State University of Rio de Janeiro, UERJ), with the objective to study health and well-being conditions among men and women aged over 65 years, living in the community.

In this study, data obtained in the city of Campinas (countryside of São Paulo state), were used considering a probabilistic sample of individuals aged 65 years and over (n=900), residing in the community. These seniors were recruited at home, in randomly selected urban census sectors. Interviewers were trained and followed a guide consisting of individual presentation, presentation of the research project, and invitation for the elderly to participate in the study, according to the questionnaire developed and tested previously.

Inclusion criteria were: aged 65 years or over, capacity to understand the questionnaire instructions, agreement to participate, and permanent residency in both household and census sector selected. Exclusion criteria were: a) elderly with severe cognitive impairment that could be suggestive of dementia, evidenced by the following signs: memory impairment, attention deficit or communication difficulties, and deficiencies in spatial and temporal orientation, as observed by interviewers; b) elderly who were using wheelchairs or were either temporarily or permanently bedridden; c) patients with severe sequelae of stroke, with localized loss of strength and/or aphasia; d) patients with severe or unstable stages of Parkinson's disease, presenting severe impairment of motor skills, speech or affectivity; e) with severe hearing or vision deficits hindering communication; and, f) end-stage elderly.

Data collection occurred in a single session and began after reading and signing the consent form. Anthropometric measures, clinical and sociodemographic data were collected. An assessment of the fragile elderly and their cognitive status was conducted using the cognitive impairment screening tool known as the Mini-Mental State Examination[15]. Only the seniors who scored above the cutoff point, according to their educational level, participated in the study (n= 689).

The following variables were used to characterize the sociodemographic profile of the elderly: gender, age, education, marital status, family income (in minimum wages), retirement/employment status and current family arrangement. Information on lifestyle habits such as physical activity, smoking and alcohol use were also collected.

The evaluation of insomnia symptoms was based on the items of the Nottingham Health Profile (NHP), which is an instrument validated in Brazil[16], with the following questions: 1. Do you take pills to help you sleep? (Use of sleeping pills); 2. Are you waking up in the early hours of the morning? (Early awakening); 3. Do you lie awake for most of the night? (Difficulty staying asleep); 4. Does it take you a long time to get to sleep? (Difficulty falling asleep); and, 5. Do you sleep badly at night? (Non-restorative sleep). The possible answers were yes or no, and interviewees should refer to their experience during the last twelve months. If the interviewee responded affirmatively to any of the questions, he/she was considered to have symptoms of insomnia, according to the DSM IV (Diagnostic and Statistical Manual of Mental Disorders IV).

The clinical conditions investigated were: high blood pressure, osteoporosis, rheumatoid arthritis/rheumatism, heart diseases, diabetes mellitus, chronic obstructive pulmonary disease, cancer, stroke and urinary incontinence. Responses were obtained by the interviewee self-reporting the following question: Has any medical doctor ever said that you have the following diseases and/or conditions? The response was dichotomous (yes or no). The Geriatric Depression Scale was applied to investigate depression among interviewees. The presence or absence of depression was considered according to the score obtained[17]. The subjective health perception was assessed through one question *How would you rate your own health?* with a five-point rating scale: very good, good, fair, poor and very poor.

According to 196/96 resolution of the Brazilian Health Council, all ethical principles were respected. The coordinator of the multicenter research project FIBRA authorized the use of the data. This study was approved by the Board of Ethics in Research, as an addendum to the FIBRA project (Process No. 208/2007) on 23rd November 2010.

Data were coded and entered into a spreadsheet, and analyzed with SPSS software (17.0 version). Data analysis was conducted by using descriptive statistical techniques and presented in table format, with the absolute numbers and percentages for each categorical variable and with means, standard deviations, and medians for each numerical variable. To identify factors associated with symptoms of insomnia, the univariate logistic regression analysis was applied to the variables of interest, and then these were tested in a multiple logistic regression model by stepwise criteria selection, considering a critical p-value level as $p \leq 0.05$.

RESULTS

The predominant characteristics among the study subjects were: female (68.8%), white/caucasian (73.9%), married (55.1%), retired (70.0%), with no current work activity (85.4 %), with at least 4 years of schooling (52.3%) and living with their families (78.0%). Among the respondents, 36.7% were aged between 65 to 69 years (mean of 72.2 years with a standard deviation of 5.3 years) and 38.8% presented a family income ranging of 1.1 to 3 minimum wages[a].

The proportions of clinical conditions identified were: high blood pressure (64.5%), rheumatoid arthritis (43.2%), heart diseases (26.4%), osteoporosis (26.3%), diabetes mellitus (21.8%), chronic obstructive pulmonary disease (10.0%), cancer (9.4%) and stroke (7.5%). Among interviewees, 55% reported at least one symptom of insomnia: early awakening (34.5%), difficulty falling asleep (27.9%), non-restorative sleep (27.7%) and difficulty staying asleep (20.3%). The use of sleeping pills was reported by 19.3% of the seniors.

Table 1 shows the significant results of the univariate logistic regression analysis in the identification of the factors associated with the insomnia symptoms.

Table 2 shows the results of the factors associated with insomnia symptoms according to multiple logistic regression analysis.

[a] The minimum wage at the time of the study development was R$465.00. Source: Ministry of Labor and Employment, 2009, http://portal.mte.gov.br/portal-mte/

Table 1 – Factors associated to insomnia symptoms (univariate logistic regression analysis) – *Fragility in Brazilian Elderly Research Network* (FIBRA) – Campinas, São Paulo, 2008-2009.

Variable	Categories	p-value	OR*	CI 95% OR*
Sex	Male (ref.)	–	1.00	–
	Female	<0.001	1.76	1.27 – 2.44
Retirement	Yes (ref)	–	1.00	–
	No	<0.001	1.85	1.31 – 2.60
Living conditions	With nonrelatives (ref.)	–	1.00	–
	With relatives	0.018	2.17	1.14 – 4.13
	Alone	0.013	2.51	1.21 – 5.21
Rheumatoid arthritis	Yes (ref)	–	1.00	–
	No	<0.001	2.24	1.64 – 3.07
Depression	Yes (ref)	–	1.00	–
	No	<0.001	2.75	1.80 – 4.20
Urinary incontinence	Yes (ref)	–	1.00	–
	No	0.033	1.42	1.03 – 1.96
Subjective self-evaluation of health	Very good (ref.)	–	1.00	–
	Good	0.006	1.97	1.22 – 3.18
	Fair	<0.001	3.88	2.35 – 6.40
	Poor	<0.001	6.44	2.51 – 16.52
	Very poor	0.041	5.54	1.08 – 29.50

*OR (Odds Ratio)=Odds Ratio for insomnia symptoms; (n=300 without insomnia symptoms and n=379 with insomnia symptoms). CI 95% OR=Confidence interval of 95% to the odds ratio. Ref.: reference level. Note: (n=679).

Table 2 – Factors associated to insomnia symptoms (multiple logistic regression analysis) – *Fragility in Brazilian Elderly Research Network* (FIBRA) – Campinas, São Paulo, 2008-2009.

Variable	Categories	p-value	OR*	CI 95% OR*
Subjective self-evaluation of health	Very good (ref.)	–	1.00	–
	Good	0.005	2.21	1.27 – 3.86
	Fair	<0.001	3.60	1.99 – 6.53
	Poor	0.009	4.02	1.41 – 11.42
	Very poor	0.037	6.15	1.12 – 33.88
Retirement	Yes (ref)	–	1.00	–
	No	<0.001	2.08	1.39 – 3.10
Rheumatoid arthritis	Yes (ref)	–	1.00	–
	No	0.001	2.28	1.39 – 3.74
Depression	Yes (ref)	–	1.00	–
	No	0.018	1.56	1.08 – 2.26

*OR (Odds Ratio)=Odds Ratio for insomnia symptoms; (n=259 without insomnia symptoms and n=316 with insomnia symptoms). CI 95% OR=Confidence interval of 95% to the odds ratio. Selection of variables conducted by stepwise criteria. Ref.: reference level. Note: (n=575).

According to multivariate analysis, we observed that individuals with higher risk of symptoms of insomnia were those with the poorest subjective health evaluation (risk 6.2 times higher for health evaluation as very poor), not retired (risk 2.1 times), with presence of depression (2.3 times greater risk), and with rheumatoid arthritis (1.6 times greater risk).

DISCUSSION

In this study, rheumatoid arthritis was significantly associated with reported symptoms of insomnia among seniors (OR=1.6). Other factors associated to insomnia symptoms found in our study were self-evaluation of health rated as very poor, poor, fair or good, depression and not being retired. The awareness of these factors allows an essential subsidy for the elderly patient assessment, contributing to the development of strategies for the health care management for this population.

In the last three decades, the Brazilian population has faced a systematic and consistent growth in the number of elderly, characterized by a majority of women, white/Caucasian, with low educational level and low monthly income[1]. These features are also found in the elderly in the metropolitan region of Campinas[18], and among the subjects of this study.

The prevalence of CNCDs among Brazilian elderly was 48.9% in 2008. High blood pressure was the most prevalent with rates reaching around 50%, and rheumatoid arthritis/rheumatism ranked third, with a prevalence of 24.2%[1]. In the metropolitan region of Campinas (SP), the most prevalent CNCDs among the elderly were cardiovascular diseases and cancer[18]. In our study population, the proportion of elderly who reported the presence of a CNCD was higher than for the average population of Campinas, with high blood pressure ranking first, followed by rheumatoid arthritis. These data emphasize the importance of studying the aspects associated with this condition that harm elderly health and well-being.

Health professionals in general, and especially those working in the field of aging, should pursue strategies to improve or maintain seniors' quality of life, and also to prevent diseases, preserve and rehabilitate health. Aiming toward these purposes, health professionals must investigate and understand the singularity of this phase of life and how aging is influenced by multiple factors (physical, psychological, social and cultural), which may impair the quality of life and health status among elderly[19].

Among these aging consequences, the quality of sleep deserves more attention than it has received from health professionals working with this population. The univariate logistic regression analysis showed several factors associated with symptoms of insomnia in the interviewees, such as: being female, living alone or with the family, not being retired, report of urinary incontinence, rheumatoid arthritis, depression and a health self-evaluation rated as good, fair, poor or very poor. Most of these factors, such as being female[4-5], urinary incontinence[7-8] and

depression[7-8], have traditionally been associated with complaints of this nature.

Subsequently, the results of the multivariate logistic regression analysis model showed the permanence of rheumatoid arthritis as a significant factor in insomnia symptoms, even in the presence of other important factors, such as depression and health self-evaluation. Other recent studies have indicated the association between rheumatoid arthritis and sleep problems in the elderly[7-8].

Rheumatoid arthritis is an autoimmune disease, with an inflammatory component and unknown etiology, characterized by peripheral polyarthritis, symmetrical, which leads to joint deformity and destruction by bone and cartilage erosion. Systemic manifestations may also occur. Epidemiological studies have estimated the prevalence of rheumatoid arthritis in 1% of the adult population, affecting three times more women than men and presenting a greater incidence among people ages 35 to 65 years[11-12]. Therefore, functional impairment occurrence is more likely in older age groups.

Authors of a Brazilian study on CNCDs[20] who used comparative data from the 1988 and 2003 National Household Sample Surveys, found a higher prevalence of rheumatoid arthritis in the 2003 survey cohort compared to the 1998 cohort, pointing out that prevalence increases with advancing age.

The pain and discomfort caused by rheumatoid arthritis can result in serious consequences for the elderly, contributing to functionality impairment; poor sleep quality; participation and social engagement losses, with significant negative impact on the health and well-being of individuals in this age group[4]. One should consider that rheumatoid arthritis is a disease that has a negative impact on social life and often leads to early interruption of work activities, both in the adult population and the elderly[1]. In Brazil, 57.9% of the elderly are retired[1], but in this study the prevalence of retirees reached 70.0%. The proportion of people without an activity was 85.2% in this study, reinforcing what was previously stated. It should be noted also that the disease may include joint deformity and disability to perform daily-life activities, with loss of muscle strength and pain, causing mental health disorders besides the physical impact, leading to problems such as depression and anxiety[20].

Our results showed the subjective health self-evaluation as an important factor associated with reported symptoms of insomnia. The prevalence of insomnia symptoms is associated with a poor perceived health, according to DSM-IV-TR[14]. In the present study, only the category *very good* in the health self-evaluation was not associated with symptoms of insomnia, suggesting the relevance of the research of these symptoms in the assessment of all seniors, even those who appear satisfied with their health. The relevance of this research is evident when one considers that poor sleep can have as consequence the worsening of diseases such as hypertension and diabetes mellitus.

A nationwide study conducted in the United States of America revealed that sleep disorders affected about ten million adults with rheumatoid arthritis. This association, according to the authors, was mediated by the presence of joint pain and its limitations[21]. The poor quality of sleep was associated with the presence of rheumatoid arthritis and correlated symptoms, namely pain, fatigue, functional disability and depressive symptoms in 162 adults (58 years old in average), of which 70% were women[22]. The results of a Brazilian study conducted with elderly living in long-term care institutions showed that seniors with severe dependence reported lower sleep efficiency, compared to those with moderate dependence and those who were independent, and pain was cited as a harmful factor to sleep by 21.1% of the study participants[23].

Authors suggest that poor sleep quality has an indirect effect on functional disability, through its association with the severity of pain and fatigue. The implications of this finding is that, by treating sleep disorders, one can also promote improvements in seniors' functional capacity[24]. One of the limitations in the present study was the lack of data regarding the presence of pain and functional capacity.

The presence of depression was also associated with symptoms of insomnia, which has been shown by other authors who investigated the quality of sleep[22]. We call attention to the possible association among the conditions that cause disability, such as rheumatoid arthritis, and the occurrence of depression and depressive symptoms. Results of a population-based cross-sectional study conducted with elderly in São Paulo suggest that the use of psychotropic drugs, especially antidepressants, was higher among those with functional sequelae resulting from multiple morbidities, which may be associated with the presence of depressive symptoms[25].

It should be emphasized that in the present study, the association between insomnia symptoms and rheumatoid arthritis remained significant even in the presence of depression, suggesting that the latter could be a trigger or a signal for insomnia symptoms in elderly with rheumatoid arthritis.

CONCLUSION

In the present investigation, the symptoms of insomnia were associated with the presence of a poor subjective health evaluation, being retired, and the presence of depression and rheumatoid arthritis. These findings bring a warning to health professionals who work with elderly to include in routine clinical practice a global assessment of this population. Health professionals should also identify insomnia symptoms, given its high prevalence in association with other health problems, which may have a significant impact on the quality of life of these patients.

REFERENCES

1. Instituto Brasileiro de Geografia e Estatística (IBGE). Síntese de Indicadores Sociais: uma análise das condições de vida da população brasileira [Internet]. Rio de Janeiro; 2010 [citado 2011 fev. 22]. Disponível em: http://www.ibge.gov.br/home/estatistica/populacao/condicaodevida/indicadoresminimos/sinteseindicsociais2010/SIS_2010.pdf

2. Casado L, Vianna LM, Thuler LCS. Fatores de risco para doenças crônicas não transmissíveis no Brasil: uma revisão sistemática. Rev Bras Cancerol. 2009; 55(4):379-88.

3. Malta DC, Oliveira MR, Moura EC, Silva AS, Zouain CS, Santos FP, et al. Fatores de risco e proteção para doenças crônicas não transmissíveis entre beneficiários da saúde suplementar: resultados do inquérito telefônico Vigitel, Brasil, 2008. Ciênc Saúde Coletiva. 2011;16(3):2011-22.

4. Wolkove N, Elkholy O, Baltzan M, Palayew M. Sleep and aging: 1. Sleep disorders commonly found in older people. CMAJ. 2007;176(9):1299-304.

5. Corrêa K, Ceolim MF. Qualidade do sono em pacientes idosos com patologias vasculares periféricas. Rev Esc Enferm USP. 2008;42(1):12-8.

6. Walsh JK, Coulouvrat C, Hajak G, Lakoma M, Petukhova M, Roth T, et al. Nighttime insomnia symptoms and perceived health in the America Insomnia Survey (AIS). Sleep. 2011;34(8):997-1011.

7. Turk DC, Cohen MJ. Sleep as a marker in the effective management of chronic osteoarthritis pain with opioid analgesics. Semin Arthritis Rheum. 2010;39(6):477-90.

8. O'Brien EM, Waxenberg LB, Atchison JW, Gremillion HA, Staud RM, McCrae CS, et al. Intraindividual variability in daily sleep and pain ratings among chronic pain patients: bidirectional association and the role of negative mood. Clin J Pain. 2011; 27(5):425-33.

9. LeBlanc M, Mérette C, Savard J, Ivers H, Baillargeon I, Morin CH. Incidence and risk factors of insomnia in a population-based sample. Sleep. 2009;32(8):1027-37.

10. Lurati A, Marrazza M, Scarpellini KAM. Safety of etanercept in elderly subjects with rheumatoid arthritis. Biologics. 2010;4:1-4.

11. Louzada Junior P, Souza BDB, Toledo RA, Ciconelli RM. Análise descritiva das características demográficas e clínicas de pacientes com artrite reumatóide no Estado de São Paulo, Brasil. Rev Bras Reumatol. 2007;47(2):84-90.

12. Mota LMH, Cruz BA, Brenol CV, Pereira IA, Rezende-Fronza LS, Bertolo MB, et al. Consenso 2012 da Sociedade Brasileira de Reumatologia para o tratamento da artrite reumatóide. Rev Bras Reumatol. 2012;52(2):135-74.

13. Pereira MG, Rebouças M. Indicadores de saúde para idosos: comparação entre o Brasil e os Estados Unidos. Rev Panam Salud Publica. 2008;23(4):237-46.

14. Roth T, Coulouvrat C, Hajak G, Lakoma MD, Sampson NA, Shahly V, et al. Prevalence and perceived health Aasociated with insomnia based on DSM-IV-TR; International Statistical Classification of Diseases and Related Health Problems, Tenth Revision; and Research Diagnostic Criteria/International Classification of Sleep Disorders, Second Edition Criteria: results from the America Insomnia Survey. Biol Psychiatry. 2011;69(6):592-600.

15. Brucki SMD, Nitrini R, Caramelli P, Bertolucci PHF, Okamoto IH. Sugestões para o uso do Mini-Exame do Estado Mental no Brasil. Arq Neuro-Psiquiatr. 2003;61(3-B):777-81.

16. Teixeira-Salmela LF, Magalhães LC, Souza AC, Lima MC, Magalhães RC, Goulart F. Adaptação do Perfil de Saúde de Nottingham: um instrumento simples de avaliação de qualidade de vida. Cad Saúde Pública. 2004;20(4):905-14.

17. Almeida OP, Almeida SA. Confiabilidade da versão brasileira da escala de depressão em geriatria (GDS) versão reduzida. Arq Neuro-Psiquiatr. 1999;57(2B):421-6.

18. Fundação Sistema Estadual de Análise de Dados (SEADE). Índice Paulista de Vulnerabilidade Social – 2010 [Internet]. São Paulo; 2010 [citado 2012 jul. 4]. Disponível em: http://www.iprsipvs.seade.gov.br/view/index.php?prodCod=2

19. Ciosak SI, Braz E, Costa MFBN, Gonçalves N, Nakano R, Rodrigues J, et al. Senescence and senility: the new paradigm in Primary Health Care. Rev Esc Enferm USP [Internet]. 2011 [cited 2012 Apr 25];45(n.spe2):1763-8. Available from: http://www.scielo.br/pdf/reeusp/v45nspe2/en_22.pdf

20. Lima-Costa MF, Loyola Filho IA, Matos DL.Tendências nas condições de saúde e uso de serviços de saúde entre idosos brasileiros: um estudo baseado na Pesquisa Nacional por Amostra de Domicílios (1998, 2003). Cad Saúde Pública. 2007; 23(10):2467-78.

21. Covic T, Cumming SR, Pallant JP, Manolios N, Emery P, Conaghan PG, et al. Depression and anxiety in patients with rheumatoid arthritis: prevalence rates based on a comparison of the Depression, Anxiety and Stress Scale (DASS) and the Hospital, Anxiety and Depression Scale (HADS). BMC Psychiatry. 2012;12:6.

22. Louie G, Tektonidou MG, Cabana-Martinez AJ, Ward MM. Sleep Disturbances in adults with arthritis: prevalence, mediators, and subgroups at greatest risk. Data from the 2007 National Health Interview Survey. Arthritis Care Res (Hoboken). 2011;63(2):247-60.

23. Araújo CLO, Ceolim MF. Sleep quality of elders living in long-term care institutions. Rev Esc Enferm USP [Internet]. 2010 [cited 2012 Apr 25];44(3):619-26. Available from: http://www.scielo.br/pdf/reeusp/v44n3/en_10.pdf

24. Luyster FS, Chasens ER, Wasko MCM, Dunbar-Jacob J. Sleep quality and functional disability in patients with rheumatoid arthritis. J Clin Sleep Med. 2011;7(1):49-55.

25. Noia AP, Secoli SR, Duarte YAO, Lebrão ML, Lieber NSR. Factors associated to the use of psychotropic drugs by community-dwelling elderly in São Paulo City. Rev Esc Enferm USP [Internet]. 2012 [cited 2012 Apr 25];46(n. spe):38-43. Available from: http://www.scielo.br/pdf/reeusp/v46nspe/en_06.pdf

Financial support from CAPES

The study Fragility in Brazilian elderly – FIBRA received support from CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico)

Correspondence addressed to: Denise Cuoghi de Carvalho Veríssimo Freitas
Av. Francisco Glicério, 1664 - Apto. 903 - Centro
CEP 13012-908 – Campinas, SP, Brazil