ORIGINAL ARTICLE / *ARTIGO ORIGINAL*

Biopsychosocial factors associated to self-percepted sleep function in Brazilian elderly people: analysis of a national survey

Fatores biopsicossociais associados à função do sono autopercebido em idosos brasileiros: análise de um inquérito nacional

Johnnatas Mikael Lopes[I] (iD), Angelo Giuseppe Roncalli[II] (iD)

ABSTRACT: *Background:* Sleep is a dimension of well-being and health. Non-restful sleep is related to health dysfunctions, especially in vulnerable populations, considering that related factors change contextually. Thus, the objective of the present study was to measure the magnitude of the reduction in sleep restorative function (SRF) and related biopsychosocial factors in Brazilian elderly. *Method:* Secondary data from the 2013 National Health Survey of cross-sectional design were analyzed. The sample consisted of individuals as from 60 years old. The outcome considered was the prevalence of reduced self-perceived sleep restorative function (SRF). Health and sleep characteristics, emotional behavior, lifestyle, social support, and urbanization were all investigated. The association with outcome was measured with the prevalence ratio (PR) and estimated with Cox regression, assuming $\alpha \leq 0.05$. *Results:* SRF was reduced by 29.2% (95%CI 27.2 – 30.6%). It is related to depression (PR = 3.37; 95%CI 2.87 – 3.97), insomnia/sleepiness (PR = 2.45; 95%CI 2.14 – 2.79); behavioral oscillation (PR = 1.75; 95%CI 1.53 – 1.99), negative health perception (PR = 1.50; 95%CI 1.23 – 1.82), computer and internet (PR = 1.44; 95%CI 1.01 – 2.07) and functional difficulty (PR = 1.13; 95%CI 1.01 – 1.27). Living in urban areas (PR = 1.32; 95%CI 1.14 – 1.52) and having a chronic condition (PR = 1.58; 95%CI 1.11 – 2.40) were only associated to the worst situation of reduced SRF. *Conclusion:* The reduction in SRF affects one third of the elderly in Brazil and is closely related to biopsychosocial factors, requiring intersectoral public health promotion approaches.

Keywords: Sleep. Sleepiness. Sleep initiation and maintenance disorders. Aged. Social determinants of health. Mental health.

[I]Medicine course, Universidade Federal do Vale do São Francisco, Paulo Afonso (BA), Brazil.
[II]Graduate Program in Collective Health, Universidade Federal do Rio Grande do Norte, Natal (RN), Brazil.
Corresponding author: Johnnatas Mikael Lopes. Colegiado de Medicina. Rua da Aurora, s/n., Quadra 27, Lote 3, General Dutra, CEP: 48607-190, Paulo Afonso, BA, Brazil. E-mail: Johnnatas.lopes@univasf.edu.br

RESUMO: *Introdução:* O sono é uma dimensão do bem-estar e da saúde. Um sono não reparador relaciona-se com disfunções de saúde, principalmente em populações vulneráveis, à medida que os fatores relacionados mudam contextualmente. Assim, objetivou-se mensurar a magnitude da redução da função reparadora do sono (FRS) e os fatores biopsicossociais relacionados em idosos brasileiros. *Método:* Foram analisados dados secundários da Pesquisa Nacional de Saúde de 2013, de delineamento transversal. A amostra constituiu-se de indivíduos a partir de 60 anos. O desfecho considerado foi a prevalência de redução da função restaurativa do sono (FRS) autorreferida. Características de saúde e sono, comportamento emocional, hábitos de vida, suporte social e urbanização tiveram suas relações investigadas. A associação com desfecho foi medida pela razão de prevalência (RP) e estimada pela regressão de Cox, assumindo α ≤ 0,05. *Resultados:* A FRS estava reduzida em 29,2% (intervalo de confiança de 95% — IC95% 27,2 – 30,6%). Ela está relacionada à depressão (RP = 3,37; IC95% 2,87 – 3,97), insônia / sonolência (RP = 2,45; IC95% 2,14 – 2,79); oscilação comportamental (RP = 1,75; IC95% 1,53 – 1,99), percepção negativa de saúde (RP = 1,50; IC95% 1,23 – 1,82), computador e internet (RP = 1,44; IC95% 1,01 – 2,07) e dificuldade funcional (RP = 1,13; IC95% 1,01 – 1,27). Viver em áreas urbanas (RP = 1,32; IC95% 1,14 – 1,52) e ter condição crônica (RP = 1,58; IC95% 1,11 – 2,40) associaram-se apenas à pior situação de redução da FRS. *Conclusão:* A redução da FRS atinge um terço dos idosos no Brasil e está intimamente relacionada a fatores biopsicossociais, exigindo abordagens de políticas públicas intersetoriais de promoção de saúde.

Palavras-chave: Sono. Sonolência. Distúrbios do início e da manutenção do sono. Idoso. Determinantes sociais da saúde. Saúde mental.

INTRODUCTION

Sleep provides recover to the wake state and it has a relevant impact on the physiologic activities, such as cognitive / emotional behavior, cardiovascular function, and pain perception modulation[1]. Sleep is also a wellness domain and its perception impacts one's health status, being associated to mortality and morbidity indices as soon as it is a focus of health promotion in the world[1,2]. Therefore, to study sleep effects in a population we should consider biological, behavioral and contextual factors[2] in analyses of epidemiologic surveys.

Sleep disorders have short and long-term repercussions on body systems, such as physical vigor and cardiovascular diseases in elderly people[3,4] and social situations in which older individuals need to respond appropriately[5]. In addition, sleep restorative function (SRF) deficits, related to poor sleep habits, cause fatigue in daily activities[6].

International estimates indicate that sleep-wake cycle disorders reach all age groups and genders, but they seem to manifest distinctly in life cycles mediated by contextual[6,7], behavioral and mental disorders[8]. In Brazil, epidemiological surveys related to sleep disorders are scarce, mostly restricted to regional subpopulations studies or focusing on morbidity. However, evidence indicates high prevalence ranges for excessive daytime sleepiness (EDS) and insomnia in elderly people[4], most common sleep complaints, associated to depression and cardiovascular risk[9].

For detecting sleep disorders, a neurologist consultation and polysomnography are needed. However, theses method are scarce and expensive in Brazil, and sleep perception

of insomnia/EDS, for example, is easily identified by assessing some complaints, like difficulty of initiating, maintaining, or returning to sleep as well as daytime sleepiness and speed assessment of sleep status and wellness[1]. Then, sleep complaints referred by population and treated as normal could be related to poor wellness and health conditions, mainly chronic diseases in the pre-clinical conditions or severe pathological stages in body system[3,4].

Studies on behavior's sleep and self-perception of health status has a potential relevance for decision making in public health and clinical management due to the evidence scarcity as to sleep wellness and disabilities in Brazilian elderly population. Then, we analyzed the National Health Survey (NHS) in Brazil, from 2013, and estimate how is the sleep wellness of Brazilian elderly population with the reduction in SRF and insomnia/EDS complaints as well as the relation between health status, behavioral and social factors related to these sleep self-perceptions.

METHODS

The NHS was developed in the Brazilian territory in 2013 and presented a complex sampling cross-sectional survey design, conducted by the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística* - IBGE) in partnership with Fundação Oswaldo Cruz.

The present study works with secondary and open access data and does not require any approval by the ethics committee.

Permanent private households' population grouped into conglomerates called census section were included, covering capitals, metropolitan regions and countryside Indigenous villages, barracks, military bases, lodges, camps, boats, penitentiaries, penal colonies, prisons, chains, asylums, orphanages, convents and hospitals[10] were excluded from the study.

Sampling size was determined from the simple random sampling assumption because there is no information on the entire population to estimate the indicators for groups. The 2010 Demographic Census with proportion of households containing population groups of interest was used as reference. Thus, a sample size of 81,357 participants was estimated as older than 18[10], and data analyzes were stratified for elderly people.

The sample was selected from a complex conglomerate sampling process, configured in three stages. The primary sampling unit was the census sector, followed by households in the sector, and the resident one. In these last two stages, the observation units were selected by simple random sample[10].

The participant answered the survey instrument with thematic modules ordered from A to W, analyzing only the modules that addressed the individual characteristics of residents, such as demographic, social, lifestyle, perception of health, and chronic diseases, as well as characteristics of the household pertinent to the study. For further information on the sampling design, consult Freitas[10].

The study outcome was SRF, measured with a self-report that questioned: "In the last two weeks, how often did you have problems because you did not feel rested and willing

during the day, feeling tired, lacking energy?", producing an ordinal variable grouped into the following response levels: "no days", "less than half the days" and "more than half the days/almost every day". This question was performed after the secondary outcome question. Thus, lacking energy is related to sleep.

The independent variables were grouped according to the NHS modules.

Demographic variables: gender (male and female), age group, marital status (living with a partner or alone), ethnicity (white and nonwhite), paid or unpaid occupation (yes or no), and social stratum, (AB, C and DE). Social stratum was created from the Brazilian Economic Classification Criteria of the Brazilian Market Research Association (*Associação Brasileira das Empresas de Pesquisas* - ABEP)[11].

Health variable: self-reported presence of sleep complaints with the question: "In the last two weeks, how often did you have problems with sleep, such as difficulty falling asleep, waking often during the night or sleeping more than usual?", being a proxy variable for insomnia/EDS complaints, which also generated an ordinal variable with the responses: "no days", "less than half the days" and "more than half the days/almost every day"; chronic disease patient (yes and no) and disability for activities of daily living (yes and no). Disability was measured by the presence of physical, mental and/or sensory disability (yes and no).

Health perception variables: general health perception (good, regular and bad), oral health perception (good, regular and bad), depressive symptoms perception (yes and no), behavioral oscillation perception (yes and no). Lifestyle variables: does not smoke, does physical activity for the last three months, and does not consume alcoholic beverages or consumes less than once a month (yes or no) were considered healthy habits. Body Mass Index (BMI) was classified as low weight, eutrophic, and overweight/obese.

Social network variables: "Do you participate in organized social activities (clubs, community or religious groups, centers for elderly coexistence, etc.)?", yes or no.

Household variables: Location of the household (urban or rural), resident/bedroom relation (adequate ≤3), computer and internet (yes or no) and for the elderly, cellular and internet (yes or no).

In a complex sampling design, the data analysis is based on the weighed estimation of the sample units in the three stages. After that, each observation incorporated its sample weight to calculate descriptive and inferential interval estimates of the analysis. Thus, it allowed the correction of the effect of the sampling plan added to the correction for non-responses.

The data were described using estimates of prevalence and their 95% confidence intervals (95%CI). The association inferences between the primary and secondary outcomes in relation to the independent variables were made with the Cox regression, with adjustment for complex design, and with Wald χ^2 significance test. In addition, prevalence ratio (PR) estimate was determined as effect measurement and $\alpha \leq 0.05$. Two models were built: model 1 with ordinal outcomes for test gradient effect, and model 2 with binary outcome, in which the answer was the worst situation, symptoms described as "more than half the days/almost every day".

RESULTS

Elderly people totaled 11,109 of the participants interviewed, of which 57.7% (95%CI 56.1 – 59.3%) were women and 56.4% (95%CI 54.7 – 58.0%) were between 60 and 69. Further details of the sample description are presented in Table 1.

Table 1. Unadjusted and adjusted association for self-perception of restorative function of sleep with Cox regression in complex sampling design in the Brazilian elderly population.

| Variable | n | % (95%CI) | Reduction of Restorative Function Complaints | | | | | |
| | | | Unadjusted Model | | Final Model 1 | | Final Model 2 | |
			PR	95%CI	PR	95%CI	PR	95%CI
Gender								
Female	6,586	57.7 (56.1 – 59.3)	**1.48**	**1.30 – 1.67**	1.12	0.98 – 1.29	1.18	0.95 – 1.45
Male	4,523	42.3 (40.7 – 43.9)	1		1		1	
Lives with his/her partner								
Yes	5,004	57.0 (55.4 – 58.5)	0.92	0.83 – 1.03	1.08	0.96 – 1.21	1.04	0.87 – 1.24
No	6,105	43.0 (41.5 – 44.6)	1		1		1	
Ethnicity/Color								
White	5,296	54.2 (52.5 – 55.9)	0.94	0.83 – 1.06	1.09	0.97 – 1.22	**1.18**	1.01 – 1.39
Non-White	5,813	45.8 (44.1 – 47.5)	1		1		1	
Age								
60–69	6,170	56.4 (54.7 – 58.0)	1.01	0.84 – 1.20	1.02	0.93 – 1.12	1.08	0.94 – 1.25
70–79	3,441	30.0(28.5 – 31.5)	1.03	0.85 – 1.25	1.04	0.96 – 1.13	1.06	0.93 – 1.21
80 or more	1,498	13.6 (12.6 – 14.7)	1		1		1	
Social Stratum								
DE	4,514	32.4 (31.0 – 33.9)	**1.33**	**1.11 – 1.58**	1.07	0.84 – 1.35	0.73	0.49 – 1.08
C	4,235	41 (39.4 – 42.7)	**1.20**	**1.02 – 1.43**	1.01	0.84 – 1.21	0.76	0.56 – 1.03
AB	2,360	26.6 (24.7 – 28.6)	1		1		1	
BMI								
Low Weight	1,713	15.3 (14.1 – 16.5)	1.01	0.84 – 1.20	0.95	0.80 – 1.14	1.22	0.95 – 1.56
Overweight	4,899	45.5 (43.9 – 47.1)	1.13	0.99 – 1.29	1.06	0.94 – 1.20	1.12	0.93 – 1.35
Eutrophic	4,497	39.2 (37.7 – 40.8)	1		1		1	

Table 1. Continuation.

Variable	n	% (95%CI)	Reduction of Restorative Function Complaints					
			Unadjusted Model		Final Model 1		Final Model 2	
			PR	95%CI	PR	95%CI	PR	95%CI
Lifestyle								
Healthy	1,753	15.3 (14.2 – 16.4)	1.14	0.96 – 1.35	0.97	0.89 – 1.06	1.07	0.80 – 1.44
Not healthy	9,353		1	1	1			
Difficulty in daily activities								
Yes	3,642	31.7 (30.3 – 33.2)	**1.98**	**1.77 – 2.22**	**1.13**	**1.01 – 1.27**	**1.36**	**1.12 – 1.65**
No	7,467	68.3 (66.8 – 69.7)	1		1		1	
Depressive Symptoms								
Yes	3,697	33.4 (31.8 – 35.1)	**6.88**	**6.00 – 7.89**	**3.37**	**2.87 – 3.97**	**3.77**	**2.88 – 4.96**
No	7,412	66.6 (64.9 – 68.2)	1		1		1	
Behavioral Oscillation								
Yes	2,973	26.4 (24.9 – 27.9)	**4.76**	**4.25 – 5.33**	**1.75**	**1.53 – 1.99**	**1.81**	**1.46 – 2.24**
No	8,136	73.6 (72.1 – 75.1)	1		1		1	
General Health Perception								
Bad	1,459	11.9 (11.0 – 13.0)	**4.61**	**3.91 – 5.44**	**1.50**	**1.23 – 1.82**	**3.12**	**2.31 – 4.21**
Regular	4,773	43.3 (41.8 – 44.9)	**2.10**	**1.83 – 2.42**	**1.21**	**1.03 – 1.41**	**1.65**	**1.26 – 2.16**
Good	4,877	44.7 (43.1 – 46.3)	1		1		1	
Oral Health Perception								
Bad	1,069	7.9 (7.2 – 8.8)	**1.83**	**1.54 – 2.18**	1.11	0.92 – 1.35	1.13	0.89 – 1.44
Regular	3,348	29.5 (27.9 – 31.1)	**1.52**	**1.34 – 1.73**	**1.21**	**1.08 – 1.37**	1.11	0.91 – 1.37
Good	6,692	62.6 (60.9 – 64.2)	1		1		1	
Insomnia/EDS								
Yes	3,789	34.1 (32.6 – 35.7)	**4.73**	**4.20 – 5.34**	**2.45**	**2.14 – 2.79**	**3.46**	**2.77 – 4.33**
No	7,321	65.9 (64.4 – 67.4)	1		1		1	
Chronic Health Condition								
Yes	8,543	78.6 (77.2 – 79.9)	**2.57**	**2.11 – 3.14**	1.20	0.99 – 1.44	**1.58**	**1.11 – 2.40**
No	2,566	21.4 (20.1 – 22.8)	1		1		1	

Table 1. Continuation.

| Variable | n | % (95%CI) | Reduction of Restorative Function Complaints | | | | | |
| | | | Unadjusted Model | | Final Model 1 | | Final Model 2 | |
			PR	95%CI	PR	95%CI	PR	95%CI
Disability								
Yes	2,319	21.3 (19.9 – 22.7)	**1.40**	**1.22 – 1.60**	1.01	0.89 – 1.13	1.15	0.95 – 1.40
No	8,790	78.7 (77.3 – 80.1)	1		1		1	
Social support								
Yes	2,736	25.1 (23.6 – 26.6)	0.82	0.31 – 2.16	**1.14**	**1.01 – 1.30**	0.94	0.76 – 1.17
No	8,373	74.9 (73.4 – 76.4)	1		**1**		1	
Occupation								
Yes	2,529	22.5 (21.1 – 23.9)	0.86	0.70 – 1.00	0.89	0.77 – 1.02	0.87	0.66 – 1.15
No	8,580	77.5% (76.1 – 78.6)	1		1		1	
Resident/bedroom								
Unsuitable	10,485	92 (91.0 – 92.9)	1.31	1.05 – 1.65	0.92	0.74 – 1.14	1.16	0.77 – 1.74
Suitable	624	8.0 (7.1 – 9.0)	1		1		1	
Computer and internet								
Yes	2,939	33.9 (32.235.7)	0.94	0.82 – 1.08	**1.44**	**1.01 – 2.07**	1.58	0.89 – 2.79
No	8,170	66.1 (64.3 – 67.8)	1		**1**		1	
Housing								
Urban	8,948	86.0 (85.1 – 86.9)	1.01	0.85 – 1.19	0.99	0.85 – 1.16	**1.32**	**1.02 – 1.72**
Rural	2,161	14.0 (13.1 – 14.9)	1		1		**1**	

Final model 1: adjustment for ordinal outcome; Final model 2: adjustment for worst outcome, last category of variable; 95%CI: 95% confidence interval; PR: prevalence ratio; BMI: body mass index; EDS: excessive daytime sleepiness.

Complaints of insomnia / EDS reach 34.1% (95%CI 32.6 – 35.7%), of which 14.8% (95%CI 13.7 – 16.0%) presents in less than half of days and 19.4% (95%CI 18.0 – 20.7%) almost every day of the week. Approximately 30% (95%CI 27.2 – 30.6%) of the elderly related RSF reduction, with 17.2% of them (95%CI 16.0 – 18.4%) having it in less than half the days of the week and 12.0% (95%CI 11.0 – 13.0%), almost every day.

SRF reduction is commonly experienced almost every day by white individuals ($PR_2 = 1.18$; 95%CI 1.01 – 1.39), living in urban area ($PR_2 = 1.32$; 95%CI 1.02 – 1.72), and chronic health condition ($PR_2 = 1.58$; 95%CI 1.11 – 2.40) only. Regular oral health perception ($PR_1 = 1.21$; 95%CI 1.08 – 1.37), social support ($PR_1 = 1.14$; 95%CI 1.01 – 1.30), and computer and

internet use (PR$_1$ = 1.44; 95%CI 1.01 – 2.07) were related to SRF reduction in less than half the days of week.

Depressive symptoms (PR$_1$ = 3.37; 95%CI 2.87 – 3.97/PR$_2$ = 3.77; 95%CI 2.88 – 4.96), behavioral oscillation (PR$_1$ = 1.75; 95%CI 1.53 – 1.99/PR$_2$ = 1.81; 95%CI 1.46 – 2.24), difficulties in domestic functional activities (PR$_1$ = 1.13; 95%CI 1.01 – 1.27/PR$_2$ = 1.36; 95%CI 1.12 – 1.65), bad health perceptions (PR$_1$ = 1.50; 95%CI 1.23 – 1.82/PR$_2$ = 3.12; 95%CI 2.31 – 4.21) and regular health perceptions (PR$_1$ = 1.21; 95%CI 1.03 – 1.41/PR$_2$ = 1.65; 95%CI 1.26 – 2.16) also revealed an association with the outcome in the form of a gradient variable as well as for the worst outcome of tiredness every day (Table 1).

DISCUSSION

The present study highlights that decline in sleep wellness occur practically in one third of the Brazilian population. Sleep complaints and SRF reduction could be the main manifestations of sleep health conditions, like sleep-related respiratory morbidities, such as snoring and obstructive sleep apnea syndrome[12], and of wellness status in health individuals. That is why we report representative estimates for complaints related to sleep quality that illustrate the perception of the Brazilian population.

Bittencourt et al. identified that 63% of Brazilians have some sleep dysfunction, with insomnia being present in 33% of them[13]. Similar scenarios were identified in an epidemiological survey in the Netherlands, where 32.1% had some sleep disorder.[14] Differently, sleep disorders between ranging from 9 to 14% of adults were reported in New Zealand[15], revealing contextual differences in their conditioning factors[16]. Differences in the estimates occur due to the measurement method, like perception or diagnosis. Our study measured the complaints with self-perception, and we were interested in detecting the sleep wellness that coincided with prevalence diagnosis.

The manifestation of sleep complaints seems to be related to several conditioning factors. When we analyze the influence of gender on sleep, several authors have reported the occurrence of sleep disorders differently as to gender, especially in women[17]. Social factors, such as double or triple workload[18], and biological characteristics, such as increased association with mood disorders[4] and menopause[19], may be related to higher frequency of sleep-related complaints in females, even in non-urban realities in Brazil[20].

The factors most strongly associated to SRF reduction are depressive symptoms, behavioral oscillation or emotional lability, and chronic health conditions in elderly populations in Brazil. Several studies have reported that depressive behavior, emotional lability and psychiatric disorders[21], and chronic disease[22,23] present an intimate connection with sleep disorders. Such health conditions are strongly conditioned by catastrophic thoughts, causing central sensitization of painful or other perception stimuli, which have shown an association with low sleep efficiency[22] and alteration of the hypothalamic function in the suprachiasmatic nucleus, which is responsible for the circadian rhythm. It seems that this association is due

alterations in the SRF, potentiating the deleterious effects of psychogenic dysfunctions and pain perception, as shown in the study of individuals with fibromyalgia[23] and osteoarthritis[22], causing the chronic conditions to have worse clinical manifestations.

Another characteristic strongly associated to sleep complaints is the general health self-perception, also related to psychogenic disorders[24]. Individuals with negative perceptions tend to have worse health outcomes, such as chronic health conditions and higher risk of death, than those with good perceptions[24]. Hale et al.[16] also identified an association between bad health perception and impaired sleep quality. In Brazil, Lima et al.[25] observed that reductions in sleep duration or their excess are associated to prior self-reported health status in the elderly population. Our findings also show that elderly participants with functional disability for activities of daily living in research are more associated to insomnia/EDS and SRF, which mediated for self-perceived health.[25]

The elderly living in urban areas as well as the use of computers and internet have an SRF reduction. There is evidence that urbanization produces a reduction in sleep time[2], and that noise produced by car traffic[26] and the abuse of media[27] and computer[7] in urban areas is related to the occurrence of sleep disorders.

There is a curious fact about the association of low social support for the elderly population with the perception of sleep disorders. The literature points to several beneficial aspects regarding social support to general health[28]. Evidence suggests that low social network also shows a modulating effect on sleep disorders with the prediction of cardiac inflammatory markers[29]. However, in a study conducted in Montreal, Canada, it was found that strong social network indicators are positively associated to restless sleep[30], which shows us an expression of contextual effects modified according to other social conditions, such as gender. Other findings revealed that there is no relation of social support in sleep function in a cohort of elderly people after multilevel adjustment and five-year follow-up[31]. This powered the multidimensional and inter-relational health and wellness theories about sleep and health promotion actions to reduce costs and morbidity.

It is prudent to mention some limitations of our study. First, it is a cross-sectional study that analyzes secondary national survey data, which can predispose to the information biases from collection to storage, data availability, and reverse causality. Second, the measurement of complaints of insomnia and EDS were performed together, not being able to identify them separately, and refer to short-term complaints. Third, it is not possible to make more in-depth contextual inferences due to the linkage impossibility with database with ecological information. Finally, there is still no direct information on income, especially for adults in the NHS database, which links the economic analysis only to the ownership.

Despite these limitations, this study brings new evidence on sleep conditions in the Brazilian elderly population, revealing this as a large public health problem, in addition to its relation with other disorders, psychogenic and chronic diseases, making them subject to aggravation according to studies in the area of sleep. Social determinants are manifested differently in sleep complaints, which implies the need to apply public health and intersectoral policies as to work, social and health care.

CONCLUSION

Sleep complaints are highly prevalent in the Brazilian population as well as SRF reduction, which suggests actions or policies aimed at a better management of wellness on sleep domain, considering that this is a sensitive indicator to the quality of life and its multidimensional reflects. In addition, the selective sleep complaints manifestation in relation to health to condition, ethnicity, social support, and urbanization imply measures aimed at structuring aspects of social organization.

Sleep complaints are strongly related to clinical manifestations of psychogenic disorders, such as depressive symptoms and emotional lability, as well as the presence of chronic diseases and a bad health perception, useful for promoting health-wellness initiatives in public health and clinical praxis.

REFERENCES

1. Garbarino S, Lanteri P, Durando P, Magnavita N, Sannita WG. Co-morbidity, mortality, quality of life and the healthcare/welfare/social costs of disordered sleep: A rapid review. Int J Environ Res Public Health 2016; 13(8): 831.
https://doi.org/10.3390/ijerph13080831

2. Grandner MA. Sleep, Health, and Society. Sleep Med Clin 2017; 12(1): 1-22.
https://doi.org/10.1016/j.jsmc.2016.10.012

3. Gooneratne NS, Richards KC, Joffe M, Lam RW, Pack F, Staley B, et al. Sleep disordered breathing with excessive daytime sleepiness is a risk factor for mortality in older adults. Sleep 2011; 34(4): 435-42.
https://doi.org/10.1093/sleep/34.4.435

4. Lopes JM, Dantas FG, Medeiros JLA de. Excessive daytime sleepiness in the elderly: association with cardiovascular risk, obesity and depression. Rev Bras Epidemiol 2013; 16(4): 872-9. https://doi.org/10.1590/S1415-790X2013000400007

5. Lee Y-T, Tsai C-F, Ouyang W-C, Yang AC, Yang C-H, Hwang J-P. Daytime sleepiness: a risk factor for poor social engagement among the elderly. Psychogeriatrics 2013; 13(4): 213-20. https://doi.org/10.1111/psyg.12020

6. Takahashi M, Tsutsumi A, Kurioka S, Inoue A, Shimazu A, Kosugi Y, et al. Occupational and socioeconomic differences in actigraphically measured sleep. J Sleep Res 2014; 23(4): 458-62. https://doi.org/10.1111/jsr.12136

7. Andersen LL, Garde AH. Sleep problems and computer use during work and leisure: Cross-sectional study among 7800 adults. Chronobiol Int 2015; 32(10): 1367-72. https://doi.org/10.3109/07420528.2015.1095202

8. Jaussent I, Bouyer J, Ancelin M-L, Akbaraly T, Pérès K, Ritchie K, et al. Insomnia and daytime sleepiness are risk factors for depressive symptoms in the elderly. Sleep 2011; 34(8): 1103-10. https://doi.org/10.5665/sleep.1170

9. Lopes JM, Fernandes SGG, Dantas FG, Medeiros JLA. Associação da depressão com as características sociodemográficas, qualidade do sono e hábitos de vida em idosos do Nordeste brasileiro: estudo seccional de base populacional. Rev Bras Geriatr Gerontol 2015; 18(3): 521-31. https://doi.org/10.1590/1809-9823.2015.14081

10. Freitas MPS de. Pesquisa Nacional de Saúde: Plano Amostral. Brasília; 2014.

11. Kamakura W, Mazzon JA. Critérios de estratificação e comparação de classificadores socioeconômicos no Brasil. Rev Adm Empres 2016; 56(1): 55-70. https://doi.org/10.1590/S0034-759020160106

12. Bibbins-Domingo K, Grossman DC, Curry SJ, Davidson KW, Epling Jr. JW, García FAR, et al. Screening for Obstructive Sleep Apnea in Adults. Jama 2017; 317(4): 407-14 https://doi.org/10.1001/jama.2016.20325

13. Bittencourt L, Santos-Silva R, Taddei J, Andersen ML, Mello MT, Tufik S. Sleep Complaints in the Adult Brazilian Population: A National Survey Based on Screening Questions. J Clin Sleep Med 2009; 5(5): 459-63.

14. Kerkhof GA. Epidemiology of sleep and sleep disorders in The Netherlands. Sleep Med 2017; 30: 229-39. https://doi.org/10.1016/j.sleep.2016.09.015

15. Paine S-J, Harris R, Cormack D, Stanley J. Racial Discrimination and Ethnic Disparities in Sleep Disturbance: the 2002/03 New Zealand Health Survey. Sleep 2016; 39(2): 477-85. https://doi.org/10.5665/sleep.5468

16. Hale L, Hill TD, Friedman E, Javier Nieto F, Galvao LW, Engelman CD, et al. Perceived neighborhood quality, sleep quality, and health status: evidence from the Survey of the Health of Wisconsin. Soc Sci Med 2013; 79: 16-22. https://doi.org/10.1016/j.socscimed.2012.07.021

17. Van den Berg JF, Miedema HME, Tulen JHM, Hofman A, Neven AK, Tiemeier H. Sex differences in subjective and actigraphic sleep measures: a population-based study of elderly persons. Sleep 2009; 32(10): 1367-75. https://doi.org/10.1093/sleep/32.10.1367

18. Silva-Costa A, Rotenberg L, Griep RH, Fischer FM. Relationship between sleeping on the night shift and recovery from work among nursing workers - the influence of domestic work. J Adv Nurs 2011; 67(5): 972-81. https://doi.org/10.1111/j.1365-2648.2010.05552.x

19. Robaina JR, Lopes CS, Rotenberg L, Faerstein E. Fatores psicossociais e socioeconômicos relacionados à insônia e menopausa: Estudo Pró-Saúde. Cad Saúde Pública 2015; 31(3): 597-606. https://doi.org/10.1590/0102-311x00045014

20. Beijamini F, Knutson KL, Lorenzi-Filho G, Egan KJ, Taporoski TP, De Paula LKG, et al. Timing and quality of sleep in a rural Brazilian family-based cohort, the Baependi Heart Study. Nature 2016; 6:39283. https://doi.org/10.1038/srep39283

21. Kim J-M, Stewart R, Kim S-W, Yang S-J, Shin I-S, Yoon J-S. Insomnia, depression, and physical disorders in late life: a 2-year longitudinal community study in Koreans. Sleep 2009; 32(9): 1221-8. https://doi.org/10.1093/sleep/32.9.1221

22. Campbell CM, Buenaver LF, Finan P, Bounds SC, Redding M, McCauley L, et al. Sleep, Pain Catastrophizing, and Central Sensitization in Knee Osteoarthritis Patients With and Without Insomnia. Arthritis Care Res 2015; 67(10): 1387-96. https://doi.org/10.1002/acr.22609

23. Choy EHS. The role of sleep in pain and fibromyalgia. Nat Rev Rheumatol 2015 28; 11(9): 513-20. https://doi.org/10.1038/nrrheum.2015.56

24. Machón M, Vergara I, Dorronsoro M, Vrotsou K, Larrañaga I. Self-perceived health in functionally independent older people: associated factors. BMC Geriatr 2016; 16: 66. https://dx.doi.org/10.1186%2Fs12877-016-0239-9

25. Lima MG, Barros MBA, Alves MCGP. Sleep duration and health status self-assessment (SF-36) in the elderly: a population-based study (ISA-Camp 2008). Cad Saúde Pública 2012; 28(9): 1674-84. https://doi.org/10.1590/S0102-311X2012000900007

26. Kim M, Chang SI, Seong JC, Holt JB, Park TH, Ko JH, et al. Road Traffic Noise: Annoyance, Sleep Disturbance, and Public Health Implications. Am J Prev Med 2012; 43(4): 353-60. https://doi.org/10.1016/j.amepre.2012.06.014

27. Fossum IN, Nordnes LT, Storemark SS, Bjorvatn B, Pallesen S. The Association Between Use of Electronic Media in Bed Before Going to Sleep and Insomnia Symptoms, Daytime Sleepiness, Morningness, and Chronotype. Behav Sleep Med 2014; 12(5): 343-57. https://doi.org/10.1080/15402002.2013.819468

28. Matsumoto S, Yamaoka K, Inoue M, Muto S, Teikyo Ishinomaki Research Group and Health and Life Revival Council in the Ishinomaki district. Social ties may play a critical role in mitigating sleep difficulties in disaster-affected communities: a cross-sectional study in the Ishinomaki area, Japan. Sleep 2014; 37(1): 137-45. https://dx.doi.org/10.5665%2Fsleep.3324

29. Cho HJ, Seeman TE, Kiefe CI, Lauderdale DS, Irwin MR. Sleep disturbance and longitudinal risk of inflammation: Moderating influences of social integration and social isolation in the Coronary Artery Risk Development in Young Adults (CARDIA) study. Brain Behav Immun 2015; 46: 319-26. https://dx.doi.org/10.1016%2Fj.bbi.2015.02.023

30. Bassett E, Moore S. Neighbourhood disadvantage, network capital and restless sleep: Is the association moderated by gender in urban-dwelling adults? Soc Sci Med 2014; 108: 185-93.

31. Chen J-H, Lauderdale DS, Waite LJ. Social participation and older adults' sleep. Soc Sci Med 2016; 149: 164-73. https://doi.org/10.1016/j.socscimed.2015.11.045