

# Impact of insomnia on self-perceived health in the elderly

## O impacto da insônia na auto-percepção de saúde do idoso

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### ABSTRACT

Health self-perception is a strong indicator of the health of a population. **Objective:** To investigate the association between self-perceived health, and sociodemographic and clinical factors in a sample of elderly outpatients in Rio de Janeiro. **Methods:** A sample of 345 elderly patients was assessed with an anamnesis, Lawton and Brody's Scale, Katz Index, Geriatric Depression Scale, Timed Up and Go Test, and Study of Osteoporotic Fracture Index. Logistic regression analyses were performed to investigate the predictors of self-perceived health. **Results:** Risk of falls, frailty, functional performance on the Instrumental Activities of Daily Living, insomnia, and familial support were related to self-perceived health. Insomnia was the variable that strongly influenced self-perceived health (OR = 0.47, CI 95%: 0.28–0.80,  $p = 0.01$ ) in our sample. **Conclusions:** The investigation of insomnia in the elderly should be routinely performed in primary care, because of the negative impact it imposes on the health of this population.

**Keywords:** self concept; aged; sleep initiation and maintenance disorders.

### RESUMO

A autopercepção de saúde é um forte indicador de saúde da população. **Objetivo:** Investigar a associação entre a autopercepção de saúde e os fatores clínicos e sociodemográficos de um grupo de idosos atendidos em um pólo de atenção secundária no Rio de Janeiro. **Métodos:** A amostra composta por 345 idosos foi avaliada através da anamnese dirigida, Escala de Lawton e Brody, Índice de Katz, Índice de SOF, Escala de Depressão Geriátrica e o Teste *Timed Up and Go*. Análises de regressão logística foram realizadas para avaliar quais os fatores preditores da autopercepção de saúde. **Resultados:** O risco de quedas, a fragilidade, a performance nas Atividades Instrumentais de Vida Diárias, a insônia e o suporte familiar foram as variáveis relacionadas à autopercepção de saúde. A insônia foi a variável que mais influenciou na autopercepção de saúde na nossa amostra. (OR = 0,47, IC95%: 0,28–0,80,  $p = 0,01$ ). **Conclusões:** A investigação de insônia no idoso deve ser realizada rotineiramente na atenção primária, devido ao impacto negativo que ela exerce na saúde desta população.

**Palavras-chave:** autoimagem; idoso; distúrbios do início e da manutenção do sono.

Self-perceived health (SPH) can be defined as a global health evaluation performed by subjective self-judgement. It is considered an integrated indicator of health, which is associated with social, psychological and biological aspects of the individual. Furthermore, it is recommended by the World Health Organization as a strong indicator of health and life expectancy of the population<sup>1,2</sup>.

Self-perceived health has been broadly investigated in gerontological research through the formulation of a simple question “*In general, how do you rate your health?*”<sup>2</sup> Despite the fact that it is a simple and direct question, it provides similar results to objective health evaluations, and has been documented as a

strong predictor of functional decline, morbidity and mortality, social well-being, better recovery of illness and quality of life<sup>1,2,3,4</sup>.

In the elderly, SPH is influenced by multiple factors such as gender, familial and social support, marital status, scholarship, social and economic status, chronic conditions, lifestyle and functionality<sup>2,4,5,6,7</sup>. According to Hartmann<sup>2</sup>, a higher level of scholarship and income are related to better SPH. Poor SPH in the elderly is associated with the presence of chronic diseases and high levels of dependence<sup>2</sup>. The study conducted by Carvalho et al.<sup>4</sup> found that SPH correlated with the following variables: gender, chronic diseases, low scholarship, absence of occupation, and reduced physical activity. Silva and Menezes<sup>5</sup> identified that women rated

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**Conflict of interest:** There is no conflict of interest to declare.

Received 13 October 2016; Received in final form 04 July 2016; Accepted 22 December 2016.



their health worse than men, and that income was a strong predictor of SPH in the elderly. Angina, stroke and chronic pulmonary disease were the conditions that remained associated with SPH in the study. The authors also found a strong relationship between pain and functionality, and SPH<sup>5</sup>. Chronic diseases, income, gender, and functional ability were also associated with SPH in the elderly, in two studies conducted in Brazil<sup>6,7</sup>.

The identification of the factors that influence SPH in the elderly who are assisted in primary care may help in the development of better public health strategies as, for example, the improvement of patient adherence to health services and treatments, as well as acting positively in the promotion of a healthy lifestyle. We hypothesize that elders with low socioeconomic status and a higher level of functional impairment will rate their SPH worse. We aimed to investigate the association between SPH and clinical and sociodemographic factors of elderly outpatients who were evaluated at a secondary care unit.

## METHODS

### Sample

Three hundred and forty-five elders were consecutively evaluated in the period between April 2012 and May 2013 in a secondary care unit that performs multidisciplinary geriatric and gerontological assessment of outpatients who are at least 60 years old and are recruited from primary care units.

The majority of the sample comprised women, in their sixties, with low socioeconomic status, and with adequate familial and social support. Sociodemographic characteristics of the sample are described in Table 1.

We excluded those who had a diagnosis of dementia (n = 19) and who did not answer the question regarding SPH. The final sample consisted of 326 elders.

### Instruments

Sociodemographic (gender, age, marital status, scholarship, familial, and social support) and clinical characteristics (insomnia and comorbidities) were assessed through direct anamnesis and clinical examination. Insomnia was defined according to ICD-10 criteria<sup>8</sup>.

Self-perceived health was assessed through direct interview with the question: "In general, how do you rate your health?" The elder could rate their SPH among five possible answers: very good, good, reasonable, bad and very bad. A similar evaluation of SPH was performed in the study conducted by Jardim et al.<sup>9</sup>

The ability to perform instrumental activities of daily living (IADL) and activities of daily living (ADL) were assessed through Lawton and Brody's Instrumental Activities of Daily Living Scale<sup>10</sup> and the Katz Index<sup>11</sup>, respectively.

The IADL scale evaluates the ability to perform instrumental tasks, such as going out alone, performing small household repairs, managing medication, making phone calls and taking care of finances. The scale consists of nine

items, which are graded between 0 (normal) and 3 (disabled). The final score is obtained through the sum of each item's score. The maximum score is 27 (severely disabled)<sup>10</sup>.

The Katz Index assesses the person's ability to perform basic activities of daily living such as bathing, dressing, and eating. The scale has six items and the final result indicates independence, or total or partial dependence to perform ADL<sup>11</sup>.

Frailty was evaluated through the Study of Osteoporotic Fracture Index<sup>12</sup>, which is an instrument that assesses frailty in the elderly according to three parameters: loss of 5% of weight, the ability to stand up without holding the armchair, and feeling full of energy. Each question is answered "Yes" or "No", and two "Yes" answers to the first two questions and/or a "No" to the third are required to classify the person as frail.

Depression was assessed through the Geriatric Depression Scale - 5<sup>13</sup> which evaluates the risk for depression in the elderly, and comprises five questions with a Yes/No answer.

The Timed Up and Go Test was used to evaluate the risk of falls. It consists of a quick test, in which the person is asked to stand up, walk approximately 2.44m, go back and sit down again, as fast as possible. If the person executes this task in a timeframe less than 10 seconds, it corresponds to an absence of risk. A timeframe between 10 and 20 seconds corresponds to a moderate risk of falls, and greater than 20 seconds to high risk of falls<sup>14</sup>.

Visual acuity was evaluated through Snellen's scale<sup>15</sup>.

Socioeconomic status was obtained using the ABIPEME Criteria of Brazilian Socioeconomic Classification<sup>16</sup>.

**Table 1.** Sociodemographic data (n = 326).

Variable	n	%
Gender		
Female	216	66.3
Male	110	33.7
Age (years)		
60-69	137	42.0
70-79	125	38.3
≥ 80	64	19.6
Marital status		
Married	108	33.1
Single/ Divorced	119	36.5
Widow	99	30.4
Scholarship (year)		
< 1	137	42.0
1-8	142	43.6
> 8	47	14.4
Socioeconomic status		
A	0	0%
B	1	1.2
C	61	18.7
D	197	60.4
E	64	19.6
Social support		
Adequate	303	92.9
Inadequate	23	7.1
Familial support		
Adequate	302	92.6
Inadequate	24	7.4

## Statistical analysis

Sociodemographic data analyses were performed through means and standard deviations or percentages. The Chi Squared test was used to compare sociodemographic and clinical variables. The SPH was dichotomized into good or bad. Age was categorized into three groups: 60-69 years old, 70-79 years old, and  $\geq 80$  years old.

We dichotomized the SPH into good (very good, good, reasonable) and bad (bad, very bad).

The risk of falls was dichotomized into with, and without, risk. We also dichotomized the ability to perform ADL and IADL into dependent or independent.

In order to identify the predictors of SPH, we performed logistic regression analyses with SPH as the dependent variable. Variables that were associated with SPH in binomial analyses were included as explanatory variables. Results were considered statistically significant if the p-value was  $\leq 0.05$ .

## Ethical aspects

The project entitled "Polo de Atenção Secundária" of the Centre for Research and Studies on Ageing (CEPE) was approved by the Ethics Committee in Research.

**Table 2.** Health self-perception according to sociodemographic characteristics.

Variable	SPH good		SPH bad		p*
	n	%	n	%	
Gender					
Female	74	22.7	142	43.6	0.10
Male	48	14.7	62	19.0	
Age (years)					
60-69	46	14.1	91	27.9	0.44
70-79	49	15.0	76	23.3	
$\geq 80$	27	8.3	37	11.3	
Marital status					
Married	39	12.0	69	21.1	0.88
Single/ Divorced	44	13.5	75	23.0	
Widowed	39	12.0	60	18.4	
Scholarship (year)					
< 1	51	15.6	75	26.4	0.51
1-8	50	15.3	92	28.2	
> 8	21	6.4	26	7.9	
Socioeconomic status					
A	0	0	0	0	0.24
B	3	0.9	1	0.3	
C	23	7.1	38	11.6	
D	78	23.9	88	36.5	
E	18	5.5	46	14.1	
Social support					
Adequate	116	35.6	187	57.4	0.24
Inadequate	6	1.8	17	5.2	
Familial support					
Adequate	117	35.9	185	56.8	0.08
Inadequate	5	1.5	19	5.9	

SPH: Self-perceived health; y; years; \*: Chi-squared test.

## RESULTS

More than half of our patients referred their SPH as bad (n = 204; 63%). Hypertension (n = 279; 86%), insomnia (n = 125; 38%), and low visual acuity (n = 103; 33%) were the most common comorbidities. Most of our patient group comprised elders who independently perform their IADL (n = 239; 73%) and basic ADL (n = 293; 90%).

Elders with inadequate familial support showed a tendency to refer to their SPH as bad (p = 0.08). However, better SPH was reported by those who were functionally able to perform IADL independently (p = 0.01), with no risk of falls (p < 0.05), non-frail (p < 0.05), and without insomnia (p < 0.01) (Tables 2 and 3).

We carried out logistic regression analyses with SPH as a dependent variable, and functional ability to perform IADL, risk of falls, frailty, insomnia, and familial support as explanatory variables. Insomnia (OR = 0.47, CI 95%: 0.2-0.80, p = 0.01) was the only variable that was significantly associated with SPH (Table 4).

**Table 3.** Self-perceived health according to clinical and functional characteristics.

Variable	SPH good		SPH bad		p <sup>a</sup>
	n	%	n	%	
Hypertension					
Yes	105	32.2	174	53.4	0.85
No	17	5.2	30	9.2	
Diabetes					
Yes	34	10.4	63	19.3	0.57
No	88	27.0	141	43.2	
Osteoarthritis					
Yes	29	8.9	64	19.6	0.14
No	93	28.5	140	42.9	
Stroke					
Yes	7	2.1	15	4.6	0.57
No	115	35.3	189	58.0	
Depression					
Yes	25	7.7	50	15.3	0.40
No	97	29.8	154	47.2	
Vision*					
Normal	80	25.6	130	41.5	0.84
Impaired	38	12.1	65	20.8	
Risk of falls**					
Without risk	98	32.1	141	46.3	0.02
With risk	17	5.6	49	16.1	
Frailty					
Non frail	110	33.7	164	50.3	0.02
Frail	12	3.7	40	12.3	
Sleep disorder					
Yes	32	9.8	93	28.6	< 0.01
No	90	27.6	111	34.1	
IADL					
Independent	99	30.4	140	42.9	0.01
Dependent	23	7.1	64	19.6	
ADL					
Independent	112	34.4	181	55.5	0.37
Dependent	10	3.1	23	7.1	

SPH: Self-perceived health; \*: Chi-Squared Test; \*n = 313; \*\*n = 305; IADL: Instrumental activities of daily living; ADL: Activities of daily living.

**Table 4.** Logistic regression analyses predicting self-perceived health.

Variable	B	EP	Wald	df	p	OR	95%CI for OR
IADL	0.45	0.30	2.26	1	0.13	1.56	0.87–2.80
Insomnia	- 0.75	0.27	7.93	1	0.01	0.47	0.28–0.80
Frailty	0.45	0.39	1.32	1	0.25	1.56	0.73–3.35
Risk of falls	0.46	0.33	1.93	1	0.16	1.58	0.83–3.00
Familial support	0.78	0.59	1.72	1	0.19	2.17	0.68–6.90
Constant	0.69	0.25	7.89	1	0.01	2.00	

IADL: Instrumental activities of daily living; OR: Odds Ratio; CI: Confidence Interval; B: Beta coefficient; EP: Epsilon; df: degrees of freedom; p: p-value.

## DISCUSSION

This study showed that elders who depended on others to perform IADL, were frail, with risk of falls, and had insomnia, had a worse SPH. Insomnia was the strongest predictor of a poor SPH in our patients.

This finding is consistent with other studies that found a significant association between functional ability and SPH<sup>2,5,7,17,18</sup>.

A study conducted in Brazil with 363 elders, found that those who reported not being able to count on anyone if they were to become bedridden reported worse SPH. According to the authors, feelings of insecurity of not having anyone to count on, contributed to a worse SPH<sup>17</sup>. In Brazil, it is estimated that approximately 90% of the elders who need some care depend on their families<sup>19</sup>. This evidence may partly explain our findings, as we found that those with adequate familial support showed a tendency to evaluate their health positively.

We found that elders who were not frail showed a better SPH. The study conducted by Moreira and Lourenço<sup>20</sup> with 847 elders, found a strong association between SPH and frailty. Thomaz and Fattori<sup>21</sup> also found a significant relationship between poor SPH and frailty.

According to the literature, history and fear of falls help to promote a poor quality of life and contribute to the institutionalization of the elderly<sup>22</sup>. In our study, those with a risk of falls showed worse SPH.

A Brazilian study conducted by Vagetti et al.<sup>23</sup> found that a significant proportion of female elders who lived in low-income regions referred to their SPH negatively. The authors found that eight out of 10 female elders evaluated their health as bad or

very bad. Physical, psychological and environmental aspects showed strong associations with SPH. Feelings of insecurity of physical integrity, and scarce financial and leisure resources, were significant predictors of a negative SPH<sup>23</sup>.

This study found that insomnia was the factor that exerted the greatest impact on SPH in our patients. Our results are consistent with those of Magee et al.<sup>24</sup> who found a strong relationship between bad SPH and short sleep duration. The prevalence of sleep disorders increases with age<sup>25,26</sup>. A study that included more than 16,000 elders from developing countries found that the prevalence of sleep disorders ranged from 9.1% to 37.7%<sup>27</sup>.

Contrary to our hypotheses, neither sociodemographic status nor functional impairment significantly predicted SPH. The review conducted by Pagotto et al.<sup>28</sup> suggests that SPH in the elderly is influenced by socioeconomic status, as elders with low socioeconomic status have less access to medical services and show low adherence to medical treatments. Also, according to the authors, SPH is more affected by functional impairment to perform ADL than suffering from a chronic disease.

Our study has some limitations that should be considered. The cross-sectional design of the study does not allow us to make any causal inferences regarding the identified associations. Longitudinal studies are necessary to further investigate the relationship between insomnia and SPH among elders derived from low-income primary care units.

To sum up, SPH was strongly correlated with insomnia in our study. The investigation of insomnia in the elderly should be routinely performed in primary care because of the negative impact it imposes on the health of this population.

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