Revista Brasileira de Enfermagem
REBEn

Factors associated with depressive symptoms in elderly caregivers with chronic pain

Fatores associados aos sintomas depressivos em idosos cuidadores com dor crônica

Factores asociados con síntomas depresivos en carreras de ancianos con dolor crónico

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How to cite this article:
Terassi M, Rossetti ES, Luchesi BM, Gramani-Say K, Hortense P, Pavarini SCI. Factors associated with depressive symptoms in elderly caregivers with chronic pain. Rev Bras Enferm. 2020;73(1):e20170782. doi: http://dx.doi.org/10.1590/0034-7167-2017-0782

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EDITOR IN CHIEF: Dulce Aparecida Barbosa
ASSOCIATE EDITOR: Maria Saraiva

Submission: 10-30-2017 **Approval:** 06-08-2018

ABSTRACT

Objective: to identify factors associated with depressive symptoms in elderly caregivers with chronic pain. **Method**: the study included people 60 years of age or older who reported chronic pain and cared for another elderly person living in the same household (n=186). Statistical analyzes were performed using the Mann-Whitney test, univariate and multiple logistic regression. **Results**: most participants had no depressive symptoms (70.4%), 24.2% had mild depressive symptoms and 5.4% had severe symptoms. Univariate analysis showed that the variables family income, number of diseases, number of medications in use, pain intensity, overload and perceived stress were associated with depressive symptoms. Multivariate analysis found an association with perceived stress (95% CI 1.101-1207) and number of medications (95% CI 1.139-1.540) in use. **Conclusion**: factors associated with depressive symptoms in elderly caregivers with chronic pain were stress and the number of medications in use.

Descriptors: Aged; Caregiver; Chronic Pain; Depressive Symptoms; Geriatric Nursing.

RESUMO

Objetivo: identificar os fatores associados aos sintomas depressivos de idosos cuidadores com dor crônica. **Método**: participaram da pesquisa pessoas com 60 anos ou mais, que relataram dor crônica e que realizam cuidado a outro idoso que mora no mesmo domicílio (n=186). Para as análises estatísticas, foram utilizados os testes de Mann-Whitney, regressão logística univariada e múltipla. **Resultados**: a maioria dos participantes não apresentou sintomas depressivos (70,4%), 24,2% apresentaram sintomas depressivos leves, e 5,4% severos. A análise univariada mostrou que as variáveis renda familiar, número de doenças, número de medicamentos em uso, intensidade da dor, sobrecarga e estresse percebido apresentaram associação com sintomas depressivos e na análise multivariada verificou-se associação com estresse percebido (IC 95% OR 1,106-1,207) e número de medicamentos (IC 95% OR 1.139-1.540) em uso. **Conclusão:** foram fatores associados aos sintomas depressivos em idosos cuidadores com dor crônica o estresse e o número de medicamentos em uso.

Descritores: Idoso; Cuidador; Dor Crônica; Sintomas Depressivos; Enfermagem Geriátrica.

RESUMEN

Objetivo: para identificar los factores asociados con los síntomas depresivos en cuidadores mayores con dolor crónico. **Método**: el estudio incluyó a personas de 60 años de edad o mayores que reportaron dolor crónico y cuidaron a otra persona anciana que vive en el mismo hogar (n=186). Los análisis estadísticos se realizaron con la prueba de Mann-Whitney, regresión logística univariada y múltiple. **Resultados**: la mayoría de los participantes no tenían síntomas depresivos (70,4%), 24,2% tenían síntomas depresivos leves y 5,4% graves. El análisis univariado mostró que las variables ingreso familiar, número de enfermedades, número de medicamentos en uso, intensidad del dolor, sobrecarga y estrés percibido se asociaron con síntomas depresivos y el análisis multivariado mostró una asociación con el estrés percibido (IC 95% O 1.106 -1,207) y la cantidad de medicamentos (IC 95% O 1,139-1,540) en uso. **Conclusión:** los factores asociados con los síntomas depresivos en los cuidadores ancianos con dolor crónico fueron el estrés y la cantidad de medicamentos en uso.

Descriptores: Ancianos; Cuidadores; Dolor Crónico; Síntomas Depresivos; Enfermería Geriátrica.

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INTRODUCTION

With increasing functional limitations, the elderly may need constant care usually provided by family members at home[1]. However, in recent decades, families have undergone changes in their structure, increasing the tendency of smaller families, which results, over the years, in elderly living only with their spouse and, when necessary, taking care of another elderly in the same household[1-2].

Caring can trigger a high degree of anxiety, fatigue, altered self-esteem, stress, and depression, mainly related to care overload. Most caregivers are fully caregivers, do not receive collaboration from others, and have no specific preparation for the activity[1-3].

Literature points out that high burden levels, stress and depressive symptoms in caregivers may be associated mainly with prolonged care time, the number of hours per day spent on caring activity, and the degree of physical or cognitive dependence of elderly care[3-4]. A US study found that the number of hours of care was associated with depressive symptoms in elderly caregivers[5].

Another factor that may influence the increase in these rates is the presence of chronic pain, since pain has negative impacts on the physical and psychological well-being of the elderly, and may impair the performance of care activities[6-7].

According to the International Association for the Study of Pain (IASP), pain is considered an "unpleasant sensory and emotional experience arising or described in terms of actual or potential tissue injury"[8]. Pain interferes with disability, making it difficult to perform basic activities of daily living[6] and compromising the social life of the caregiver. In addition, research indicates high rates of depressive symptoms in individuals with chronic pain[7,9]. Depressive symptoms may lead to changes in cognitive processing, increased drug use and the number of comorbidities in people with chronic pain[10-11].

Factors associated with depression in the elderly have been previously described by several authors[3-5]. Factors associated with depression in the elderly with chronic pain were also researched, with low education, income and worse self-reported health[7,12]. However, when it comes to elderly caregivers with chronic pain, there are gaps in knowledge. In addition, considering caregiver health variables, such as medication use, stress, overload, and cognitive performance seems to be important, as besides being caregivers, the elderly also have characteristics inherent to aging. Identifying possible factors associated with the presence of depressive symptoms in elderly caregivers with chronic pain can help prevent this condition and contribute to the creation of health strategies that benefit this population.

OBJETIVE

To identify factors associated with depressive symptoms in elderly caregivers with chronic pain.

METHOD

Ethical aspects

This study was authorized by the Municipal Health Secretariat of the municipality (Opinion 68/2013) and approved by the Research Ethics Committee on Human Beings of *Universage Federal de São Carlos* (Opinion 517,182 of January 29, 2014). Interviews only started after participants' consent.

Design, study place and period

This is a quantitative cross-sectional, observational and analytical study. The research was conducted in a city São Paulo State's countryside from April to November 2014 at elderly homes, through individual interviews conducted by graduate students, all previously trained. The municipality totals 16 Family Health Units, two in rural areas and 14 in urban areas.

Population and sample: inclusion and exclusion criteria

Population consisted of elderly caregivers of elderly living in urban and rural areas covered by Family Health Units (FHU). There were 594 households on the list and provided by all USFs, with all being visited. The lists included the name and address of elders who lived with another elderly.

Inclusion criteria were people aged 60 years or older, with chronic pain for more than six months[13], enrolled in FHU in urban and rural area of a municipality in São Paulo State's countryside and who performed primary care to another. elderly person living in the same household. Exclusion criteria were elderly people who were not at home within three attempts, death, change of address, refusal and situation in which the two elderly were equally dependent or independent to perform activities of daily living. From the initial sample composed of 594 elderly caregivers, 69 participants were excluded because they were not at home in up to three contact attempts; 26 for deaths; 28 by change of address; 84 for refusal; 36 because the two elderly were equally dependent; 164 for not reporting chronic pain; and one participant who did not answer the depressive symptoms questionnaire. Thus, the final study sample totaled 186 elderly caregivers with chronic pain.

Study protocol

To identify the elderly caregiver, questionnaires to evaluate the performance in basic activities of daily living (BADL) and instrumental activities of daily living (IADL) were used. To evaluate the performance in ABVD, we used the Katz Index[14]. To assess IADL performance, the Lawton and Brody Daily Life Instrumental Activities Scale was used[15]. The elderly with the best performance in the score sum of two tools was considered the caregiver elderly. The elderly with the lowest score was the one who received care. All participants in this research assisted or performed at least one of the BADL or IADL for the other elderly living in the same household, considering the caregiver, therefore, the one who performed one of these activities to another elderly.

The dependent variable of this research was depressive symptoms, and for evaluation, we used the Geriatric Depression Scale (GDS-15) scale, which aims to track depressive symptoms in the elderly. From 0 to 5 scores indicate no depressive symptoms, 6 to 10 mild depressive symptoms, and 11 to 15 severe depressive symptoms[16].

The independent variables used were gender, age, education (in years), family income (in *reais* (Brazilian currency), number

of self-reported diseases, number and type of continuous use medications, length of care provided (in months), pain intensity, performance cognitive stress and overload.

To characterize sociodemographic, health and care data, a structured script was used with gender, age, education (in years), family income (in *reais*), number of self-reported diseases, continuous use drugs (number and type) and length of care (in months) variables. Subsequently, the age variable was divided into three categories: 60-69 years, 70-79 and 80 years or older, as well as illiterate education, 1-4 years of schooling, 5-8 and 9 or above years of schooling.

To assess pain, the Multidimensional Pain Evaluation Scale (EMA-DOR) was used. This tool includes the Numeric Pain Intensity Scale, in which the elderly report the intensity of pain in the last week, ranging from 0 to 10 (the higher, the more intense the pain); ten descriptors corresponding to three qualitative dimensions of chronic pain (sensory, affective and evaluative dimensions); and a body diagram in which the participant visually indicates sites affected by pain[17].

To assess cognitive performance, the Addenbrooke Cognitive Examination Tool Revised (ACE-R) was used to assess five cognitive domains: attention and orientation, memory, verbal fluency, language and visual-spatial ability. The overall ACE-R score ranges from 0 to 100 points and is distributed among the five domains: orientation/attention (18 points), memory (26 points), verbal fluency (14 points), language (26 points) and visual skills (16 points)[18].

In stress assessment, the Perceived Stress Scale (PSS) was validated for Portuguese and used. The 14-question scale assesses the level of stress perceived by the elderly. The total scale is the sum of the scores of the 14 questions, and the scores may vary from zero to 56, and the higher the score, the higher the level of perceived stress[19].

To assess care burden, the Overload Assessment Inventory was translated and validated for the Brazilian culture. Questions sum can range from 0 to 20 points, where the caregiver is characterized with slight overload, 21 to 40 points with moderate overload, 41 to 60 points from moderate to severe overload, and 61 to 88 points with severe overload[20].

Analysis of results

Data normality was verified by the Shapiro-Wilk test. Results were presented as absolute, relative, mean and standard deviation. To compare numerical variables between groups, the Mann-Whitney test was used. To study the factors associated with depression, univariate and multiple logistic regression analysis were used, with Stepwise variable selection criteria, data presented by the Odds Ratio for major depression and 95% confidence interval[21].

A database was created in Epidata 3.1 software. Two typists performed data entry independently and blindly. For all statistical tests, a significance level of $p \leq 0.050$ was adopted.

RESULTS

The sample consisted of 186 elderly caregivers with chronic pain. Table 1 presents the socio-demographic, health and care characterization data of the research participants.

The average length of care was 128.3 (±164.5) months, which corresponds to approximately 11 years. Regarding daily medication use 68.2% (n=127), participants reported using antihypertensive, 33.8% (n=63) analgesic/anti-inflammatory, 17.2% (n=32) anxiolytic and 16.1% (n=30) antidepressant.

The main chronic pain sites reported by the elderly caregivers were the lower back (58.8%, n=110); lower limbs (58.8%, n=110); dorsal region (25.8%, n=48); upper limbs (22.4%, n=42); cervical/abdominal/thoracic region (22.4%, n=42); cephalic region (5.3%, n=10) and pelvic/genital region (2.1%, n = 4). 56.1% of participants reported pain in more than one body location. The main descriptors listed by caregivers to represent pain were: uncomfortable (92.5%), painful (87.1%) and persistent (73.7%). It is noteworthy that participants could choose more than one descriptor to characterize their pain.

Regarding depressive symptoms, 70.4% (n=131) of the participants had no mood swings, 24.2% (n=45) had mild depressive symptoms and 5.4% (n=10) severe symptoms.

Elders were divided into two groups: with depressive symptoms (mild and severe) and absence of depressive symptoms, and a comparison of the groups was performed. Table 2 shows that the variables schooling, family income, number of diseases, number of medications, pain intensity, overload and stress presented statistically significant differences between the two groups.

Table 1 – Sociodemographic, health and care characterization of elderly caregivers with chronic pain (n=186), São Carlos, São Paulo, Brazil, 2014

Variable	n (%)	Mean (±SD)
Gender		
Female	150(80.6)	
Male	36(19.4)	
Age. years		68.9(±7.0)
60-69	117(62.9)	
70-79	49(26.3)	
80+	20(10.8)	
Schooling		
0 years	27(14.5)	
1-4 years	119(64.0)	
5-8 years	18(9.7)	
≥ 9 years and above	22(11.8)	
Family income (in *reais*)		2277.4 (±1439.5)
Number of diseases		6.1(±3.0)
Number of medications in use		3.6 (±2.4)
Care time. Months		128.3(±164.5)
Pain – intensity		6.4 (±2.4)
Absence	5(2.7)	
Light (1-3)	15(8.0)	
Mild (4-6)	73(39.2)	
Intense (7-9)	71 (38.2)	
Unbearable (10)	22 (11.9)	
Cognition		64.6(±17.4)
Stress		20.4(±10.1)
Overload		
Small	110(59.1)	
	53(28.5)	
Mild	19(10.2)	
Mild to Severe	4(2.2)	
Severe		
Depressive symptoms	131(70.4)	
Normal	45(24.2)	
Mild depressive symptoms	10(5.4)	

Note: SD = Standard Deviation.

Table 2 - Comparison of numerical variables between groups of elderly with depressive symptoms (n = 55) and absence of depressive symptoms (n=131), São Carlos, São Paulo, Brazil, 2014

Variable	With depressive symptoms Mean (±SD)	Absence of depressive symptoms Mean (±SD)	*p* value
Age	69.8(±7.46)	68.5(±6.92)	0.295
Schooling	3.2(±3.17)	4.5(±3.77)	0.030
Family income (R$)	1778.0(±797.15)	2490.0(±1592.9)	0.004
Number of diseases	7.2(±3.44)	5.62(±2.71)	0.002
Number of medications	4.8(±2.87)	3.0(±2.07)	**<0.001**
Care time (meses)	109.4(±148.60)	136.8(±171.35)	0.248
Pain intensity	7.3(±2.07)	5.9(±2.47)	**<0.001**
Cognition	61.1(±18.21)	66.1(±16.96)	0.107
Stress	29.5(±10.73)	16.5(±6.93)	**<0.001**
Overload	28.6(±20.23)	16.87(±11.35)	**<0.001**

Note: p≤0.05.

Table 3 - Results of multiple univariate logistic regression analysis for depression levels, according to sociodemographic, health and care variables (n=186), São Carlos, São Paulo, Brazil, 2014

Variable	Univariate		Multivariate	
	OR	95% CI OR	OR	95% CI OR
Gender				
Male (Ref.)	1.00			
Female	1.55	0.66-3.66		
Age (years)				
60-69 (Ref.)	1.00			
70-79	1.12	0.54-2.32		
≥80	2.02	0.78-5.24		
Schooling				
≥9 years (Ref.)	1.00			
5-8 years	0.58	0.10-3.38		
1-4 years	1.97	0.31-6.17		
0 years	3.41	0.92-12.57		
Family income (to be continued)	0.60	0.43- 0.86*		
Number of diseases (to be continued)	1.21	1.08-1.34*		
Number of medications (to be continued)	1.33	1.17- 1.52*	1.324	1.139-1.540*
Care time (to be continued)	0.99	0.99-1.00		
Pain intensity (to be continued)	1.31	1.13-1.52*		
Cognition	0.98	0.96- 1.00		
Stress	1.15	1.11 - 1.20*	1.155	1.106-1.207*
Overload				
Small (Ref.)	1.00			
Mild	1.92	0.91-4.01		
Mild to Severe	8.62	3.15- 23.58*		
Severe	151.38	13.32- 1000.00*		

*Note: *p<0.05. OR (Odds Ratio) = Odds Ratio for major depression; (n = 132 normal; n = 45 mild depressive symptom; n = 10 severe depressive symptom). CI 95% OR = 95% confidence interval for Odds Ratio. Ref.: reference level. Stepwise variable selection criteria. Proportional risk models. p≤0.05.*

To verify which variables were associated with depressive symptoms in elderly caregivers with chronic pain, a univariate logistic regression was performed, followed by multiple regression (Table 3).

Univariate analysis showed that the variables family income, number of diseases, number of medications, pain intensity, overload (categories: mild to severe, and severe) and perceived stress were associated with depressive symptoms. From the results of multivariate analysis with Stepwise variable selection criteria, it was found that the variables perceived stress and number of medications were selected as being significantly associated with the highest level of depression.

DISCUSSION

Prevalence of depressive symptoms (mild or severe) was 29.6%, similar to results found in other studies of the elderly community. A population-based survey of 585 elderly people in a southern Brazilian city identified a prevalence of depressive symptoms in 30.6% (95% CI 26.9-34.3%)[22]. A systematic review and meta-analysis of studies evaluating depressive symptoms in the elderly in Brazil, the prevalence ranged from 13 to 39%, with a combined estimate of 26% (95% CI 21-32)[23]. In Australia, the prevalence of depression in elderly caregivers was 43%[5].

With regard to research on older people with chronic pain, studies show prevalence of higher depressive symptoms. A survey that aimed to evaluate the prevalence of depressive symptoms in adult and elderly individuals with chronic pain seen at a general pain treatment outpatient clinic found that 48% of the 125 respondents had depressive symptoms[9]. Another study conducted with elderly people with chronic low back pain in a city in southern Brazil found a higher prevalence, and 65.2% of subjects had depressive symptoms[24].

Association between pain and depression has been investigated in several studies, showing that individuals with chronic pain are more likely to have depression. Neurotransmitter deficiency, receptor changes, and biological rhythm disorder are justifications for depression in patients with chronic pain, as they involve similar biochemical mechanisms that may result in lower availability of neurotransmitters in the central nervous system. Other mechanisms that explain the link between pain and depression are related to activation of the sympathetic nervous system, involvement of the hypothalamus-pituitary axis, and regulation of benzodiazepine receptors in the frontal cortex[6,25].

Chronic pain can trigger negative feelings in individuals, such as anger, hostility, anxiety, fear, and changes in daily life. These listed factors confirm the hypothesis that depression can evolve with pain, just as pain can trigger depression, establishing a vicious cycle, pain-depression-pain or depression-pain-depression. However, it is not possible to say which one first manifests, the pain or the depressive symptom[6,25]. A cohort study in the United Kingdom evaluated pain intensity compared with the presence of depressive symptoms in 502 participants with a mean age of 65.2 years. The results showed that the group with the highest level of pain presented higher rates of depression, anxiety and worse general health when compared to the group with the lowest pain intensity[7].

Os achados de dor crônica em idosos no presente estudo corroboram com os dados encontrados na literatura, em que a maior prevalência de dor crônica encontra-se nos membros inferior e na região lombar[26-27]. A survey of 934 community-dwelling older adults showed that 34.5% of participants reported lower limb pain and 29.5% in the lower back, with prevalence of strong intensity (42.1%) followed by mild intensity (25.9%)[27].

Univariate logistic regression analyzes showed that depressive symptoms in elderly caregivers with chronic pain were associated with family income, number of diseases, number of medications, pain intensity, overload and stress, data corroborated by the literature[11-12,28-30]. The variables gender, cognitive performance and schooling did not present statistically significant results associated with depressive symptoms, data that differ from other studies[12,31].

A population survey of 1,656 elderly people found that the presence of depressive symptoms was higher in individuals with cognitive impairment, low schooling, a fall in the last year, pain reports on most days, poorer health perception and lower income[12]. According to the results of a study of 21,417 elderlies in Australia, socioeconomic disadvantage increases the likelihood of depression, possibly explaining the high levels of stress these people may have experienced during their lifetime[11]. Physiological and environmental stressors interact to modulate the risk of depression in the elderly[32], and in elderly low-income caregivers, these stress indices may be higher due to their association with caregiving.

The present study found that a greater number of comorbidities increases the chance of presenting depressive symptoms by 1.2 times. Similar data were presented in a study of elderly from a reference geriatric outpatient clinic, in which a positive association between depression and a number of chronic pathologies greater than three was observed[33].

In the literature, it is possible to observe higher rates of associated comorbidities in elderly caregivers when compared to non-caregivers, as in a study developed by the Brazilian Elderly Frailty Research Group (FIBRA - *Pesquisa sobre Fragilidade em Idosos Brasileiros*), in which 43.2% participants had three or more diseases[2]. Caregivers, as well as people with chronic pain, have a higher risk for developing health problems due to overload and carelessness of their own health to dedicate themselves to the care of others, and the longer the time spent on care, greater is the impact on caregiver health[4,34-35].

Care time was not associated with depressive symptoms, but stress and overload level showed statistically significant results, which may contribute to the hypothesis that even the oldest caregivers may have high overload and stress levels due to dependence elderly recipient of care and activations performed. Associated with these variables, chronic pain contributes even more to the negative interferences in this caregiver's BADL and to the aggravation of depressive symptoms[7,9].

In an investigation with older caregivers, depressive symptoms were associated with longer hours of care and one of the caregiver's personality traits (neuroticism), and were not associated with the care recipient's diagnosis, other personality traits, attitudes toward to old age and leisure and domestic physical activity[5].

Existing research on overload associated with depressive symptoms in elderly caregivers with chronic pain is scarce, limiting the discussion of results. The present study found a relationship between the depressive symptoms and overload variables, and 28.5% of caregivers presented overload mild. The literature indicates high caregiver overload rates, mainly associated with prolonged care time and the degree of dependence of the elderly[3,34-35].

A sample with family caregivers of elderly living in the city of João Pessoa (Paraíba State) identified that 57.3% had overload mild; 15.7% overload from mild to severe and 2.2% overload severe. The authors observed higher overload levels in older female caregivers and among functional illiterate caregivers[3]. A survey of 124 relatives of dependent older adults found that the caregivers with the highest burden were women, spouses, with poor cognitive performance and who care for older dependent older people for longer hours[35]. Another investigation with 140 family caregivers of elderly found a relationship between overload with age, depression and cognitive decline of the elderly receiving care receiving care, and with the social support of the caregiver[4].

In the multivariate analysis, only the use of medications and perceived stress were in the model. Regarding continuous use medications, the main ones reported by the elderly were antihypertensive drugs (68.4%) and analgesics/anti-inflammatory drugs (34.2%). An association between drugs and depressive symptoms was observed, and for each medication used by the elderly, the risk of depression increased 1.3 times, corroborating a study conducted in the city of São Paulo, SP with 1,667 elderlies. Individuals taking between three and four drugs had a 3.81 odds ratio for depression compared to non-drug users, and those who reported using five or more drugs, this ratio was 9.13[36]. The elderly population uses a large number of medications and this factor may be associated with the use of more than one medication for the treatment of the same condition[37]. It is also noteworthy that the population of the present study has chronic pain and, according to the literature, the elderly with chronic pain use more drugs when compared to elderly without pain[38].

The present investigation found a significant association between the depressive symptoms and stress variables, in which, at each point of the stress score, the risk of depression increased 1.2 times (15.5%). A cohort study conducted in the United States with a sample of 375 elderly caregivers and 694 non-caregivers found that the caregiver group had higher stress indices, with statistically significant differences. In addition, in both groups the participants with the highest stress level were 1.8 times more likely to die in three years compared to the elderly with the lowest stress level[29].

Study limitations

A limitation of the study is the lack of data on chronic pain duration (in years) reported by these elderly. Although the study population consisted of elderly caregivers registered in the total FHU of the municipality, the data cannot be extended to the entire population, as they do not reflect the universe of elderly residents in the place.

Contributions to Nursing, Health or Public Policy

The results showed that in elderly caregivers with chronic pain, the factors associated with depressive symptoms are not

directly related to care, but are health (number of medications) and psychological (perceived stress) factors, which may have been influenced by care and chronic pain presented.

It is hoped that the results can contribute to the physical and psychosocial health of these individuals as they allow reflection among professionals on the importance of creating strategies that benefit these elderly caregivers at home, specifically targeting medication use, stress and pain management. The relevant contribution of this research was to study the factors associated with depressive symptoms in a specific population, elderly caregivers with chronic pain, since there are no studies in Brazil.

CONCLUSION

Approximately one third of the elderly caregivers in the present study had depressive symptoms. In the comparison between groups and socio-demographic variables, only family income and schooling presented statistical differences. The variables number of medications, number of diseases, pain intensity, stress level and overload presented higher levels in the group with depressive symptoms when compared to the group with no depressive symptoms, with statistically significant results. Regarding the multiple regression analysis, the variables number of medications and stress were associated with the outcome.

Understanding the relationship between chronic pain and depression in elderly caregivers is necessary to know aspects not yet explored in this population. Longitudinal studies with elderly caregivers are believed to improve the understanding of the interference of depressive symptoms and chronic pain in the care provided, as well as the development of experimental research evaluating the behavior of modifiable factors and their relationship with depressive symptoms and chronic pain in the elderly population.

FUNDING

This research was funded by the Coordination for the Improvement of Higher Education Personnel (CAPES - *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*).

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