# Chronic pain in elderly caregivers and influence on stress and depressive symptoms

## Dor crônica em idosos cuidadores e influência no estresse e sintomas depressivos

## Dolor crónico en personas mayores y su influencia en el estrés y en síntomas depresivos

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## Abstract

**Objective:** To verify the effect of chronic pain on stress and depressive symptoms in elderly caregivers over four years.

**Method:** This is a longitudinal study, with data collection in 2014 and 2018, with 104 individuals aged 60 years and older who provided care to another older adult living in the same household and residing in the urban areas of the city of São Carlos-SP, registered in Family Health Units (FHU). For statistical analyses, the linear regression model with mixed effects (random and fixed effects) and analysis of covariance (ANCOVA) were used. All models were adjusted for sex, age, education, number of medications and number of diseases.

**Results:** Participants with chronic pain had an average of 5.21 points higher in the stress score (p=0.019; CI: -9.823 – -0.604) in the second assessment (2018) and an increase of 1.3 in the depressive symptoms score in the first assessment (2014), in addition to 1.8 in the second assessment (2018) (=0.020; CI: -2.530 - -0.225 and p=0.003; CI: -3.016 - -0.640, respectively). Pain intensity was associated with stress (p=0.019; CI= 0.179- 1.958) and depressive symptoms in the first and second assessments (p=0.001; CI: 0.218-0.772; p=0.013; CI: 0.066- 0.538). Through ANCOVA analysis, it was found that the greater the difference in pain intensity, the greater the difference in depressive symptoms over time.

**Conclusion:** It is necessary to take effective action to manage chronic pain in elderly caregivers to minimize problems related to stress and depressive symptoms.

## Resumo

**Objetivo:** Verificar o efeito da dor crônica no estresse e nos sintomas depressivos de idosos cuidadores de idosos no decorrer de quatro anos.

**Método:** Estudo longitudinal, com coleta de dados em 2014 e 2018, com 104 indivíduos com idade igual ou superior a 60 anos, que realizavam cuidado a outro idoso que morava no mesmo domicílio e residentes nas áreas urbanas do município de São Carlos-SP, cadastrados nas Unidades de Saúde da Família (USF). Para as análises estatísticas, foram utilizados o modelo de regressão linear com efeitos mistos (efeitos aleatórios e fixos) e a análise de covariância (ANCOVA). Todos os modelos foram ajustados por sexo idade, escolaridade, número de medicamento e número de doenças.

**Resultados:** Participantes com dor crônica apresentaram média de 5,21 pontos maior no escore de estresse (p=0,019; IC: -9,823 – -0,604) na segunda avaliação (2018) e um aumento de 1,3 no escore dos sintomas depressivos na primeira avaliação (2014), e 1,8 na segunda avaliação (2018) (=0,020; IC:-2,530 - - 0,225 e p=0,003; IC: -3,016 - -0,640, respectivamente). A intensidade da dor esteve associada ao estresse (p=0,019; IC= 0,179- 1,958) e sintomas depressivos na primeira e segunda avaliação (p=0,001; IC: 0,218-

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0,772; p=0,013; IC: 0,066- 0,538). Por meio da análise da ANCOVA, verificou-se que, quanto maior a diferença na intensidade da dor, maior a diferença nos sintomas depressivos ao longo do tempo.

**Conclusão:** É necessário realizar uma ação efetiva para o manejo da dor crônica em cuidadores idosos para minimizar os agravos relacionados ao estresse e sintomas depressivos.

## Resumen

**Objetivo:** Verificar los efectos del dolor crónico sobre el estrés y los síntomas depresivos en personas mayores cuidadoras de personas mayores en el transcurso de cuatro años.

**Método:** Estudio longitudinal, cuya recopilación de datos se realizó en 2014 y 2018, llevado a cabo con 104 individuos de 60 años o más, que cuidaban a otras personas mayores que vivían en el mismo domicilio y eran residentes de áreas urbanas del municipio de São Carlos, estado de São Paulo, registrados en las Unidades de Salud de la Familia (USF). Para los análisis estadísticos, se utilizó el modelo de regresión lineal de efectos mixtos (efectos aleatorios y fijos) y el análisis de covarianza (ANCOVA). Todos los modelos se ajustaron según sexo, edad, escolaridad, número de medicamentos y número de enfermedades.

**Resultados:** Participantes con dolor crónico presentaron un promedio de 5,21 puntos más en el puntaje de estrés (p=0,019; IC: -9,823 – -0,604) en la segunda evaluación (2018) y un aumento de 1,3 en el puntaje de los síntomas depresivos en la primera evaluación (2014), y 1,8 en la segunda evaluación (2018) (=0,020; IC:-2,530 - - 0,225 y p=0,003; IC: -3,016 - -0,640, respectivamente). La intensidad del dolor se relacionó con el estrés (p=0,019; IC= 0,179- 1,958) y con síntomas depresivos en la primera y segunda evaluación (p=0,001; IC: 0,218- 0,772; p=0,013; IC: 0,066- 0,538). Mediante el análisis ANCOVA, se verificó que, cuanto mayor es la diferencia en la intensidad del dolor, mayor es la diferencia en los síntomas depresivos a lo largo del tiempo.

**Conclusión:** Es necesario realizar una acción efectiva para el manejo del dolor crónico de cuidadores que son personas mayores para minimizar los agravios relacionados con el estrés y los síntomas depresivos.

## Introduction

With the aging of the population, the increasing incidence of chronic non-communicable and degenerative diseases in older adults is notable, often progressing to disabilities and dependence,[1] impacting functional and cognitive capacity. Older adults often need the assistance of a caregiver to carry out their daily activities.[1,2]

A caregiver is responsible for the act of caring, which includes assistance with basic and instrumental activities of daily living. A caregiver can be informal, not having an employment relationship and providing care to a family member, or formal, having the same duties, but with remuneration for providing care. A caregiver can be primary, who has full responsibility for care, or secondary, who carries out complementary activities. The vast majority of caregivers do not have any qualifications or preparation for this.[2]

Most of the time, these caregivers are also older adults and have health conditions that are aggravated by care burden.[3] The burden on caregivers, in turn, can increase the likelihood of this older adult experiencing depressive symptoms, stress and chronic pain.[4,5]

According to the literature, chronic pain in older adults is a clinical condition present in the aging process, but it is underestimated and undertreated, favoring a decrease in quality of life and causing negative impacts on physical and mental health.[6-8]

Among the impacts caused on the health of people with chronic pain, anxiety and depression stand out.[6,9,10] Research carried out in Finland with older adults over 75 years old and divided into two groups, 175 participants with chronic pain and 220 with no pain found that the group with pain rated their health and physical mobility worse, in addition to feeling sadder, isolated and tired when compared to the group with no pain.[11]

Studies that investigate the psychological and physical health of older adults who care for other older adults indicate that stress levels can have a negative effect on their health and quality of care.[11,12] Therefore, it is necessary to study the existence of these variables even before the chronic pain process begins, analyzing how these variables behave.

A study carried out with 46 elderly caregivers with low back pain showed, through correlational analyses, a significant and directly proportional relationship between the intensity of low back pain and depressive symptoms, although of a weak magnitude (rho=0.302, p=0.041).[13]

Investigations into the relationship between these variables in older adults who care for other older adults are necessary, as they are scarce in the literature, and it is necessary to establish a relationship between chronic pain, stress and depressive symptoms. The effect of chronic pain on stress and depressive symptoms in elderly caregivers occurs over four years.

Therefore, the present study aims to verify the effect of chronic pain on stress and depressive symptoms in elderly caregivers over four years.

## Methods

This is a quantitative, observational and longitudinal study guided by the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) checklist, with data collection carried out in 2014 and 2018.

Data collection was carried out in the city of São Carlos-SP. People aged 60 or older who provided informal care to another older adult in the same household, residing in urban areas of the city of São Carlos-SP and registered in Family Health Units (FHU), were included. Older adults who were not at home within three attempts were excluded due to death, change of address, refusal and situation in which the two older adults were equally independent in activities of daily living.

Data collection occurred through two assessments, carried out in 2014 and 2018, after prior scheduling, at older adults' own homes, by a pair of previously trained interviewers. The first assessment was carried out between April and November 2014, and participants were identified through lists made available by FHU, which included the names and addresses of all older adults who lived with at least one other older adult in the same household. To identify elderly caregivers, questionnaires assessing performance in basic activities of daily living[14,15] and instrumental activities of daily living were used.[16] The older adult with the best performance, in the sum of the scores from the two instruments, was considered the caregiver, and the older adult with the lowest score was considered the one who received the care. All homes that appeared on the lists made available by FHU were visited by the researchers, and after applying the aforementioned inclusion and exclusion criteria, 266 elderly caregivers took part in the first stage.

The second assessment took place between April and September 2018, and all 266 homes were visited again by researchers, as described in a previous study.[17]

A total of 32 participants were excluded due to death; 16 participants, after three unsuccessful contact attempts on different days and times; 36, due to a change of address in which the interviewer was unable to obtain information about the new residence; and 46, due to refusals. Given the objective of this study, we decided to exclude participants who showed a change in the presence of pain over the four years, i.e., the participant who reported pain in 2014 and did not report it in 2018 (n=9) as well as what did not report in 2014 and reported in 2018 (n=14). Furthermore, elderly caregivers who presented speech impairment or very significant cognitive decline were excluded, in which the interviewer was unable to carry out the assessment (n=9). Thus, the final sample consisted of 104 elderly caregivers.

During interviews with participants, information was collected on sociodemographic characteristics (sex, age, education), self-reported health information (number of illnesses and number of medications) and data related to care (hours of daily care and relationship with recipient of care).

To assess chronic pain, the Visual Numerical Scale (VNS) was used, which ranges from zero to 10, so that pain intensity is represented with numerical increase (from one to three: mild pain; four to six: pain moderate pain; and seven to 10: severe pain). Pain lasting six months or more, continuous or recurrent, was considered chronic. VNS is a reliable and valid measure for assessing pain intensity in elderly patients, with moderate to substantial temporal stability.[18]

Regarding the functionality of older adults, two instruments were used: Basic Activities of Daily Living (ADL) and Instrumental Activities of Daily Living Scale (IADL). These assessment instruments were created with a focus on assessing older adults' ability to perform tasks.[15,16] They are reliable tools[19,20] for assessing self-care tasks and assessment of older adults' performance of more complex tasks, respectively.

Since, ADL measures activities related to the ability to feed, bathe, dress, groom, mobilize and maintain control over elimination. It consists of six questions that present three alternatives in each

question, and the one that most represents the condition of the older adult is highlighted. At the end of the exam, it is possible to calculate the resulting score, which can vary from zero to six. Therefore, zero indicates total independence and six total or partial dependence in carrying out all activities. The intermediate score warns of total or partial dependence on any of the activities.[14,15]

Meanwhile, IADL is used to assess older adults' performance of more complex tasks, such as using the telephone, shopping, preparing meals, housework, using transport, taking medication and handling money. Each assessment question has three answer options. Number three represents that the interviewee demonstrates a condition of independence; number two indicates a state of semi-dependence (needs partial help to carry out the task); and number one signals the existence of total dependence. The full scale score can range from seven to 21, with seven meaning total dependence, eight to 20 points partial dependence and 21 meaning independence.[16]

Burden was assessed using the Zarit Overload Scale, with 22 questions with Likert-type answers. The sum of the questions can vary from 0 to 88 points, which presents good internal consistency indexes.[21-22]

Depressive symptoms were measured by the Geriatric Depression Scale (GDS-15), which aims to screen depressive symptoms in older adults. It consists of 15 questions, with dichotomous alternatives, "yes" or "no", and the score can vary from 0 to 15 points. Scores greater than six indicate the presence of depressive symptoms.[23]

Perceived stress was assessed using the Perceived Stress Scale (PSS), composed of 14 questions in which each item has response options ranging from 0 to 4 (0 = never, 1 = almost never, 2 = sometimes, 3 = almost always, 4 = always). The total scale can range from 0 to 56.[24] The scale does not present a cut-off score, and the higher the score on the instrument, the higher the level of stress. It is a scale with psychometric qualities suitable for assessing Brazilian older adults.[24]

Participants who presented changes in any of the scales were notified by the research participants as well as by the FHU covered by that participant.

For data analysis, a database was created and double-entered in Excel® 2010. After double entry validation, the data was exported to SAS system for Windows® (9.2). In the independent sample comparison tests (comparison of sociodemographic and health characteristics), at baseline, Student's t test and chi-square test were chosen. For the analyzes involving the relationship between stress and depressive symptoms with the presence and chronic pain intensity, the linear regression model with mixed effects (random and fixed effects) was proposed. For the relationships between time deltas (before-after) between depressive symptoms and stress with pain intensity, analysis of covariance (ANCOVA) was proposed. All models were adjusted for sex, age, education, number of medications and number of diseases. For all statistical tests, a significance level of 5% was adopted.

The present study was authorized by the Municipal Health Department, and was approved by a Research Ethics Committee (CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 34577920.4.0000.5504) (Opinion: 4.292.235). All older adults who agreed to participate in the study signed the Informed Consent Form.

## Results

A total of 104 elderly caregivers participated in the study, divided into the chronic pain (n=73) and no pain (n=31) groups. Regarding the sociodemographic and health characteristics of participants at baseline (2014), it was observed that number of medications, number of comorbidities, stress and depressive symptoms present higher rates in participants with chronic pain, with significant statistical differences. The majority of participants were female (83.6%), with an average age of 67.7 years (Table 1).

As for care characteristics, in both groups, the prevalence of spouse in providing care was observed, represented by 63% in the chronic pain group and 96.7% in the without pain group. There were no statistical differences between groups in relation to

**Table 1.** Comparison of sociodemographic variables and health characteristics between groups of caregivers with chronic pain and those without pain at baseline

| Variables | With chronic pain (n=73) | Without pain (n=31) | p-value |
|---|---|---|---|
| Sex | | | |
| Female | 83.6% | 61.3% | 0.014 |
| Male | 16.4% | 38.7% | |
| Age (mean, standard deviation) | 67.7 (±5.55) | 69.7 (±6.06) | 0.995 |
| Education | 3.0 | 3.1 | 0.798 |
| Number of medications | 3.6 | 1.7 | <0.001 |
| Number of comorbidities | 6.0 | 2.7 | <0.001 |
| Care burden (continuous) | 20.9 | 15.5 | 0.096 |
| Perceived stress | 21.8 | 12.9 | <0.001 |
| Depressive symptoms | | | |
| Presence | 37% | 3.3% | <0.000 |
| Absence | 63% | 96.7% | |

**Table 2.** Relationship of stress and depressive symptoms with duration and presence of chronic pain

| Variables | Estimate | p-value | IC 95% |
|---|---|---|---|
| Stress | | | |
| Difference between duration (2014 versus 2018)* | -0.897 | 0.484 | -3.433 1.639 |
| Presence of pain associated with duration (2014-2018) | | 0.331 | |
| Presence of pain (no/yes) (2014) | -2.764 | 0.217 | -7.182 1.654 |
| Presence of pain (no/yes) (2018) | -5.213 | 0.027 | -9.823 -0.604 |
| Depressive symptoms | | | |
| Difference between duration (2014 versus 2018)** | 0.863 | 0.006 | 0.252 1.473 |
| Presence of pain associated with duration (2014-2018) | | 0.458 | |
| Presence of pain (no/yes) (2014) | -1.377 | 0.020 | -2.530 -0.225 |
| Presence of pain (no/yes) (2018) | -1.828 | 0.003 | -3.016 -0.640 |

Model adjusted for sex, age, education, number of medications and number of diseases; *Result of the difference between duration (2014 versus 2018) in stress; **Result of the difference between duration (2014 versus 2018) in depressive symptoms.

daily time spent on care, with both groups averaging approximately 5.7 hours per day. Table 2 presents the results of the relationship between stress and depressive symptoms with the presence of pain, during 2014 and 2018, through linear regression analysis with mixed effects. There was no effect on the interaction of duration on the presence of pain and stress (p=0.331); however, in the second assessment (2018), a difference was observed between the presence or absence of pain, in which participants with chronic pain presented average of 5.21 points, higher in the stress score (p=0.019; CI: -9.823 – -0.604). Concerning depressive symptoms, it was observed that there was also no interaction with duration (p=0.458); however, it was observed that the presence of chronic pain in the first and second assessment increases by 1.3 and 1.8, respectively, the average points in depressive symptoms (p=0.020; CI: -2.530 - -0.225 and p=0.003; CI: -3.016 - -0.640). Table 2 presents detailed data.

Pain intensity was associated with stress (p=0.006, CI=-0.319 – 1784), but without the effect of duration. In 2018, it was observed that an increase of one point in pain intensity increases the stress score by one point (p=0.019; CI= 0.179-1.958). In relation to depressive symptoms and pain intensity, despite not having shown an effect of duration, an association was detected, with one unit in pain intensity favoring an increase in the depressive symptoms scale by 0.398 points (p=< 0.001, CI= 0.203 – 0.593). Similar results were evidenced in 2014 and 2018, observing that the effect on depressive symptoms was 0.4 points (p=0.001; CI: 0.218- 0.772) for the first assessment and 0.3 (p=0.013; CI: 0.066- 0.538) for the second assessment for each unit of increase in pain intensity. Table 3 shows detailed data is presented.

**Table 3.** Relationship of stress and depressive symptoms with chronic pain intensity

| Variables | Estimate | p-value | 95% CI |
|---|---|---|---|
| Stress | | | |
| Difference between duration (2014 versus 2018) | -2915 | 0.487 | -11.258 5.428 |
| Pain intensity | 1.052 | 0.006 | 0.319 1.784 |
| Intensity associated with duration (2014 -2018) | | 0.957 | |
| Pain intensity (2014) | 1.035 | 0.051 | -0.006 2.076 |
| Pain intensity (2018) | 1.069 | 0.019 | 0.179 1.958 |
| Depressive symptoms | | | |
| Difference between duration (2014 versus 2018) | -0.816 | 0.463 | -3030 1.398 |
| Pain intensity | 0.398 | <0.001 | 0.203 0.593 |
| Intensity associated with duration (2014 - 2018) | | 0.254 | |
| Pain intensity (2014) | 0.495 | 0.001 | 0.218 0.772 |
| Pain intensity (2018) | 0.302 | 0.013 | 0.066 0.538 |

Model adjusted for sex, age, education, number of medications and number of diseases.

Table 4 presents the results of ANCOVA analysis, which verified the relationship between change

in pain intensity (first and second assessment) and influence on stress and depressive symptoms. The present study showed that the greater the difference in pain intensity, the greater the difference in depressive symptoms, i.e., with an increase in pain intensity, there is an increase in the presence of depressive symptoms over duration.

**Table 4.** Relationship of change in pain intensity (2014-2018) with depressive symptoms and stress

| Variables | Estimate | p-value | 95% CI |
|---|---|---|---|
| Stress | | | |
| Pain intensity | 0.934 | 0.058 | -0.031<br>1.898 |
| Depressive symptoms | | | |
| Pain intensity | 0.287 | 0.027 | 0.033<br>0.541 |

Model adjusted for sex, age, education

## Discussion

The results of this study made it possible to identify a trend in the effect of presence of chronic pain and pain intensity on stress and depressive symptoms in elderly caregivers, but without the interaction of duration. The presence of chronic pain was associated with an increase in stress scale scores in the second assessment (2018) and in depressive symptoms in both assessments (2014 and 2018). Regarding pain intensity, similar results were observed.

It is noteworthy that the results obtained through ANCOVA analysis demonstrate that the greater the increase in pain intensity, the higher the score of depressive symptoms over time, and these data were not evidenced in stress.

Longitudinal studies investigating depressive symptoms in elderly caregivers with chronic pain are still scarce in the literature. However, in Brazil, a cross-sectional study with 186 elderly caregivers found that 24.2% of the sample had mild depressive symptoms and 5.4% had severe symptoms. Among the results of this study, the authors confirmed the association between pain intensity and stress through univariate regression analysis, and the association with stress was confirmed through multivariate regression.[25] From these results, it is possible to verify similarity with the present study, reinforcing that the older adult who cares for another older adult suffers greater health problems.[26]

The profile of elderly caregivers can lead to fragility in their health. Data presented by a study with elderly caregivers of older adults showed, with statistically significant results, that increased burden leads to an increase in the number of chronic diseases, consequently increasing the risk of chronic pain in elderly caregivers of older adults.[27] Continuity in health problems can be seen based on the data verified in this present work, demonstrating the influence of chronic pain on elderly caregivers' mental health.

Considering a study carried out over a period of eight years between 2006 and 2014, which involved the participation of 963 American couples, it was found that pain intensity was significantly associated with depressive symptoms in older adults in all waves of the study. According to the couples' reports, pain intensity was related to change in depressive symptoms.[28] These results are similar to our findings. Although the study did not characterize caregivers, the authors state that greater pain intensity has the potential to put older adults and their partners at risk for elevated depressive symptoms.

Other studies carried out with older adults show similar results, observing the influence of chronic pain on depressive symptoms.[29,30] Research carried out with 419 older adults aged 70 years or older analyzed the relationship between chronic pain and sociodemographic variables and health conditions, verifying a direct and bidirectional association between depressive symptoms and the presence of chronic pain.[29] Furthermore, similar data were identified in a study with 1,788 Chinese older adults, with an association between the presence of chronic pain and depressive symptoms through logistic regression results. This study found an additive interaction effect between the presence of pain and depressive symptoms with increased physical frailty in older adults.[30] In parallel, in the present study, in addition to the impact of the association of pain and depressive symptoms, older adults called caregivers of other older adults offer care by giving up their own physical and psychological care, causing greater implications for their health and the care offered.[28,31]

The literature presents hypotheses about the various influences and associations of the presence of depressive symptoms in patients with chronic pain related to anatomical and physiological issues and the negative feelings that are triggered. According to studies, similar biochemical mechanisms may be involved in the process of depression and pain, resulting in reduced availability of some neurotransmitters. Another important factor to be mentioned is related to negative feelings (anger, fear, anxiety) that can be experienced by individuals who report pain as well as by individuals with depressive symptoms.[32-36]

Regarding stress, the present study identified an association between the presence and intensity of chronic pain and increase in stress scale scores, regardless of duration. However, studies that assess stress longitudinally in older adults who care for other older adults are still incipient. However, supporting the findings of this study, cross-sectional research was developed with 341 elderly caregivers, with higher levels of stress being associated with pain intensity, and this relationship may be a consequence of the care provided by these older adults.[12] The role of caregiver can be received as a privilege of caring for a loved one, however burden can lead to deterioration of physical and psychological health.[27]

Providing care maintains an intrinsic relationship with stress, according to a study carried out with 43 caregivers of older adults, as it involves acceptance of the roles of provider and recipient of care, with implications for family balance and quality of life for those who care. The authors of this study point out that caregivers for older adults experience stress that is related to physical aspects, such as pain.[33] Furthermore, a study carried out with 94 elderly caregivers proves, through a regression analysis, that caregivers with stress have an average of 56.61% more burden than caregivers without stress, i.e., burden is a factor of risk for stress.[34] Caregivers are more vulnerable to health problems when compared to non-caregivers.[35] The act of caring includes carrying out arduous tasks which, often, due to a lack of training for this activity, make them more costly to their health and can result in conditions such as pain and stress.

The present study assessed older adults in the community who provided care to other older adults in the same household, a population that is growing in our country due to increased life expectancy and advances in medicine. However, health actions aimed specifically at caregivers of older adults who are also elderly are still scarce, as is the influence of the act of caring on elderly caregivers' physical and psychological health. Therefore, it is necessary to implement health service actions and interventions with a focus on the demands of older adults who play the role of caring for others, with a focus on improving physical and psychological well-being, with the aim of contributing to the quality of life of this population and reduce care burden, especially in individuals who report chronic pain.

The presence of chronic pain in older adults, in itself, contributes to the worsening of health conditions and worsening of psychosocial condition.[28] However, when added to care demand and burden, these problems can be intensified, demonstrating the importance of assessments and continuous monitoring so that future interventions can be carried out in health services.[33] Thus, the present study makes contributions with the aim of highlighting the association between the presence and pain intensity and stress and depressive symptoms over the course of 4 years.

Among the limitations of this study, we can highlight the lack of more specific data related to chronic pain duration (in years) and the consideration of only self-reports on the number of medications in use and the presence of diseases.

## Conclusion

The present study identified the effect of chronic pain on stress and depressive symptoms, regardless of duration, in elderly caregivers living in the community. The presence of chronic pain was associated with an increase in stress scale scores and depressive symptoms, and an increase in pain intensity is also associated with an increase in the scores of these variables. Furthermore, the greater the increase in pain intensity, the higher the depressive symptom

score, data that demonstrate the need for effective action to manage chronic pain in this population. Discussing the effect of chronic pain on psychological variables is necessary to enable reflection on the need for assessment and management of chronic pain in elderly caregivers, with the aim of developing strategies within the health system, in the short and long term, to promote caregivers' physical and mental health.

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## Collaborations

Terassi M, Rossetti ES, Bento SR, Pavarini SCI and Hortense P declare that they contributed to study design, data analysis and interpretation, article writing, critical review of relevant intellectual content and approval of the final version to be published.

## References

1. Veras RP, Oliveira M. Aging in Brazil: the building of a healthcare model. Cien Saude Colet. 2018;23(6):1929–36.
2. Lopes CC, Oliveira GA, Stigger FD, Lemos AT. Associação entre a ocorrência de dor e sobrecarga em cuidadores principais e o nível de independência de idosos nas atividades de vida diária: estudo transversal. Cad Saude Colet. 2020;28:98-106.
3. Martins G, Corrêa L, Caparrol AJ, Santos PT, Brugnera LM, Gratão AC. Características sociodemográficas e de saúde de cuidadores formais e informais de idosos com Doença de Alzheimer. Esc Anna Nery. 2019;23(2):e20180327.
4. Diniz MA, Melo BR, Neri CH, Casemiro FG, Figueiredo LC, Gaioli CC, et al. Comparative study between formal and informal caregivers of older adults. Cien Saude Colet. 2018;23(11):3789-98.
5. Andrade GN, Camacho AC, Assis CR, Queiroz RS. The pain in elderly caregivers: an integrative review. Rev Enferm Atual In Derme. 2019;87(25):1-10.
6. Nugraha B, Gutenbrunner C, Barke A, Karst M, Schiller J, Schäfer P, Falter S, Korwisi B, Rief W, Treede RD; IASP Taskforce for the Classification of Chronic Pain. The IASP classification of chronic pain for ICD-11: functioning properties of chronic pain. Pain. 2019;160(1):88-94. Review.
7. Treede RD, Rief W, Barke A, Aziz Q, Bennett MI, Benoliel R, et al. Chronic pain as a symptom or a disease: the IASP Classification of Chronic Pain for the International Classification of Diseases (ICD-11). Pain. 2019;160(1):19-27. Review.
8. Ferretti F, Castanha AC, Padoan ER, Lutinski J, Silva, MR. Quality of life in the elderly with and without chronic pain. Br J Pain. 2018;1(2):111-15.
9. Hayde L. Examining the association of intergenerational relationships and living arrangement on depression prevalence in home health and hospice patients age 65 and older [thesis]. Georgia: State University; 2019.
10. Valentim JC, Meziat-filho NA, Nogueira LC, Reis FJ. Conhece DOR: the development of a board game for modern pain education for patients with musculoskeletal pain. Br J Pain. 2019;2(2):166-75. Review.
11. Rapo-Pylkkö S, Haanpää M, Liira H. Chronic pain among community-dwelling elderly: a population-based clinical study. Scand J Prim Health Care. 2016;34(2):159-64.
12. Luchesi BM, Souza ÉN, Gratão AC, Gomes GA, Inouye K, Alexandre TS, et al. The evaluation of perceived stress and associated factors in elderly caregivers. Arch Gerontol Geriatr. 2016;67:7-13.
13. Donatti A, Alves ES, Terassi M, Luchesi BM, Pavarini SI, Inouye K. Relationship between the intensity of chronic low back pain and the generated limitations with depressive symptoms. BrJP. 2019;2(3):247–54.
14. Katz S, Ford AB, Moskowitz RW, Jackson BA, Jaffe MW. Studies of Illness in the Aged. JAMA. 1963;185(12):914–9.
15. Lino VT, Pereira SR, Camacho LA, Ribeiro Filho ST, Buksman S. Adaptação transcultural da escala de independência em atividades da vida diária (Escala de Katz). Cad Saude Publica. 2008;24(1):103–12.
16. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. Gerontologist. 1969;9(3):179–86.
17. Terassi M, Montoya P, Pavarini SC, Hortense P. Influence of chronic pain on cognitive performance in elderly caregivers: a longitudinal study. Rev Bras Enferm. 2021;74 suppl 2:e20200412.
18. Wood BM, Nicholas MK, Blyth F, Asghari A, Gibson S. Assessing pain in older people with persistent pain: the NRS is valid but only provides part of the picture. J Pain. 2010;11(12):1259–66.
19. Santos RL, Júnior JS. Confiabilidade da versão brasileira da escala de atividades instrumentais da vida diária. Rev Bras Pesq Saúde. 2008;21(4):290–6.
20. Duarte YA, de Andrade CL, Lebrão ML. O Index de Katz na avaliação da funcionalidade dos idosos. Rev Esc Enferm USP. 2007;41(2):317–25.
21. Scazufca M. Brazilian version of the Burden Interview scale for the assessment of burden of care in carers of people with mental illnesses. Rev Bras Psiquiatr. 2002;24(1):12–7.
22. Bianchi M, Flesch LD, Alves EV, Batistoni SS, Neri AL. Indicadores psicométricos da Zarit Burden Interview aplicada a idosos cuidadores de outros idosos. Rev Lat Am Enfermagem. 2016;24:e2835.
23. Almeida OP, Almeida SA. Confiabilidade da versão brasileira da escala de depressão em geriatria (GDS) versão reduzida. Arq Neuropsiquiatr. 1999;57 2B:421–6.
24. Luft CD, Sanches SO, Mazo GZ, Andrade A. Versão brasileira da Escala de Estresse Percebido: tradução e validação para idosos. Rev Saude Publica. 2007;41(4):606–15.
25. Terassi M, Rossetti ES, Luchesi BM, Gramani-Say K, Hortense P, Pavarini SC. Fatores associados aos sintomas depressivos em idosos cuidadores com dor crônica. Rev Bras Enferm. 2020;73(1):e20170782.

26. Liu Z, Heffernan C, Tan J. Caregiver burden: A concept analysis. Int J Nurs Sci. 2020;7(4):438–45.

27. Terassi M, Bento SR, Rossetti ES, Pavarini SC, Hortense P. Influência da sobrecarga, estresse e sintomas depressivos na saúde de idosos cuidadores: estudo longitudinal. Esc Anna Nery. 2023;27:e20220437.

28. Polenick CA, Brooks JM, Birditt KS. Own and partner pain intensity in older couples: longitudinal effects on depressive symptoms. Pain. 2017;158(8):1546–53.

29. Ciola G, Silva MF, Yassuda MS, Neri AL, Borim FS. Chronic pain in older adults and direct and indirect associations with sociodemographic and health-related characteristics: a path analysis. Rev Bras Geriatr Gerontol. 2020;23(3):e200065.

30. Tian X, Wang C, Qiao X, Liu N, Dong L, Butler M, et al. Association between pain and frailty among Chinese community-dwelling older adults: depression as a mediator and its interaction with pain. Pain. 2018;159(2):306–13.

31. Mendes PN, Figueiredo ML, Santos AM, Fernandes MA, Fonseca RS. Sobrecargas física, emocional e social dos cuidadores informais de idosos. Acta Paul Enferm. 2019;32(1):87–94.

32. Lentsck MH, Pilger C, Schoereder EP, Prezotto KH, Mathias TA. Prevalência de sintomas depressivos e sinais de demência em idosos na comunidade. Rev Eletr Enf. 2015;17(3):1–9.

33. Cesario VA, Leal MC, Marques AP, Claudino KA. Estresse e qualidade de vida do cuidador familiar de idoso portador da doença de Alzheimer. Saúde Debate. 2017;41(112):171–82.

34. Kobayasi DY, Rodrigues PR, Fhon SJ, Silva LM, de Souza AC, Chayamiti CE. Sobrecarga, rede de apoio social e estresse emocional do cuidador do idoso. Av Enferm. 2019;37(2):140–8.

35. Janson P, Willeke K, Zaibert L, Budnick A, Berghöfer A, Kittel-Schneider S, et al. Mortality, morbidity and health-related outcomes in informal caregivers compared to Non-Caregivers: a systematic review. Int J Environ Res Public Health. 2022;19(10):5864. Review.