

Mental state, prevalence of anxiety and depression, and sociodemographic characteristics of formal and informal caregivers of hospitalized older adults

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Abstract. *Background and aim:* Population aging has increased demand for caregivers, affecting their mental health. This study aimed to characterize caregivers of hospitalized older adults, exploring sociodemographic, economic, and clinical aspects, and correlating these with their mental state, anxiety, and depression. *Methods:* This cross-sectional study involved 74 caregivers, assessing them with a sociodemographic questionnaire, the Hospital Anxiety and Depression Scale (HADS), and the Mini-Mental State Examination (MMSE). Statistical analyses included correlation tests and group comparisons. *Results:* Most caregivers were informal (89.19%), female (77.03%), Caucasian (64.86%), urban residents (93.24%), aged 50.42±14.30 years, with over eight years of education (43.24%), and working outside the home (54.05%). They had low prevalence of hypertension (68.92%), diabetes (86.49%), or other health issues (54.05%). Lower education correlated with lower MMSE scores (p=0.001); informal caregivers had lower MMSE scores than formal ones (p=0.002). Higher education related to lower HADS anxiety and depression scores (p=0.014). *Conclusions:* Caregivers of hospitalized older adults are mainly informal, exhibit high cognitive performance, and generally lack anxiety or depression related to their caregiving role. Education significantly influences mental health and mood symptoms, underscoring the need for tailored support and training to enhance caregivers' well-being and quality of life. (www.actabiomedica.it)

Key words: anxiety, caregiver, depression, aged, mental health

Introduction

Population aging is a global phenomenon that brings significant challenges for public health. In addition to biological aspects, such as the accumulation of molecular and cellular damage, aging involves changes in social roles, maturity, and the ability to cope with losses, characterizing a multidimensional process (1,2).

From the 1970s onwards, developed and developing countries underwent a demographic transition, with a predominantly urban society, a reduction in the number of children, and a decrease in infant mortality rates (1). This change in the population profile resulted in a significant increase in the number of older adults, requiring comprehensive public policies to ensure the quality of the aging process (3).

Alongside the demographic transition, there is a change in the morbidity and mortality profile, with a predominance of chronic-degenerative diseases, such as cardiovascular diseases, neoplasms, and gastrointestinal disorders (4). Moreover, cognitive losses, sensory decline, accidents, and social isolation can lead to functional dependence in older adults, compromising their ability to maintain an independent and autonomous life (1,5).

When the functional capacity of older adults is compromised, the need for a caregiver arises (6,7). The act of caring is associated with subjectivity based on family values and beliefs, reflecting both positive and negative aspects for informal caregivers (7). While self-satisfaction and a sense of accomplishment are positive aspects, burden, family conflicts, loss of quality of life, and insecurity prevail, along with a lack of information, which can affect caregivers' health and, consequently, the quality of care provided to older adults (6,7).

Caregivers of older adults may experience depressive symptoms, anxiety, insomnia, and physical problems such as tension headaches, asthenia, chronic fatigue, and alterations in the sleep-wake cycle (8). The degree of exhaustion is directly related to the type of disease or condition faced by the caregiver (9).

Despite the growing relevance of the topic, studies specifically investigating caregivers of hospitalized older adults are still scarce. Understanding the characteristics, needs, and challenges faced by this population is essential for the development of appropriate support interventions and policies.

In this context, the present study aims to characterize caregivers of hospitalized older adults and investigate the correlation between their sociodemographic, economic, and clinical aspects with mental state, anxiety, and depression. The results obtained may contribute to the identification of stressors and the adoption of measures that minimize illness and promote the well-being and quality of life of caregivers, resulting in better care for older adult patients.

Methods

This is a cross-sectional study with a descriptive design and a quantitative analytical approach, aiming to characterize caregivers of hospitalized older adults

and investigate the correlation between their sociodemographic, economic, and clinical aspects with mental state, anxiety, and depression.

The study was conducted with caregivers of older adults hospitalized in a teaching hospital in the interior of the state of São Paulo, Brazil, which is a reference in high-complexity care. The study included caregivers aged 18 years or older, capable of responding to the cognitive assessment of the Mini-Mental State Examination (MMSE) within the parameters established by Bertolucci et al. (1994) (10,11). The collection period was from January 2018 to May 2018. Caregivers with cognitive or communication deficits that made it impossible to apply the assessment instruments were excluded. The sample was selected by convenience, consisting of 74 caregivers who met the inclusion criteria during the data collection period.

Data collection was performed through individual interviews conducted by trained researchers in a private location within the hospital. Questionnaires were applied to obtain sociodemographic information (age, sex, marital status, education), economic data (family income), and clinical data (time of care, underlying diseases of the older adult) of the caregivers. Mental state was assessed using the Mini-Mental State Examination (MMSE) (10,12), while anxiety and depression were assessed using the Hospital Anxiety and Depression Scale (HADS) (13,14).

The MMSE is a widely used cognitive assessment instrument, translated and validated for the Portuguese language (12). It covers three areas: temporal orientation, spatial orientation, and immediate memory. The score ranges from 0 to 30, with higher scores indicating better cognitive function. The cutoff points used were those proposed by Bertolucci et al. (1994) (10), considering the level of education.

The HADS consists of 14 items, 7 for assessing anxiety (HADS-A) and 7 for depression (HADS-D). Each item is scored from 0 to 3, resulting in a maximum score of 21 points for each subscale. Scores ≥ 9 indicate the presence of clinically significant anxiety or depression. The HADS was validated for the Brazilian population by [Brazilian validation reference], presenting satisfactory psychometric properties (Cronbach's alpha: 0.83 for HADS-D, 0.80 for HADS-A, and 0.85 for the total score) (14).

Data were analyzed using descriptive and inferential statistics with Minitab 17 software (Minitab Inc.). Categorical variables were described by absolute and relative frequencies, while continuous variables were expressed as mean and standard deviation or median and interquartile range, according to data distribution.

To compare MMSE and HADS scores in relation to categorical variables with up to two response levels, the t-test for independent samples was used. For categorical variables with more than two levels, Analysis of Variance (ANOVA) with Tukey's post-hoc multiple comparison tests was employed. The correlation between instrument scores and continuous variables was assessed using Spearman's correlation coefficient. A significance level of 5% was adopted for all statistical tests.

Results

Sample characterization

The main objective of this study was to characterize the sociodemographic and health profile of caregivers of older adults hospitalized in a geriatric unit, as well as to assess mental state and the presence of anxiety and depression symptoms in this population. The study included 74 caregivers, most of whom were female (57; 77.03%), white (48; 64.86%), from urban areas (69; 93.24%), with a partner (46; 62.16%), with more than eight years of education (32; 43.24%), and working outside the home (33; 44.59%). Most were not formal caregivers (66; 89.19%) and had income from work (47; 63.51%).

Regarding housing and health characteristics, most of the assessed caregivers lived with family (40; 54.05%), had their own home (45; 60.81%), resided in a house (71; 95.95%), were Catholic (37; 50.00%), did not have hypertension (46; 63.01%) or diabetes (64; 86.49%), and did not have other health problems (39; 52.70%).

The mean age of caregivers was 50.42 ± 14.30 years, with a median of 53 years and a coefficient of variation (CV) of 28.3%. The minimum age observed was 18 years and the maximum was 77 years. Of the 27 caregivers who had hypertension, 25 (92.6%) reported

a mean treatment time of 9.94 ± 8.21 years, with a median of 10 years and a CV of 82.6%. The minimum treatment time for hypertension was six months and the maximum was 38 years. Of the 10 caregivers who had diabetes, nine (90.0%) reported a mean treatment time of 8.44 ± 5.66 years, with a median of seven years and a CV of 67.0%. The minimum treatment time for diabetes was two years and the maximum was 15 years.

Time of care and hospitalization

Another objective of the study was to assess the time the caregiver has been with the older adult patient and the time of care during hospitalization. The mean time the caregiver has been with the older adult patient was 3.81 ± 9.22 years, with a median of six months and a CV of 241.9%. The minimum time was one day and the maximum was 52 years. The mean time the caregiver provided care to the patient in the hospital was 11.28 ± 15.73 days, with a median of seven days and a CV of 139.4%. The minimum time of care in the hospital was one day and the maximum was 120 days.

Assessment of mental state and symptoms of anxiety and depression

To assess the mental state of caregivers, the Mini-Mental State Examination (MMSE) was used, which covers aspects related to orientation, memory, attention (maximum score of 21 points), and specific abilities such as naming and comprehension (maximum score of nine points), totaling a maximum score of 30 points. The results indicated that caregivers had a mean MMSE score of 27.87 ± 2.77 , considered a high score of cognitive performance.

The presence of anxiety and depression symptoms was assessed using the Hospital Anxiety and Depression Scale (HADS), which presents questions with a maximum score of 21 points in each category (anxiety and depression), totaling a maximum score of 42 points. The mean score of the HADS instrument was 14.18 ± 8.96 , considered a mean score below 21 points, which assumes that caregivers did not present significant symptoms of anxiety and depression related to their work.

Influence of sociodemographic variables on MMSE and HADS scores

MMSE scores were compared with categorical variables of interest to verify the influence of these variables on caregivers' mental state (Table 1). Significant

differences were observed in MMSE scores regarding education (P=0.001), occupation (P=0.034), and being a formal caregiver (P=0.002). Caregivers with more than eight years of education had significantly higher MMSE scores compared to caregivers with up to four years of education. Unemployed caregivers and those

Table 1. Descriptive statistics of MMSE scores according to categorical variables. (n = 74, Brazil, 2024)

Categorical variables	n	Mean±standard deviation	Median	P-value
Gender¹				
Female	57	27,80±2,90	29,00	0,656
Male	17	28,11±2,37	28,00	
Skin color¹				
White	48	28,12±2,43	29,00	0,348
Non-white	26	27,42±3,31	28,50	
Marital status¹				
With partner	46	27,95±2,28	29,00	0,781
Without partner	28	27,75±3,48	29,00	
Education²				
Up to 4 years	23	26,30±3,61 b	28,00	0,001
5 to 8 years	19	27,78±2,72 ab	28,00	
More than 8 years	32	29,06±1,13 a	29,00	
Occupation²				
Retired	13	25,92±4,48 b	28,00	0,034
Unemployed	9	28,66±2,64 a	30,00	
Work outside the home	33	28,42±2,01 a	29,00	
Domestic work	19	27,89±1,96 ab	28,00	
Is a formal caregiver?²				
No	66	27,69±2,87	29,00	0,002
Yes	8	29,37±0,91	30,00	
Hypertension¹				
No	46	27,74±3,20	29,00	0,539
Yes	27	28,11±1,94	29,00	
Diabetes¹				
No	64	28,09±2,62	29,00	0,191
Yes	10	26,50±3,44	28,00	
Other health problems¹				
No	39	27,92±2,64	29,00	0,886
Yes	35	27,83±2,95	29,00	

¹P-value referring to the t-test for independent samples at P<0.05. ²P-value referring to the Analysis of Variance (ANOVA) test at P<0.05. Different letters in the same column indicate significant differences by Tukey's multiple comparison test at P<0.05.

working outside the home also had significantly higher scores compared to retired caregivers. Furthermore, formal caregivers had significantly higher MMSE scores compared to informal caregivers.

HADS scores were also compared with categorical variables (Table 2). Significant differences

were observed in HADS scores regarding education ($P=0.014$), with caregivers with up to four years of education presenting higher levels of anxiety and depression compared to caregivers with more than four years of education. For the other categorized variables, no significant influences were observed on HADS scores.

Table 2. Descriptive statistics of HADS scores according to categorical variables. (n = 74, Brazil, 2024)

Categorical variables	n	Mean±standard deviation	Median	P-value
Gender¹				
Female	57	14,60±9,53	12,00	0,381
Male	17	12,76±6,74	14,00	
Skin color¹				
White	48	14,19±9,11	12,00	0,988
Non-white	26	14,15±8,85	12,50	
Marital status¹				
With partner	46	14,87±8,29	12,50	0,420
Without partner	28	13,04±10,01	11,50	
Education²				
Up to 4 years	23	17,57±9,59 a	18,00	0,014
5 to 8 years	19	15,68±8,78 ab	12,00	
More than 8 years	32	10,84±7,59 b	9,00	
Occupation²				
Retired	13	12,62±8,26	10,00	0,081
Unemployed	9	20,78±12,68	18,00	
Work outside the home	33	12,48±8,10	12,00	
Domestic work	19	15,05±7,88	12,00	
Is a formal caregiver?¹				
No	66	14,68±9,05	12,50	0,130
Yes	8	10,00±7,29	11,00	
Hypertension¹				
No	46	15,28±9,40	12,50	0,076
Yes	27	11,70±7,36	10,00	
Diabetes¹				
No	64	14,20±8,86	12,00	0,953
Yes	10	14,00±10,07	10,00	
Other health problems¹				
No	39	12,51±8,41	11,00	0,094
Yes	35	16,03±9,30	14,00	

¹P-value referring to the t-test for independent samples at $P<0.05$. ²P-value referring to the Analysis of Variance (ANOVA) test at $P<0.05$. Different letters in the same column indicate significant differences by Tukey's multiple comparison test at $P<0.05$.

Correlation between MMSE, HADS scores and continuous variables

MMSE and HADS scores were correlated with continuous variables using Spearman's correlation coefficient (Table 3). No significant correlations were observed between mental state scores (MMSE) and anxiety and depression scores (HADS) with the analyzed continuous variables, such as age, treatment time for hypertension and diabetes, time the caregiver has been with the older adult patient, and time of care in the hospital. These results suggest that these continuous variables did not significantly influence the scores of the instruments applied in the study.

The results of this study allowed characterizing the sociodemographic and health profile of caregivers of hospitalized older adults in a geriatric unit, as well as assessing mental state and the presence of anxiety and depression symptoms in this population. Significant influences of education, occupation, and being a formal caregiver on MMSE scores, and of education on HADS scores were identified. These findings contribute to the understanding of factors that may impact the well-being and mental health of caregivers of hospitalized older adults, providing support for the development of support strategies and interventions targeted at this population.

Discussion

The main objective of this study was to characterize the sociodemographic and health profile of caregivers of hospitalized older adults in a geriatric unit,

as well as to assess mental state and the presence of anxiety and depression symptoms in this population. The results obtained allowed for the identification of important characteristics of caregivers and factors associated with their mental well-being.

Most of the assessed caregivers were informal (89.19%), female (77.03%), and with a mean age of 50.42 years, resembling the profile found in other Brazilian and international studies (15,16). This finding reinforces the Western and cultural view that women are naturally caregivers, whether for their husbands, children, parents, or other family members, even with changes in women's roles in society, such as female emancipation and inclusion in the labor market (15). This female predominance in the care of dependent older adults has important implications for the health and quality of life of female caregivers, who often accumulate multiple responsibilities and face physical and emotional burden (17).

Regarding sociodemographic characteristics, of the 74 caregivers analyzed, 48 were white, 69 were from urban areas, and 90.54% had some religion, with 50% being Catholic. These findings are similar to those found in other Brazilian studies, which point to the influence of cultural and religious factors on the profile of caregivers of older adults (18,19).

Education, occupation, and being a formal caregiver significantly influenced ($p < 0.005$) the scores of the MMSE instrument, while gender, skin color, and marital status had no significant impact on the results. In the HADS scores, only education proved to be important. These findings corroborate previous studies that identified education as a relevant factor for mental state and the presence of anxiety and depression symptoms in caregivers (20–23).

Table 3. Spearman's correlation coefficients (P-value) for the correlation between MMSE and HADS scores according to continuous variables. (n = 74, Brazil, 2024).

Continuous variables	MMSE score	HADS score
Age (years)	-0,156 (0,184)	0,100 (0,399)
Time treating hypertension (years)	0,175 (0,402)	0,190 (0,364)
Time treating diabetes (years)	0,047 (0,904)	-0,043 (0,912)
Mean time the caregiver has been with the older adult patient (years)	-0,143 (0,226)	0,207 (0,077)
Mean time the caregiver has been with the patient in the hospital (days)	-0,004 (0,976)	-0,028 (0,813)

The average education level of caregivers in this study was considered high, with 43.24% having more than eight years of education, contradicting some studies that found low education levels among caregivers (9,24), but consistent with another Brazilian study (14). It was observed that caregivers with up to four years of education had higher levels of anxiety and depression compared to caregivers with more than four years of education ($p=0.014$). This relationship between low education and more depressive symptoms in caregivers has already been reported in another study (21). Moreover, the lower the education level, the lower the caregiver's mental state score ($p=0.001$), corroborating data from the literature (20,22,23). These findings suggest that education may be a protective factor for caregivers' mental health, possibly by influencing their ability to understand, cope with, and adapt to the demands of caregiving.

Retired caregivers had significantly lower MMSE scores when compared to unemployed caregivers or those who perform some type of work ($p=0.034$). Although other studies have found a relationship between individual income and cognition, with higher rates of cognitive impairment in people with unfavorable income situations, occupation was not significantly highlighted in these studies (22,23). In the present study, occupation had no significant influence on HADS scores.

The prevalence of informal caregivers over formal caregivers as responsible for the care of older adults found in this study is confirmed by data from the literature (15,25). This finding reflects the Brazilian reality, in which the family is still the main source of care for dependent older adults, often without adequate preparation or formal support (26). However, mental state scores were significantly higher in formal caregivers compared to informal caregivers ($p=0.002$), corroborating a study conducted in Singapore (27). A study conducted in Porto Alegre also found changes in mental state scores in 20% of professional caregivers, while in family caregivers there was no change in cognitive signs (28). These results suggest that the training and qualification of formal caregivers may contribute to the maintenance of better mental state, highlighting the importance of investing in the qualification of informal caregivers.

Although some studies report a high burden index mainly in informal caregivers due to the long time spent on care and the lack of preparation regarding the role performed, which can cause health problems and reduced quality of life (8,29,30), the results of the present study indicated that most of the analyzed caregivers did not present significant symptoms of anxiety and depression related to their work. This finding differs from a study conducted by the Federal University of Paraíba in association with the University of São Paulo, which demonstrated high burden indices in 84.6% of caregivers, with potential physical, social, financial, and emotional impacts, such as depression and anxiety (31). This divergence can be explained by differences in the characteristics of the studied samples and the instruments used to assess burden and symptoms of anxiety and depression.

The presence of comorbidities such as hypertension and diabetes did not significantly influence HADS scores in this study. However, it is important to consider that these chronic conditions can affect the health and quality of life of caregivers in the long term, requiring longitudinal follow-up to assess their impact (32).

This study has some limitations that should be considered when interpreting the results. The sample was selected by convenience in a single geriatric unit, which may limit the generalization of the findings to other caregiver populations. Moreover, the cross-sectional design of the study does not allow for the establishment of causal relationships between the investigated variables. Longitudinal studies are needed to assess the evolution of mental state and symptoms of anxiety and depression in caregivers over time and to identify predictive factors.

Despite these limitations, this study makes relevant contributions by characterizing the profile of caregivers of hospitalized older adults in a geriatric unit and identifying factors associated with their mental state and the presence of anxiety and depression symptoms. These findings can support the development of interventions and public policies aimed at supporting and training caregivers, with the goal of promoting their mental health and quality of life.

Future studies should further investigate the factors that influence caregivers' mental well-being,

considering aspects such as the relationship between the caregiver and the older adult, the duration of care, the social support received, and the coping strategies used. In addition, it is important to assess the effectiveness of psychoeducational and emotional support interventions for caregivers, seeking to prevent and treat symptoms of anxiety and depression.

Conclusion

The main objectives of this study were to characterize the sociodemographic and health profile of caregivers of hospitalized older adults in a geriatric unit, assess mental state and the presence of anxiety and depression symptoms in this population, as well as identify factors associated with these conditions. The results obtained allowed for an overview of the characteristics of caregivers and highlighted relevant aspects for understanding their mental well-being.

Among the main findings, it was evident that most caregivers were women, white, from urban areas, and belonging to the group of informal caregivers. This profile corroborates the Brazilian reality, in which the family is still the main source of care for dependent older adults, with emphasis on the role of women in this function. This finding highlights the importance of considering the specific demands and burden faced by informal female caregivers, who often accumulate multiple responsibilities.

Regarding mental state, it was observed that the lower the caregiver's education level, the lower the MMSE score. Moreover, informal caregivers had lower scores than formal caregivers. These results indicate the influence of education and professional training on caregivers' cognitive performance, suggesting the need for special attention and support for caregivers with lower educational levels and without formal training.

Despite these differences, caregivers generally presented a mean MMSE score considered high for cognitive performance. This finding is positive and may be related to factors such as the average age of caregivers and the absence of significant cognitive impairment in the studied sample.

In the assessment of anxiety and depression using the HADS, education also proved to be a significant factor. However, the mean score obtained by caregivers

was below the cutoff point for clinically relevant symptoms. This result suggests that, despite the demands and challenges faced, the analyzed caregivers did not present significant symptoms of anxiety and depression related to their work.

These findings have important implications for clinical practice and the formulation of public policies aimed at caregivers of older adults. It is essential that health professionals be attentive to the sociodemographic and health characteristics of caregivers, especially those with lower education and without formal training, offering support, guidance, and resources appropriate to their needs.

Moreover, the results reinforce the importance of investing in training programs and emotional support for caregivers, aiming to promote their mental health and quality of life. Public policies that recognize the essential role of caregivers and offer adequate working conditions, remuneration, and social support are fundamental for the sustainability of care for dependent older adults.

It is important to acknowledge the limitations of this study, such as the sample selected by convenience in a single geriatric unit and the cross-sectional design, which does not allow for the establishment of causal relationships. Future studies should further investigate the factors that influence caregivers' mental well-being, considering aspects such as the relationship between the caregiver and the older adult, the duration of care, and the coping strategies used.

Acknowledgments: We would like to thank everyone who participated in the study.

Funding: The authors received no financial support for this article's research, authorship, and publication.

Conflict of Interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

Ethic Committee: The study was approved by the Research Ethics Committee of the Faculty of Medicine of São José do Rio Preto (FAMERP) - Brazil, under Opinion No. 2,0409,851. All

participants signed the Informed Consent Form (ICF), after being informed about the objectives, procedures, risks, and benefits of the research, as well as the guarantee of data confidentiality. This article is part of the Parent Project entitled “Study of the Quality of Life of Older Adults”, approved under Opinion No. 1,508,014.

Authors Contribution: BT, JM, JA, VB, RR: Have made a substantial contribution to the concept or design of the article; or the acquisition, analysis, or interpretation of data for the article; MS, VP, MP, AL: Drafted the article or revised it critically for important intellectual content; YS, ES, RMR: Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved; DP, LS: Approved the version to be published;

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Received: 14 June 2024

Accepted: 29 August 2024

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