

Caregiver burden and related factors on caregivers of the elderly with chronic diseases



Original article

Nguyen Thi Huong Lan^a, Huynh Thi Ly^{b,*}, Hoang Thi Ngoc Sen^c

^aDepartment of Neurology, Lao Cai Provincial General Hospital, Lao Cai 31000, Vietnam

^bGeneral Nursing Department, Faculty of Nursing, Da Nang University of Medical Technology and Pharmacy, Da Nang 50000, Vietnam

^cSpecialized – Community Nursing Department, Faculty of Nursing, Da Nang University of Medical Technology and Pharmacy, Da Nang 50000, Vietnam

Received: 21 March 2025; Accepted: 28 April 2025; Published: 20 March 2026

Abstract: **Objective:** The aging population is growing rapidly, leading to a rise in chronic diseases and placing significant physical, emotional, and financial strain on caregivers. Managing chronic conditions alongside caregiving responsibilities often results in burnout, adding to the burden on caregivers. This issue also affects society and healthcare systems through increased costs and greater demands for support services. Understanding the factors contributing to caregiver burden is crucial for creating effective interventions to address these challenges. The aim of this study is to describe the extent of caregiver burden and identify some factors related to burden among caregivers of chronically ill elderly people. By gaining insight into these relationships, this study seeks to identify strategies to reduce the burden on caregivers.

Methods: This study utilized a cross-sectional design to examine caregivers of the elderly with chronic diseases receiving treatment in the public healthcare facility. Data collection involved administering structured questionnaires that gathered information on the demographic characteristics of both the elderly and their caregivers, the level of social support received, the functional status of patients as measured by daily activity indices, and the level of caregiver burden. Description was used to elaborate the characteristics of participants. Mann–Whitney, Kruskal–Wallis, and Spearman’s correlation test were applied to explore the relationship between variables. Statistical significance was determined at P value < 0.05 .

Results: Caregivers of the elderly with chronic diseases had a moderate care burden score (22.62 ± 11.24 , CI: 95%). The patients’ level of dependence, relationship with the patients, and time spent as a caregiver were factors related to caregiver burden ($P < 0.05$).

Conclusions: Those who care for elderly people with chronic diseases suffered great burden. The finding had found a number of factors that influence the caregivers’ weight loss. Healthcare providers should consider these relevant factors when developing intervention plans to reduce caregiver burden.

Keywords: *burden of caregivers • chronic diseases • level of dependence • social support • the elderly*

© Shanxi Medical Periodical Press Co., Ltd.

1. Introduction

Chronic diseases are defined as noncommunicable diseases of long duration and generally having slow progression, including cardiovascular diseases, cancers, chronic respiratory diseases, diabetes, and mental health diseases.¹ These are the leading causes of death and

they have become serious diseases worldwide. According to the World Health Organization, >41 million people die each year from chronic diseases, accounting for 74% of all deaths, with most occurring in low- and middle-income countries.¹ The proportion of elderly people

How to cite this article: Lan NTH, Ly HT, Sen HTN. Caregiver burden and related factors on caregivers of the elderly with chronic diseases. *Front Nurs.* 2026;1:105–114.

*Corresponding author.

E-mail: htly@dhktyduocdn.edu.vn (H. -T. Ly).

has gradually increased, resulting in a rise in the number of people with chronic diseases. Approximately 50% of people aged 65 and over suffered from 2 and more chronic illness.² Vietnam is one of the countries with the fastest aging population in the world.³ In 2019, Vietnam had 11.41 million people aged 60 and over, accounting for 11.86% of the total population, with about 95% of the elderly having illnesses, mainly chronic diseases.³

The risk of disability in the elderly increases with the development of chronic diseases. As a result, the need for health care in the elderly raises.⁴ In Vietnam, caregiving for older adults with chronic illnesses is primarily provided by family members, reflecting the country's strong cultural emphasis on filial responsibility. Unlike Western countries, where formal caregiving services are more common, Vietnamese caregivers—typically spouses, children, or close relatives—play a central role in providing both emotional and physical support.⁵ This family based caregiving model is deeply rooted in traditional values, where caring for elderly parents is considered a fundamental duty.⁶

Caregivers of elderly people with chronic diseases may experience significant burdens related to their caregiving activities.^{7,8} Caregiver burden is referred as “the level of multifaceted strain a caregiver experiences from caring for a family member and/or loved one over time.”⁹ Studies have revealed that caregiver burden negatively impacts their physical health, such as sleep fatigue, pain, decreased energy, anorexia, weight loss, and increased psychological, social, and physical problems, as well as affecting the economic situation of caregivers.^{7,8,10} Nearly three-quarters of people caring for chronically ill patients at home experienced a light or moderate burden.^{11,12}

The literature review found several factors associated with caregiver burden, which could be classified into 2 groups: caregiver's characteristics and elderly's characteristics. Caregiver's characteristics included age, gender, education level, marital status, employment status, relationship with the elderly, time as a caregiver, and social support.^{10,13} The elderly's characteristics related to caregiver burden consisted of age, gender, type of chronic disease, number of accompanying chronic diseases, and dependency of the elderly.^{10,13–15}

Research on the burden of caregivers for elderly people with chronic diseases has not been conducted widely in Vietnam. Some studies have focused on analyzing the burden of care for specific diseases such as Alzheimer,⁶ diabetes,¹⁶ and stroke¹⁷ or have identified contrasting perspectives. For example, caregivers did not perceive caring for individuals with chronic conditions such as dementia as a burden.⁵ Therefore, the aim of this study is to describe the caregiver burden and explore factors related to the burden of caregivers for elderly people with chronic diseases.

2. Methods

2.1. Design

The study was conducted using a descriptive cross-sectional design.

2.2. Participants, sampling, and sample size

The inclusive criteria were people aged over 18 and provided primary care for elderly patients receiving treatment in the hospital. Elderly patient was defined as a person over 60 years old and diagnosed with a chronic disease being treated at Da Nang C Hospital. Caregivers who were unable to verbally communicate and those caring for elderly patients in a medical emergency were excluded from this study. Participants were recruited using random sampling by the department with the elderly patients of Da Nang C Hospital.

The sample size was calculated by the following formula as:

$$n = z_{(1-\alpha/2)}^2 \frac{p(1-p)}{d^2}$$

where

n : the minimum sample size

$Z_{(1-\alpha/2)}$: the Z value obtained from the Z table corresponding to the α value. In this study, α was 0.05 and Z was 1.96.

p : Based on the study of Limpawattana et al.¹⁸ conducted in Thailand, 48% of caregivers suffered from the burden. The P value used in the formula was 0.48.

d : the allowable error of 0.06.

From the formula, the sample size was 266.

2.3. Setting

The study was conducted at Da Nang C Hospital, a major general hospital in central Vietnam that provides medical care for diverse population. The hospital serves as a referral center for chronic disease management, offering specialized treatments for conditions such as cardiovascular diseases, diabetes, chronic respiratory diseases, Alzheimer, Parkinson, and cancer. As a public healthcare facility, Da Nang C Hospital plays a crucial role in providing long-term care for older adults with chronic illnesses, making it a suitable setting for investigating caregiver burden in this population.

2.4. Instruments

The questionnaires in the study included:

The elderly's characteristics: age, gender, diagnosed chronic disease at this hospitalization, and the number of other chronic comorbidities.

The caregiver's characteristics: age, gender, education level, marital status, employment status, relationship with the elderly, and duration as a caregiver.

Social support: The Multidimensional Scale of Perceived Social Support (MSPSS), developed by Zimet et al.¹⁹ was used to measure the perceived social support from family, friends, and significant others. The questionnaire included 12 items with 5-point Likert scale from 0 (very strongly disagree) to 4 (very strongly agree). The structure of the MSPSS was as follows: items 1–5 measured family support, items 6–9 measured friend support, and items 10–12 measured significant other support. The total score ranged from 0 to 48. The high scores indicated high perceived social support to caregivers. Ho et al.²⁰ translated this questionnaire into Vietnamese and validated it, reporting Cronbach's alpha coefficients of 0.866 for family support, 0.859 for friend support, and 0.889 for significant other support. In this study, the Cronbach's alpha was 0.877, indicating good internal consistency.

Level of dependence: The Barthel Index (BI) was a scale developed by Mahoney and Barthel in 1965,²¹ used to measure performance in daily activities. The BI includes 10 daily living activities of self-care and mobility. The Cronbach's alpha reliability is 0.97.

Caregiver burden: The Zarit Burden Interview (ZBI) revised, which originated from Zarit Scale, is a questionnaire used to assess caregiver burden. It includes 22 items ranked in a 5-point Likert scale that ranged from 0 (never) to 4 (nearly always). The total score ranged from 0 to 88 points, with the following levels: 0–20 points, indicating no or mild burden, 21–40 points, indicating moderate burden, 41–60 points, indicating severe burden, and 61–88 points, indicating very severe burden.²² The ZBI was translated into Vietnamese by Anh and Hy,²³ achieving high reliability with Cronbach's alpha of 0.92. In this study, Cronbach's alpha was 0.826.

2.5. Data collection

Data were collected from caregivers who met the inclusion criteria through a structured questionnaire administered at Department of Cardiology, Department of Endocrinology, Department of Nephrology and Urology, and Department of Respiratory of Da Nang C Hospital. Eligible participants were identified based on patients' records and recruited using random sampling by department, ensuring a representative sample of caregivers across different medical units. Researchers approached

caregivers in designated hospital areas, explained the study objectives, and obtained informed consent before administering the survey. Caregivers completed the questionnaire on-site, with assistance provided if needed. To maintain data quality, responses were reviewed for completeness and any missing or unclear information was immediately clarified.

2.6. Data analysis

Data were entered and processed on SPSS 22.0 software (IBM Corporation, Armonk, New York, United States). Frequency and descriptive statistics were used to elucidate the study variables. Mann–Whitney and Kruskal Wallis tests were used to explore the relationship between demographic variables and caregiver ZBI. Spearman's rho test was used to identify the age of patients, age of caregivers, MSPSS, and the level of dependence, BI to ZBI. The level of significance was at 0.05.

3. Results

3.1. Demographic characteristics of patients (care-receivers) and caregivers

There were 266 patients participated in the study. The mean age of patients was 75.18 (standard deviation [SD] = 8.8). Out of 266 patients, the results indicated that the proportion of men with the disease was higher than that of women, at 58.6% and 41.4%, respectively. Hypertension was the most common condition, affecting 21.8% of the patients. The half of patients had 3 and more comorbidities (Table 1).

The mean age of caregivers was 46.82 (SD = 13.51), ranging from 19 years old to 79 years old. Nearly two-thirds of the study participants were female. Among the caregivers, 40.6% held an undergraduate degree. More than a half of the caregivers were the children of the patients. The majority of caregivers were married, were employed, and had been providing care for <6 months (85.3%, 71.8%, and 70.7%, respectively) (Table 2).

3.2. The social support, level of dependence, and caregiver burden

Table 3 indicated that the mean score for MSPSS was 37.5 (SD = 7.8), with a range from 7 to 48. The mean BI score, reflecting patient dependence, was 72.1 (SD = 26.4), within a range of 5 and 100. The mean caregiver burden score was 22.62 (SD = 11.2), ranging

Characteristics of patients	<i>n</i>	%
Age (mean = 75.18, SD = 8.8, Min = 60, Max = 98)		
<i>Gender</i>		
Male	156	58.6
Female	110	41.4
<i>Type of chronic diseases</i>		
Hypertension	58	21.8
Chronic coronary artery disease	43	16.2
Diabetes	40	15.0
COPD	34	12.8
Heart failure	33	12.4
Chronic kidney failure	32	12.0
Asthma	21	7.9
Others*	05	1.9
<i>Number of comorbidities</i>		
None	14	5.3
1	57	21.4
2	62	23.3
≥3	133	50.0

Note: *There were other chronic diseases such as arthritis, stroke, and Alzheimer; COPD, chronic obstructive pulmonary disease; Min, minimum; Max, maximum; SD, standard deviation.

Table 1. Demographic characteristics of patients (care-receivers) (*n* = 266).

from 0 to 58. The majority caregivers experienced a moderate level of burden (48.1%), whereas only 7.1% reported a severe burden (Table 3).

3.3. Factors related to the burden of elderly caregivers with chronic illnesses

The Mann–Whitney test was used to identify the differences in caregiver burden based on the gender of patients and caregivers. The Kruskal–Wallis test was applied to assess the differences in caregiver burden across patients' disease type and number of comorbidities, and caregivers' educational level, relationship with the patients, marital status, employment status, and the duration of caregiving. Spearman's rho test was used to check the relationships of patients' age, caregivers' age, MSPSS, and BI with caregiver burden.

The Kruskal–Wallis test showed that there was statistically significant difference in caregiver burden between different relationships with patients, $\chi^2(2) = 7.0$, $P = 0.03$, with a mean rank caregiver burden of 156.1 for spouse, 129.2 for children, and 120.2 for others. Additionally, this test revealed that the difference of duration of caring, $\chi^2(2) = 13.1$, $P = 0.001$, with a mean rank caregiver burden of 123.0 for <6 months, 144.7 for 6–12 months, and 164.8 for >12 months.

The Spearman's rho test showed the significantly reverse relationship between BI and caregiver burden with $r_s = -0.29$, $P = 0.00$.

Characteristics of caregivers	<i>n</i>	%
Age (Mean = 46.82, SD = 13.51, Min = 19, Max = 79)		
<i>Gender</i>		
Male	96	36.1
Female	170	63.9
<i>Educational level</i>		
Primary school	25	9.4
Secondary school	50	18.8
High school	76	28.6
Undergraduate	108	40.6
Graduate	07	2.6
<i>Relationship with patients</i>		
Spouse	59	22.2
Children	159	59.8
Others*	48	18.0
<i>Marital status</i>		
Married	227	85.3
Single	22	12.4
Divorced/widowed	06	2.3
<i>Employment status</i>		
Employed	191	71.8
Retired	39	14.7
Unemployed	36	13.5
<i>Duration of caring</i>		
<6 months	188	70.7
6–12 months	23	8.6
>12 months	55	20.7

Note: *The significant persons; SD, standard deviation.

Table 2. Demographic characteristic of caregivers (*n* = 266).

There was no relationship between any other variables and caregiver burden found in this study (Table 4).

4. Discussion

One of the main findings of the study was the number of caregivers who experienced moderate level of burden was the highest (48.1%). This result was consistent with the findings in Thailand,¹⁸ Greece,²⁴ and Iran.²⁵ However, the mean caregivers burden scores were significantly higher than those reported by Thi Bui et al.¹² who studied individuals with type 2 diabetes mellitus. The study emphasized that caregiver burden concerned physical and psychological conditions.²⁴ Additionally, the findings showed lower caregiver burden compared to other studies conducted internationally, such as those in Egypt and Turkey.^{14,26} This difference may be explained by the settings in which patients were treated. In our study, patients were hospitalized, whereas in Egypt and Turkey, patients were outpatients treated at home.^{14,26}

Variables	Mean (SD)	Min–Max	n (%)
MSPSS	37.5 (7.8)	7–48	
BI	72.1 (26.4)	5–100	
ZBI	22.62 (11.2)	0–58	
None or mild	12.9 (5.2)	0–20	119 (44.7)
Moderate	28.2 (5.8)	21–40	128 (48.1)
Severe	45.9 (4.3)	41–58	19 (7.1)

Note: BI, Barthel Index; MSPSS, Multidimensional Scale of Perceived Social Support; SD, standard deviation; ZBI, Zarit Burden Interview.

Table 3. The social support, level of dependence, and caregiver burden (n = 266).

Variables	Caregiver burden		P
	χ^2 (df)	Mean rank	
<i>Gender of patients</i>			0.85 ^a
Male		134.2	
Female		132.5	
<i>Types of chronic diseases</i>	5.2 (7)		0.64 ^b
Hypertension		135.9	
Chronic coronary artery disease		130	
Diabetes		111.8	
COPD		142.7	
Heart failure		138.2	
Chronic kidney failure		143.2	
Asthma		131.3	
Others*		162.5	
<i>Number of comorbidities</i>	1.8 (3)		0.62 ^b
None		111.8	
1		139.8	
2		128.9	
≥3		135.2	
<i>Gender of caregiver</i>			0.76 ^a
Male		131.6	
Female		134.6	
<i>Educational level</i>	1.9 (4)		0.75 ^b
Primary school		144.7	
Secondary school		142.2	
High school		126.9	
Undergraduate		131	
Graduate		142.6	
<i>Relationship with patients</i>	7.0 (2)		0.03 ^b
Spouse		156.1	
Children		129.2	
Others		120.2	
<i>Marital status</i>	3.4 (2)		0.18 ^b
Married		133.1	
Single		145.3	
Divorced/widowed		82.4	
<i>Employment status</i>	3.7 (2)		0.16 ^b
Employed		129.7	
Retired		131.1	
Unemployed		156.5	

(Continued)

Table 4. Continued

Variables	Caregiver burden		P
	χ^2 (df)	Mean rank	
<i>Duration of caring</i>	13.1 (2)		0.001 ^b
<6 months		123	
6–12 months		144.7	
>12 months		164.8	
<i>Age of patients, $r_s = -0.05$</i>			0.43 ^c
<i>Age of caregivers, $r_s = -0.001$</i>			0.99 ^c
<i>MSPSS, $r_s = -0.11$</i>			0.08 ^c
<i>BI, $r_s = -0.29$</i>			0.00 ^c

Note: ^aMann–Whitney test; ^bKruskal–Wallis test; ^cSpearman's rho test; $P < 0.05$; BI, Barthel Index; COPD, chronic obstructive pulmonary disease; *There were other chronic diseases such as arthritis, stroke, and Alzheimer; MSPSS, Multidimensional Scale of Perceived Social Support.

Table 4. Factors related to caregiver burden ($n = 266$).

Notably, the percentage of caregivers experiencing severe burden in our study was 7.1, which is considerably lower than that of 21.7 reported in another study conducted in a Southeast Asian country.²⁷ The substantial difference in caregiver burden between these studies may be due to the settings in which the studies were conducted. Our research was conducted in hospital clinical wards where nurses provided care and support, whereas the other study was carried out in an outpatient medical clinic.

The current study showed a statistically significant difference between caregiver burden and the caregiver's relationship to the patient. This finding aligned with the study by Elhameed and Alam¹⁴ in Egypt. In the present study, spousal caregivers reported a higher level of burden compared to caregivers who were the children of patients. This can be explained by the fact that most of the patients in the study were over 60 years old, and the majority of their caregivers were their spouses. As spousal caregivers age, they often face their own health issues while also managing the burden of caring for their partner, which can result in a higher level of caregiver burden. Previous studies have primarily focused on spousal caregivers, but current demographic trends suggest that children are increasingly becoming the primary caregivers for their elderly parents. In cases where elderly spouses are unable to provide care due to their own health problems, their children typically assume this responsibility.^{8,28} Spouses, as well as sons and daughters-in-law, tended to experience greater caregiver stress due to their close relationship with patients.²⁹ However, some studies conducted in Iran demonstrated that there were no correlation between caregiver burden and the caregiver's relationship to the patient, especially during COVID-19 pandemic.^{30,31}

The study also revealed a significant relationship between the duration of caregiving and the caregiver

burden. Caregivers who had been providing care for more than 12 months were more likely to report higher levels of burden compared to those who had been caregiving for a shorter period. Research consistently indicated that an increase in the average daily hours of caregiving was closely associated with a heightened level of caregiver burden.^{11,13,18,29} The impact of caregiving duration can be explained by the progressive nature of chronic diseases, which often require long-term, daily care. As the patient's condition worsens, caregiving demands increase, leaving caregivers with less personal time and leading to lifestyle changes and limited social activities.⁹ This can create role conflict between the caregiver's professional responsibilities, caregiving duties, and family needs.

Additionally, the study found a significant negative correlation between the BI and caregiver burden. Similar findings have been reported in studies conducted in Turkey, Egypt, India, and China, where higher caregiver burden was associated with caring for elderly patients with chronic diseases and were highly dependent.^{14,26,32,33} As a patient's condition deteriorates and their dependency increases, caregivers were required to provide more intensive care, which can eventually exceed their capacity to cope, leading to increased burden.^{13,14} Pai et al.³² identified that caregiver burden, particularly in terms of physical and psychological stress, was higher when stroke patients were dependent on caregivers for their daily activities. Depressive symptoms were correlated with the extent of a patient's functional disability, as those with greater impairments were more likely to depend on caregivers for assistance and care.³³ The inability to implement routine activities had been shown to increase the burden on caregivers across a broad spectrum of patients, including those with dementia and stroke.³⁴

The study found no significant correlation between perceived MSPSS and caregiver burden among

caregivers of chronically ill older adults. This contrasted with previous researches indicating that social support reduced caregiver burden by providing emotional and practical assistance.^{35–37} However, some studies had also reported weak or inconsistent relationships, suggesting that the impact of social support may depend on contextual factors.^{15,34} One possible explanation was that caregiver burden was influenced by multiple factors beyond social support, such as the severity of the patient's condition, financial constraints, and personal coping strategies.²⁹ While MSPSS measured perceived emotional support, it might not fully capture instrumental support (e.g., financial aid, respite care), which had been found to be more directly linked to reducing caregiver stress.³⁸

This study had several limitations. First, the majority of participants were caring for patients with mild diseases and few disabilities, so the results represent the caregiver burden of older adults in general and are not representative of those caring for individuals with severe medical conditions such as dementia, advanced cancer, cerebrovascular disease, or physical disabilities. Additionally, the study was conducted in a single public hospital, which may limit the generalizability of the findings.

5. Conclusions

This study provides new insights by quantifying the caregiver burden as moderate, offering a nuanced understanding of the challenges faced by family caregivers in a hospital setting. Unlike previous studies that focus broadly on caregiving burden, this research specifically highlights the greater strain on spousal caregivers, who may face both physical and emotional exhaustion.

Additionally, the study underscores the progressive impact of long-term caregiving, emphasizing that caregiver burden increases over time, particularly when

caring for highly dependent older adults. This finding reinforces the importance of early intervention strategies to prevent worsening burden.

From a practical perspective, the study calls for a shift in caregiving support strategies, advocating for collaborative nursing approaches that equip caregivers with essential skills and promote independence of patients. Furthermore, the study highlights the need for targeted policies to support aging caregivers and those providing long-term care, ensuring sustainable caregiving and improved patient outcomes.

Acknowledgments

We would like to express our sincere gratitude to Da Nang University of Medical Technology and Pharmacy and Da Nang C Hospital for the invaluable support they provided in facilitating this research. Additionally, we extend our thanks to the patients and caregivers who enthusiastically participated in the study.

Ethical approval

The study was approved by Scientific Research Ethics Council of Da Nang University of Medical Technology and Pharmacy (Number 01/BB-HDDD). Before obtaining informed consent, the researchers explained the aims, procedures, advantages, and risks of the study to participants. The respondents were informed that they could refuse or withdraw from the study at any time if they encountered any difficulties. Personal data would be kept confidential.

Conflicts of interest

All contributing authors declare no conflicts of interest.

References

1. World Health Organization. *Noncommunicable Diseases*. Updated 16 September 2023. <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>. Accessed March 5th, 2024.
2. Rivera V, Ko FC. What are multimorbidity and frailty and how do they affect the care of older adults? In: Goldstein NE, Woodrell CD, Morrison RS, eds. *Evidence-Based Practice of Palliative Medicine*. 2nd ed. Netherlands, Elsevier; 2023:469–476.
3. General Statistics Office. *The Population and Housing Census 2019: Population Ageing and Older Persons in Vietnam*. Updated July 2021. <https://www.gso.gov.vn/wp-content/uploads/2021/08/Dan-so-gia-hoaEN.pdf>. Accessed March 5th, 2024.
4. Fisher KA, Griffith LE, Gruneir A, et al. Effect of socio-demographic and health factors on the association between multimorbidity and acute care service use: population-based survey linked to health administrative data. *BMC Health Serv Res*. 2021;21:62.
5. Nguyen H, Nguyen T, Tran D, Hinton L. "It's extremely hard but it's not a burden": a qualitative study of family caregiving for people living with dementia in Vietnam. *PLoS One*. 2021;16:e0259788.
6. Tran D, Nguyen H, Pham T, et al. Resources for Enhancing Alzheimer's Caregiver Health in Vietnam (REACH VN): study protocol for a cluster randomized controlled trial to test the efficacy of a family

- dementia caregiver intervention in Vietnam. *Trials*. 2022;23:377.
7. Xie H, Cheng C, Tao Y, et al. Quality of life in Chinese family caregivers for elderly people with chronic diseases. *Health Qual Life Outcomes*. 2016;14:99.
 8. Faronbi JO, Faronbi GO, Ayamolowo SJ, Olaogun AA. Caring for the seniors with chronic illness: the lived experience of caregivers of older adults. *Arch Gerontol Geriatr*. 2019;82:8–14.
 9. Liu Z, Heffernan C, Tan J. Caregiver burden: a concept analysis. *Int J Nurs Sci*. 2020;7:438–445.
 10. Aman Z, Liew SM, Ramdzan SN, Philp I, Khoo EM. The impact of caregiving on caregivers of older persons and its associated factors: a cross-sectional study. *Singapore Med J*. 2020;61:238–245.
 11. Rahmani F, Roshangar F, Gholizadeh L, Asghari E. Caregiver burden and the associated factors in the family caregivers of patients with schizophrenia. *Nurs Open*. 2022;9:1995–2002.
 12. Thi Bui DH, Nguyen BX, Søndergaard J, et al. Informal caregiving among people supporting a person with type 2 diabetes in rural communities of Northern Vietnam: a cross-sectional study of caregiver burdens. *PLoS One*. 2024;19:e0304821.
 13. Lindt N, van Berkel J, Mulder BC. Determinants of overburdening among informal carers: a systematic review. *BMC Geriatr*. 2020;20:304.
 14. Elhameed SHA, Alam RR. Relationship between burden of caring for older adult patients with chronic diseases and family caregivers health status. *Alexandria Sci Nurs J*. 2016;18:43–60.
 15. Marinho JDS, Batista IB, Nobre RADS, et al. Burden, satisfaction caregiving, and family relations in informal caregivers of older adults. Brief Research Report. *Front Med*. 2022;9:1059467.
 16. Huyen DBT, Thi AN, Kim DVT, Le Minh H, Gammeltoft T, Vestergaard AR. Mobilizing morality: How caregivers in Vietnam handle the challenges of daily diabetes care. *BMC Public Health*. 2023;23:1744.
 17. Hanh PTH, Jullamate P, Piphatvanitcha N. Factors Related to Caregiver Burden among Family Caregivers of Older Adults with Stroke in Hai Duong, Vietnam, Burapha University;2017.
 18. Limpawattana P, Theeranut A, Chindaprasirt J, Sawanyawisuth K, Pimporm J. Caregivers burden of older adults with chronic illnesses in the community: a cross-sectional study. *J Community Health*. 2013;38:40–45.
 19. Zimet GD, Powell SS, Farley GK, Werkman S, Berkoff KA. Psychometric characteristics of the Multidimensional Scale of Perceived Social Support. *J Pers Assess*. 1990;55(3–4):610–617.
 20. Ho TTQ, Li C, Gu C. Cyberbullying victimization and depressive symptoms in Vietnamese university students: examining social support as a mediator. *Int J Law Crime Justice*. 2020;63:100422.
 21. Mahoney FI, Barthel DW. Functional evaluation: the Barthel index. *Md State Med J*. 1965;14:61–65.
 22. Bédard M, Molloy DW, Squire L, Dubois S, Lever JA, O'Donnell M. The Zarit Burden Interview: a new short version and screening version. *Gerontologist*. 2001;41:652–657.
 23. Anh NN, Hy DTK. Survey on caregiving burden for patients with Alzheimer at the Central Gerontological Hospital in 2020 – 2021. *Vietnam Med J*. 2021;503 (In Vietnamese).
 24. Albani EN, Toska A, Togas C, et al. Burden of caregivers of patients with chronic diseases in primary health care: a cross-sectional study in Greece. *Nurs Reports*. 2024;14:1633–1646.
 25. Adib-Hajbaghery M, Ahmadi B. Caregiver burden and its associated factors in caregivers of children and adolescents with chronic conditions. *Int J Community Based Nurs Midwifery*. 2019;7:258–269.
 26. Yigitalp G, Surucu HA, Gumus F, Evinc E. Predictors of caregiver burden in primary caregivers of chronic patients. *Intl J Caring Sci*. 2017;10:1168–1177.
 27. Ghazali SB, Abdullah KL, Aziz ABA, et al. Burden of caregivers of the elderly with chronic illnesses and their associated factors in an urban setting in Malaysia. *Malaysian J Public Health Med*. 2015;15:1–9.
 28. Bastawrous M. Caregiver burden – a critical discussion. *Int J Nurs Stud*. 2013;50:431–441.
 29. Choi JY, Lee SH, Yu S. Exploring factors influencing caregiver burden: a systematic review of family caregivers of older adults with chronic illness in local communities. *Healthcare (Basel)*. 2024;12:1002.
 30. Barghbani H, Barghbani R, Salehi Y, Rad M. The relationship between health anxiety and caregiver burden in informal caregivers of patients with COVID-19. *Jundishapur J Chronic Dis Care*. 2023;12:e132191.
 31. Sayadi L, Masoumi Fard F. Relationships between burden of care and mental health of family members of hospitalized patients with COVID-19. *J Res Develop Nurs Midwif*. 2022;19:59–62.
 32. Pai HS, Kannan B, Jebasingh YK, Raj ATE, Das S. Analysis of Barthel index and care giver strain index in stroke patients in tertiary care hospital in South India. *Int J Res Med Sci*. 2023;11:4437–4440.
 33. Fang L, Dong M, Fang W, Zheng J. Relationships between care burden, resilience, and depressive symptoms among the main family caregivers of stroke patients: a cross-sectional study. *Front Psychiatry*. 2022;13:960830.

34. Kim EK, Park H. Factors associated with burden of family caregivers of home-dwelling elderly people with dementia: a systematic review and meta-analysis. *Korean J Adult Nurs.* 2019;31:351–364.
35. Yu DSF, Cheng ST, Wang J. Unravelling positive aspects of caregiving in dementia: an integrative review of research literature. *Int J Nurs Stud.* 2018;79:1–26.
36. Bongelli R, Busilacchi G, Pacifico A, et al. Caregiving burden, social support, and psychological well-being among family caregivers of older Italians: a cross-sectional study. *Front Public Health.* 2024;12:1474967.
37. Ong HL, Vaingankar JA, Abdin E, et al. Resilience and burden in caregivers of older adults: moderating and mediating effects of perceived social support. *BMC Psychiatry.* 2018;18:27.
38. Roth DL, Fredman L, Haley WE. Informal caregiving and its impact on health: a reappraisal from population-based studies. *Gerontologist.* 2015;55:309–319.