Vietnam Journal of Community Medicine, Vol. 67, English version No. 1, 2026, 111-116

PREVALENCE OF DEPRESSION AND ASSOCIATED FACTORS AMONG CAREGIVERS OF INPATIENTS AT MEDICAL AND PHARMACEUTICAL UNIVERSITY HOSPITAL

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Received: 18/04/2026
Revised: 08/05/2026; Accepted: 26/05/2026

ABSTRACT

Background: Depression is a prevalent mental health issue among caregivers, especially those caring for patients with chronic conditions or requiring prolonged hospitalization. Early identification and intervention are crucial to improving both caregiver well-being and patient care quality.

Objective: To determine the prevalence of depression and identify associated factors among caregivers of inpatients at the Medical and Pharmaceutical University Hospital.

Methods: A cross-sectional study was conducted on 330 caregivers of inpatients at the Medical and Pharmaceutical University Hospital from December 2025 to March 2026. Depression was screened using the Patient Health Questionnaire-9 (PHQ-9) scale. Data were analyzed using descriptive statistics and multivariable logistic regression.

Results: The prevalence of depressive symptoms among caregivers was 51.2%, including at-risk (22.7%), mild (9.7%), moderate (9.7%), and severe (9.1%) levels. The mean depression score was 7.5±7.2 (total: 27). Multivariable logistic regression identified several associated factors with depression as residing in rural areas (OR = 3.54; 95% CI: 1.54–8.09; p < 0.05); poor caregiver health status (OR = 2.23; 95% CI: 1.05–4.72; p = 0.036); caregiving burden (OR = 1.97; 95% CI: 1.09–3.56; p = 0.023). The type of patient illnesses was significantly associated with the depression of caregivers (p<0.001).

Conclusion: More than half of the caregivers experienced depressive symptoms. Targeted psychological support, health education, and social assistance, particularly for older caregivers and those from rural areas, are essential to mitigate depression and enhance caregiving outcomes.

Keywords: Depression, caregivers, inpatients, PHQ-9, associated factors.

1. INTRODUCTION

Caregivers are vital to the treatment and recovery process of patients with chronic diseases, stroke, or those requiring prolonged hospitalization. However, the physical, emotional, and financial demands of long-term caregiving often lead to significant psychological distress, with depression emerging as a primary concern. Global studies indicate a high prevalence of depression among caregivers, particularly those supporting stroke patients, with rates reaching up to 59.5%[1].

The risk of depression is influenced by various factors, including caregiver demographics and pre-existing health status[2–5]. In the hospital setting, caregiver depression does not only impair their own quality of life but also creates a "ripple effect" that compromises the safety, medication adherence, and overall treatment outcomes of the patients.

Despite the heavy burden placed on family caregivers in Vietnam's healthcare system, empirical research on their mental health remains limited, especially in multidisciplinary university hospitals. This study was conducted to analyze the prevalence of depression and identify associated factors among caregivers at the Medical and Pharmaceutical University Hospital. The findings aim to provide a scientific basis for developing targeted psychological screening and support interventions for this vulnerable group.

2. METHODS

2.1. Study design: A hospital-based cross-sectional descriptive study was conducted to achieve the research objectives.

2.2. Participants and Setting

A total of 330 caregivers of inpatients at the Medical and Pharmaceutical University Hospital were recruited from December 2025 to March 2026 using a convenience sampling technique.

- ***Inclusion criteria:*** Caregivers aged ≥18 years, capable of communicating in direct interviews, and providing informed consent.

- ***Exclusion criteria:*** Individuals with severe sensory or cognitive impairments (hearing, speech, or mental health disorders preventing interview participation) or those requiring total assistance for their own self-care.

2.3. Data collection and instruments

Data were collected through face-to-face interviews using a structured questionnaire in a private setting to ensure confidentiality. The survey instrument included:

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- Demographics and clinical characteristics: age, sex, occupation, marital status, education level, residency, caregiver health status, relationship to the patient, and patient's clinical data (diagnosis, duration of illness, number of admissions).

- Depression screening (PHQ-9): Depression was assessed using the Patient Health Questionnaire-9 (PHQ-9). This 9-item scale evaluates the frequency of depressive symptoms over the past two weeks on a 4-point Likert scale (0 to 3). Total scores range from 0 to 27, categorized as: No depression (0–4), Risk of depression (5–9), Mild (10–14), Moderate (15–19), and Severe depression (20–27)[6]. The Vietnamese version used in this study is culturally adapted and recognized for clinical use. To identify associated factors with depression of caregivers, we use the outcome binary variable (depression: total score ≥10; no depression: total score <10).

- Caregiver Burden (ZBI): The Zarit Burden Interview (ZBI), consisting of 22 items, was used to evaluate caregiving-related stress (5). Each item is scored from 0 (never) to 4 (always), with a total score range of 0–88. Burden levels were classified as: Little/No burden (<20), Mild to Moderate (21–40), Moderate to Severe (41–60), and Severe burden (>61). For statistical purposes, caregiver burden was analyzed as a binary variable: "No/Little burden" (score < 21) and "Presence of burden" (score ≥21). This dichotomization follows established clinical cut-off points to distinguish between caregivers with and without significant distress.

2.4. Data management and analysis

Data were cleaned and analyzed using SPSS version 20.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations (SD), were calculated. To identify associated factors, univariate analysis (Chi-square or Fisher's exact test) was first applied. Variables with $p < 0.05$ were then entered into a multivariable binary logistic regression model to determine independent predictors of depression. Statistical significance was set at $p < 0.05$.

2.5. Ethical considerations

The study protocol received ethical approval from the Institutional Review Board (IRB) of the Medical and Pharmaceutical University Hospital (Decision No. 612/HĐĐĐ-BVĐHYD, issued on January 7, 2026). All participants were fully informed of the study's purposes and provided voluntary written consent before data collection began.

3. RESULTS

3.1. General characteristics of the study population

Among 330 caregivers, the majority were female (60%). Detailed demographic and clinical characteristics are presented in Table 1.

Table 1. Demographic and socio-economic characteristics of caregivers (n = 330)

Characteristics	Male (n=132)		Female (n=198)		Total (n=330)		p
	n	%	n	%	n	%	
Age							
< 60	105	41,8	146	58,2	251	76,1	0,226
≥60	27	34,2	52	65,8	79	23,9	
$\bar{X} \pm SD$	51,0 ± 12,6		51,4 ± 12,8		51,2 ± 12,7		
Educational level							
Less than high school	18	29,0	44	71,0	62	18,8	0,050
High school or higher	114	42,5	154	57,5	268	81,2	
Occupation							
Manual labor	34	36,6	59	63,4	93	28,2	0,424
Intellectual labor	98	41,4	139	58,6	237	71,8	
Marital status							
Single	17	44,7	21	55,3	38	11,5	0,526
Married	115	39,4	177	60,6	292	88,5	
Place of residence							
Rural	31	43,1	41	56,9	72	21,8	0,587
Urban	101	39,1	157	60,9	258	78,2	
Family economic status							
Difficult	18	32,7	37	67,3	55	16,7	0,228
Average/well-off	114	41,5	161	58,5	275	83,3	

p-values were obtained from the chi-square test or Fisher's exact test

The mean age of the study participants was 51.2 ± 12.7 years. Most participants had an educational level of high school or higher (81.2%), and the majority were engaged in intellectual labor (71.8%). Most caregivers were married (88.5%), lived in urban areas (78.2%), and had average or better family economic status (83.3%) ($p > 0.05$).

Table 2. Personal and caregiving characteristics of caregivers (n = 330)

Characteristics	Male (n=132)		Female (n=198)		Total (n=330)		p
	n	%	n	%	n	%	
Health status							
Normal	116	40,7	169	59,3	285	86,4	0,513
Fatigued/poor health	16	35,6	29	64,4	45	13,6	
Relationship to the patient							
Family member	131	41,5	185	58,5	316	95,8	0,01
Hired caregiver	1	7,1	13	92,9	14	4,2	
Aregiving duration							
< 8 hours/day	50	39,1	78	60,9	128	38,8	0,782
≥ 8 hours/day	82	40,6	120	59,4	202	61,2	
Caregiver burden							
No/Minimal burden (ZBI < 21)	64	40,5	94	59,5	158	47,9	0,857
Yes (ZBI ≥21)	68	39,5	104	60,5	172	52,1	

Normal health status accounted for 86.4% of caregivers, while 13.6% reported frequent fatigue or poor health, with no significant difference between males and females (p > 0.05). Most caregivers were family members (95.8%), whereas hired caregivers accounted for only 4.2%, with a statistically significant difference between males and females (p < 0.05). The proportion of caregivers providing care for ≥ 8 hours per day was highest at 61.2%, with no significant difference between the two gender (p > 0.05).

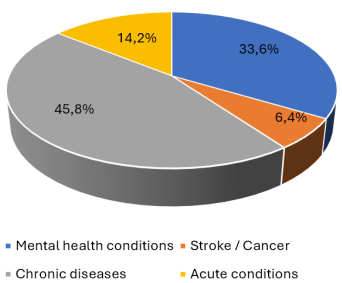


Figure 1. Classification of inpatients' diseases (n = 330)

Patients with conditions requiring caregiver support were mainly those with chronic diseases, accounting for the highest proportion (45.8%), followed by mental health conditions (33.6%), while acute illnesses accounted for the lowest proportion (6.4%).

Among the 330 caregivers, 48.8% (161 individuals) showed no symptoms of depression. However, a considerable proportion of caregivers experienced different levels of depression. Specifically, 22.7% (75 individuals) were at risk of depression, 9.7% (32 individuals) had mild depression, 9.7% (32 individuals) had moderate depression, and 9.1% (30 individuals) had severe depression. The mean depression score among caregivers was 7.5 ± 7.2, ranging from 0 to 27 (Table 3).

Table 3. Prevalence of depression among caregivers according to PHQ-9 (n = 330)

Severity of depression	n	%
No depression (0–4 points)	161	48,8
Risk of depression (5–9 points)	75	22,7
Mild depression (10–14 points)	32	9,7
Moderate depression (15–19 points)	32	9,7
Severe depression (≥ 20 points)	30	9,1
Total	330	100
Score of PHQ-9: $\bar{X}$ ± SD; Max - Min	7,5 ± 7,2; 0 - 27	

3.2. Factors associated with depression of the caregivers

Table 4. Univariate regression analysis of the association between several factors and depression (n = 330)

Characteristics	Depression		Univariate analysis		
	No n (%)	Yes n (%)	p	OR	95%CI
Sex					
Male	88 (66,7)	44 (33,3)	0,112	1,48	0,91 – 2,4
Female	148 (74,7)	50 (25,3)		1	
Age					
< 60	184 (73,3)	67 (26,7)	0,200	0,70	0,40 – 1,2
≥60	52 (65,8)	27 (34,2)		1	

Characteristics	Depression		Univariate analysis		
	No n (%)	Yes n (%)	p	OR	95%CI
Educational level					
Less than high school	40 (64,5)	22 (35,5)	0,177	0,66	0,37 – 1,20
High school or higher	196 (73,1)	72 (26,9)		1	
Occupation					
Manual labor	56 (60,2)	37 (39,8)	0,005	2,08	1,2 – 3,4*
Intellectual labor	180 (75,9)	57 (24,1)		1	
Marital status					
Single	23 (60,5)	15 (39,5)	0,114	1,75	0,87 – 3,54
Married	213 (72,9)	79 (27,1)		1	
Health status					
Normal	213 (74,7)	72 (25,3)	0,002	0,35	0,18 – 0,67*
Fatigued/poor health	23 (51,1)	22 (48,9)		1	
Place of residence					
Rural	33 (45,8)	39 (54,2)	0,000	0,22	0,13 – 0,39**
Urban	203 (78,7)	55 (21,3)		1	
Family economic status					
Difficult	33 (60)	22 (40)	0,04	1,88	1,02 – 3,43*
Average/well-off	203 (73,8)	72 (26,2)		1	
Relationship to the inpatient					
Family member	228 (72,2)	88 (27,8)	0,231	0,515	0,17 – 1,52
Hired caregiver	8 (57,1)	6 (42,9)		1	
Caregiving duration					
< 8 hours/day	104 (81,2)	24 (18,8)	0,002	0,43	0,25 – 0,73*
≥ 8 hours/day	132 (65,3)	70 (34,7)		1	
Type of patients' illnesses					
Mental health conditions	48 (43,2)	63 (56,8)		11,02	4,05 – 29,98**
Stroke/cancer	15 (71,4)	6 (28,6)	0,000	3,36	0,89 – 12,64**
Chronic diseases	131 (86,8)	20 (13,2)		1,28	0,45 – 3,62**
Acute conditions	42 (89,4)	5 (10,6)		1	
Caregiver burden					
No	124 (78,5)	34 (21,5)	0,008	0,51	0,31 – 0,80*
Yes	112 (65,1)	60 (34,9)		1	

**: p < 0,05; **: P < 0,001*

Univariate logistic regression identified several significant predictors of caregiver depression ($p < 0.05$). Regarding socio-demographic factors, rural residents (OR = 0.22; 95% CI: 0.13–0.39) and manual laborers (OR = 2.08 for intellectual vs. manual) faced significantly higher risks. Financial difficulty also increased the likelihood of depression (OR = 0.53 for well-off vs. difficult). Among caregiving and clinical factors, poor health status (OR = 1.88) and caregiving duration ≥8 hours/day (OR = 0.43) were major correlates. Notably, the type of patient illness showed the strongest association, with caregivers of patients with mental health conditions (OR = 11.02) and stroke/cancer (OR = 3.36) experiencing the highest risks compared to acute conditions. Finally, perceived caregiver burden (ZBI ≥21) nearly doubled the risk of depression (OR = 0.51; 95% CI: 0.31–0,80).

3.3. Multivariable logistic regression analysis of risk factors and stroke prevention knowledge

Table 5. Multivariable logistic regression analysis of risk factors associated with stroke prevention knowledge (n = 330)

Characteristic	Depression		
	p	OR	95%CI
Age	0,560	1,206	0,64 – 2,26
Occupation	0,592	0,808	0,37– 1,76
Educational level	0,815	1,086	0,54 – 2,16
Marital status	0,157	0,585	0,27 – 1,23
Health status	0,036	2,231	1,05 – 4,72*
Relationship to the patient	0,794	1,171	0,35 – 3,83
Caregiving duration	0,619	0,846	0,43 – 1,63
Place of residence	0,003	3,540	1,54 – 8,09*
Family economic status	0,837	0,926	0,44 – 1,923
Type of patients' illnesses	0,000	0,410	0,30 – 0,54**
Caregiver burden	0,023	1,979	1,09 – 3,56*

**: p<0,05; **: P<0,001*

Multivariable logistic regression analysis showed that caregivers' depression was significantly associated with health status, place of residence, caregiving burden, and patients' underlying diseases.

4. DISCUSSION

The study revealed a mean PHQ-9 score of 7.5 ± 7.2, with 51.2% of caregivers exhibiting some level of depressive symptoms (PHQ-9 ≥5). While nearly half (48.8%) reported no symptoms, the prevalence of moderate to severe depression (18.8%) remains a significant clinical concern. Compared to previous local studies, our prevalence is slightly higher than Nguyen Thanh Binh's, who reported that 30.8% of caregivers had depressive symptoms, including 19.2% with mild depression and 11.6% with moderate depression[6], but lower than studies focusing exclusively on stroke caregivers (43.87%)[3]. This variance is likely due to our diverse inpatient population. Unlike stroke patients who often suffer from permanent disabilities and high dependency, our sample included various medical conditions with differing levels of acuity, potentially mitigating the overall psychological strain on some caregivers.

Caregivers of patients with mental health disorders had the highest prevalence of depression (56.8%). This finding is consistent with previous studies, possibly because mental disorders are often chronic and recurrent, patients are highly dependent on caregivers, and behavioral disturbances may occur, increasing psychological and emotional burden. A study by Yao (2024) involving 1,224 informal caregivers of individuals with mental illness in China reported that 53.5% experienced moderate to severe depression[7,8].

In our study, caregivers of cancer patients had a depression rate of 33.3%, higher than many other disease groups. This may be related to the severity of the disease, prolonged treatment duration, concerns about prognosis, and high treatment costs. A 2022 meta-analysis of 85 studies including more than 23,000 caregivers of cancer patients reported a depression prevalence of 25% (9). Stroke patients often experience mobility limitations, functional impairment, and dependence in daily activities, leading to prolonged caregiving and increased caregiver burden. A study by Ly Thuy Dan Phuong (2024) reported a depression prevalence of 26.6% among caregivers of stroke patients[4].

Our study showed that caregiver depression was significantly associated with current health status, rural residence, and caregiver burden ($p < 0.05$). Caregivers living in rural areas had a higher risk of depression compared with those living in urban areas (OR = 0.43; 95% CI: 0.25–0.73). Caregivers residing in rural settings may have limited access to healthcare services, psychological support, and social resources, thereby increasing caregiving burden and negatively affecting mental health. This finding is consistent with the study by Jun Wu (2026), which identified place of residence as a factor associated with caregiver depression, with rural caregivers having a higher risk due to economic burden and limited access to healthcare services[10].

Caregivers with poor health had a higher risk of depression compared with those with good health (OR = 0.35; 95% CI: 0.18–0.67). Our findings are consistent with a study by Lee (2023) on caregivers of patients with depressive disorders, which reported that individuals with poor health were more likely to experience depressive symptoms than those with good health[11]. A 2024 survey among caregivers of patients with mental disorders in China also found that declining health status was associated with increased depression, particularly among those with poor health or persistent fatigue[8] Thus, caregiver health status is closely related to depression. When physical health deteriorates, the ability to cope with stress decreases, and caregiving burden increases, thereby elevating the risk of depressive symptoms.

Our findings are also consistent with previous studies showing that caregiver burden is strongly associated with depression (OR = 0.51; 95% CI: 0.31–0.80). Mohamad reported that caregiver burden was an important risk factor for depression, with a moderate correlation ($r = 0.408$) and statistical significance ($p < 0.001$)[12]. Similarly, a study among caregivers of patients with dementia in Kazakhstan found that spousal caregivers experienced more severe caregiving burden and had a higher risk of depression compared with other groups[7]. Nguyen Thanh Thuy (2024) also reported a very strong positive correlation between depression and caregiver burden ($r = 0.92$; $p < 0.001$)[9].

These findings suggest that as caregiver burden increases, the risk of depression also increases. Caregiver burden includes not only daily caregiving tasks but also psychological stress, concerns about prognosis, treatment costs, and disruptions in personal life, all of which contribute to deteriorating mental health. Balancing patient care, family responsibilities, and economic demands may lead to both physical and emotional exhaustion, thereby increasing the risk of depression. When patients become more dependent, caregivers must devote more time and effort and face prolonged stress, resulting in reduced social activities, limited rest, and increased psychological strain. These findings highlight the importance of early assessment of caregiver burden and implementation of supportive interventions such as psychological counseling,

caregiving skills training, shared caregiving responsibilities within families, and enhanced social support. Such interventions may help reduce caregiving burden, improve mental health, and decrease the risk of depression among caregivers.

5. CONCLUSION

This study reveals a significant prevalence of depressive symptoms among caregivers, affecting 51.2% of the participants. While demographic characteristics such as age, sex, and education did not show significant associations, caregiver depression was strongly linked to several key factors, including rural residence, poor personal health status, high caregiving intensity (≥8 hours/day), and elevated caregiver burden. Notably, the type of patient illness—particularly mental health disorders, stroke, and cancer—significantly increased the risk of depression. These findings emphasize the necessity of routine psychological screening and targeted supportive interventions to address these associated factors, thereby improving the mental health and quality of life for high-risk caregivers.

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