Journal of Multidisciplinary Healthcare

Dovepress
Taylor & Francis Group

Open Access Full Text Article

ORIGINAL RESEARCH

Co-Occurring Neuropsychiatric Conditions and Functional Status: Associations with Caregiver Quality of Life in Older Veterans

Steven D Shirk[1–3], Victoria Ngo[1], Elizabeth S Chamberlin[1], Elizabeth E Marfeo[4], Bret L Hicken[5,6], Lauren R Moo[1,7]

[1]New England Geriatric Research Education and Clinical Center (NE GRECC), VA Bedford Healthcare System, Bedford, MA, USA; [2]Department of Psychiatry and Behavioral Sciences and Population and Quantitative Health Sciences, Chan Medical School, University of Massachusetts, Worcester, MA, USA; [3]Research Service, VA Bedford Healthcare System, Bedford, MA, USA; [4]Department of Community Health, Tufts University, Medford, MA, USA; [5]VA Office of Rural Health (ORH), Veterans Rural Health Resource Center, Salt Lake City, UT, USA; [6]Department of Medicine, University of Utah, Salt Lake City, UT, USA; [7]Department of Neurology, Harvard Medical School, Boston, MA, USA

Correspondence: Lauren R Moo, New England Geriatric Research Education and Clinical Center (NE GRECC), Bedford VA Healthcare System, 200 Springs Road, Bedford, MA, 01730, USA, Email lauren.moo@va.gov

Objective: This study examined the impact of a care recipient's level of daily functioning and the presence of co-occurring neuropsychiatric conditions on caregiver Quality of Life (QoL).

Methods: This cross-sectional study involved 504 informal caregivers of U.S. veterans aged 65 years and older. Measures included caregiver QoL, care recipient functioning, and questions regarding the care recipient's neuropsychiatric conditions. Hierarchical linear regression analyses examined relationships between these variables while adjusting for important socio-demographic factors.

Results: Caregivers of veterans with a neuropsychiatric condition (54.0% of the sample) reported lower QoL than those caring for veterans without such conditions. In hierarchical linear regression, ADL functioning ($\beta = 0.15$, $p = 0.002$) and the presence of a neuropsychiatric condition ($\beta = -0.11$, $p = 0.021$) independently predicted poorer caregiver QoL, while adjusting for sociodemographic variables. Within the subgroup of participants with neuropsychiatric conditions, depression emerged as the only condition significantly associated with reduced caregiver QoL ($\beta = -0.19$, $p = 0.001$), even after adjusting for functional status.

Conclusion: Our findings highlight the significant negative impact of care recipient functional limitations and depression on caregiver QoL and contribute to our broader understanding of how care recipient characteristics affect caregiver outcomes among older adult populations.

Keywords: informal caregiving, veterans, neuropsychiatric conditions, depression, functional status, quality of life

Introduction

The global aging population has created unprecedented demands for informal caregiving, with approximately 24 million Americans providing care to adults aged 65 years and older.[1] While caring for older adults can offer meaningful rewards, it frequently imposes significant physical, psychological, and financial burdens on caregivers. This burden is particularly pronounced among those caring for veterans, who often present with complex physical and mental health conditions resulting from their service experiences. Understanding the factors impacting informal caregivers' QoL is essential for developing targeted interventions to support this vulnerable population.

Previous caregiving research proposes three main factors affecting caregiver outcomes: (1) caregiver characteristics, (2) caregiving context, and (3) care recipient characteristics.[2,3] While there is significant literature on the first two categories, studies on care recipient characteristics are comparatively limited, often focusing on sociodemographic factors or a specific disease like Alzheimer's disease (AD) or cancer. This narrow approach hinders our understanding

https://doi.org/10.2147/JMDH.S590459
Received: 21 January 2026
Accepted: 8 April 2026
Published: 13 May 2026

of how these findings apply in broader clinical settings and overlooks the complex interactions of various care recipient traits. Two key aspects that need more attention are functional limitations and co-occurring neuropsychiatric conditions.

Functional status—measured through activities of daily living (ADLs) and instrumental activities of daily living (IADLs)—represents a fundamental determinant of caregiving intensity and time commitment. As care recipients lose independence in basic functions such as bathing, dressing, or medication management, caregivers must provide increasingly hands-on assistance, often resulting in physical strain, disrupted sleep, and restricted personal time. Previous research has demonstrated that ADL dependency correlates with increased caregiver burden in disease-specific studies.[4,5] Each additional ADL limitation potentially adds considerable hours to weekly care provision.[6] Despite this substantial impact, care recipient functional limitations have received limited attention outside disease-specific contexts, leaving a significant gap in understanding their role across diverse older adult populations.

Neuropsychiatric conditions introduce distinct caregiving challenges that extend beyond physical care demands. These conditions (eg., depression, anxiety, PTSD, and neurodegenerative diseases) fundamentally alter care recipient behavior, cognitive processes, and emotional regulation. Caregivers must navigate unpredictable mood fluctuations, manage potentially distressing behaviors, monitor medication adherence, and provide complex emotional support—tasks that require specialized skills and can impose considerable psychological strain.

When examining their impact on caregivers, it is important to distinguish between neuropsychiatric *symptoms* and neuropsychiatric *conditions*. Neuropsychiatric symptoms—such as agitation, delusions, or mood disturbances—have been extensively studied as manifestations of primary conditions like dementia or Parkinson's disease (PD). Mortby et al found these symptoms highly prevalent across the cognitive spectrum (308–80%), viewed as secondary features arising from underlying neurodegenerative processes.[7] In contrast, neuropsychiatric conditions represent formal clinical diagnoses that may precede or co-occur with other health problems like dementia and often follow distinct treatment trajectories. For example, Bhome et al demonstrated this distinction in Functional Cognitive Disorder (FCD) patients, where 49% had co-morbid depression as a separate clinical condition meeting full ICD-10 criteria for Major Depressive Disorder—not merely manifesting as a symptom secondary to FCD[8] Importantly, they found FCD and depression are distinct disorders that can exist co-morbidly, with patients having both conditions showing greater impairment in executive function and memory domains, suggesting additive burden rather than symptoms from a single pathology. While neuropsychiatric symptoms arising from neurodegenerative conditions like AD[9] and chronic diseases[10,11] demonstrably affect caregiver QoL, the impact of co-occurring, co-morbid neuropsychiatric conditions remains less understood despite their high prevalence in older populations, particularly veterans.

In clinical care settings (eg., primary care), clinicians observe that caregivers often struggle when managing both the physical needs and psychological complexities of their care recipients, such as handling the physical challenges of a mobility-impaired person who also experiences anxiety.[12,13] While some research has highlighted the impact of neuropsychiatric symptoms on caregiver well-being in specific conditions like PD and AD, there is a significant gap in understanding how neuropsychiatric conditions and functioning simultaneously impact caregiver QoL across broader clinical populations.

The veteran population represents an ideal context for examining these relationships. They are older and experience higher rates of both functional limitations and neuropsychiatric conditions compared to the general population.[14,15] Additionally, the Veterans Health Administration (VHA), with its national programs, can serve as a clinical framework for the private sector.

Several gaps in the existing literature motivate the current study. First, much of the research on care recipient characteristics focuses on specific diseases (eg., dementia) or neuropsychiatric symptoms within those diseases, limiting generalizability. Second, there is insufficient research examining the combined and independent effects of formal neuropsychiatric conditions (as co-morbid diagnoses, rather than symptoms) and functional status on caregiver outcomes. Third, the unique caregiving context of older veterans (a population with high rates of both functional limitations and neuropsychiatric comorbidities) remains underexplored. To our knowledge, this is the first study to investigate how co-occurring neuropsychiatric conditions (as opposed to symptoms) and daily functioning levels jointly impact caregiver QoL in a broader population of older veterans receiving care. We hypothesize that lower functioning in care recipients and the presence of neuropsychiatric conditions will independently predict poorer caregiver QoL while adjusting for relevant sociodemographic factors. Among veteran care recipients with neuropsychiatric conditions, we further investigate which specific condition(s) emerge as the strongest predictors of reduced caregiver QoL. Findings from this study may inform targeted interventions and policy (eg., screening) to support caregivers of older veterans better.

Materials and Methods

Participants

Five hundred four caregivers of older US veterans (N = 504) were included in the present study and participated in a survey administered using the Qualtrics® federal platform from August 2022 to November 2022.[16] Participants were caregivers for veterans aged 65 years or older who lived independently and had provided care for more than 1 month, accompanied the veteran to a medical appointment within the past 12 months, and were not paid caregivers. Of 1772 eligible individuals,[16] 236 declined to participate. Next, we performed rigorous data quality checks and validation. This process involved attention checks and removal of responders who did not complete the survey. In addition, the quality of the data was further reviewed for consistent responses. These included the veteran's age and service era, mental health diagnosis, and mental health appointment attendance, as well as the relationship between the veteran and caregiver, which remained consistent (eg., their response did not change from spouse to friend). After review, 1025 provided invalid responses, yielding 511 participants with valid data. Seven participants who reported not knowing if the care recipient had a neuropsychiatric condition were excluded from this analysis, leaving a final sample of 504.

Ethics Approval and Consent to Participate

This study was reviewed by the VA Bedford Healthcare System Institutional Review Board (IRB ID#1657702) and was classified as "exempt". All participants were fully informed about the purpose and nature of the study prior to providing consent. Responsibility for participant consent was handled by the Qualtrics team, adhering to the Declaration of Helsinki.

Measures

Sociodemographic Information

Caregiver participants provided information on the care recipient's age, sex, race, ethnicity, education level, and income. They also provided the same information regarding themselves and whether they cohabitated with the care recipient.

Care Recipient's Neuropsychiatric Conditions

Participants answered two questions regarding the care recipient's current neuropsychiatric conditions. First, "Does the Veteran have a mental health condition(s) or a history of a mental health condition(s) (for example, post-traumatic stress disorder [PTSD], anxiety, depression, dementia)?"

Response options included "yes", "no", and "I don't know". For participants who responded "yes", they were directed to "Check all mental health conditions the Veteran currently has". The presented list included anxiety disorders, attention disorders, bipolar disorders, depressive disorders, neurodegenerative disease, obsessive-compulsive disorder (OCD), PTSD, psychotic disorders, and substance use disorders. Specific examples were given for each category. Respondents could select multiple conditions from the provided list. To be included in the neuropsychiatric conditions group, participants had to endorse the presence of a mental health condition and then select at least one neuropsychiatric condition.

Daily Functioning: ADLs and IADLs

Participants completed the Katz Index of Independence in Activities of Daily Living[17] and the Lawton Instrumental Activities of Daily Living Scale.[18] The Katz Index of Independence assesses functional status as a measure of the ability to perform basic activities of daily living. The caregiver indicates that the care recipient is independent in performing six functions: bathing, dressing, toileting, transferring, continence, and feeding. Response options are "yes" or "no", with yes items scored 1 and no items scored 0, with the total maximum score of 6 indicating high independence. The Katz Index demonstrated good internal consistency in our sample (Cronbach's α =0.83).

The Lawton Instrumental Activities of Daily Living (IADL) Scale assesses the care recipient's current level of performance and the assistance needed for higher-level skills. There are eight domains of function measured (eg., food preparation, managing finances). Scores range from 0 to 1 for each domain, and participants are scored according to their highest level of functioning in that category. The total score ranges from 0 to 8, with higher scores indicating greater independence. The Lawton IADL scale showed good internal consistency in this study (Cronbach's α =0.85).

Caregiver QoL

The Caregiver Quality of Life Questionnaire (CQLQ)[19] assesses the caregiver's physical and emotional QoL and functional well-being over the past week. The measure includes five domains: health history, physical well-being, social/family well-being, emotional well-being, and functional well-being, with a total of 19 items. Each item is scored on a 5-point Likert scale from 1=strongly agree to 5=strongly disagree. A higher score indicates better QoL. The CQLQ demonstrated good-excellent internal consistency in our study (Cronbach's α =0.90).

Statistical Analyses

Our primary outcome was caregiver QoL, measured by the CQLQ. Data analyses involved bivariate comparisons between CQLQ scores and sociodemographic information, functional measures, and neuropsychiatric conditions. We then performed two hierarchical linear regressions. For the full sample (N = 504), the first regression accounted for significant sociodemographic variables (Model 1), ADL and IADL scores (Model 2), and neuropsychiatric conditions (Model 3). An unconditional model, excluding sociodemographic covariates, is also reported.

For caregivers whose care recipient has a neuropsychiatric condition (n=272), a second regression included significant sociodemographic variables and ADL scores (Model 2) and depression (Model 3). Two-sided tests were used with an overall p =0.05. Multicollinearity diagnostics were performed, and all models met all statistical assumptions. Analyses were conducted using SAS 9.4®.

Results

Over half reported that the veteran care recipient had a current neuropsychiatric condition (54.0%, n=272). Veterans with a neuropsychiatric condition and their caregiver tended to be younger (M = 74.0, SD = 7.04; M = 40.8, SD = 11.86, respectively) than those veterans without a reported neuropsychiatric condition (M = 75.8, SD = 7.27; $t(502)$ = 2.77, p =0.006, d = 0.25) and their associated caregivers (M = 48.3, SD = 14.93; $t(399.76)$ = 6.04, p <0.001, d = 0.56).

Of the 272 caregivers caring for a veteran with a neuropsychiatric condition, the most frequent condition reported was PTSD (76.1%, n=207), followed by anxiety (66.9%, n=182), depression (54.4%, n=148), and a neurodegenerative disorder (50.4%, n=137). Notably, caregivers of veterans with a neuropsychiatric condition reported significantly lower QoL (M = 66.71, SD = 13.70) than those caring for veterans without such conditions (M = 72.55, SD = 11.53; t = 4.99, p <0.001, d = 0.44).

Bivariate Associations with Caregiver QoL

Initial bivariate analyses examined associations between sociodemographic characteristics, functional status, and caregiver QoL (see Table 1). Among demographic variables, caregiver sex was significantly associated with QoL, with male caregivers reporting higher QoL (M = 71.47, SD = 12.14) compared to female caregivers (M = 68.32, SD = 13.43; t = 2.59, p =0.001, d = 0.23). Caregiver income was also significantly related to QoL, with those earning ≥$60,000 reporting higher QoL (M = 72.86, SD = 12.07) than those earning less (M = 69.66, SD = 12.18; t = 2.39, p =0.017, d = 0.21). Caregiver age was positively associated with QoL (r =0.12, p =0.008), suggesting that older caregivers reported better QoL, although this effect was small.

Significant associations were found regarding caregiving context variables. Caregivers living with veterans reported lower QoL (M = 66.0, SD = 14.42) compared to non-cohabitating caregivers (M = 70.8, SD = 12.21; t = 3.56, p <0.001, d = 0.32). Since caregiver income was only applicable for those not living with the veteran, cohabitation was treated as a covariate in further analysis. Veterans' functional status also significantly impacted caregiver QoL, with higher ADL

Table 1 Caregivers' and Veterans' Demographic Information and Bivariate Comparisons with Caregiver QoL

Dichotomous Variables	**n (%)**	**CQLQ Score *M* (*SD*)**	***t***	***p***	***d***
Sex					
Veteran			1.26	0.207	0.23
Male	471 (94.2%)	69.66 (13.05)			
Female	31 (5.8%)	66.61 (12.33)			
Caregiver			2.59	**0.001**	0.23
Male	173 (34.0%)	71.47 (12.14)			
Female	330 (66.0%)	68.32 (13.43)			
Race					
Veteran			1.47	0.143	0.21
White	408 (81.6%)	68.99 (13.08)			
Non-white	96 (18.4%)	71.16 (12.93)			
Caregiver			1.67	0.095	0.24
White	411 (82.2%)	68.94 (13.24)			
Non-white	93 (17.8%)	71.44 (12.11)			
Ethnicity					
Veteran			0.77	0.440	0.14
Hispanic/Latino	34 (6.8%)	67.79 (14.38)			
Non-Hispanic/Latino	465 (93.2%)	69.59 (13.00)			
Caregiver			1.26	0.207	0.23
Hispanic/Latino	38 (7.6%)	71.95 (12.74)			
Non-Hispanic/Latino	465 (92.4%)	69.17 (13.09)			
Education					
Veteran			1.79	0.074	0.26
College degree	94 (18.8%)	71.47 (11.46)			
No college degree	393 (81.2%)	68.78 (13.44)			
Caregiver			1.19	0.236	0.17
College degree	148 (29.6%)	70.47 (12.72)			
No college degree	355 (70.4%)	68.95 (13.22)			
Income					
Veteran			1.52	0.129	0.22
≥60,000 USD	120 (24.0%)	70.15 (12.60)			
<60,000 USD	289 (76.0%)	67.99 (13.32)			
Caregiver (if living separately)			2.39	**0.017**	0.21
≥60,000 USD	132 (26.4%)	72.86 (12.07)			
<60,000 USD	220 (73.6%)	69.66 (12.18)			
Caregiver Cohabitation			3.56	**<0.001**	0.32
Yes	148 (29.6%)	66.00 (14.42)			
No	356 (70.4%)	70.81 (12.21)			
Neuropsychiatric Condition			4.99	**<0.001**	0.44
Yes	272 (54.0%)	66.71 (13.70)			
No	232 (46.0%)	72.55 (11.53)			
Continuous Variables		*M* (*SD*)	*r*	*p*	
Age (years)					
Veteran		74.8 (7.19)	0.04	0.3249	
Caregiver		44.1 (13.78)	0.12	**0.008**	
ADL		4.1 (2.05)	0.27	**<0.001**	
IADL		1.7 (2.19)	0.20	**<0.001**	

Notes: Bold p-values indicate statistical significance ($p < 0.05$). A Cohen's *d* of 0.2 indicates a small effect, 0.5 indicates a moderate effect, and greater than 0.8 indicates a large effect.

Abbreviations: CQLQ, Caregiver Quality of Life Questionnaire (higher scores indicate better quality of life); ADL,Activities of Daily Living; IADL, Instrumental Activities of Daily Living.

(r =0.27, p <0.001) and IADL (r =0.20, p <0.001) scores correlating positively with caregiver QoL. Caregivers of veterans with greater functional independence experienced better QoL.

Neuropsychiatric Condition and Functioning as Predictors of Caregiver QoL

A hierarchical multiple regression analysis was conducted to determine the relative contributions of sociodemographic, functional, and neuropsychiatric variables to caregiver QoL (Table 2). In Model 1, demographic variables (caregiver sex, caregiver age, and cohabitation status) were entered; caregiver sex (male; β =0.14, p <0.001), age (β =0.18, p <0.001), and cohabitation ($\beta = -0.20$, p <0.001) were significant predictors. In Model 2, ADL (β =0.17, p <0.001) and IADL (β =0.11, p =0.022) scores were significant positive predictors of caregiver QoL. All sociodemographic variables remained significant.

In the final model, the presence of neuropsychiatric conditions was added and was a significant negative predictor of caregiver QoL ($\beta = -0.12$, p =0.012), indicating that caregivers of veterans with neuropsychiatric conditions reported lower QoL even after accounting for demographic and functional factors. Notably, IADL was no longer a significant predictor (p =0.089), while ADL remained significant (β =0.15, p =0.002). All sociodemographic variables remained significant. An unadjusted model examining only functional and neuropsychiatric variables revealed that ADL (β =0.19, p <0.001) and neuropsychiatric condition ($\beta = -0.14$, p =0.002) were significant predictors, while IADL was not (p =0.196).

Neuropsychiatric Conditions Subgroup Analysis

Having established that the presence of care recipient neuropsychiatric conditions significantly predicted lower caregiver QoL in the full sample, we conducted a focused subgroup analysis to examine which specific neuropsychiatric conditions

Table 2 Hierarchical Regression Analysis Predicting Caregiver QoL

Model	B	β	SE	CI	p	Adj-R^2
Model 1						
Caregiver Sex	3.78	0.14	1.22	[1.38, 6.19]	**0.002**	0.07
Caregiver Age	0.17	0.18	0.04	[0.09, 0.26]	**<0.001**	
Caregiver Cohabitation	−5.74	−0.20	1.27	[−8.23, −3.25]	**<0.001**	
Model 2						
Caregiver Sex	3.61	0.13	1.20	[1.25, 5.97]	**0.003**	0.12
Caregiver Age	0.12	0.12	0.04	[0.03, 0.20]	**0.008**	
Caregiver Cohabitation	−5.15	−0.18	1.25	[−7.62, −2.69]	**<0.001**	
ADL	1.09	0.17	0.32	[0.47, 1.71]	**0.001**	
IADL	0.67	0.11	0.29	[0.10, 1.24]	**0.022**	
Model 3 (Full Model)						
Caregiver Sex	3.33	0.12	1.20	[0.97, 5.69]	**0.006**	0.13
Caregiver Age	0.09	0.10	0.04	[0.01, 0.18]	**0.043**	
Caregiver Cohabitation	−5.07	−0.18	1.25	[−7.46, −2.56]	**<0.001**	
ADL	0.99	0.15	0.32	[0.36, 1.61]	**0.002**	
IADL	0.52	0.09	0.30	[−0.08, 1.09]	0.089	
Neuropsychiatric Condition	−3.12	−0.12	1.23	[−5.54, −0.70]	**0.012**	
Unadjusted Model						
ADL	1.23	0.19	0.32	[0.60, 1.85]	**<0.001**	0.09
IADL	0.39	0.06	0.30	[−0.20, 0.97]	0.196	
Neuropsychiatric Condition	−3.77	−0.14	1.21	[−6.14, −1.39]	**0.002**	

Notes: Caregiver Sex is coded as 0 = female, 1 = male; Caregiver Cohabitation is coded as 0 = no, 1 = yes; Neuropsychiatric Condition is coded as 0 = no, 1 = yes. Higher scores on the dependent variable (Caregiver Quality of Life) indicate better quality of life. Bolded p-values indicate statistical significance (p <0.05).

Abbreviations: ADL, Activities of Daily Living; IADL, Instrumental Activities of Daily Living; CI, 95% confidence interval.

might be driving this effect. This analysis included only those caregivers who reported that the veteran care recipient had at least one neuropsychiatric condition (n = 272).

Within this subgroup, bivariate relationships between caregiver sex and QoL remained significant, with male caregivers reporting higher QoL (M = 70.41, SD = 12.41) than female caregivers (M = 64.88, SD = 13.97; t = 3.19, p =0.002, d = 0.41). Similarly, cohabitation status continued to show a significant association, with non-cohabitating caregivers reporting higher QoL (M = 68.67, SD = 12.83) than those living with the veteran (M = 62.16, SD = 14.63; t = 3.68, p <0.001, d = 0.47). However, caregiver age was no longer significantly associated with QoL (r =0.00, p =0.994). ADL was significantly associated with caregiver QoL (r =0.18, p =0.003); IADL was not (r =0.07, p =0.229). See Table 3.

We then examined bivariate relationships between each neuropsychiatric condition and caregiver QoL (Table 4). Despite PTSD being the most prevalent condition (76.1%), it did not show a significant association with caregiver QoL

Table 3 Caregivers' and Veterans' Demographic Information and Bivariate Comparisons with Caregiver QoL for Neuropsychiatric Conditions Subsample (n = 272)

Dichotomous Variables	**n (%)**	**CQLQ Score *M* (*SD*)**	***t***	***p***	***d***
Sex					
Veteran			0.06	0.956	0.01
Male	253 (93.0%)	66.81 (13.64)			
Female	17 (7.0%)	67.00 (14.21)			
Caregiver			3.19	**0.002**	0.41
Male	90 (33.1%)	70.41 (12.41)			
Female	182 (66.9%)	64.88 (13.97)			
Race					
Veteran			0.98	0.326	0.15
White	215 (79.0%)	66.29 (13.67)			
Non-white	57 (21.0%)	68.30 (13.84)			
Caregiver			1.68	0.094	0.25
White	217 (79.8%)	66.01 (13.84)			
Non-white	55 (20.2%)	69.47 (12.91)			
Ethnicity					
Veteran			0.03	0.975	0.01
Hispanic/Latino	24 (9.0%)	66.71 (15.47)			
Non-Hispanic/Latino	243 (91.0%)	66.80 (13.64)			
Caregiver			1.41	0.160	0.29
Hispanic/Latino	26 (9.6%)	70.31 (13.16)			
Non-Hispanic/Latino	246 (90.4%)	66.33 (13.73)			
Education					
Veteran			1.42	0.157	0.22
College degree	50 (18.9%)	69.06 (12.20)			
No college degree	215 (81.1%)	66.00 (14.06)			
Caregiver			0.50	0.617	0.07
College degree	73 (26.8%)	67.40 (13.86)			
No college degree	199 (73.2%)	66.46 (13.67)			
Income					
Veteran			1.50	0.136	0.22
≥60,000 USD	62 (27.2%)	68.44 (13.22)			
<60,000 USD	166 (72.8%)	65.39 (13.85)			
Caregiver (if living separately)			0.83	0.407	0.13
≥60,000 USD	62 (33.0%)	69.79 (13.35)			
<60,000 USD	126 (67.0%)	68.13 (12.68)			

(*Continued*)

Table 3 (Continued).

Dichotomous Variables	**n (%)**	**CQLQ Score *M* (*SD*)**	***t***	***p***	***d***
Caregiver Cohabitation			3.68	**<0.001**	0.47
Yes	82 (30.1%)	62.16 (14.63)			
No	190 (69.9%)	68.67 (12.83)			
Continuous Variables		*M* (*SD*)	*r*	*p*	
Age (years)					
Veteran		74.0 (7.04)	0.02	0.777	
Caregiver		40.5 (11.54)	0.00	0.994	
ADL		3.52 (2.10)	0.18	**0.003**	
IADL		1.04 (1.71)	0.07	0.229	

Notes: A Cohen's *d* of 0.2 indicates a small effect, 0.5 indicates a moderate effect, and greater than 0.8 indicates a large effect. Bolded p-values indicate statistical significance (p <0.05).

Abbreviations: CQLQ, Caregiver Quality of Life Questionnaire (higher scores indicate better quality of life); ADL, Activities of Daily Living; IADL, Instrumental Activities of Daily Living;

Table 4 Caregiver QoL Comparisons by Neuropsychiatric Condition Among Veterans with at Least One Neuropsychiatric Condition (n = 272)

Neuropsychiatric Condition	**Present**	**Absent**	***t***	***p***	***d***
Anxiety					
n (%)	182 (66.9%)	90 (33.1%)	0.88	0.382	0.12
CQLQ Score, *M* (*SD*)	66.20 (13.50)	67.74 (14.12)			
Depression					
n (%)	148 (52.1%)	124 (45.6%)	3.14	**0.002**	0.38
CQLQ Score, *M* (*SD*)	64.36 (13.74)	69.52 (13.18)			
PTSD					
n (%)	207 (72.9%)	65 (23.9%)	1.27	0.207	0.18
CQLQ Score, *M* (*SD*)	66.12 (13.43)	68.58 (14.48)			
OCD					
n (%)	44 (15.5%)	228 (83.8%)	0.99	0.324	0.16
CQLQ Score, *M* (*SD*)	64.84 (13.49)	67.07 (13.74)			
Psychosis					
n (%)	28 (9.9%)	244 (89.7%)	0.68	0.496	0.14
CQLQ Score, *M* (*SD*)	65.04 (11.27)	66.90 (13.96)			
Bipolar					
n (%)	64 (22.5%)	208 (76.5%)	−0.01	0.995	0.00
CQLQ Score, *M* (*SD*)	66.72 (12.62)	66.71 (14.05)			
Substance Use					
n (%)	48 (16.9%)	224 (82.4%)	1.22	0.223	0.19
CQLQ Score, *M* (*SD*)	64.52 (13.87)	67.18 (13.65)			
Attention					
n (%)	49 (17.3%)	224 (82.4%)	−0.36	0.720	0.06
CQLQ Score, *M* (*SD*)	67.65 (13.97)	66.57 (13.68)			
Neurodegenerative					
n (%)	137 (48.2%)	135 (49.6%)	−0.50	0.616	0.06
CQLQ Score, *M* (*SD*)	67.12 (13.52)	66.29 (13.93)			

Notes: Effect size interpretations for Cohen's *d*: small = 0.2, medium = 0.5, large = 0.8. Bolded *p* values indicate statistical significance at p <0.05.

Abbreviations: CQLQ, Caregiver Quality of Life Questionnaire (higher scores indicate better quality of life); PTSD, Post-Traumatic Stress Disorder; OCD, Obsessive-Compulsive Disorder.

Table 5 Hierarchical Regression Analysis Predicting Caregiver QoL for Veterans with Neuropsychiatric Conditions (n = 272)

Model	B	β	SE	CI	*p*	Adj-R^2
Model 1						
Caregiver Sex	4.83	0.17	1.69	[1.50, 8.16]	**0.005**	0.09
Caregiver Cohabitation	−5.62	−0.19	1.75	[−9.06, −2.18]	**0.001**	
ADL	0.95	0.15	0.38	[0.20, 1.71]	**0.013**	
Model 2						
Caregiver Sex	4.32	0.15	1.67	[1.03, 7.62]	**0.010**	0.12
Caregiver Cohabitation	−5.99	−0.20	1.72	[−9.38, −2.60]	**0.001**	
ADL	0.92	0.14	0.38	[0.18, 1.66]	**0.016**	
Depression	−4.98	−0.18	1.58	[−8.09, −1.88]	**0.002**	

Notes: Caregiver Sex is coded as 0 = female, 1 = male; Caregiver Cohabitation is coded as 0 = no, 1 = yes; Depression is coded as 0 = no, 1 = yes. Higher scores on the dependent variable (Caregiver Quality of Life) indicate better quality of life. Bolded *p* values indicate statistical significance (p <0.05).
Abbreviations: ADL, Activities of Daily Living; CI, 95% confidence interval.

(t = 1.27, p =0.207). Similarly, anxiety, neurodegenerative conditions, and other neuropsychiatric disorders were not significantly associated with caregiver QoL in bivariate analyses. The only neuropsychiatric condition that showed a statistically significant bivariate relationship with caregiver QoL was depression (t = 3.14, p =0.002, d = 0.38), indicating that caregivers of veterans with depression reported significantly lower QoL (M = 64.36, SD = 13.74) compared to caregivers of veterans with other neuropsychiatric conditions but without depression (M = 69.52, SD = 13.18).

Next, a hierarchical regression was conducted to determine the relative contribution of caregiver sex, cohabitation status, ADL, and depression to caregiver QoL within the neuropsychiatric condition subgroup (Table 5). In the first model, caregiver sex, cohabitation status, and ADL were entered, and caregiver sex (β =0.17, p =0.005), cohabitation (β = −0.19, p <0.001), and higher ADL functioning (β =0.15, p =0.013) were all significant predictors.

In a second model, depression was added to the model and was a significant negative predictor of caregiver QoL (β = −0.18, p =0.002). All other covariates and ADL remained statistically significant. This finding indicates that depression in veterans has a unique negative impact on caregiver QoL beyond the effects of sociodemographic factors and functional limitations.

Discussion

This study investigated how care recipients' daily functioning and neuropsychiatric conditions relate to caregiver QoL in a sample of informal caregivers of older veterans. Our findings revealed that both lower functional ability and the presence of neuropsychiatric conditions in the care recipient independently predicted poorer caregiver QoL, even after adjusting for relevant sociodemographic covariates. Among veterans with a co-occurring neuropsychiatric condition, depression emerged as the only condition significantly associated with reduced caregiver QoL.

Care Recipient Functioning and Caregiver QoL

Our results demonstrate that veterans' functional limitations in basic activities of daily living significantly predicted lower caregiver QoL, aligning with previous research. While both ADL and IADL limitations independently predicted reduced caregiver QoL in bivariate analyses, IADL limitations became statistically non-significant when neuropsychiatric conditions were introduced in the full model.

This shift in significance suggests neuropsychiatric conditions may share variance with IADL limitations in predicting caregiver QoL. This finding is supported by our subgroup analysis, where IADL limitations were not significantly associated with caregiver QoL among veterans with neuropsychiatric conditions. This pattern may be explained by several mechanisms: neuropsychiatric conditions often result in impaired executive functioning directly affecting complex instrumental activities, motivation deficits common in these conditions may impact IADL performance while

https://doi.org/10.2147/JMDH.S590459

potentially sparing more automatic ADLs, and caregivers may attribute IADL difficulties to psychological factors rather than physical limitations when they occur in the setting of neuropsychiatric conditions. The continued QoL significance of ADL dependence, even when adjusting for neuropsychiatric conditions, highlights the distinct burden imposed by assisting with basic self-care needs, representing direct physical care demands that operate through mechanisms distinct from other caregiving challenges.

Importantly, the differential sensitivity of ADL/IADL measures across conditions warrants consideration. In neurodegenerative diseases, functional decline is a core feature of the disease trajectory, and ADL measures capture this progression directly. Consequently, when ADL is entered into the model before neuropsychiatric conditions, it likely absorbs a substantial portion of the variance attributable to neurodegenerative disease, potentially explaining its non-significance as an independent predictor. The broad heterogeneity within the neurodegenerative disease category and its high comorbidity with depression and anxiety may further dilute any independent signal. In contrast, depression may impair functioning through motivational deficits and social withdrawal that traditional ADL/IADL scales do not fully capture, allowing depression to retain independent predictive power. This interpretation aligns with the concept of "functional deprivation",[20,21] which proposes that functional decline and depression can form a reinforcing cycle, providing a theoretical framework for understanding the interrelationship between these variables observed in our data. Future research employing functional measures with greater sensitivity to psychiatric populations would help clarify these differential pathways.

Neuropsychiatric Conditions and Caregiver QoL

Our findings confirm that care recipient neuropsychiatric conditions significantly predict reduced caregiver QoL beyond the impact of functional limitations. Most notably, among various neuropsychiatric conditions examined, care recipient depression emerged as the only significant predictor of reduced caregiver QoL. This finding is notable given the high prevalence of PTSD (76.1%) compared to depression (52.7%) in our sample. We note that conditions with low prevalence in our subgroup, such as psychotic disorders (4.4%) and bipolar disorder (8.1%), could not be adequately evaluated, and our null findings for these conditions should not be interpreted as evidence of no effect. Similarly, the non-significance of neurodegenerative disease (50.4%) likely reflects several factors: the broad heterogeneity within this category, its high comorbidity with depression and anxiety (whose variables may capture the neuropsychiatric symptom burden associated with neurodegeneration), and the substantial shared variance with ADL functioning discussed above. This finding should not be interpreted as dismissing the well-established impact of dementia caregiving on caregiver outcomes.

Several factors may explain depression's predominant effect: persistent low mood, anhedonia, and withdrawal may directly impact relationship quality and communication; depression symptoms may exacerbate perceived caregiving burden through decreased motivation and self-care compliance; and emotional contagion may increase caregivers' risk for depression, as suggested by previous research on bidirectional relationships between care recipient and caregiver mental health.[22] The high comorbidity between PTSD and depression in veteran populations complicates the interpretation of their independent effects on caregiver QoL. In our sample, the majority of veterans with PTSD likely also had co-occurring depression, and the depressive component of these comorbid presentations may account for the significant association observed.

Clinical Implications

Our findings have important clinical implications for healthcare providers working with older veterans and their caregivers. The strong association between veteran depression and reduced caregiver QoL suggests that treating depression in veterans should be viewed as potentially benefiting both the veteran and caregiver. VHA providers' routine depression screening using the Patient Health Questionnaire-2 (PHQ-2) supports early identification, but our findings emphasize the importance of including concerns regarding caregiving dynamics in subsequent mental health referrals.

Additionally, the independent impact of care recipient functional limitations highlights the importance of occupational therapy and other rehabilitative services in maximizing veteran independence and reducing caregiver burden. The VHA's interdisciplinary approach is well-positioned to address the complex interplay between neuropsychiatric conditions and functional limitations through Geriatric Evaluation and Management clinics and Home-Based Primary Care teams that can implement coordinated care plans addressing both veterans' depression and functional needs while supporting caregivers. For example, a positive depression screen in a veteran could trigger an accompanying caregiver burden assessment, and occupational therapy and mental health services could develop joint care goals to address both functional limitations and depressive symptoms simultaneously.

Beyond the VHA context, our findings suggest that treating depression in older adults may yield secondary benefits for caregiver well-being, potentially delaying institutional care and associated costs. Community-based organizations and non-VA healthcare systems could adapt lessons from VHA caregiver support programs whose aims are to support caregivers so they can better support veterans. Acknowledging and addressing challenges posed by care recipient depression and ADL limitations can help identify caregivers in need of such services.

Policy Implications

These results underscore the need for integrated support approaches for veterans and caregivers, recognizing their interconnected well-being. The VA MISSION Act, which expanded eligibility to veterans and their caregivers from all eras, could be enhanced to address the specific needs of caregivers managing both functional limitations and neuropsychiatric conditions. Likewise, the VHA Program of Comprehensive Assistance for Family Caregivers could specifically incorporate targeted training on managing depression and its impact on caregiving relationships. Meanwhile the VHA Whole Health initiative could more explicitly integrate caregiver well-being into care planning.

While focused on veterans, many of our findings likely extend to broader caregiver populations. The impact of care recipient functional limitations and depression on caregiver QoL aligns with research in non-veteran populations,[23] suggesting that these represent universal aspects of caregiving, and screening outside of the VHA would be beneficial.[24] However, certain findings may be veteran-specific, particularly the high PTSD prevalence and unique influences of military culture on help-seeking behaviors and caregiver-veteran relationships.[25,26]

Limitations and Future Directions

Several limitations should be considered when interpreting these findings. First, our reliance on caregiver reports of veteran neuropsychiatric conditions rather than clinical diagnoses introduces potential reporting bias. Because this study enrolled caregivers rather than veterans, medical record access was not feasible, and conditions in remission may have been reported as active due to ongoing treatment. While caregiver perception of conditions is relevant to understanding caregiver QoL, this approach limits diagnostic precision. Second, our survey did not capture symptom severity for neuropsychiatric conditions. The impact of conditions such as depression likely varies by severity, and because veterans were not direct participants, validated severity measures could not be administered. Third, the high comorbidity among neuropsychiatric conditions in our sample (many veterans had multiple diagnoses) limits our ability to fully isolate the independent effects of individual conditions. Additionally, conditions with low prevalence in our subgroup (eg., psychotic disorders [4.4%] and bipolar disorder [8.1%]) could not be adequately evaluated, and our null findings for these conditions should not be interpreted as evidence of no effect, given that existing research has demonstrated their impact on caregiver QoL.[27–29] Fourth, the cross-sectional design precludes causal inference; the observed associations are predictive in a statistical sense but directionality cannot be established. Fifth, while nationally representative regarding racial composition, our findings may not generalize to all caregiving contexts, particularly non-veteran care recipients. Sixth, potential selection bias is possible, as caregivers experiencing extreme burden may be less likely to participate in research. Future research should explore bidirectional relationships between care recipient and caregiver mental health, examining whether improvements in care recipient depression or increased professional help with ADLs lead to corresponding improvements in caregiver QoL. Longitudinal designs enrolling both care recipients and caregivers would allow for direct clinical assessment, severity measurement, and examination of causal pathways. Future studies could also develop and test conceptual pathway models examining how functional status, neuropsychiatric conditions, and caregiver outcomes interrelate over time. Mediation and interaction analyses could further clarify whether neuropsychiatric conditions mediate the effect of functional limitations on caregiver QoL, or whether these factors interact.

Intervention studies targeting both functional support and depression management could evaluate whether integrated approaches yield greater benefits than single-focus interventions.

Conclusion

This study enhances our understanding of how care recipient characteristics affect caregiver QoL when caring for older adults. Our results demonstrate that functional limitations and neuropsychiatric conditions, especially depression, significantly negatively impact caregiver QoL. Addressing depression in older adults is crucial not only for their own health but also for improving caregiver outcomes. As the older adult population increases, effective strategies for supporting both older adults and their caregivers are vital for healthcare systems and policymakers.

Data Sharing Statement

The data underlying this article cannot be shared publicly for ethical reasons and for the privacy of individuals who participated in this study. Data are available from the corresponding author (Lauren R. Moo) upon reasonable request, conditioned on appropriate approval by the U.S. Department of Veterans Affairs.

Acknowledgments

Preparation of this manuscript was supported by the U.S. Department of Veterans Affairs Office of Rural Health. The funding source had no role in the design of the study, execution, analyses, intepretation of the data, or decision to submit the manuscript. The contents do not represent the views of Department of Veterans Affairs or the United States government.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

This work was funded by the Department of Veterans Affairs, Veterans Health Administration, Office of Rural Health, NOMAD #PROJ22-009682. This work was also supported by the Department of Veterans Affairs New England Geriatrics Research, Education and Clinical Center (NE GRECC) (SS, VN, EC, LM), the Department of Veterans Affairs Office of Rural Health (BH, SS, EC, EM, LM), the Department of Veterans Affairs VISN-1 Clinical Trials Network (SS), and the Department of Veterans Affairs Office of Academic Affiliations (VN).

Disclosure

The authors report no conflicts of interest in this work.

References

1. Wolff JL, Cornman JC, Freedman VA. The number of family caregivers helping older US adults increased from 18 million to 24 million, 2011-22: article examines growth in the number of family caregivers providing help to older adults in the US. *Health Aff*. 2025;44(2):187–195. doi:10.1377/hlthaff.2024.00978
2. Duxbury L, Ding R, Stevenson M, Sadavoy J. Impact of care-recipient health conditions on employed caregiver well-being: measure development and validation. *J Aging Health*. 2025;37(3–4):192–209. doi:10.1177/08982643241239086
3. Pinquart M, Sörensen S. Differences between caregivers and noncaregivers in psychological health and physical health: a meta-analysis. *Psychol Aging*. 2003;18(2):250–267. doi:10.1037/0882-7974.18.2.250
4. Hébert R, Dubois MF, Wolfson C, Chambers L, Cohen C. Factors associated with long-term institutionalization of older people with dementia. *J Gerontol a Biol Sci Med Sci*. 2001;56(11):M693–M699. doi:10.1093/gerona/56.11.M693
5. Martinez-Martin P, Rodriguez-Blazquez C, Forjaz MJ, et al. Neuropsychiatric symptoms and caregiver's burden in Parkinson's disease. *Parkinsonism Relat Disord*. 2015;21(6):629–634. doi:10.1016/j.parkreldis.2015.03.024
6. National Alliance for Caregiving. *Caregiving in the US 2020*. Washington, DC: National Alliance for Caregiving and AARP Public Policy Institute; 2020.

7. Mortby ME, Burns R, Eramudugolla R, Ismail Z, Anstey KJ. Neuropsychiatric symptoms and cognitive impairment: understanding the importance of co-morbid symptoms. *J Alzheimers Dis*. 2017;59(1):141–153. doi:10.3233/JAD-170050
8. Bhome R, Huntley JD, Price G, Howard RJ. Clinical presentation and neuropsychological profiles of Functional Cognitive Disorder patients with and without co-morbid depression. *Cogn Neuropsychiatry*. 2019;24(2):152–164. doi:10.1080/13546805.2019.1590190
9. Majer R, Simon V, Csiba L, et al. Behavioural and psychological symptoms in neurocognitive disorders: specific patterns in dementia subtypes. *Open Med*. 2020;15(1):307–316.
10. Kim Y, Schulz R. Family caregivers' strains: comparative analysis of cancer caregiving with dementia, diabetes, and frail elderly caregiving. *J Aging Health*. 2008;20(5):483–503. doi:10.1177/0898264308317533
11. Liu Z, Chen Q, Hu Z. Relationship between activities of daily living and depression among older adults and the quality of life of family caregivers. *Front Nurs*. 2023;5(2):97–104.
12. Hinton L, Tomaszewski Farias S, Wegelin J. Neuropsychiatric symptoms are associated with disability in cognitively impaired Latino elderly with and without dementia: results from the Sacramento Area Latino study on Aging. *Int J Geriatr Psychiatry*. 2008;23(1):102–108. doi:10.1002/gps.1952
13. Ploeg J, Yous ML, Fraser K, et al. Healthcare providers' experiences in supporting community-living older adults to manage multiple chronic conditions: a qualitative study. *BMC Geriatr*. 2019;19(1):316. doi:10.1186/s12877-019-1345-2
14. Kessler RC, Heeringa SG, Stein MB, et al. Thirty-day prevalence of DSM-IV mental disorders among nondeployed soldiers in the US Army: results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *JAMA Psychiatry*. 2014;71(5):504–513. doi:10.1001/jamapsychiatry.2014.28
15. Spillman BC. *Why Do Elders Receiving Informal Home Care Transition to Long Stay Nursing Home Residency?* Washington, DC: US Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation; 2014.
16. Chamberlin E, Marfeo E, Shirk S, et al. Rural clinician perspectives on barriers to care for older veterans and caregivers. *J Am Geriatr Soc*. 2023;71:S76.
17. Katz S. Assessing self-maintenance: activities of daily living, mobility, and instrumental activities of daily living. *J Am Geriatr Soc*. 1983;31(12):721–727. doi:10.1111/j.1532-5415.1983.tb03391.x
18. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist*. 1969;9(3):179–186. doi:10.1093/geront/9.3_Part_1.179
19. Bates GE, Hashmi AK, Bressler T, et al. Approach to offering remote support to mesothelioma patients: the mesothelioma survivor project. *Transl Lung Cancer Res*. 2016;5(3):216. doi:10.21037/tlcr.2016.05.05
20. Zhou L, Wang W, Ma X. The bidirectional association between the disability in activities of daily living and depression: a longitudinal study in Chinese middle-aged and older adults. *BMC Public Health*. 2024;24(1):1884. doi:10.1186/s12889-024-19421-w
21. Zhang J, Zhang D, Xue X, Wang X, Ding S, Ma Y. Intergenerational psychological capital, disability, and depressive symptoms in the shadow of functional deprivation among middle-aged and older adults in China. *Psychol Res Behav Manage*. 2025;18:2237–2257. doi:10.2147/PRBM.S552384
22. Isik AT, Soysal P, Solmi M, Veronese N. Bidirectional relationship between caregiver burden and neuropsychiatric symptoms in patients with Alzheimer's disease: a narrative review. *Int J Geriatr Psychiatry*. 2019;34(9):1326–1334. doi:10.1002/gps.4965
23. Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. *Med Care*. 2003;41(11):1284–1292. PMID: 14583691. doi:10.1097/01.MLR.0000093487.78664.3C
24. Xie H, Chen PW, Zhao L, Sun X, Jia XJ. Relationship between activities of daily living and depression among older adults and the quality of life of family caregivers. *Front Nurs*. 2018;5(2):97–104.
25. Garcia ME, Hinton L, Neuhaus J, Feldman M, Livaudais-Toman J, Karliner LS. Equitability of depression screening after implementation of general adult screening in primary care. *JAMA Netw Open*. 2022;5(8):e2227658. doi:10.1001/jamanetworkopen.2022.27658
26. Ramchand R, Dalton S, Dubowitz T, et al. America's military and veteran caregivers: hidden heroes emerging from the shadows. *Rand Health Q*. 2024;12(1):7.
27. Randles R, Finnegan A. Veteran help-seeking behaviour for mental health issues: a systematic review. *BMJ Mil Health*. 2022;168(1):99–104. doi:10.1136/bmjmilitary-2021-001903
28. Gagiu C, Dionisie V, Manea MC, et al. Quality of life in caregivers of patients with schizophrenia: a systematic review of the impact of sociodemographic, clinical, and psychological factors. *Behav Sci*. 2025;15(5):684. doi:10.3390/bs15050684
29. Karambelas GJ, Filia K, Byrne LK, Allott KA, Jayasinghe A, Cotton SM. A systematic review comparing caregiver burden and psychological functioning in caregivers of individuals with schizophrenia spectrum disorders and bipolar disorders. *BMC Psychiatry*. 2022;22(1):422. doi:10.1186/s12888-022-04069-w