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An integrative review of U.S. studies: Caregiver psychological health and hospitalization characteristics of older adult care recipients

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Abstract

Background—This integrative review involved studies conducted in the United States that assessed hospitalizations of older adults receiving family care and the psychological health of the family caregivers. The primary objectives were to: 1) summarize findings between caregiver psychological health and older care recipient hospitalizations, and 2) describe how caregiver psychological health has been measured with regard to older care recipient hospitalizations.

Methods—Online databases were searched for papers published in English from 2000 through July, 2013. Search terms included combinations of the following keywords: care recipient; hospitalization(s); caregiver; caregiver burden; caregiver psychosocial health; family caregiver; and patient outcomes. Inclusion criteria included: 1) studies conducted in the U.S.; 2) articles assessing caregiver psychological health (e.g., burden, strain, depressive or anxious symptoms) and older care recipient hospitalizations in the U.S.; 3) samples including caregivers of care recipients with a mean age of 65 years or older.

Results—Few studies in the U.S. have assessed hospitalization characteristics of older care recipients and the psychological health of their family caregivers. All analyses incorporated a measure of depression, while the measurement of other psychological health constructs (e.g., anxious symptoms, perceived burden) was limited or absent. Findings note the potential importance of focusing on readmissions rates in light of caregiver psychological health. Findings also note the benefit of caregiver emotional and instrumental support toward reducing hospitalizations among older adults receiving family care.

Keywords

Caregiving; aging; distress

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With the broadening of the American population age 65 or older, containing health care spending for older adults is a pressing need (Vincent & Velkoff, 2010). Substantial Medicare and Medicaid expenditure growth is expected and will be due largely to nursing home and hospital care costs for older adults (Keehan, Lazenby, Zezza, & Catlin, 2004). As such, preventing or delaying use of high cost health care services among older adults is a foremost goal. It is widely known that characteristics of an individual (e.g., age), their condition(s) (e.g., cognitive deficits), and the type and quality of their health insurance (e.g., Medicaid enrollment) contribute to the use of health care services (Korten et al., 1999; Mete, 2005; Miller & Weissert, 2000; Wingard, Jones, & Kaplan, 1987). Elements of one's environment may also contribute to the use of services (Saunders, 2008; Wilson & Cleary, 1995). This integrative review focuses on one underexplored factor that may contribute to hospitalizations among older adults, which is the psychological health of "family caregivers" or relatives or friends who provide assistance to an older adult.

The availability of a family caregiver is commonly touted as protective against the use of formal services by older adults. For example, being married, a strong indicator of an available caregiver, is shown to increase the probability of an older adult remaining within one's home compared to being placed in nursing home care (Mete, 2005). Having a co-residing caregiver is also reported in the literature as associated with shorter hospital stays than having a caregiver who lives in a different household (Skinner et al., 1994).

Yet, the true benefit of family care may depend on the functioning of caregivers. A growing body of literature across diverse care contexts indicates that caregiving can be emotionally burdensome, including heightened perceived burden and depressive or anxious symptoms (Carod-Artal & Egido, 2009; Dunbar, Clark, Quinn, Gary, & Kaslow, 2008; Etters, Goodall, & Harrison, 2008; Garcia-Alberca et al., 2012; Kim & Schulz, 2008; National Alliance for Caregiving, 2009). Deficits in emotional health places caregivers at risk for poorer physical health outcomes, including decreased immune function (Damjanovic et al., 2007; Redwine et al., 2004; Schulz & Beach, 1999; Sherwood et al., 2008). Ultimately, emotional and physical strains among family caregivers may have adverse consequences for care recipient outcomes. Literature, including several reviews, in the dementia context reports that poorer psychological health among caregivers is associated with earlier nursing home placement of patients (Chenier, 1997; Dunkin & Anderson-Hanley, 1998; Gaugler, Yu, Krichbaum, & Wyman, 2009; Mittelman, Haley, Clay, & Roth, 2006).

In contrast, understandings of caregiver psychological health and older care recipient hospitalizations are less well known. Therefore, through this integrative review, we focus specifically on literature incorporating measurement of caregiver psychological health and hospitalizations of older care recipients in the U.S. The primary objectives were to: 1) summarize findings between caregiver psychological health and older recipient hospitalizations in the U.S., and 2) describe how caregiver psychological health has been measured with regard to older care recipient hospitalizations. These understandings might contribute to directions for research, practice and policy within the aging context.

Methods

Published articles were identified through a literature search using online databases (PUBMED, PSYCINFO, and CINAHL) for papers published in English from January 2000 through July, 2013. Search terms included combinations of the following keywords: care recipient; hospitalization(s); caregiver; caregiver burden; caregiver psychosocial health; family caregiver; and patient outcomes. Reference lists from citations were also reviewed for relevant publications. Identified articles were evaluated based on the following inclusion criteria: 1) studies conducted in the U.S.; 2) articles assessing caregiver psychological health (e.g., burden, strain, depressive or anxious symptoms) and older recipient hospitalizations; 3) samples including caregivers of care recipients with a mean age of 65 years or older. Studies were limited to those conducted in the U.S. so that findings would be directly relevant to U.S. policy and practice.

Results

Seven papers met inclusion criteria. Findings are organized according to the primary diagnosis for which care was provided, including dementia, chronic illness (varied forms within one sample), and cardiovascular disease. Results are categorized according to care context given that hospitalizations may be more or less likely depending upon a given diagnosis, and, therefore, should be organized in a way that separates out conditions. Within each care context, findings are framed in light of the research objectives, including: 1) summarizing findings between caregiver psychological health and older recipient hospitalizations, and 2) describing how caregiver psychological health was measured with regard to older recipient hospitalizations. Additional key features of studies (e.g., study objective, patient and caregiver characteristics, and study design) are also provided in Table 1.

Dementia

Three of the seven studies identified pertained to care for persons with dementia. While exploring urban-rural differences in ambulatory care hospitalizations, Thorpe and colleagues (Thorpe, Van Houtven, Sleath, & Thorpe, 2010) incorporated assessments of caregiver depression and instrumental and emotional support (see Table 1 for specific measures). As noted in Table 1, participation of caregivers was limited based on demographics. The mean depression score of the caregivers (mean of 5) was well below that which is considered to be indicative of “significant” or “mild” depressive symptomology. Over one-year, 30% of the dementia patients had at least one non-ambulatory hospitalization and 13% had at least one ambulatory hospitalization. Caregiver depressive symptoms did not predict either type of patient hospitalizations. Emotional support and instrumental support among caregivers were significantly associated with patient non-ambulatory hospital admissions in unadjusted analyses (Thorpe, et al., 2010).

In two separate analyses (using the same data) within the AD context, the effect of caregiver burden was explored as mediating the relationship between general health status of patients and institutional service use (Miller, Rosenheck, & Schneider, 2010, 2012). Burden was measured using four commonly used scales, including the Caregiver Distress Scale (CDS), Beck Depression Inventory (BDI), Caregiver Activity Survey (CAS), and the Zarit Caregiver Burden Interview (ZBI). The caregivers were predominately female and spouses (see Table 1). Burden levels (according to CDS and ZBI) were higher than reports in the literature, while depression scores were equivalent.

Caregiver burden was shown to weaken the inverse relationship between health utilities and service use and institutional costs, leading to greater service use and greater costs than would be expected at a given health level (Miller, et al., 2010, 2012). Differences were also evident depending upon the type of burden measure. Higher burden through the CDS, BDI, and CAD were shown to lead to an increased use of institutional services (i.e., hospital care, nursing home care, or residential care) than expected based on solely on health utilities or health functioning. In contrast, assessment of burden using the ZBI showed a weaker, non-significant moderating effect (Miller, et al., 2012). When specifically looking at hospital care alone (Miller, et al., 2010), significant inverse relationships between health utility or functioning and hospital costs were evident when caregiver burden (CDS, CAS) was zero. On average, 13% of the sample was admitted to inpatient care (i.e., hospital, nursing home, or residential care) monthly, while 4.5% were specifically admitted to hospital care (see Table 1 for definition) each month on average. Moreover of those who used institutional services, an average of 6.7 day per month was spent in hospital care.

Chronic Illness

Two studies focused on care provided to older care recipients with chronic illness. Exploring hospital readmissions, Schwarz and colleagues (2000) incorporated assessments of caregiver depressive symptomology and elements of social support (see Table 1 for specific measures). The caregivers were predominately female and white and were providing care to recipients who had been hospitalized for a chronic illness and were experiencing at least two activities of daily living (ADL) deficits. Caregivers had a mean depression score of 9.68 on the CES-D at baseline and a mean score of 10.26 at 3-month follow up. At 3-months post hospitalization, 33% of patients were readmitted to hospital care. A greater number of hospital readmissions were significantly related to greater depressive symptoms, lower tangible support, and lower emotional support of caregivers. In adjusted analyses, depressive symptoms were not a significant predictor of readmission, while elements of social support (i.e., tangible and integration) were significant predictors. Greater depression at 3-months was significantly associated lower emotional support and lower satisfaction with informal social support (Schwarz, 2000).

Also exploring different hospitalization characteristics, Wolf and Kasper assessed hospital admission rates and discharge delays of female Medicare patients over 3-years. The female care recipients were receiving family care due to moderate to severe disability (due to chronic illness) without cognitive deficits, and the caregivers were predominately offspring (54%) of the care recipients and 31% were African American. Psychosocial measures included depression, caregiving “overload” (mismatch between tasks and time available), “role captivity” (being an unwilling, involuntary caregiver) and perceptions of caregiving competence.

Slightly more than half of the older female recipients were admitted for hospital care over the three years for diverse reasons including circulatory, respiratory, skin, digestive and nervous system conditions. Among caregivers of recipients who were not hospitalized, 21% were experiencing depression, while 28.2% of caregivers of hospitalized recipients experienced depression. These hospitalization rates did not differ significantly according to caregiver depression. With respect to discharge delays, unadjusted findings indicated that the older women in the sample were significantly more likely (more than twice as likely) to be delayed from hospital discharge if a caregiver characterized themselves by role captivity (Wolff & Kasper, 2004). Neither role captivity nor overload among caregivers was associated with care recipient hospitalization delayed discharge in adjusted analyses. Significant findings were reported with regard to caregiver competence. Care recipients of caregivers who viewed themselves as competent caregiver were more likely (40% more) to be admitted to a hospital, but were less likely (48% less) to experience a discharge delay than care recipients of caregivers expressing less caregiving competence (Wolff & Kasper, 2004).

Cardiovascular Disease

Two studies focused on hospitalization characteristics of older care recipients with heart failure, including admissions, discharge delays, and readmissions. Focusing specifically on readmissions, Schwarz and colleagues (2003) assessed depression and perceived strain among caregivers for heart failure patients who had been hospitalized. The caregivers' perceived stress was low, while depressive symptoms were also low to moderate (mean of 11.4). Twenty-one percent of the caregivers were experiencing depressive symptomology. On average, caregivers also had high positive appraisal of caregiving and high informal social support. Within 3 months of being hospitalized, 44% of patients were readmitted to the hospital. High levels of informal social support among caregivers significantly reduced risk for readmission as did the presence of depressive symptoms. Further analyses indicated that an interaction between stress and depression significantly increased the risk for patient readmission (Schwarz & Elman, 2003).

Using a retrospective study design, Saunders and colleagues (Saunders, 2008) studied associations between caregiving appraisal and depression and hospitalizations of heart failure patients. Approximately 21% of caregivers experienced depressive symptomology. Depressive symptoms were not significantly associated with the hospitalization or length of stay (Saunders, 2008). Lack of family support (as well as caregiver-perceived patient severity, caregiver hours per week) were significantly correlated with hospitalizations, while lack of family support was the only variable significantly associated with the number of days hospitalized. A lack of family support was also significantly correlated with depression.

Discussion

Adults age 65 and older account for the highest percentage of hospitalizations in the U.S. and have the longest average length of hospital stay (Hall, DeFrances, Williams, Golosinskiy, & Schwartzman, 2010). Hospital readmissions have been a major financial strain to Medicare in recent years to the extent that the Patient Protection and Affordable Care Act (hereinafter referred to as the Affordable Care Act) required the establishment of a Hospital Readmission Reduction Program (Jencks, Williams, & Coleman, 2009; "The Patient Protection and Affordable Care Act," 2010). Given the substantial amount of family care provided in the U.S. (National Alliance for Caregiving, 2009), it seems appropriate to consider the well-being of caregivers in analyses of older adult hospitalizations. Yet, as indicated by this review, few studies have incorporated caregiver psychological factors within such analyses.

Findings from this integrative review also demonstrate the growing diversity of care contexts explored within the field of older adult caregiving. Dementia was the care context most frequently reported on (three studies), while additional studies included reports related to cardiovascular-related disease (two studies) or samples comprised of individuals with diverse forms of chronic illness (two studies). Findings by context are meaningful given that hospitalizations due to specific conditions may drive hospital care costs more than other conditions. Alzheimer’s disease and cardiovascular disease, in particular, are high and expected to grow substantially over the next several decades (AHRQ, 2002; Rudolph et al., 2010).

Across contexts, several similarities are evident with respect to findings and the measurement of caregiver distress. All studies included an assessment of caregiver depression and all but one used the CES-D as the measurement tool. Depression was consistently shown not to be a direct significant predictor of hospital admissions or discharge delays. It is important to note that based either on the sample mean for the CES-D (including 5.7; 9.6; 11.4 for those that reported) or the percentage experiencing a score of 16 or above (21% in two studies), depressive symptomology was lower in these samples compared to other reports in the literature that used the CES-D (Hatch, Dehart, & Norton, 2013; Roth, Ackerman, Okonkwo, & Burgio, 2008; Siegler, Brummett, Williams, Haney, & Dilworth-Anderson, 2010). This may contribute to findings of non-significance and should be further explored. Differences in the caregiver demographics across samples might have contributed the differential findings for depression. For example, the study with the lowest reported mean depression level had preset limitations on the caregiving sample.

Given the aim of the Affordable Care Act to reduce hospital readmissions, findings related to readmissions of older care recipients are timely. Caregiver depression was directly associated with a greater number of readmissions for older care recipients with chronic disease, while an interaction between stress and depression (high stress and high depression) among caregivers significantly increased readmission rates for care recipients with heart failure. Thus, prospective, longitudinal studies should continue to focus on care recipient readmission rates in light of caregiver distress.

In contrast to the measurement of caregiver depression, few studies incorporated a measure of perceived burden. As reported by Miller and colleagues, caregiver burden weakened the inverse relationship between care recipient functioning and institutional service use (including but not limited to hospitalizations). The study further noted that how burden was measured contributed differently to findings. Future research should incorporate validated measures of caregiver burden. Moreover, other psychosocial constructs such as anxious symptomology were absent from the assessments despite a growing body of literature indicating high anxiety levels among caregivers (Cooper, Balamurali, & Livingston, 2007). Thus, as research in this area expands, a more full representation of distress should be considered. Likewise, positive perceptions of caregiving and abilities might be considered in future research as discharge delays were less likely given higher perceptions of caregiving competence by caregivers themselves.

The importance of adequate social, emotional, and instrumental support networks for family caregivers was reinforced across the care contexts. These elements of support were consistently associated with lower care recipient rates of hospital admissions, including readmissions, and a lower likelihood of being delayed from discharge. Moreover, poorer perceived support of caregivers was consistently associated with caregiver depressive symptoms. Thus, developing strategies and processes to monitor support levels of caregivers for community-dwelling as well as hospitalized care recipients might contribute to reducing unnecessary hospitalizations or readmissions. Cost-effectiveness analyses of such approaches would be of value. Of particular benefit might be assessing the value of programming and time spent with family caregivers by hospital-based health professionals in terms of readmission rates and related costs. Such findings might contribute to policy discussions and initiatives regarding reimbursement for such programming.

Conclusion

Few studies have assessed hospitalization characteristics of older care recipients and caregiver psychological health. Review of the available literature highlights the need to expand analyses in terms of the caregiver psychological health assessments utilized. Findings also suggest the potential importance of focusing on readmissions rates in light of caregiver health. Finally, intervention research may attend to the effect of interventions aimed at providing greater emotional, social, and instrumental support and the impact on hospitalizations and related costs (Dahlrup, Nordell, Steen Carlsson, & Elmståhl, 2013).

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References

AHRQ. Hospitalization in the United States, 2002. 2002. Agency for Healthcare Research and Quality Retrieved from http://archive.ahrq.gov/data/hcup/factbk6/factbk6c.htm.

Carod-Artal FJ, Egido JA. Quality of life after stroke: the importance of a good recovery. Cerebrovasc Dis. 2009; 27(Suppl 1):204–214. doi:000200461 [pii] 10.1159/000200461. [PubMed: 19342853]

Chenier MC. Review and analysis of caregiver burden and nursing home placement. Geriatr Nurs. 1997; 18(3):121–126. [PubMed: 9197613]

Cooper C, Balamurali TB, Livingston G. A systematic review of the prevalence and covariates of anxiety in caregivers of people with dementia. Int Psychogeriatr. 2007; 19(2):175–195. [PubMed: 17005068]

Dahlrup B, Nordell E, Steen Carlsson K, Elmståhl S. Health Economic Analysis on a Psychosocial Intervention for Family Caregivers of Persons with Dementia. Dement Geriatr Cogn Disord. 2013; 37(3–4):181–195. [PubMed: 24157891]

Damjanovic AK, Yang Y, Glaser R, Kiecolt-Glaser JK, Nguyen H, Laskowski B, Weng NP. Accelerated telomere erosion is associated with a declining immune function of caregivers of Alzheimer's disease patients. J Immunol. 2007; 179(6):4249–4254. [PubMed: 17785865]

Dunbar SB, Clark PC, Quinn C, Gary RA, Kaslow NJ. Family influences on heart failure self-care and outcomes. J Cardiovasc Nurs. 2008; 23(3):258–265. doi:10.1097/01.JCN.0000305093.20012.b8 00005082-200805000-00012 [pii]. [PubMed: 18437068]

Dunkin JJ, Anderson-Hanley C. Dementia caregiver burden: a review of the literature and guidelines for assessment and intervention. Neurology. 1998; 51(1 Suppl 1):S53–S60. discussion S65–57. [PubMed: 9674763]

Etters L, Goodall D, Harrison BE. Caregiver burden among dementia patient caregivers: a review of the literature. J Am Acad Nurse Pract. 2008; 20(8):423–428. doi: JAAN342 [pii] 10.1111/j.1745-7599.2008.00342.x. [PubMed: 18786017]

Garcia-Alberca JM, Cruz B, Lara JP, Garrido V, Lara A, Gris E. Anxiety and depression are associated with coping strategies in caregivers of Alzheimer's disease patients: results from the MALAGA-AD study. Int Psychogeriatr. 2012:1–10. doi: S1041610211002948 [pii] 10.1017/S1041610211002948.

Gaugler JE, Yu F, Krichbaum K, Wyman JF. Predictors of nursing home admission for persons with dementia. Med Care. 2009; 47(2):191–198. doi:10.1097/MLR.0b013e31818457ce 00005650-200902000-00009 [pii]. [PubMed: 19169120]

Hall MJ, DeFrances CJ, Williams SN, Golosinskiy MS, Schwartzman A. National hospital discharge survey: 2007 summary. Natl Health Stat Report. 2010; 29:1–20. [PubMed: 21086860]

Hatch DJ, Dehart WB, Norton MC. Subjective stressors moderate effectiveness of a multi-component, multi-site intervention on caregiver depression and burden. International Journal of Geriatric Psychiatry. 2013

Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-service program. N Engl J Med. 2009; 360(14):1418–1428. doi:360/14/1418 [pii] 10.1056/NEJMsa0803563. [PubMed: 19339721]

Keehan SP, Lazenby HC, Zezza MA, Catlin AC. Age estimates in the national health accounts. Health Care Financing Review. 2004; 1(1):1–16.

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: 0898264308317533 [pii] 10.1177/0898264308317533. [PubMed: 18420838]

Korten AE, Jorm AF, Jiao Z, Letenneur L, Jacomb PA, Henderson AS, Rodgers B. Health, cognitive, and psychosocial factors as predictors of mortality in an elderly community sample. J Epidemiol Community Health. 1999; 53(2):83–88. [PubMed: 10396468]

Mete C. Predictors of elderly mortality: health status, socioeconomic characteristics and social determinants of health. Health Econ. 2005; 14(2):135–148. [PubMed: 15386677]

Miller EA, Rosenheck RA, Schneider LS. Caregiver burden, health utilities, and institutional service costs among community-dwelling patients with Alzheimer disease. Alzheimer Dis Assoc Disord. 2010

Miller EA, Rosenheck RA, Schneider LS. Caregiver burden, health utilities, and institutional service use in Alzheimer's disease. Int J Geriatr Psychiatry. 2012; 27:382–393. [PubMed: 21560160]

Miller EA, Weissert WG. Predicting elderly people's risk for nursing home placement, hospitalization, functional impairment, and mortality: a synthesis. Med Care Res Rev. 2000; 57(3):259–297. [PubMed: 10981186]

Mittelman MS, Haley WE, Clay OJ, Roth DL. Improving caregiver well-being delays nursing home placement of patients with Alzheimer disease. Neurology. 2006; 67(9):1592–1599. doi:67/9/1592 [pii] 10.1212/01.wnl.0000242727.81172.91. [PubMed: 17101889]

National Alliance for Caregiving. Caregiving in the U.S. 2009. MetLife Foundation; 2009. p. 79

The Patient Protection and Affordable Care Act. 2010

Redwine L, Mills PJ, Sada M, Dimsdale J, Patterson T, Grant I. Differential immune cell chemotaxis responses to acute psychological stress in Alzheimer caregivers compared to non-caregiver controls. [Comparative Study Research Support, U.S. Gov't, P.H.S.]. Psychosomatic Medicine. 2004; 66(5):770–775. [PubMed: 15385705]

Roth DL, Ackerman ML, Okonkwo OC, Burgio LD. The Four-Factor Model of Depressive Symptoms in Dementia Caregivers: A Structural Equation Model of Ethnic Differences. Psychol Aging. 2008; 23(3):567–576. [PubMed: 18808246]

Rudolph JL, Zanin NM, Jones RN, Marcantonio ER, Fong TG, Yang FM, Inouye SK. Hospitalization in community-dwelling persons with Alzheimer's disease: frequency and causes. J Am Geriatr Soc. 2010; 58(8):1542–1548. doi:10.1111/j.1532-5415.2010.02924.x JGS2924 [pii]. [PubMed: 20553338]

Saunders MM. Family caregiver support & hospitalizations of patients with heart failure. Home Healthc Nurse. 2008; 26(10):624–632. [PubMed: 19001918]

Schulz R, Beach SR. Caregiving as a risk factor for mortality: the Caregiver Health Effects Study. JAMA. 1999; 282(23):2215–2219. [PubMed: 10605972]

Schwarz KA. Predictors of early hospital readmissions of older adults who are functionally impaired. J Gerontol Nurs. 2000; 26(6)

Schwarz KA, Elman CS. Identification of factors predictive of hospital readmissions for patients with heart failure. Heart Lung. 2003; 32(2)

Sherwood PR, Given BA, Donovan H, Baum A, Given CW, Bender CM, Schulz R. Guiding research in family care: a new approach to oncology caregiving. Psychooncology. 2008; 17(10):986–996. [PubMed: 18203244]

Siegler IC, Brummett BH, Williams RB, Haney TL, Dilworth-Anderson P. Caregiving, residence, race, and depressive symptoms. Aging & Mental Health. 2010; 14(7):771–778. [PubMed: 20635234]

Thorpe JM, Van Houtven CH, Sleath BL, Thorpe CT. Rural-urban differences in preventable hospitalizations among community-dwelling veterans with dementia. J Rural Health. 2010; 26(2): 146–155. doi: JRH276 [pii] 10.1111/j.1748-0361.2010.00276.x. [PubMed: 20447001]

Vincent, GK.; Velkoff, VA. Population estimates and projections. US Department of Commerce, Economics and Statistics Administration, US Census Bureau; 2010. The next four decades:The older population in the United States: 2010 to 2050; p. 1-16.

Wilson IB, Cleary PD. Linking clinical variables with health-related quality of life. A conceptual model of patient outcomes. JAMA. 1995; 3(1):59–65. [PubMed: 7996652]

Wingard DL, Jones DW, Kaplan RM. Institutional care utilization by the elderly: a critical review. Gerontologist. 1987; 27(2):156–163. [PubMed: 3108079]

Wolff JL, Kasper JD. Informal caregiver characteristics and subsequent hospitalization outcomes among recipients of care. Aging Clin Exp Res. 2004; 16(4):307–313. [PubMed: 15575125]

Table 1

U.S. studies incorporating caregiver psychological health and hospitalization characteristics of older care recipients

First Author (Year)	Study Objective	Sample (with age)		Care Reason	Study Design	Caregiver Psychosocial Measure	Findings
Miller (2012)	To explore the moderating effect of caregiver burden on the relationship between patients' health status and institutional costs in Alzheimer's disease.	421 community-dwelling AD patients in clinical antipsychotic trials in U.S. Patients diagnosed with AD, living at home, and having severe symptoms (delusions, hallucinations, etc). Patients were on average 77.9 years of age, 56% female, 59% married, and 79% white.	Caregiver was one who lived with or visited the participant for at least 3 days per week for an accumulative 8 hours. Caregivers were on average 63 years of age, 71% female, predominantly spouse (52%) or adult child (34%)	Dementia	Longitudinal	CDS BDI ZBI CAS	This study, using different analyses (logistic regression), reported similar overall findings of Miller 2010 (below). Caregiver burden weakens the inverse relationship between health utilities and institutional service use.
Miller (2010)		Same sample as above		Dementia	Longitudinal	CDS BDI ZBI CAS	Monthly, patients were admitted to hospital care at a rate of 4.5%. Of those hospitalized, the average days hospitalized was 6.7. Institutional service use was defined as use of any of the following services: inpatient hospital care, nursing home care, or residential care. Higher burden through the Caregiver Distress Scale, BDI, and Caregiver Activity Survey were shown to lead to an increased use of institutional services than expected based on solely on health utilities or health functioning. Assessment of burden using the Zarit Burden

First Author (Year)	Study Objective	Sample (with age)		Care Reason	Study Design	Caregiver Psychosocial Measure	Findings
							Interview showed a weaker, non-significant Interview showed a weaker, non-significant Interview showed a weaker, non-significant Interview showed a weaker, non-significant
Thorpe (2010)	To identify veteran, caregiver, and community factors that may explain urban-rural differences in ambulatory care sensitive hospitalizations.	1,186 US male veterans with dementia and primary caregivers in U.S. Patients had either Alzheimer's disease or vascular dementia. The sample of dyads was limited to only African American or white dyads, dyads with female caregivers, dyads whose caregiver was a spouse, daughter or sister, and dyads of caregivers who resided with recipient.	Primary caregivers were defined as the person who provided the most time with the older veteran and provided the most care, assistance and support.	Dementia	Longitudinal	CES-D-10 DSSI	Over one-year, 30% of the dementia patients had at least one non-ambulatory hospitalization and 13% had at least one ambulatory hospitalization. The caregivers had a mean depression score of 5.7 (SD: 4.7, range 0–20). Caregiver depression was not associated with ambulatory or non-ambulatory patient hospitalizations over one year in unadjusted and adjusted analyses. Instrumental and emotional social support (as well as perceived financial adequacy) were associated with non-ACSC hospitalizations in unadjusted analyses but not adjusted analyses.
Wolff & Kasper (2004)	To examine caregiver attributes with respect to recipients' hospitalization experiences.	420 female Medicare beneficiaries aged 65 or older receiving informal care and primary caregivers from Maryland, U.S. Of 420, 384 remained in year 2 and 319 remained in year 3. Main reason for attrition was death. Patients were on average 80 years of age, 31% African American.	Caregiver was defined as someone who was providing unpaid care. Caregivers had a median age of 57 years and were predominantly offspring (54%) or spouses (17.4%); 31% were African American.	Moderately to severely (cognitively well) disabled due to chronic illness	Secondary Medicare data, prospective longitudinal (3 years)	GDS Study created survey of burdens (overload, role captivity, competence) based on work of Pearlin.	Approximately 52% of care recipients were hospitalized over the 3 years. Reasons for hospitalizations varied, including issues related to circulatory, respiratory, skin, digestive, and nervous system. Primary caregivers characterized with role captivity (which

First Author (Year)	Study Objective	Sample (with age)		Care Reason	Study Design	Caregiver Psychosocial Measure	Findings
							is related to perceived burden) were more th is related to perceived burden) were more th is related to perceived burden) were more th is related to perceived burden) were more th is related to perceived burden) were more th is related to perceived burden) were more th is related to perceived burden) were more th is related to perceived burden) were more th is related to perceived burden) were more th
Saunders (2008)	To explore caregiver characteristics for associations with hospitalizations of heart failure patients	41 heart failure patients and primary caregivers in U.S. (Detroit). Patients had to have had a primary diagnosis of heart failure for at least 12 months. Patients had a mean age of 77.6 years (SD: 9.8, range 53–93), 51% female, 85% white.	Primary caregiver as designated by the patient and ability to speak and understand English. Caregivers had a mean age of 59 years (SD: 15, range 18–82 years), 85% female, and most often provided care as an adult child (46%) or spouse (46%).	Cardiovascular disease	Retrospective (12-months prior to caregiver interview)	CES-D-10 CRA (caregiver appraisal)	21% of caregivers had a score of 16 or higher on the CES-D, suggesting depression. Caregivers perceived mild to moderate levels of negative caregiver appraisal. Caregiver depression was not significantly correlated with hospitalizations or number of days hospitalized. Lack of family support (as well as caregiver-perceived patient severity, caregiver hours per week) were significantly correlated with hospitalizations, while lack of family support was the only variable significantly associated with the number of days hospitalized. A lack of family support was significantly correlated with depression (p<.01).
Schwarz (2003)	To determine predictors of hospital readmission for older adults with heart failure.	156 patient-caregiver dyads in northeastern Ohio consented with 128 dyads completing the study (only difference was mental function between those who completed	Caregiver description: M: 64.8 (±14.6), range 16 to 86; 74% female; 89% white; 62% were spouses.	Heart Failure	Longitudinal	PSS CES-D PGCCAS (caregiving appraisal) MISSB (Informal Social Support)	Caregivers perceived stress had a mean of 16.5 (±8.8). Depressive symptoms had a mean of 11.4 (±8.8), range 3 to 46. 21% scored >16 on CES-

First Author (Year)	Study Objective	Sample (with age)		Care Reason	Study Design	Caregiver Psychosocial Measure	Findings
		study and those who did study and those who did study and those who did study and those who did study and those who did study and those who did study and those who did study and those who did study and those who did study and those who did study and those who did study and those who did Patient demographics: Age: M: 77.3 (±6.1), range 65 to 92 years; 50% male; 89% white.	Caregivers were family members who lived in the same city as the patient and provided the majority of assistance. not). Drop out from not). Drop out from not). Drop out from not). Drop out from not). Drop out from not). Drop out from not). Drop out from not). Drop out from not). Drop out from not). Drop out from not). Drop out from not). Drop out from	the study was due to patient the study was due to patient the study was due to patient the study was due to patient the study was due to patient the study was due to patient the study was due to patient the study was due to patient the study was due to patient the study was due to patient the study was due to patient the study was due to patient	death. Patients were 65 or older death. Patients were 65 or older death. Patients were 65 or older death. Patients were 65 or older death. Patients were 65 or older death. Patients were 65 or older death. Patients were 65 or older death. Patients were 65 or older death. Patients were 65 or older death. Patients were 65 or older death. Patients were 65 or older death. Patients were 65 or older	and had been hospitalized with and had been hospitalized with and had been hospitalized with and had been hospitalized with and had been hospitalized with and had been hospitalized with and had been hospitalized with and had been hospitalized with and had been hospitalized with and had been hospitalized with and had been hospitalized with and had been hospitalized with	a primary diagnosis of heart failure. Patients a primary diagnosis of heart failure. Patients a primary diagnosis of heart failure. Patients a primary diagnosis of heart failure. Patients a primary diagnosis of heart failure. Patients a primary diagnosis of heart failure. Patients a primary diagnosis of heart failure. Patients a primary diagnosis of heart failure. Patients a primary diagnosis of heart failure. Patients a primary diagnosis of heart failure. Patients a primary diagnosis of heart failure. Patients a primary diagnosis of heart failure. Patients D indicating depressive symptomology. Caregivers also had high positive appraisal of caregiving (M: 21.5) and high informal social support (M: 25.7). 44% of patients were readmitted to the hospital within 3 months. Increased caregiver informal social support significantly reduced risk for readmission (HR: .933, P<.01, CI: .991–1.037) as did the presence of depressive symptoms (HR: .882, P<.05, CI: .778–.999). Further analyses indicated that an interaction between stress and depression increased the risk for patient readmission (HR: 1.005, P<.05, CI: 1.001–1.008).
Schwarz (2000)	To determine whether low informal social support, low satisfaction with social support, high depressive symptomology of caregiver, and minimal use of home health care predicted hospital readmission of older adults.	Convenience sample from 2 hospitals of family members providing care to patients age 65 years of age or older who had been hospitalized. 60 of 85 family caregivers completed the 3-month follow-up (completers and non-completers did not differ with regard to primary measures). Hospice patients were excluded. Patient demographics: Age: M: 78.9 (±6.4), range 66 to 93 years;	Caregivers resided with the older adult and were able to speak and understand English. Characteristics: Age: M: 64.4 (±14.29), range 27–92, 73% female, 92% white, 60% spouses.	Chronic illness and were functionally impaired in two activities of daily living (ADL). Most care recipients had heart disease (25%), stroke (26%), cancer (15%), or skeletal problems (15%).	Longitudinal (over 3-months)	MISSB: (informal social support) ISSS (satisfaction with informal support) CES-D	Caregivers had a mean score of 9.68 (SD: 10.20) on CES-D at baseline and a mean score of 10.26 (SD: 12.49) at 3-month follow up. 33% of patients were readmitted at 3-months. The number of hospital readmissions ranged from 0 to 8 (M: .57, SD = 1.18). At 3-month interview, a greater number of hospital readmissions was significantly related to greater depressive symptoms

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		48% male; 97% white. 48% male; 97% white.					(r = .24), lower tangible support (r = −.24) and lower emotional support (r = −.24). In adjusted analyses, depressive symptoms were not a significant predictor of readmission (tangible and integration subscales of social support were significant predictors).