THE GERONTOLOGICAL SOCIETY OF AMERICA®

The Gerontologist
cite as: *Gerontologist*, 2016, Vol. 56, No. 6, 1053–1061
doi:10.1093/geront/gnv121
Advance Access publication September 8, 2015

OXFORD

Research Article

Dementia Caregivers' Use of Services for Themselves

Jennifer Martindale-Adams, EdD,[1,2] Linda O. Nichols, PhD,*,[1,2] Jeffrey Zuber, MA,[1,2] Robert Burns, MD,[1,3] and Marshall J. Graney, PhD[1,2]

[1]Department of Preventive Medicine, University of Tennessee Health Science Center, Memphis. [2]Veterans Affairs Medical Center Memphis, Tennessee. [3]Geriatrics Group of Memphis, Tennessee.

*Address correspondence to Linda O. Nichols, Veterans Affairs Medical Center Memphis, 1030 Jefferson Avenue, Memphis, TN 38104. E-mail: linda.nichols@va.gov

Received January 21, 2015; Accepted July 1, 2015

Decision Editor: Rachel Pruchno, PhD

Abstract

Purpose of the Study: Health care and social services such as physician visits and support groups used by dementia caregivers for themselves were examined. Caregivers (N = 642) were from the Resources for Enhancing Alzheimer's Caregivers Health (REACH II) study.
Design and Methods: Caregiver predisposing, enabling, and need variables were examined using chi-squared and t-tests to characterize service users. Stagewise linear regression was used to explain numbers of services used.
Results: Predisposing, enabling, and need variables were significantly related to dementia caregivers' service use. In regression, caregivers who were older, more educated, married, not employed, depressed, with functional disability needs, more illness-related reduced activity days, more medications, more symptoms, and fewer hours on duty per day used significantly more services for themselves. The statistically significant model explained 22.2% variance in numbers of services used. Service users, compared with nonusers, evidenced greater burden, bother with behaviors, and more desire to institutionalize.
Implications: This study shows that caregiver service use is related to caregiver characteristics. Future work should examine the impact of caregiving on health care and social service use and costs. The societal costs of caregiving may be better understood when we account for additional service use by caregivers themselves. A significant clinical and policy issue is who should assess and support the caregiver. Possibilities include the care recipient's health care practitioner, the caregiver's health care practitioner, or a formal caregiver-focused program based in the health care system or the social service network.

Keywords: Caregiving—informal, Dementia, Health services, REACH II

Health care and social services use for the person with dementia, especially for those with increasing impairment, cannot be separated from services used by the caregiver to facilitate care (Gill, Hinrichsen, & DiGiuseppe, 1998; Toseland, McCallion, Gerber, & Banks, 2002). These care recipient focused services offer direct (e.g., respite, housework) and indirect (personal care, transportation, day care) help to caregivers (Hong, 2010). Consequently, most research on service use in dementia care has focused on both the care recipient and the caregiver. As expected, caregiver characteristics, such as increased burden, are related to use of services by the care recipients (Gill et al., 1998; Hong, 2010; Toseland et al., 2002).

However, little attention has focused on caregiver use of services that do not involve or target the care recipient, such as support group participation. This is despite broad acknowledgment that caregiving is a stressful activity with adverse psychological and physical consequences (Brodaty, Green, & Koschera, 2003; Connell, Janevic, & Gallant, 2001; Etters, Goodall, & Harrison, 2008; Pinquart & Sörensen, 2003; Vitaliano, Zhang, & Scanlan, 2003; von Känel et al., 2008). Further, research has shown that spouses of individuals with Alzheimer's, compared with spouses of individuals without such a diagnosis, use more health care services and have significantly higher monthly Medicare use (Gilden, Kubisiak, Kahle-Wrobleski, Ball, & Bowman, 2014).

The Andersen and Aday behavioral model of health care use is one of the most extensively used frameworks for analyzing factors related to use of health care and/or social services (Babitsch, Gohl, & von Lengerke, 2012). This well-studied model includes predisposing variables that reflect propensities to use services (e.g., demographic, social structural, attitudinal-belief variables), enabling variables that reflect an individual's ability to find and access services (e.g., family resources, community characteristics), and need variables related to the illness (e.g., perceived and evaluated illness) (Aday & Andersen, 1974; Andersen, 1995).

Across different populations (e.g., lower-income populations, immigrants, ethnic groups, individuals suffering from varying diseases), similar variables are examined using the Andersen–Aday model. Frequently researched predisposing variables for service use are age, marital status, gender/sex, education, race/ethnicity, and employment status (Babitsch et al., 2012; Dhingra, Zack, Strine, Pearson, & Balluz, 2010). The most commonly studied enabling variables related to service use are income/financial situation, health insurance, having a usual source of care, emotional support, and availability of medical services (Babitsch et al., 2012; Dhingra et al., 2010). Frequently studied need variables are mental or physical health, self-reported/perceived health, unhealthy days, objective or medically evaluated need, medical conditions (diabetes, depressive symptoms, hypertension, heart disease, cancer), prior medical/chronic conditions, and daily activity limitation (Babitsch et al., 2012; Dhingra et al., 2010).

At least three studies (Gill et al., 1998; Hong, 2010; Toseland et al., 2002) have used the Andersen–Aday model to examine service use by dementia caregivers for their care recipients. Caregivers play an active role identifying and accessing services in dementia care recipient service use. Therefore, caregiver predisposing, enabling, and need variables are generally included with care recipient variables in modeling service use. For example, caregiver burden may be as important in predicting care recipient service use as the care recipient's level of dementia behaviors (Toseland et al., 2002). Further, both caregiver health limitations and care recipient need for help with activities of daily living may predict use of personal care services by the care recipient (Gill et al., 1998).

Caregiver *predisposing variables* associated with care recipient service use, including health services and human services, include older caregiver age (Hong, 2010; Robinson, Buckwalter, & Reed, 2005; Sun, Kosberg, Kaufman, Leeper, & Burgio, 2007), being the patient's spouse (Hong, 2010; Toseland et al., 2002), being a minority (Hong, 2010; Toseland et al., 2002), being employed (Hong, 2010) or being unemployed (Sun et al., 2007), and higher educational attainment (Gill et al., 1998; Hong, 2010; Sun et al., 2007; Toseland et al., 2002). These variables may also be important in predicting caregivers' own use of services.

Caregiver *enabling variables* associated with care recipient service use include financial situation measures, such as use of public transportation (Toseland et al., 2002), and Medicaid eligibility (Gill et al., 1998; Toseland et al., 2002), personal resources (Hong, 2010), less caregiver knowledge about services (Gill et al., 1998; Toseland et al., 2002), and less social support (Robinson, Buckwalter, & Reed, 2013; Sun et al., 2007) or more social support and family cooperation (Hong, 2010).

Caregiver *need variables* associated with care recipient service use include poor health (Toseland et al., 2002), perception that caregiving negatively impacts health (Toseland et al., 2002), burden (Hong, 2010; Toseland et al., 2002), more diverse caregiving tasks (Hong, 2010), better physical functioning (Hong, 2010), and caring for another family member (Toseland et al., 2002).

The objective of this study was to examine health care and social services used by dementia caregivers for themselves, not including care recipient services that might benefit the caregiver. Service use and nonuse were examined with the Andersen–Aday behavioral model of service use, using caregivers from the national multisite Resources for Enhancing Alzheimer's Caregivers Health II (REACH II) randomized clinical trial. REACH II, which examined a behavioral intervention for racially and ethnically diverse caregivers (Belle et al., 2006), was funded by the National Institute of Aging and the National Institute of Nursing Research, September 2001 to December 2004. It was conducted in Birmingham, Memphis, Miami, Palo Alto, and Philadelphia. REACH II has been extensively studied and articles on many aspects of the caregiving experience can be accessed through different databases. In the diverse REACH II sample, there was an opportunity to use caregiver predisposing, enabling, and need variables and care recipient predisposing and need variables to examine the influence of caregiver and care recipient characteristics and caregiver role stressors on caregivers' use of health care and social services.

Methods

Participants

The 642 REACH II caregivers were at least 21 years old, coresident with the care recipient, and provided at least 4 hr per day of care for the past 6 months (Belle et al., 2006). They could not be enrolled in another study or have an illness or disability that would prevent participation. Care recipients had a diagnosis of Alzheimer's disease or related dementia or a Mini-Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975) score ≤23, with at least one activities of daily living (ADL) limitation (Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963) or two limitations in instrumental activities of daily living (IADL) (Lawton & Brody, 1969).

Data for Model Development

All sites obtained approval from their local Institutional Review Board. After screening and consent, certified research staff collected data in the home. All data except care recipient MMSE were from caregiver report. Only baseline data are reported here. Measures were those used in the REACH II study (Belle et al., 2006).

Service use data were from the 12-item formal care and services measure, which was developed for the REACH I study (Harrow 2004). Each item assessed whether a service was used during the past month. If yes for any of the listed services or any of three additional services, a follow-up item asked: who used the service and for how many days. Services included homemaker, home health aide, meals, transportation, visiting nurse, day care or senior day health program, support group, physician visit, mental health visit, emergency room visit, inpatient care, and nursing home placement. Only 11 services were options for caregivers, excluding nursing home placement; similarly, support group use was excluded for care recipients. All other services could be used by caregiver, care recipient, or both. Caregivers could also indicate up to three other services that either they or the care recipient used. Service use was computed as number of types of services used, which could range from 0 to 14, 11 caregiver-option services plus 3 additional. Services were counted if the caregiver reported that only they used the service or that they and the care recipient both used the service. For example, if a caregiver had used a support group three times in the past month, that would count as one type of service used, support group.

Predisposing caregiver variables included caregiver age, race, ethnicity, education, marital status, relationship to care recipient, and sex.

Enabling caregiver variables were annual household income, employment status, and social support. Employment status was coded as employed or not employed. Ten social support items measured received support and negative interactions (Krause, 1995), and satisfaction (Krause, 1995; Krause & Markides, 1990). Items use a scale of 0 (*never*, *not at all*) to 3 (*very often*, *very*). Overall, the instrument scores range from 0 to 30 with higher scores indicating more social support.

Caregiver need variables included depression, burden, general health, comorbid diagnoses, symptoms, disability, days reduced activity due to illness, total years caregiving, hours per day performing caregiving tasks, hours per day on duty, number of medications, caregiver frustrations, and desire to institutionalize.

The Center for Epidemiologic Studies Short Depression scale (CES-D 10) consists of 10 items (Irwin, Artin, & Oxman, 1999; Radloff, 1977) measured on a scale ranging from 0 (*rarely or none of the time*) to 3 (*most or almost all of the time*). Scores range from 0 to 30, with higher scores indicating more depressive symptoms. The 12-item Zarit Burden Interview (ZBI) assessed caregiver burden (Bédard et al., 2001; Zarit, Reever, & Bach-Peterson, 1980). The items are answered using a scale ranging from 0 (*never*) to 4 (*nearly always*) and summed scores range from 0 to 48, with higher scores indicating more burden. Caregiver health was assessed from 1 (*poor*) to 5 (*excellent*) with one question from the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36) (Ware et al., 1995).

Comorbidities assesses if caregivers had any of 12 common diseases (e.g., arthritis). Items are scored 0 (*no*) or 1 (*yes*) with total scores of 0 to 12, with higher scores indicating more comorbidities. Total number of symptoms in the past month from a list of 21 symptoms often associated with stress (e.g., sore throat, headache, diarrhea, skin rash, rapid heartbeat) was assessed. Each item is scored 0 (*no*) or 1 (*yes*). Symptom scores range from 0 to 21, with higher scores indicating more symptoms. Two questions on caregiver functional disability assess whether the caregiver has need of other persons in handling personal care needs (e.g., ADLs) or routine needs (e.g., IADLs). Both items are scored 0 (*no*) or 1 (*yes*) with total scores of from 0 to 2, with higher scores indicating more disability. One question from the SF-36 asks how many days the caregiver cut down on activity due to illness (Ware et al., 1995).

Questions from the Caregiver Vigilance scale (Mahoney et al., 2003) included time the caregiver spent performing tasks for the care recipient and overall time spent on duty per day. The Frustrations of Caregiving scale includes eight questions examining how often in the past 6 months the caregiver felt like hitting, yelling at or using a harsh tone, confining, or blaming the care recipient. Each item is scored from 0 (*never*) to 3 (*always*). Total scores range from 0 to 24, with higher scores indicating more frustration. Desire to institutionalize (Morycz, 1985) contains six *yes/no* items regarding institutionalizing the care recipient. Total scores range from 0 to 6 with higher scores indicating more desire to institutionalize.

Frequency of and bother with problem behaviors were assessed with a modified Revised Memory and Behavior Problem Checklist (RMBPC) (Teri et al., 1992). The checklist contains 24 items that can be answered on a scale from 0 (*not in the past week*) to 3 (*daily or more often*). Scores for this scale range from 0 to 72, with higher scores indicating more problem behaviors. For each problem that is present, a follow-up question that asks about bother/upset is scored from 0 (*not at all*) to 4 (*extremely*). Scores for the bother scale range from 0 to 96 with higher scores indicating more bother and concern.

Care recipient characteristics included predisposing variables of age and sex, and need variables of general health, stage of dementia, ADL/IADL, and frequency of problem behaviors from the RMBPC. Care recipient physical health (not related to memory or confusion) was measured using the same question as caregiver general health (Ware et al., 1995). The 11 MMSE items (Folstein et al., 1975) assess cognitive functioning through orientation to time and place, recall ability, short-term memory, and arithmetic ability. Scores range from 0 to 30 with higher scores indicating better cognitive functioning and a score of 23 or below indicating cognitive impairment.

The six care recipient ADL (Katz et al., 1963) items are answered 0 (*no*) or 1 (*yes*). Scores range from 0 to 6 with higher scores indicating more functional impairment. The eight care recipient IADL (Lawton & Brody, 1969) items are scored in the same manner. Scores range from 0 to 8 with higher scores indicating higher levels of helping with instrumental activities.

Data Analysis

Baseline data were compared between caregivers who used services (users) and those who did not (nonusers) using chi-squared or independent-samples t-tests, as appropriate. For data that did not meet criteria for the chi-squared test, Fisher's exact test p-values are reported. Multivariate models were constructed using stagewise linear regression, introducing blocks of predisposing, enabling, and caregiver need variables successively as explainers of numbers of services used by caregivers. A final model added care recipient predisposing and need variables. For all analyses, p values less than or equal to .05 were considered statistically significant. Effect sizes for continuous variables (Cohen's d) and categorical variables (Cramer's V) were estimated (Cohen, 1988; Rea & Parker, 2012). Effect size of Cohen's d of .20 was considered small and .50 medium (Cohen, 1992). For Cramer's V effect sizes from .10 to .19 were considered weak and moderate effect sizes were from .20 to .39 (Rea & Parker, 2012).

Results

Service Use

Table 1 shows services used by caregivers and care recipients, excluding nursing home placement. Frequently used services by caregivers were physicians/psychiatrists, support groups, and homemaker services. Common "other" services reported by caregivers that were not on the list included occupational or physical therapy, home repairs, recreational services, social worker visit, and friendly visitor.

Service Users and NonUsers

The REACH II sample of caregivers has been previously published (Belle et al., 2006; Salgado-García et al., 2013). Table 2 compares caregivers who were using services for themselves to those who were not using services. There were statistically significant predisposing, enabling, and need variable differences between 392 service users and 250 caregivers who were not using services. Caregivers who used services were more likely to be older, Caucasian, not Latino, married, and be spouses of the care recipient. For enabling variables, caregivers using services had higher income and were more likely to be retired. For caregiver need variables, those using services had significantly more depression, burden, comorbid diagnoses, symptoms, disability, reduced activity days due to illness, number of medications, greater desire to institutionalize, and bother with problem behaviors.

Table 1. Frequency of Services Used ($N = 642$)

Service type	CGs only using service, %	CRs only using service, %	Both CG and CR using service, %	Total CGs using service, %
Homemaker	2.6	10.9	13.6	16.2
Home health aide	0.6	25.7	0.3	0.9
Meals	0.6	9.3	5.1	5.8
Transportation	0.9	16.5	3.0	3.9
Visiting nurse	0.3	15.9	0.9	1.2
Day care or senior day health program	1.6	25.1	1.7	3.3
Support group (CG only)	16.2	n/a	n/a	16.2
Physician and/or psychiatrist	8.6	38.3	28.0	36.6
Counselor, psychologist, or clergy	8.4	3.1	1.7	10.1
ER visits	3.9	8.3	0.3	4.2
Inpatient care	2.5	7.0	9.5	12.0
CGs using 1 other service	7.8	n/a	n/a	7.8
CGs using 2 other services	1.2	n/a	n/a	1.2
CGs using 3 other services	0.5	n/a	n/a	0.5

Note: Percentages are number reported out of total N (642). Other services included occupational or physical therapy, home repairs, recreational services, social worker visit, and friendly visitor. CG = caregiver; CR = care recipient; Total CGs using service = CGs only using service + Both CG and CR using service; n/a = not applicable.

Table 2. Baseline Characteristics of Caregivers Using and Not Using Services (*N* = 642)

Variable	Used services (*n* = 392), *M* ± *SD* or %	Did not use services (*n* = 250), *M* ± *SD* or %	*p* Value	Cohen's *d*	Cramer's *V*
Predisposing					
Age, years	63.2 ± 13.1	56.5 ± 12.6	<.001	.51	
Race			.002		.15
Caucasian	55.6	41.2			
African American	30.4	38.0			
American Indian/Alaskan Native	0.3	—			
Other	12.2	19.6			
No primary group	1.5	1.2			
Ethnicity, Latino	28.8	39.2	.006		.11
Education, years	13.1 ± 3.7	12.7 ± 3.5	.148	.12	
Marital status			<.001		.19
Married or living as married	73.5	56.0			
Divorced, not currently married	12.2	18.0			
Never married	8.4	17.2			
Widowed, not currently married	4.6	6.0			
Separated	1.3	2.8			
Relationship to care recipient					
Child	37.8	63.6	<.001		.28
Spouse	53.1	25.6			
Grandchild	2.8	3.6			
Sibling	3.3	2.0			
Niece/nephew	1.5	3.2			
Other	1.5	2.0			
Sex, female	81.9	84.4	.410		.03
Enabling					
Household income ≥ $30,000	50.3	39.3	.008		.11
Employment status					
Full time	18.9	31.2	<.001		.20
Part time	7.1	10.0			
Homemaker	19.6	21.2			
Retired	43.9	26.0			
Not employed, not retired	10.5	11.6			
Social support (0–40)	17.9 ± 5.5	17.1 ± 5.8	.088	.14	
Caregiver need					
Depression (0–30)	10.6 ± 6.5	9.1 ± 6.3	.003	.24	
Burden (0–44)	19.4 ± 9.8	17.8 ± 9.8	.039	.17	
General health (1–5)	2.8 ± 1.1	3.0 ± 1.0	.089	.13	
Comorbid diagnoses (0–12)	2.8 ± 1.7	2.1 ± 1.6	<.001	.37	
Symptoms (0–21)	4.1 ± 3.3	3.2 ± 2.7	<.001	.29	
Functional disability (0–2)	0.2 ± 0.4	0.1 ± 0.2	<.001	.28	
Days reduced activity due to illness	2.8 ± 6.3	1.2 ± 3.5	<.001	.30	
Total years caregiving	5.1 ± 7.4	4.6 ± 6.8	.389	.07	
Hours performing tasks	8.8 ± 5.2	8.2 ± 4.6	.156	.12	
Hours on duty	19.4 ± 6.8	19.0 ± 7.0	.529	.05	
Number of medications	5.2 ± 4.1	3.2 ± 2.9	<.001	.56	
Caregiver frustrations (0–24)	4.0 ± 2.9	3.7 ± 2.9	.206	.10	
Desire to institutionalize (0–6)	1.3 ± 1.5	1.0 ± 1.4	.018	.20	
Bother with behaviors (0–96)	17.6 ± 13.5	15.5 ± 13.2	.043	.16	

Note: Depression = Center for Epidemiologic Studies Short Depression scale; Burden = Zarit Burden Inventory; Bother with behaviors = Revised Memory and Behavior Problem Checklist.

Caregivers who used services were more likely to be taking care of male care recipients (52.6% vs 33.2%, $p < .001$; $V = .14$) and less demented care recipients (MMSE: 13.0 ± 7.3 vs 11.6 ± 7.4, $p = .017$, $d = .20$).

Behavioral Model of Service Use

Although every service was used by caregivers for themselves, no single caregiver reported using more than seven services. For statistically significant predisposing variables, caregivers who were older, married, and with more education used more services (Table 3). The statistically significant predisposing model explained 9.7% of variance in numbers of services used. Adding enabling variables resulted in employment status (caregiver not employed) as a significant variable, along with age, education, and marital status, for an additional 1.5% in variance explained; the combined model was statistically significant.

When caregiver need variables were added, the predisposing and enabling variables of age, education, marital status, and employment status remained significant. Significant need variables were depression, symptoms, disability, activity days due to illness, hours on duty, and medications. Specifically, caregivers who exhibited more depression, symptoms, disability, and days lost to illness, used more medications, and had fewer hours on duty used more services. The combined model was statistically significant, with an additional 11.0% of variance explained for 22.2% total explained variance in numbers of services used. When care recipient predisposing and need variables were added to the model, none were significant and only 1.0% additional variance in caregiver service use was explained (data not shown).

Discussion

To our knowledge this is the first study focused on dementia caregivers' use of health care and social services for themselves. Our findings are similar to previous work examining other groups characterized by a variety of diagnoses using services (Babitsch et al., 2012). In distinguishing caregivers who used services from those who did not, caregivers who used services were significantly more likely to be older, Caucasian, non-Latino, married, spouses of the care recipient, retired, and with higher household income. They were more likely to be taking care of male and less demented care recipients. In examining caregiver need variables, caregivers who were depressed, burdened, with multiple comorbid diagnoses, more symptoms, functional disability needs related to ADL/IADL, more days with reduced activity due to illness, greater numbers of medications, a desire to institutionalize the care recipient, and greater bother with care recipient behaviors were all significantly more likely to use services.

Caregiver need variables could be related to providing care or related to the caregiver's pre-existing health status (Roth, Fredman, & Haley, 2015; Schulz & Sherwood, 2008). Dementia caregivers who used services had significantly greater burden, a desire to institutionalize the care recipient, and more bother; these variables are likely related to providing care. For other need variables related to using services, it is more difficult to determine which may be related to the stress of caregiving. For example, although depression is frequently linked to service use, it is commonly present in dementia caregivers and is often used as a target outcome for caregiving interventions. Symptoms such as headache could also be considered stress related. The symptom measure was comprised of symptoms that have been linked to stress. Greater numbers of medications could also be linked to the stress of caregiving. For example, 25.1% of REACH II caregivers reported taking at least one medication for anxiety, depression or stress.

In explaining variance in the number of services used by dementia caregivers, caregivers who were older, married, retired, and with more education used more services. (Relationship to the care recipient was not included in the regression model because being a spouse of the care recipient and being older were closely related.) In examining caregiver need, caregivers who were depressed, exhibited more symptoms, functional disability, and days of reduced activity, took more medications, and/or spent fewer hours on duty used more services. The combined model was statistically significant, with 22.2% total explained variance in numbers of services used. Again, it is difficult to determine whether these caregiver need variables are associated with providing care.

Caution should be exercised in over-attributing caregiver health status to caregiving. Although caregiver physical and psychological health outcomes have been linked to the caregiving experience, the caregiver's health is not entirely a function of caregiving. In this study, in addition to variables that could be associated with caregiving such as burden or desire to institutionalize, clinical variables such as comorbidities and functional disability were also important in caregivers' use of services. Health status and outcomes for caregivers may be relatively independent of the caregiving role or related to individual characteristics that existed prior to assuming the caregiving role, such as socioeconomic status, health habits, prior illness, and age (Brown & Brown, 2014; Roth et al., 2015; Schulz & Sherwood, 2008).

One caveat is that these were self-report data and caregivers may have not been clear about some of the services, for example, reporting that they used day care/senior day health program when in fact they attended a wellness or exercise program at a senior center. In addition, because the data are cross-sectional, it is not possible to determine causality, for example, whether fewer hours on duty is a result of the use of more services. Readers should be aware that, on average, a study with as many chi-squared and *t*-tests as shown in Table 1 will produce at least one statistically significant finding by chance alone. The sample was diverse, including equal numbers of Caucasian, African

Table 3. Caregiver Services Used Regression Models (*N* = 642)

Variable	Stage 1 Beta	Stage 1 *p* Value	Stage 2 Beta	Stage 2 *p* Value	Stage 3 Beta	Stage 3 *p* Value
Predisposing						
Age	.253	<.001	.214	<.001	.213	<.001
White	.021	.606	.013	.754	−.020	.628
Latino	−.026	.532	−.021	.631	.002	.958
Education	.088	.042	.102	.028	.101	.026
Married	.099	.017	.088	.041	.094	.022
Sex	.026	.507	.026	.517	−.014	.713
Enabling						
Household income ≥ $30,000			.044	.345	.052	.237
Employed			−.134	.003	−.098	.028
Social support			−.039	.335	.033	.443
Caregiver need						
Depression					.119	.026
Burden					.089	.754
General health					.027	.574
Comorbid diagnoses					.003	.949
Symptoms					.140	.004
Functional disability					.084	.044
Days reduced activity due to illness					.087	.041
Total years caregiving					.023	.549
Hours performing tasks					.082	.055
Hours on duty					−.086	.039
Number of medications					.099	.024
Caregiver frustrations					−.071	.116
Desire to institutionalize					.073	.074
Bother with behaviors					.003	.953
R^2	.097	<.001	.112	<.001	.222	<.001

Note: Depression = Center for Epidemiologic Studies Short Depression scale; Burden = Zarit Burden Inventory; Bother with behaviors = Revised Memory and Behavior Problem Checklist.

American, and Latino caregivers with spouse, children, and other caregivers represented. Despite this diversity, generalizability may be limited to stressed and burdened caregivers willing to enroll in an intervention study.

Despite these caveats, this study has implications for researchers, policy makers, and clinicians providing care to dementia caregivers. The finding that both individual health status variables and variables that may be associated with caregiving are independently related to caregiver health care and social service use provides evidence that a broad picture of the caregiver's health is necessary. This linkage of health care and social services use and caregiving distress (e.g., burden, desire to institutionalize the care recipient) suggests that caregiving can be detrimental to the health of the caregiver. Further, it is confirmation that there is interdependence between the health care status of dementia patients and the health care use of their spouses (Gilden et al., 2014).

The results of this study, which build upon and expand the work of other researchers examining health status of dementia care recipients and caregivers, further clarify the complex interrelationships between the care recipient and caregiver. There is increased interest in interventions and programs to help caregivers in their role. With potential replacement costs of $864.11 billion per year for the level of skilled and unskilled care that family caregivers provide (Chari, Engberg, & Mehrotra, 2014), society is dependent on the role caregivers play in taking care of their loved ones as part of the care system. When we account for additional health care and social service utilization by caregivers that may be related to their caregiving role, costs may be even greater.

A significant clinical and policy issue is who should assess and support the caregiver, particularly in primary care and in caregivers' accessing of health care and social services for themselves (O'Shaughnessy, 2013). Assessment of caregiver burden and provision of caregiver support could be driven by the care recipient's primary care provider. However, that decision changes the focus of care from the patient to both members of the dyad and may not be reimbursable. The caregiver's provider is a logical source of support but there must be readily available identification, assessment and intervention tools for the primary care provider to use. Finally, interventions may be directed by third parties, either health care systems or social service agencies with formal caregiver-focused programs, to provide assistance outside the primary care encounter.

Funding

The original REACH II study was funded by the National Institute on Aging (AG13305, AG13289, AG13313, AG20277, and AG13265) and the National Institute of Nursing Research (NR004261). This work was supported by the Memphis Veterans Affairs Medical Center.

Acknowledgments

The contents are solely the responsibility of the authors and do not represent the views of the Department of Veterans Affairs or the U.S. Government.

References

Aday, L. A., & Andersen, R. (1974). A framework for the study of access to medical care. *Health Services Research*, **9**, 208. doi:10.2307/2137284

Andersen, R. M. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*, **36**, 1–10.

Babitsch, B., Gohl, D., & von Lengerke, T. (2012). Re-revisiting Andersen's behavioral model of health services use: A systematic review of studies from 1998–2011. *Psycho-social Medicine*, **9**. doi:10.3205/psm000089

Bédard, M., Molloy, D. W., Squire, L., Dubois, S., Lever, J. A., & O'Donnell, M. (2001). The Zarit Burden interview a new short version and screening version. *The Gerontologist*, **41**, 652–657. doi:10.1093/geront/41.5.652

Belle, S. H., Burgio, L., Burns, R., Coon, D., Czaja, S. J., Gallagher-Thompson, D., …Zhang, S. (2006). Enhancing the quality of life of dementia caregivers from different ethnic or racial groups: A randomized, controlled trial. *Annals of Internal Medicine*, **145**, 727–738. doi:10.7326/0003-4819-145-10-200611210-00005

Brodaty, H., Green, A., & Koschera, A. (2003). Meta-analysis of psychosocial interventions for caregivers of people with dementia. *Journal of the American Geriatrics Society*, **51**, 657–664. doi:10.1034/j.1600-0579.2003.00210.x

Brown, R. M., & Brown, S. L. (2014). Informal caregiving: A reappraisal of effects on caregivers. *Social Issues and Policy Review*, **8**, 74–102. doi:10.1111/sipr.12002

Chari, A., Engberg, J., & Mehrotra, A. (2014). The opportunity costs of informal elder-care in the United States. *Health Services Research*. doi:10.1111/1475–6773.12238

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cohen, J. (1992). A power primer. *Psychological Bulletin*, **112**, 155–159. doi:10.1037/0033-2909.112.1.155

Connell, C. M., Janevic, M. R., & Gallant, M. P. (2001). The costs of caring: Impact of dementia on family caregivers. *Journal of Geriatric Psychiatry and Neurology*, **14**, 179–187. doi:10.1177/089198870101400403

Dhingra, S., Zack, M., Strine, T., Pearson, W., & Balluz, L. (2010). Determining prevalence and correlates of psychiatric treatment with Andersen's behavioral model of health services use. *Psychiatric Services*, **61**, 524–528. doi:10.1176/appi.ps.61.5.524

Etters, L., Goodall, D., & Harrison, B. E. (2008). Caregiver burden among dementia patient caregivers: A review of the literature. *Journal of the American Academy of Nurse Practitioners*, **20**, 423–428. doi:10.1111/j.1745-7599.2008.00342.x

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-mental state": A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, **12**, 189–198. doi:10.1016/0022-3956(75)90026-6

Gilden, D. M., Kubisiak, J. M., Kahle-Wrobleski, K., Ball, D. E., & Bowman, L. (2014). Using US medicare records to evaluate the indirect health effects on spouses: A case study in Alzheimer's disease patients. *BMC Health Services Research*, **14**, 291. doi:10.1186/1472-6963-14-291

Gill, C. E., Hinrichsen, G. A., & DiGiuseppe, R. (1998). Factors associated with formal service use by family members of patients with dementia. *Journal of Applied Gerontology*, **17**, 38–52. doi:10.1177/073346489801700103

Hong, S.-I. (2010). Understanding patterns of service utilization among informal caregivers of community older adults. *The Gerontologist*, **50**, 87–99. doi:10.1093/geront/gnp105

Irwin, M., Artin, K. H., & Oxman, M. N. (1999). Screening for depression in the older adult: Criterion validity of the 10-item Center for Epidemiological Studies Depression Scale (CES-D). *Archives of Internal Medicine*, **159**, 1701–1704. doi:10.1001/archinte.159.15.1701

Katz, S., Ford, A. B., Moskowitz, R. W., Jackson, B. A., & Jaffe, M. W. (1963). Studies of illness in the aged. The index of ADL: A standardized measure of biological and psychosocial function. *Journal of the American Medical Association*, **185**, 914–919. doi:10.1001/jama.1963.03060120024016

Krause, N. (1995). Negative interaction and satisfaction with social support among older adults. *Journal of Gerontology: Psychological Sciences*, **50**, P59–P73. doi:10.1093/geronb/50B.2.P59

Krause, N., & Markides, K. (1990). Measuring social support among older adults. *The International Journal of Aging and Human Development*, **30**, 37–53. doi:10.2190/CY26-XCKW-WY1V-VGK3

Lawton, M., & Brody, E. (1969). Assessment of older people: Self-maintaining and instrumental activities of daily living. *The Gerontologist*, **9**, 179–186. doi:10.1093/geront/9.3_Part_1.179

Mahoney, D. F., Jones, R. N., Coon, D. W., Mendelsohn, A. B., Gitlin, L. N., & Ory, M. (2003). The caregiver vigilance scale: Application and validation in the resources for enhancing Alzheimer's caregiver health (REACH) project. *American Journal of Alzheimer's Disease and Other Dementias*, **18**, 39–48. doi:10.1177/153331750301800110

Morycz, R. K. (1985). Caregiving strain and the desire to institutionalize family members with Alzheimer's disease: Possible predictors and model development. *Research on Aging*, **7**, 329–361. doi:10.1177/0164027585007003002

O'Shaughnessy, C. V. (2013). Family caregivers: The primary providers of assistance to people with functional limitations and chronic impairments. *National Health Policy Forum*. Background Paper No. 84.

Pinquart, M., & Sörensen, S. (2003). Differences between caregivers and noncaregivers in psychological health and physical health: A meta-analysis. *Psychology and Aging*, **18**, 250. doi:10.1037/0882-7974.18.2.250

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, **1**, 385–401. doi:10.1177/014662167700100306

Rea, L. M., & Parker, R. A. (2012). *Designing and conducting survey research: A comprehensive guide*. San Francisco, CA: John Wiley & Sons.

Robinson, K. M., Buckwalter, K., & Reed, D. (2013). Differences between dementia caregivers who are users and nonusers of community services. *Public Health Nursing*, **30**, 501–510. doi:10.1111/phn.12041

Robinson, K. M., Buckwalter, K. C., & Reed, D. (2005). Predictors of use of services among dementia caregivers. *Western Journal of Nursing Research*, **27**, 126–140.

Roth, D. L., Fredman, L., & Haley, W. E. (2015). Informal caregiving and its impact on health: A reappraisal from population-based studies. *The Gerontologist*. doi:10.1093/geront/gnu177

Salgado-García, F. I., Zuber, J. K., Graney, M. J., Nichols, L. O., Martindale-Adams, J. L., & Andrasik, F. (2013). Smoking and smoking increase in caregivers of Alzheimer's patients. *The Gerontologist*. doi:10.1093/geront/gnt149

Schulz, R., & Sherwood, P. R. (2008). Physical and mental health effects of family caregiving. *The American Journal of Nursing*, **108**(9 Suppl.), 23. doi:10.1097/01.NAJ.0000336406.45248.4c

Sun, F., Kosberg, J. I., Kaufman, A. V., Leeper, J. D., & Burgio, L. D. (2007). Formal services utilization by family caregivers of persons with dementia living in rural southeastern USA. *Rural Social Work and Community Practice*, **12**, 22–30.

Teri, L., Truax, P., Logsdon, R., Uomoto, J., Zarit, S., & Vitaliano, P. P. (1992). Assessment of behavioral problems in dementia: The revised memory and behavior problems checklist. *Psychology and Aging*, **7**, 622. doi:10.1037/0882-7974.7.4.622

Toseland, R. W., McCallion, P., Gerber, T., & Banks, S. (2002). Predictors of health and human services use by persons with dementia and their family caregivers. *Social Science & Medicine*, **55**, 1255–1266. doi:10.1016/S0277-9536(01)00240-4

Vitaliano, P. P., Zhang, J., & Scanlan, J. M. (2003). Is caregiving hazardous to one's physical health? A meta-analysis. *Psychological Bulletin*, **129**, 946–972. doi:10.1037/0033-2909.129.6.946

von Känel, R., Mausbach, B. T., Patterson, T. L., Dimsdale, J. E., Aschbacher, K., Mills, P. J.,…Grant, I. (2008). Increased Framingham Coronary Heart Disease Risk Score in dementia caregivers relative to non-caregiving controls. *Gerontology*, **54**, 131–137. doi:10.1159/000113649

Ware, J. E. Jr., Kosinski, M., Bayliss, M. S., McHorney, C. A., Rogers, W. H., & Raczek, A. (1995). Comparison of methods for the scoring and statistical analysis of SF-36 health profile and summary measures: Summary of results from the Medical Outcomes Study. *Medical Care*, **33**(4 Suppl.), AS264–AS279.

Zarit, S. H., Reever, K. E., & Bach-Peterson, J. (1980). Relatives of the impaired elderly: Correlates of feelings of burden. *The Gerontologist*, **20**, 649–655. doi:10.1093/geront/20.6.649