

Correlates of Physical Health of Informal Caregivers: A Meta-Analysis

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Effects of caregiving on physical health have received less theoretical and empirical attention than effects on psychological health. This meta-analysis integrates results from 176 studies on correlates of caregiver physical health. Caregiver depressive symptoms had stronger associations with physical health than did objective stressors. Higher levels of care recipient behavior problems were more consistently related to poor caregiver health than were care receiver impairment and intensity of caregiving. Higher age, lower socioeconomic status, and lower levels of informal support were related to poorer health. Predictors of physical health are not identical to predictors of psychological health. Associations of caregiving stressors with health were stronger among older samples, dementia caregivers, and men. In sum, negative effects of caregiving on physical health are most likely to be found in psychologically distressed caregivers facing dementia-related stressors.

WHEREAS hundreds of studies have assessed the effects of caregiving on psychological health, much less research is available on the effects of providing care on the physical health of informal caregivers. Poor health of caregivers may be due to (a) the effects of physical exertion that produces muscle strain, skeletal injury, aggravation of chronic illness such as arthritis, or other sources of physical discomfort and pain; (b) negative changes in health-related activities, such as diet and exercise; (c) physiological effects of psychological distress, such as depression, which increase susceptibility to infectious agents; and (d) changes in sympathetic arousal and cardiovascular reactivity that increase the risk for hypertension and cardiovascular disease (e.g., Shaw et al., 1997). In addition to being intrinsically undesirable and incurring increased health care costs, poor health of caregivers has been identified as a risk factor for difficulties in managing the caregiving responsibilities, with potential negative effects on the care recipient (Navaie-Waliser et al., 2002) and for institutionalization of the care recipient (e.g., McCann, Hebert, Bienias, Morris, & Evans, 2004).

According to narrative reviews, between 18% and 35% of informal caregivers perceive their health as fair or poor (Schulz, O'Brien, Bookwala, & Fleissner, 1995), and caregivers have frequently been referred to as the "hidden patients" (Fengler & Goodrich, 1979). Two meta-analyses have found that informal caregivers have poorer physical health than noncaregivers, measured both by perceived health (Pinquart & Sörensen, 2003a) and by objective health measures, such as stress hormones, antibodies, and medication use (Vitaliano, Zhang, & Scanlan, 2003). However, these studies did not analyze predictors of impaired physical health among caregivers. Understanding which aspects of caregiving contribute to health decrements can help identify caregivers at risk and can contribute to tailored psychosocial and medical interventions. As a result of between-study heterogeneity in sample sizes, sampling characteristics, and methods for assessment, individual studies on correlates of caregiver health have provided inconsistent results. Our goal in the present meta-analysis is to integrate the available

research on associations of physical health of caregivers with sociodemographic characteristics, stressors, resources, and psychological distress. This analysis provides reliable information on the size of the associations, and it identifies study characteristics that moderate the size of the observed associations.

CORRELATES OF PHYSICAL HEALTH

Sociodemographic Variables

We focus on associations of caregiver health with three sociodemographic characteristics: age, spousal status, and coresidence. We do not focus on gender or ethnicity because our previous meta-analyses have already shown that caregiving women have lower levels of physical health than do caregiving men (Pinquart & Sörensen, 2006) and that ethnic minority caregivers have poorer physical health than do Caucasian caregivers (Pinquart & Sörensen, 2005).

Age.—The literature has been inconsistent with regard to age differences in caregiver health. One would expect older caregivers to have worse physical health (a) because of age-associated decreases in physical health irrespective of the caregiving role (Rowe & Kahn, 1998) and (b) because caregiving-related stressors may have stronger negative effects on the physical health of older caregivers with preexisting health problems. Nonetheless, because caregiving is more developmentally on time for older than for younger adults (Neugarten, 1969) and as some sources of stress would be less prevalent in older caregivers (e.g., competing demands from the work role), age differences in physical health might be smaller than expected. In fact, some studies have found poorer physical health among older caregivers (e.g., Navaie-Waliser et al., 2002), whereas others have found no significant age differences (e.g., Harwood, Barker, Ownby, & Duara, 2000).

Spousal status.—Similarly, spouses may report worse physical health than adult children do, because they are usually older

and more likely to show age-associated physical decline. However, many adult children have additional family and work responsibilities (Cantor, 1992) that may conflict with caregiving. Associations of spousal status with physical health also were inconsistent in previous studies. For example, Cantor (1983) found poorer physical health in caregiving spouses than in caregiving adult children, but Gräsel (2002) found that health changes in caregivers did not differ between spouses and adult children.

Coresidence.—Sharing the home with the care recipient (CR) may be associated with more stressors, because coresiding caregivers have less time off from their caregiving role. Brodaty and Hadzi-Pavlovic (1990) found worse physical health in caregivers who lived with their parents than in other caregivers. However, Li, Seltzer, and Greenberg (1999) could not replicate this finding.

Caregiver Stressors

Greater physical impairment of the CR and high need for providing hands-on care may affect caregiver health through physical strain, changes in health habits, psychological distress, and physiological changes (Shaw et al., 1997). The latter three pathways may also explain the negative effect of CR's cognitive impairment and behavior problems on the caregiver's physical health.

However, the literature shows inconsistent results: Some studies report associations of physical health with the number of hours of care provision (e.g., Navaie-Waliser et al., 2002), the number of caregiver tasks (e.g., Pruchno, Kleban, Michaels, & Dempsey, 1990), and the number of months in the caregiver role (e.g., Mui, 1995 for men only), as well as the level of the CR's functional impairment (e.g., Penning, 1998), cognitive impairment (e.g., Moritz, Kasl, & Ostfeld, 1992), and behavior problems (e.g., Brodaty & Hadzi-Pavlovic, 1990). Other studies, however, do not find significant such effects (e.g., Fredman & Daley, 1997; Morissey, Becker, & Rubert, 1990; Mui; Neundorfer, 1991; Penning, 1998).

Caregiver Resources

With regard to caregiver resources, we focus on socioeconomic status (SES) and social support.

SES.—Caregivers with higher SES face fewer stressors not specific to caregiving and have better access to the health care system (Brodaty, Thompson, Thompson, & Fine, 2005). However, some studies report a positive correlation between educational attainment and caregiver health (e.g., Navaie-Waliser et al., 2002), whereas others do not find such an association (e.g., Beach, Schulz, Yee, & Jackson, 2000). Similarly, positive correlations of income with physical health have been reported in some studies (e.g., Riemsma et al., 1999) but not in others (e.g., Kiecolt-Glaser, Dura, Speicher, Trask, & Glaser, 1991).

Social support.—Social support may positively affect caregiver health by reducing caregiver stressors (e.g., Chappell & Reid, 2002), helping to develop effective forms of coping (Losada, Montorio, Marquez, & Izal, 2005), and promoting positive health behaviors (Tang & Chen, 2002). Morissey and colleagues (1990) and Uchino, Kiecolt-Glaser, and Cacioppo (1992) observed that lower levels of social support were associated with worse physical health of caregivers, although

Mui (1995) did not find such a relationship. Two sources of social support have been distinguished: Informal support from relatives and friends, and formal support from professional helpers. We investigate these separately.

Psychological Distress

According to Shaw and colleagues (1997), Patterson and Grant (2003), and Vitaliano and associates (2003), psychological distress, such as caregiver burden and depression, may cause negative hormonal changes, increase susceptibility to infectious agents, and disrupt health habits, such as getting enough sleep and engaging in healthy eating patterns. In addition, depressed caregivers may overreport physical problems (DeFrias, Tukko, & Rosenberg, 2005).

Consistent with these considerations, Pruchno and colleagues (1990) observed that depression predicted a decline of physical health of caregiving wives over a 6-month period. Although no associations were found among male caregivers, this was likely due to the sample size. There may be a negative feedback loop between decline in psychological health and decline in physical health, with worsening physical health acting as a risk factor for caregiver depression (Whitlatch, Feinberg, & Sebesta 1997; also see Killian, Turner, & Cain, 2005). Notably, the size of associations of caregiver burden and depressive symptoms with physical health varies considerably among available studies (e.g., Atienza & Stephens, 2000; Blood, Simpson, Dineen, Kaufman, & Raimondi, 1994).

Influences of Study Characteristics

The variability in results of existing studies demonstrates the need for an integrative approach to analyzing and interpreting these data. The heterogeneity of the results of the available studies may, in part, be based on between-study differences in sample and study characteristics. We therefore analyze whether the strength of the association between stressors and caregiver physical health varies by age, spousal status, gender, dementia caregiving, health measures chosen, and sampling procedure of the studies.

Age.—In addition to being directly related to poorer caregiver physical health, age may also affect the associations between stressors and physical health. Thus, because the physical health of older adults becomes increasingly fragile (Rowe & Kahn, 1998), stronger associations between stressors and caregiver health may be expected in older samples.

Spouse status.—After statistical control for the fact that spouses are, on average, older than other caregivers, spouses may show weaker associations between caregiver stressors and physical health because caregiving for a spouse is more normative than caregiving for other frail persons, and because spouses usually do not face conflicts between the caregiver role and other family roles.

Gender.—Because women are often socialized to be caregivers, they may be more prepared than men for the caregiver role (Stoller, 1994). As a result, associations between stressors and health may be stronger in men than in women. In a study by Mui (1995), functional impairments of the CR were related to worse physical health, but only for male caregivers. However,

Table 1. Measures Used in the Included Studies

Variable	Measure	No. of Studies
Caregiver health	Subjective health measures:	
	Single-item indicators	116
	Symptom checklists (e.g., SF-36)	34
	Objective indicators:	
	No. of medical or chronic conditions	27
	Medication use	3
	No. of hospitalizations or doctor visits	3
	Combination of subjective and objective measures	5
CR physical impairments	ADL or IADL scales	37
CR cognitive problems	Mental status questionnaires (e.g., MMSE)	29
CR behavioral problems	Original or revised MBPC	10
	Related scales	29
Caregiver involvement	No. of caregiving hours per day/week	17
	No. of caregiving tasks (e.g., help with toileting, cooking)	26
Duration of caregiving	No. of months in caregiver role	30
	Change in caregiver health between 2 points of measurement	8
SES	Years of school completed	25
	Level of income	22
Social support	Availability or use of informal support	38
	Use of formal services	11
Caregiver burden	CBI	33
	Other scales	84
Caregiver depression	CES-D	49
	Related measures	25

Notes: SF-36 = Short Form-36 (see Ware & Sherbourne, 1992); ADL = activity of daily living; IADL = instrumental activity of daily living; MMSE = Mini-Mental State Exam (Folstein, Folstein, & McHugh, 1975); MBPC = Memory and Behavior Problems Checklist (Teri et al., 1992); SES = socioeconomic status; CBI = Caregiver Burden Interview (Zarit, Reever, & Bach-Petersen, 1980); CES-D = Center for Epidemiological Studies–Depression scale (Radloff, 1977).

male caregivers may be more likely to seek social support or to give up the caregiver role when demands become too high. Indeed, number of months in the caregiver role was correlated with caregiver health for women but not men in that study.

Dementia caregiving.—Because dementia caregiving is more stressful than caregiving for physically impaired older adults (Pinquart & Sörensen, 2003a), stronger associations of stressors with physical health are expected among dementia caregivers versus other carers.

Health measure.—Associations with caregiving demands with the use of objective measures of health (e.g., number of chronic illnesses, number of hospitalizations) may be smaller than associations with the use of subjective indicators of perceived health, because many diseases included in the checklists (e.g., osteoporosis) are not likely to be influenced by caregiving.

Sampling procedure.—Because nonsignificant results are less likely than significant results to be published (the file-drawer problem; see Rosenthal, 1991), more significant correlations and larger average correlations are expected in

peer-reviewed articles than in other articles. Similarly, stronger associations may be expected in probability samples than in convenience samples, because convenience samples often focus on highly distressed caregivers (Schulz et al., 1995). This may restrict the variance of measures assessing stressors and distress and reduce the strength of associations of stressors and resources with caregiver physical health.

METHODS

Sample

We identified studies from the developmental and gerontological literature through three electronic databases [PsycINFO, MEDLINE, PSYINDEX, with search terms: health and (caregiving or caregivers or carer or support provider) and (elderly or old age)], cross-referencing, and searches for unpublished studies at conferences. Our criteria for the inclusion of studies in the meta-analysis were as follows:

1. Informal caregivers of older adults were assessed.
2. Associations of study variables with physical health were reported as correlations or as other effect size measures.
3. Studies were written in English, German, or a language for which we could get translation.

About 23% of the total number of publications surveyed had to be eliminated, for the most part because insufficient information about the magnitude of relationship (zero-order effect sizes) between variables had been reported. After exclusion of such studies, we were able to include 176 articles in the meta-analysis. The majority of these were from English-language journals; only 7 German articles, 1 Dutch article, and 1 Spanish article could be used. The majority of articles were from the *Journals of Gerontology* (13) or *The Gerontologist* (10); others were from the *International Journal of Geriatric Psychiatry* (8), *Psychology and Aging* (6), the *Journal of Applied Gerontology* (6), *Aging & Mental Health* (5), *Research on Aging* (5), the *Journal of Aging and Health* (5), and other journals (90). In addition, 13 presentations at conferences, 6 dissertations, 6 books or book chapters, and data from three electronic raw data files were included. Studies used in the meta-analysis are listed in the Reference section and are marked with an asterisk. Studies were coded by two doctoral-level researchers, and a good interrater agreement was found ($\kappa = 0.88$). An overview of the measures is provided in Table 1. We entered the sample size, the sampling procedure (1 = probability sample, 0 = convenience sample), publication status (1 = peer-reviewed journal, 0 = others), illness of the CR (1 = dementia, 0 = others), the percentage of caregivers who are spouses, the percentage of women, the mean age of the respondents, the measurement of the variables, and the correlations between the variables. If more than one study from one and the same author was available, we checked whether these articles referred to different data sets; we omitted duplicate results.

Statistical Integration of the Findings

We based our computations on random-effects models (Hedges & Vevea, 1998). First we computed effect sizes (d) for each study by transforming correlation coefficients, t values,

Table 2. Bivariate Associations of Sociodemographic Variables, Stressors, Resources, and Psychological Distress With Physical Health of Caregivers

Variable	<i>k</i>	<i>N</i>	<i>r</i>	95% CI	<i>t</i>	χ^2
Sociodemographic variables						
Age	50	14,721	-.15	-0.19 – -0.12	-8.21***	182.87***
Spouse	45	17,441	-.13	-0.17 – -0.09	-7.30***	191.21***
Coresidence	11	4,091	-.14	-0.29 – 0.02	-1.71	228.17***
Stressors						
Hours of care provision	17	8,933	-.10	-0.20 – -0.04	-3.37***	76.23***
No. of caregiving tasks	26	9,938	-.06	-0.11 – -0.02	-2.73**	99.61***
No. of months in caregiver role	38	8,784	-.08	-0.12 – -0.04	-3.59***	97.78***
Physical impairments of care recipient	37	8,931	-.10	-0.14 – -0.06	-4.88***	92.02***
Cognitive impairments of care recipient	29	5,865	-.07	-0.11 – -0.03	-3.39***	51.38**
Behavioral problems of care recipient	41	13,960	-.14	-0.19 – -0.11	-7.08***	152.47***
Resources						
Education	25	9,109	.14	0.09 – 0.18	5.95***	89.37***
Income	22	4,946	.18	0.12 – 0.24	6.10***	79.81***
Informal support	39	11,605	.08	0.03 – 0.12	3.84***	115.39***
Formal support	11	4,456	.10	-0.02 – 0.22	1.57	63.56***
Psychological distress						
Caregiver burden	118	21,368	-.29	-0.32 – -0.25	-14.89***	759.70***
Depressive symptoms	74	19,121	-.37	-0.40 – -0.34	-24.05***	246.15***

Notes: *k* = number of samples; *N* = number of caregivers; *r* = mean correlation coefficient; CI = confidence interval; *t* = test of significance of gender differences; χ^2 = test of heterogeneity of effect size.

p* < .05, *p* < .01, ****p* < .001.

F values, and exact *p* values (Rosenthal, 1991). Then we tested the homogeneity of effect sizes by using homogeneity statistics (*Q*). Next we weighted studies by the inverse of their variances, and we computed weighted mean effect sizes *d* and their confidence intervals (CIs) that include 95% of the effects. Because readers may be more familiar with interpreting correlation coefficients than effect sizes *d* as indicators of the size of association between variables, we converted the effects sizes and their CIs back into the metric of correlation coefficients (Rosenthal). We then tested the significance of the mean by dividing the weighted mean effect size by the estimated standard deviation. We interpreted differences between two conditions as significant when the 95% CIs did not overlap. In order to test for the influence of study characteristics, we used weighted multiple ordinary least squares regression analyses, following the random-effects approach and the method of moments outlined by Raudenbush (1994). As a tool for interpreting the practical significance of correlation coefficients, we used the binomial effect size display (BESD; Rosenthal). For example, after the median split of a caregiving stressor and of caregiver health, the percentage of caregivers with above-average health in the distressed group is computed by $0.5 + r/2$, and the percentage of above-average health in the less distressed group is $0.5 - r/2$.

RESULTS

Sample Description

The studies we included were published or presented between 1986 and spring 2006. Forty-eight percent of the studies focused on dementia caregiving, 18% focused on caregiving for physically frail older adults, and 34% included both dementia caregivers and other caregivers. About 13%

studies used probability samples, and 6.8% (12 studies) had a longitudinal design. The number of participants of the studies ranged between 14 and 5,627 (median = 111). The caregivers had a mean age of 60.6 years (*SD* = 6.0 years). Approximately 74% were women, 38% were adult children, and 50% spouses. The CRs were, on average, 75.7 years old (*SD* = 5.3) and about 62% of them were women. They had been providing care for about 54 months (*SD* = 21), and they provided at the time of assessment, on average, 55 hours of care per week (*SD* = 30).

Correlates of Physical Health

We first tested whether the effects sizes would vary between studies by use of objective measures (e.g., number of chronic illnesses) versus subjective measures of perceived health. Because no significant differences appeared, we combined all studies for the following analyses. As shown in Table 2, two out of three sociodemographic variables were associated with caregiver health: Older caregivers and spouses had worse physical health, whereas living with the CR showed no bivariate associations with physical health, probably due to the smaller number of available studies. According to Cohen's (1992) criteria, we interpret both significant correlations as small effects.

In bivariate analyses, all five caregiving stressors were significantly related to poorer physical health. Small effects (<0.20) emerged for the association of health with CR behavior problems, CR physical impairments, and the number of hours of care provision. The other effects were very small (<0.10; Cohen, 1992). To further exemplify the meaning of these effects, we present the BESD, which indicates that 57.5% of caregivers caring for CRs with above-median levels of behavior problems had above-median impairments of physical health, as compared with 42.5% of caregivers for older adults with lower levels of behavior problems. For physical impairments of the

Table 3. Multivariate Associations With Physical Health, Burden, and Depression of Caregivers (Structural Equation Modeling)

Variable	Impairment of Physical Health		Caregiver Burden		Caregiver Depression	
	β	95% CI	β	95% CI	β	95% CI
Age	.07***	0.05 – 0.10	-.08***	-0.10 – -0.05	-.04**	-0.06 – -0.01
Spouse	-.07***	-0.09 – -0.04	.03*	0.00 – 0.06	.03*	0.00 – 0.06
Coresidence	.17***	0.14 – 0.20	.01	-0.01 – 0.03	.07***	0.04 – 0.09
Hours of care provision	.00	-0.02 – 0.03	.12***	0.09 – 0.15	.08***	0.06 – 0.10
No. of caregiving tasks	-.06***	-0.08 – -0.03	.09***	0.06 – 0.11	-.03	-0.05 – 0.00
No. of months in caregiver role	.05***	0.03 – 0.07	.02*	0.00 – 0.04	.04***	0.02 – 0.06
CR physical impairments	-.01	-0.03 – 0.02	.04**	0.01 – 0.06	.02	-0.01 – 0.05
CR cognitive impairments	.03*	0.01 – 0.05	.06***	0.03 – 0.08	.03**	0.01 – 0.06
CR behavioral problems	.18***	0.16 – 0.20	.31***	0.29 – 0.33	.26***	0.24 – 0.28
Education	-.07***	-0.09 – -0.04	-.01	-0.04 – 0.01	-.07***	-0.09 – -0.05
Income	-.10***	-0.12 – -0.08	.04*	0.02 – 0.06	-.03*	-0.05 – -0.00
Informal support	-.03**	-0.05 – -0.01	-.14***	-0.16 – -0.12	-.19***	-0.21 – -0.17
Formal support	.02	-0.00 – 0.04	-.00	-0.02 – 0.02	.04***	0.02 – 0.06
R ²	.10		.20		.16	
Caregiver burden	.19***	0.17 – 0.21				
Depressive symptoms	.24***	0.22 – 0.26	.30***	0.28 – 0.32		

Notes: A saturated model was computed; $N = 7,638$; β = standardized path coefficient; CI = confidence interval; R^2 = explained variance; CR = care recipient. Boldface effect sizes differ between caregiver health and caregiver burden or depression. For impairment of physical health, caregiver burden, and caregiver depression, higher values indicate stronger impairments of health, stronger burden, and more depressive symptoms.

* $p < .05$; ** $p < .01$; *** $p < .001$.

CR and for hours of care, the numbers were 55% (above-median levels of stressors) and 45% (below-median stressors), respectively. According to the fail-safe N (Rosenthal, 1991), 217 or more studies with null results would have been to make the correlations for health with behavior problems nonsignificant, and more for the other associations.

Having higher income and education levels as well as receiving more informal and formal support were related to better physical health of caregivers. Effects were very small for receipt of formal support and small for the other resources.

Finally, greater caregiver burden and more severe depressive symptoms were related to worse physical health. According to Cohen's criteria, both associations were of medium size. The BESD indicates that 64.5% of caregivers with above-median levels of burden show below-median levels of physical health, as compared with 35.5% of caregivers with lower levels of burden. The nonoverlap of the 95% CIs indicates that associations of physical health with burden and depression were significantly stronger than associations with stressors, resources, age, and spousal status.

Because the correlates of physical health are not independent of each other, and should only be interpreted if confirmed in multivariate analyses, we computed multivariate statistics. We computed a full correlation matrix of the variables, on the basis of the meta-analytic approach of Rosenthal (1991). Because physical health, caregiver burden, and depression may influence each other, and because we wanted to compare predictors of physical health with predictors of burden and depression, we computed a path analysis that specified paths from sociodemographics variables, stressors, and resources on physical health, burden, and depression, and error covariances between physical health, burden, and depression.

Worse physical health was associated with higher age, *not* being a spouse, coresidence, higher levels of behavior problems and cognitive impairments of the CR, *fewer* caregiving tasks, more months in the caregiver role, lower educational attainment, lower income, receipt of less informal support,

and higher levels of burden and depression. No associations emerged with hours of care provision, physical impairments of the CR, and with use of formal support (Table 3). As indicated by the nonoverlap of the 95% CI, physical health showed weaker associations with behavior problems and with receipt of informal support than did burden and depression. However, physical health was more strongly associated with coresidence and income than burden and depression. In addition, lower age and being a spouse were related to better physical health but to *higher* levels of burden and depression. Furthermore, the number of hours of care provision was only associated with burden and depression. Whereas performing more caregiving tasks was associated with better caregiver physical health, it was also related to more caregiver burden.

Impact of Study Characteristics

In order to analyze the effect of study characteristics on the size of correlations with physical health, we computed weighted multiple linear regression analyses, based on random-effects models (Raudenbush, 1994). Because only 11 studies were available for associations with coresidence and formal support, we excluded these two variables from the analysis.

In older samples the associations of age, spousal status, and functional impairments of the CR with caregiver health were stronger than in younger samples (Table 4). Health was more strongly associated with the number of caregiving tasks in samples with a higher percentage of men. In samples with more spouses, physical health showed weaker associations with age, spousal status, hours of care, and functional impairments of the CR than in samples with fewer spouses. However, associations between burden and physical health were stronger in these samples. Furthermore, in studies focused on dementia caregiving, the hours of care, number of caregiving tasks, cognitive impairment, and income were more strongly associated with physical health than for other caregiver samples.

When measures of objective health were used (such as number of hospitalizations), associations of caregiver health

Table 4. Impact of Study Characteristics on the Association of CG Physical Health with Sociodemographic Variables, Stressors, Resources, and Psychological Distress

Study characteristics	Age	Spouse	Hours of care	No. of caregiving tasks	Months in CG role	Functional impairments	Cognitive impairments	Behavior problems	Education	Income	Informal support	Burden	Depression
	β	β	β	β	β	β	β	β	β	β	β	β	β
Age	.65*	.75***	1.45***	.23	-.61	.56*	.37	.12	-.62	-.47	-.45	-.18	-.09
% women	.10	.10	.25	-.38*	-.01	-.22	-.14	-.11	-.14	.27	.10	-.06	-.04
% spouses	-.69**	-.56**	-1.02**	-.18	.28	-.50*	-.36	.16	.57	.71	-.04	.28*	.29
Dementia	.16	.15	1.22***	.42*	.28	.02	.61*	-.35	-.10	.51*	.02	-.09	-.02
Measure of objective health	-.22	-.11	.41	.13	-.48*	.11	-.22	-.07	-.10	.10	.03	.11	-.04
Probability sample	-.13	-.11	.34	.00	.46	.23	-.13	.05	-.00	.00	-.33*	.13	.20
Peer-reviewed journal	.09	.13	.66*	-.22	.63*	.35*	-.28	.08	-.07	.06	.33*	-.05	-.11
R^2	.28	.44	.68	.29	.44	.35	.58	.15	.19	.40	.28	.08	.12
K	50	45	17	26	38	37	29	41	25	22	39	118	74

Notes: CG = caregiver; β = standardized regression coefficient; R^2 = explained variance of the association of sociodemographic variables, caregiving stressors, resources, burden, and depression with physical health; k = number of included studies. For dementia, measure of objective health, probability sample, and peer-reviewed journal, 1 = yes and 0 = no.

* $p < .05$; ** $p < .01$; *** $p < .001$.

with number of months in the caregiver role were weaker than when subjective health was assessed. Studies with probability samples showed smaller associations of informal support with physical health than those with convenience samples. Finally, articles in peer-reviewed studies reported stronger associations of health with of hours of care provision, number of months in the caregiver role, functional impairments of the CR, and informal support.

DISCUSSION

Predictors of Physical Health

Our multivariate results show that the severity of CR behavior problems and cognitive impairments, length of time in the caregiver role, coresidence, not being a spousal caregiver, higher caregiver burden and depression, higher age, lower SES, and lower levels of informal support were related to worse physical health among caregivers.

Interestingly, associations of caregiver health are stronger with depressive symptoms than with objective stressors. This may, first, indicate an overlap of depression and health measures, because some depression scales contain somatic items. However, when depression is measured with the Geriatric Depression Scale, which does not include physical symptoms (Brink et al., 1992), the size of the association with physical health ($d = -0.37$, 95% CI = -0.39 to -0.34) does not differ from studies using other depression scales ($d = -0.37$, 95% CI = -0.40 to -0.34). Second, longitudinal studies suggest reciprocal relationships between depression and physical health (Pruchno et al., 1990; Whitlatch et al., 1997). Such effects may increase the size of the association between physical health and depression.

With regard to caregiving stressors, behavior problems of the CR have the strongest associations with caregiver health, burden, and depression, but the size of the relationship is smaller for physical health than for the other outcomes. Because hours of care provision are associated only with higher levels of burden and depression, we conclude that physical health is less

strongly influenced by caregiving stressors than by psychological health. This may explain the results of a previous meta-analysis showing that caregivers and noncaregivers were more likely to differ in depressive symptoms than in physical health (Pinquart & Sörensen, 2003a).

Because no associations of physical impairments of CRs with caregiver health are found in the multivariate analysis, we posit that related behavioral problems rather than physical exertion from high caregiving demands (Shaw et al., 1997) are a probable source of impaired physical health among caregivers. Furthermore, in multivariate analyses, more caregiving tasks are related to better physical health. This result indicates a suppressor effect, because these effects are reversed in the bivariate analysis. The suppressor effect suggests that after the level of impairments of the CR is statistically controlled for, caregivers with better health are able to provide higher levels of support.

Younger caregivers and spouses report better physical health but more caregiver burden and depression. The former effects are not specific to caregiving: When we compare the present bivariate associations to the results from previous meta-analyses with samples not specific to caregiving (not shown; see Pinquart, 1998, 2001), we find that the size of associations of physical health with age, education, income, informal support, and depressive symptoms does not differ between caregivers and noncaregivers. Therefore we conclude that caregivers and noncaregivers benefit to a similar degree from high SES and informal support. However, associations of age and spousal status with burden and depression are caregiving specific. They may indicate competing demands between the caregiver role and other social roles (e.g., work-related and parenting-related roles; see Cantor, 1992). Finally, weaker associations of social support with physical health than with burden and depression are probably due to the fact that most social support instruments assess emotional support, which is more likely to correlate with psychological than physical health.

Caregivers with higher income and those who do not live with the CR have better physical health. Both associations are stronger than those of income and coresidence with burden and

depression. Effects of income on physical health may be based on less than ideal health practices (e.g., Laaksonen et al., 2003) and less access to the health care system by low-income caregivers (e.g., Brodaty et al., 2005). The fact that coresidence has a stronger impact on physical than on mental health may indicate that health-related habits, such as getting enough sleep and engaging in healthy eating patterns, are impaired when living with the CR.

The Role of Study Characteristics

The size of correlates of physical health was significantly affected by study characteristics. We limit our discussion to associations with caregiving stressors and psychological distress. First, age affects the associations of caregiving demands and CR impairments with caregiver health. Associations are stronger in samples with older individuals, suggesting that physical health becomes more vulnerable to stressors as people age (Rowe & Kahn, 1998). Second, among samples with a higher percentage of spouses, associations of hours of care and CR functional impairment with physical health are weaker than those among nonspouses. Caring for a spouse is more socially normative than caring for other persons. Thus, after general age differences in health are statistically controlled for, higher care demands may have less impact on a spousal caregiver's than a nonspousal caregiver's health. Nonetheless, associations of caregiver burden with physical health are stronger among spouses: If spouses feel overburdened, they may be less able to protect their physical health against deterioration.

Third, the association of the number of caregiving tasks with physical health is weaker in samples with a higher percentage of female caregivers. Women are often better socialized to provide personal care and may be more resilient in the face of more care tasks. Fourth, among dementia caregivers, associations of stressors with caregiver health are stronger than those among other caregivers. Providing care for dementia patients is generally more stressful than providing care for physically frail older adults (e.g., Pinquart & Sörensen, 2003a); the higher levels of physical and emotional demands the dementia caregiver experiences are more likely to affect physical health.

Fifth, among studies that measured health more objectively (e.g., with illness checklists), associations of months in the caregiver role with physical health were weaker than among other studies. Several items of checklists ask for illnesses that are not likely to be influenced by caregiving (e.g., cancer, diabetes, and osteoporosis). However, only 1 out of 13 analyses show a moderating effect of the method of health assessment, thus indicating more similarities than differences in the effects of caregiving by use of different health measures.

Finally, we observed stronger associations of stressors with caregiver health in peer-reviewed articles than in other papers, probably indicating a file-drawer problem (Rosenthal, 1991): Because nonsignificant results are less likely to be published, results from peer-reviewed journals alone may overestimate the size of relationships.

LIMITATIONS AND CONCLUSIONS

The present study has several limitations. First, as most of the studies we reviewed here were cross-sectional studies, the causal direction of the associations cannot be evaluated.

Nonetheless, it is unlikely that poorer current caregiver health would increase impairments of the CR, the number of caregiving tasks, or (retrospectively) the length of care provision. However, more longitudinal studies would be a useful addition to the literature, because the timing of symptoms appears to affect the trajectory of caregiver distress over time (Gaugler, Kane, Kane, & Newcomer, 2005), which may in turn influence physical health.

Second, stressors, resources, and sociodemographic variables explain only 10% of the variance of caregiver health (Table 3). We could not include some important influences, such as a person's preexisting illnesses before taking the caregiver role, in the meta-analysis because there was an insufficient number of available studies. Future studies should include preexisting illnesses as well as preexisting vulnerabilities, such as mental health issues, in their assessment. Third, because few studies have assessed associations of caregiver health with coresidence and use of formal support, the estimation of the size of their associations with physical health is less reliable.

Despite these limitations, we can draw several conclusions. First, caregiving-related stressors affect caregivers' physical health, but these associations are weaker than the effects of stress on psychological health. Second, feeling depressed is more strongly associated with caregivers' physical health than the absolute levels of caregiving demands. Third, higher caregiving demands have a stronger impact on the physical health of older caregivers, dementia caregivers, and men, thus suggesting that these are additional risk factors for practitioners to be aware of.

We conclude that psychological interventions should not only target caregivers' psychological health but also include physical health promotion, such as offering opportunities for exercise, nutrition improvement, and preventive care visits (also see Patterson & Grant, 2003). Furthermore, as most available studies on caregiver health are based on self-reports, we need more triangulated, objective assessment approaches to explain the health consequences of informal caregiving more fully. In addition, more longitudinal studies are needed that allow tests for mediators of the relationship of caregiver stressors and burden with physical health. For example, it would be important to identify which changes in health habits mediate the observed relationship between stressors and physical health. Finally, future studies should specify which forms of illness are most likely to be influenced by caregiving stressors.

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REFERENCES

References used in the meta-analysis are marked with an asterisk; superscript letters indicate the following: a, association with age; b, association with spousal status; c, coresidence; d, hours of care provision; e, number of caregiving tasks; f, number of months in the caregiver role; g, physical impairments of the CR; h, cognitive impairments of the CR; i,

behavior problems of the CR; j, education; k, income; l, informal support; m, formal support; n, burden; o, depression.

- *Adler, C., Gunzelmann, T., Machold, C., Schumacher, J., & Wilz, G. (1996). Belastungserleben pflegender Angehöriger von Demenzpatienten [Stress of family caregivers of dementia patients]. *Zeitschrift für Gerontologie und Geriatrie*, 29, 143–342.^b
- *Adler, G., Kuskowski, M. A., & Mortimer, J. (1995). Respite use in dementia patients. *Clinical Gerontologist*, 15, 17–342.^m
- *Allen-Holmes, L. M., Markides, K., & Chiriboga, D. (2000, November). *Physical health and service use utilization among elderly Hispanic caregivers and non-caregivers*. Paper presented at the 53rd annual meeting of the Gerontological Society of America, Washington, DC.ⁿ
- *Alvarez-Ude, F., Valdes, C., Estebanez, C., & Rebollo, P. (2004). Health-related quality of life of family caregivers of dialysis patients. *Journal of Nephrology*, 17, 841–342.ⁿ
- *Arai, Y., & Washio, M. (1999). Burden felt by family caring for the elderly members needing care in southern Japan. *Ageing & Mental Health*, 3, 158–342.^{l,o}
- *Atienza, A. A., & Stephens, M. A. P. (2000). Social interactions at work and the well-being of daughters involved in parent care. *Journal of Applied Gerontology*, 19, 243–342.^{n,o}
- *Atienza, A. A., & Stephens, M. P. (2002). Dispositional optimism, role-specific stress, and the well-being of adult daughter caregivers. *Research on Aging*, 24, 193–342.^{k,n,o}
- *Bakas, T., & Champion, V. (1999). Development and psychometric testing of the Bakas Caregiving Outcomes Scale. *Nursing Research*, 48, 250–342.ⁿ
- *Barber, C. E., & Pasley, B. K. (1994). Family care of Alzheimer's patients: The role of gender and generational relationship on caregiver outcomes. *Journal of Applied Gerontology*, 14, 172–342.^b
- *Barnes, C. L., Given, B. A., & Given, C. W. (1992). Caregivers of elderly relatives: Spouses and adult children. *Health and Social Work*, 17, 282–342.^b
- *Barnes, K. A., & Patrick, J. H. (2000, November). *Effects of caregiving on older husbands*. Paper presented at the 53rd annual meeting of the Gerontological Society of America, Washington, DC.ⁿ
- *Baumgarten, M., Hanley, J. A., Infante-Rivard, C., Battista, R. N., Becker, R., & Gauthier, S. (1994). Health of family members caring for elderly persons with dementia: A longitudinal study. *Annals of Internal Medicine*, 120, 126–342.^{f,g,h,i}
- *Baumgarten, M., Battista, R. N., Infante-Rivard, C., Hanley, J. A., Becker, R., & Gauthier, S. (1992). The psychological and physical health of family members caring for an elderly person with dementia. *Journal of Clinical Epidemiology*, 45, 61–342.^{a,b}
- *Beach, S. R., Schulz, R., Yee, J. L., & Jackson, S. (2000). Negative and positive health effects of caring for a disabled spouse: Longitudinal findings from the Caregiver Health Effects Study. *Psychology and Aging*, 15, 259–342.^{a,c,g,j,n,o}
- *Bédard, M., Chambers, L., Molloy, D. W., Lever, J. A., & Stones, M. (1999). The impact of Alzheimer's disease on caregivers is gender-specific. *Annals of the Royal College of Physicians and Surgeons of Canada*, 32, 21–342.ⁿ
- *Bédard, M., Raney, D., Molloy, D. W., Lever, J., Pedlar, D., & Dubois, S. (2001). The experience of primary and secondary caregivers caring for the same adult with Alzheimer's disease. *Journal of Mental Health and Aging*, 7, 287–296.ⁿ
- *Bédard, M., Kuzik, R., Chambers, L., Molloy, W., Dubois, S., & Lever, J. (2005). Understanding burden differences between men and women caregivers: The contribution of care-recipient characteristics. *International Psychogeriatrics*, 17, 1–20.^{b,n}
- *Bianchetti, A., Metitieri, T., Cipriani, G., Lucchi, M., & Trabucchi, M. (2001, November). *Caregiver burden in Alzheimer dementia and Parkinson disease*. Paper presented at the 54th annual meeting of the Gerontological Society of America, Chicago, IL.^b
- *Blood, G. W., Simpson, K. C., Dineen, M., Kaufman, S. M., & Raimondi, S. C. (1994). Spouses of individuals with laryngeal cancer: Caregiver strain and burden. *Journal of Communication Disorders*, 27, 19–35.ⁿ
- Brink, T. L., Yesavage, J. A., Lum, O., Heersema, P. H., Adey, M., & Rose, T. L. (1982). Screening tests for geriatric depression. *Clinical Gerontologist*, 1, 37–43.
- *Brodaty, H., & Hadzi-Pavlovic, D. (1990). Psychosocial effects on carers of living with persons with dementia. *Australian & New Zealand Journal of Psychiatry*, 24, 351–361.^{b,c,h,i,l,o}
- Brodaty, H., Thomson, C., Thompson, C., & Fine, M. (2005). Why caregivers of people with dementia and memory loss don't use services. *International Journal of Geriatric Psychiatry*, 20, 537–546.
- *Brown, R., Carne, W., & Regg, P. (2004, November). *Correlates of caregiver burden from spouses of individuals with Parkinson's disease*. Paper presented at the 57th annual meeting of the Gerontological Society of America, Washington, DC.ⁿ
- Burton, L. C., Newsom, J. T., Schulz, R., Hirsch, C. H., & German, P. S. (1997). Preventive health behaviours among spousal caregivers. *Preventive Medicine*, 26, 162–169.
- *Cahill, S. M., & Shapiro, M. M. (1998). The only one you neglect is yourself: Health outcomes for carers of spouses or parents with dementia. Do wives and daughter carers differ? *Journal of Family Studies*, 4, 87–100.^b
- *Call, K. T., Finch, M. A., & Huck, S. M. (1999). Caregiver burden from a social exchange perspective: Caring for older people after hospital discharge. *Journal of Marriage and the Family*, 61, 688–699.^b
- *Cantor, M. H. (1983). Strain among caregivers: A study of experience in the United States. *The Gerontologist*, 23, 597–604.^b
- Cantor, M. H. (1992). Families and caregiving in an aging society. *Generations*, 16(3), 67–70.
- *Carlson, K. W., & Robertson, S. E. (1990). The influence of impairment on the burden experienced by spouses of partners with dementia. *Canadian Journal of Rehabilitation*, 3, 213–222.ⁿ
- *Caserta, M. S., Lund, D. A., & Wright, S. D. (1996). Exploring the caregiver burden inventory (CBI): Further evidence for a multidimensional view of burden. *International Journal of Aging and Human Development*, 43, 21–34.ⁿ
- *Cerrato, I. M., de Troconiz, M. I., Lopez, A. L., & Colderon, M. S. (1998). La entrevista de carga del cuidador: Utilidad y validez del concepto de carga. *Anales de Psicología*, 14, 229–248.ⁿ
- *Chappell, N., & Litkenhaus, R. (1995). *Informal caregivers to adults in British Columbia*. Victoria, BC: University of Victoria. Unpublished raw data file.^{a,b,c,d,e,f,g,i,j,l,m,n}
- Chappell, N.L., & Reid, C. (2002). Burden and well-being among caregivers: Examining the distinction. *The Gerontologist*, 42, 772–780.
- *Chumbler, N. R., Grimm, J. W., Cody, M., & Beck, C. (2003). Gender, kinship and caregiver burden: The case of community-dwelling memory impaired seniors. *International Journal of Geriatric Psychiatry*, 18, 722–732.^b
- *Clark, L. M., & Hartman, M. (1996). Effects of hardness and appraisal on the psychological distress and physical health of caregivers to elderly relatives. *Research on Aging*, 18, 379–401.^{e,i}
- *Clipp, E. C., & George, L. K. (1993). Dementia and cancer: A comparison of spouse caregivers. *The Gerontologist*, 33, 534–541.^b
- *Coen, R. F., Swanwick, G. R., O'Boyle, C. A., & Coakley, D. (1997). Behavior disturbance and other predictors of carer burden in Alzheimer disease. *International Journal of Geriatric Psychiatry*, 12, 331–336.ⁿ
- *Coen, R. F., O'Boyle, C., Swanwick, G. R., & Coakley, D. (1999). Measuring the impact on relatives of caring for people with Alzheimer's disease: Quality of life, burden and well-being. *Psychology and Health*, 14, 253–261.^{g,h,i,n}
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155–159.
- *Cooney, R. S., & Di, J. (1999). Primary family caregivers of impaired elderly in Shanghai, China. *Research on Aging*, 21, 739–761.^b
- *Covinsky, K. E., Newcomer, R., Fox, P., Wood, J., Sands, L., Dane, K., et al. (2003). Patient and caregiver characteristics associated with depression in caregivers of patients with dementia. *Journal of General Internal Medicine*, 18, 1006–1014.^o
- *Cox, C., & Monk, A. (1990). Minority caregivers of dementia victims: A comparison of Black and Hispanic families. *Journal of Applied Gerontology*, 9, 340–354.^f
- Cox, C. B., & Albus, K. (2003). The impact of caregiving for a relative with Alzheimer's disease: A comparison of those caring for persons living alone, spousal caregivers, and co-resident adult children. *Journal of Mental Health and Aging*, 9, 23–33.^{b,c}
- *Croog, S. H., Sudilovsky, A., Burselson, J. A., & Baume, R. M. (2001). Vulnerability of husband and wife caregivers of Alzheimer disease patients to caregiving stressors. *Alzheimer Disease and Associated Disorders*, 15, 201–210.^l

- *Dautzenberg, M. G., Diedriks, J. P., Philipsen, H., & Tan, F. E. (1999). Multigenerational caregiving and well-being: Distress in middle-aged daughters providing assistance to elderly parents. *Women and Health, 29*(4), 57–74.ⁿ
- *DeFrias, C. M., Tukko, H., & Rosenberg, T. (2005). Caregiver physical and mental health predicts reactions to caregiving. *Aging & Mental Health, 9*, 331–336.^{a,o}
- *DeVught, M. E., Nicolson, N. A., Aalten, P., Lousberg, R., Jolle, J., & Verhey, F. R. (2005). Behavioural problems in dementia patients and salivary cortisol patterns in caregivers. *Journal of Neuropsychiatry and Clinical Neuroscience, 17*, 201–207.¹
- *Dilworth-Anderson, P., Goodwin, P. Y., & Wallace Williams, S. (2004). Can culture explain the physical health effects of caregiving over time among African American caregivers? *Journal of Gerontology: Social Sciences, 59B*, S138–S145.^{a,f,g,h,j,n}
- *Donaldson, C., Tarrier, N., & Burns, A. (1998). Determinants of carer stress in Alzheimer's disease. *International Journal of Geriatric Psychiatry, 13*, 248–256.^{f,g,h,i,l}
- *Dorfman, L. T., Holmes, C. A., & Berlin, K. (1996). Wife caregivers of frail elderly veterans. *Family Relations, 45*, 46–55.^{a,d,g,k,l,n}
- *Duberstein, P. (2002). *Spouses of lung cancer patients*. Electronic raw data file. University of Rochester.^{a,j,k,n,o}
- *Farran, C. J., Miller, B. H., Kaufman, J. E., Donner, E., & Fogg, L. (1999). Finding meaning through caregiving: Development of an instrument for family caregivers of persons with Alzheimer's disease. *Journal of Clinical Psychology, 55*, 1107–1125.^{e,g,i,k,n,o}
- Fengler, A. P., & Goodrich, N. (1979). Wives of elderly disabled men: The hidden patients. *The Gerontologist, 19*, 175–183.
- 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.
- *Franks, M. M., & Stephens, M. A. P. (1996). Social support in the context of caregiving: Husbands' provision of support to wives involved in parental care. *Journal of Gerontology: Psychological Sciences, 51B*, P43–P52.^o
- *Fredman, L., Daly, M. P., & Lazur, A. M. (1995). Burden among White and Black caregivers to elderly adults. *Journal of Gerontology: Social Sciences, 50B*, S110–S118.ⁿ
- *Fredman, L., & Daley, M. P. (1997). Weight change: An indicator of caregiver stress. *Journal of Aging and Health, 9*, 43–70.^{a,c,d,e,i,j,o}
- *Friss, L. R., & Whitlatch, C. J. (1991). Who's taking care? A statewide study of family caregivers. *American Journal of Alzheimer's Disease and Other Dementias, 6*, 16–26.^{a,b,k,n,o}
- *Fritsch, T. (2000). *Depression, strain, and health outcomes in caregivers of cognitively impaired, hospitalized patients: Do ACE units help?* Unpublished doctoral dissertation, Miami University, Ohio.^{b,c,e,f}
- *Gallagher-Thompson, D., & Powers, D. V. (1997). Primary stressors and depressive symptoms in caregivers of dementia patients. *Aging & Mental Health, 1*, 248–255.^{n,o}
- *Gauggel, S., & Rößler, D. (1999). Die Belastung älterer Menschen durch die Pflege eines Angehörigen [Burden of older adults who provide care for a relative]. *Zeitschrift für Medizinische Psychologie, 4*, 175–181.^{a,b,f,g,h,o}
- Gaugler, J. E., Kane, R. L., Kane, R. A., & Newcomer, R. (2005). The longitudinal effects of early behavior problems in the dementia caregiving career. *Psychology and Aging, 20*, 100–116.
- *Given, B. A., King, S. K., Collins, C., & Given, C. W. (1988). Family caregivers of the elderly: Involvement and reactions to care. *Archives of Psychiatric Nursing, 5*, 281–288.^{e,n}
- *Gold, D. P., Franz, E., Reis, M., & Senneville, C. (1994). The influence of emotional awareness and expressiveness on care-giving burden and health complaints in women and men. *Sex Roles, 31*, 205–224.^{a,c,e,f,h,i,j,k,n}
- *Gold, D. P., Cohen, C., Shulman, K., Zuccherro, C., Andres, D., & Etezadi, J. (1995). Caregiving and dementia: Predicting negative and positive outcomes. *International Journal of Aging and Human Development, 41*, 183–201.^{e,h,i,l,m,n}
- *Gold, D. P., Reis, M. F., Markiewicz, D., & Andres, D. (1995). When home caregiving ends: A longitudinal study of outcomes for caregivers of relatives with dementia. *Journal of the American Geriatrics Society, 43*, 10–16.^f
- *Golimbet, V., & Trubnikov, V. (2001). Evaluation of the dementia carers situation in Russia. *International Journal of Geriatric Psychiatry, 16*, 94–99.^b
- *Grant, J. S., Bartolucci, A. A., Elliott, T. R., & Ginger, J. N. (2000). Sociodemographic, physical, and psychosocial characteristics of depressed and non-depressed family caregivers of stroke survivors. *Brain Injury, 14*, 1089–1100.^o
- *Grant, J. S., Elliott, T. R., Giger, J. N., & Bartolucci, A. A. (2001). Social problem-solving abilities, social support, and adjustment among family caregivers of individuals with a stroke. *Rehabilitation Psychology, 46*, 44–57.^{1,o}
- *Gräsel, E. (1997). *Belastungen und gesundheitliche Situation der Pflegenden* [Stress and health of caregivers]. Hohenhausen, Germany: Hänsele.^{a,d,e,f,g,h,i,n}
- *Gräsel, E. (2002). When home care ends—Changes in the physical health of informal caregivers caring for demented patients: A longitudinal study. *Journal of the American Geriatrics Society, 50*, 843–849.^f
- *Grau, L., Teresi, J., & Chandler, B. (1993). Demoralization among sons, daughters, spouses, and other relatives of nursing home residents. *Research on Aging, 15*, 324–345.^{b,h,n}
- *Gunzelmann, T., Wilz, G., Adler, C., & Brähler, E. (1999). Caregiver burden and psychological support for family caregivers of demented elderly. In R. Manz & W. Kirch (Eds.), *Public health research and practice* (pp. 65–77). Regensburg: Roderer.^b
- *Haley, W. E., Finley, P., Robb, C., Whitten, M., Han, B., & Schonwetter, R. S. (2000, November). *Predictors of depression in bereaved former hospice caregivers*. Paper presented at the 53rd annual meeting of the Gerontological Society of America, Washington, DC.ⁿ
- *Haley, W. E., LaMonde, L. A., Han, B., Burton, A. M., & Schonwetter, R. (2003). Predictors of depression and life satisfaction among spousal caregivers in hospice: Application of a stress process model. *Journal of Palliative Medicine, 6*, 215–224.^o
- *Hartiens, J. M. (1995). The impact of respite on physical health, depression, and marital satisfaction in spousal caregivers of dementia victims. *Dissertation Abstracts International, 56*(5B), 2941.^o
- *Harwood, D. G., Barker, W. W., Ownby, R. L., & Duara, R. (2000). Caregiver self-rated health in Alzheimer's disease. *Clinical Gerontologist, 21*, 19–33.^{a,h,i,n,o}
- *Harwood, D. G., Ownby, R. L., Burnett, K., Barker, W. W., & Duara, R. (2000). Predictors of appraisal and psychological well-being in Alzheimer's disease family caregivers. *Journal of Clinical Geropsychology, 6*, 279–297.^{e,h,i,l,n,o}
- *Hawranik, P. G., & Strain, L. A. (2001). Cognitive impairment, disruptive behaviors, and home care utilization. *Western Journal of Nursing Research, 23*, 148–162.^{b,l}
- *Hebert, R., Dubois, M.-F., Wolfson, C., Chambers, L., & Cohen, C. (2001). Factors associated with long-term institutionalization of older people with dementia: Data from the Canadian Study of Health and Aging. *Journal of Gerontology: Medical Sciences, 56A*, M693–M699.ⁿ
- Hedges, L. V., & Vevea, J. L. (1998). Fixed- and random-effects models in meta-analysis. *Psychological Methods, 3*, 486–504.
- *Hooker, K., Monahan, D., Shifren, K., & Hutchinson, C. (1992). Mental and physical health of spouse caregivers: The role of personality. *Psychology and Aging, 7*, 367–375.^{n,o}
- *Hooker, K., Monahan, D. J., Bowman, S. R., Frazier, L. D., & Shifren, K. (1998). Personality counts a lot: Predictors of mental and physical health of spouse caregivers in two disease groups. *Journal of Gerontology: Psychological Sciences, 53B*, P73–P85.^{a,l,n,o}
- *Hooker, K., Bowman, S. R., Coehlo, D. P., Lim, S. R., Kaye, J., Guariglia, R., & Li, F. (2002). Behavioral change in persons with dementia: Relationships with mental and physical health of caregivers. *Journal of Gerontology: Psychological Sciences, 57B*, P453–P460.^{1,n,o}
- *Jeng-Ru, L., Hills, G. A., Kaplan, S., & Johnson, P. (1998). Burden among caregivers of stroke patients in Taiwan. *Topics in Geriatric Rehabilitation, 14*, 74–83.^b
- *Kahana, E., Young, R., Kercher, K., & Kaczynski, R. (1993). Testing a symmetrical model of caregiving outcomes during recovery from heart attacks. *Research on Aging, 15*, 371–398.^{d,f,g,n}
- *Kang, S.-Y. (2003, November). *Emotional strain and coping strategies between spouse and adult child caregivers of frail elders*. Paper presented at the 56th annual meeting of the Gerontological Society of America, San Diego, CA.^b
- *Kaplan, L., & Boss, P. (1999). Depressive symptoms among spousal caregivers of institutionalized mates with Alzheimer's: Boundary ambiguity and mastery as predictors. *Family Process, 38*, 85–103.^{1,n,o}

- Kiecolt-Glaser, J. K., Dura, J. R., Speicher, C. E., Trask, J., & Glaser, R. (1991). Spousal caregivers of dementia victims: Longitudinal changes in immunity and health. *Psychosomatic Medicine*, *53*, 345–362.
- *Killeen, M. (1990). The influence of stress and coping on family caregivers' perceptions of health. *International Journal of Aging and Human Development*, *30*, 197–211.ⁿ
- Killian, T., Turner, J., & Cain, R. (2005). Depressive symptoms of caregiving women in midlife: The role of physical health. *Journal of Women and Aging*, *17*, 115–127.
- *Konstam, V., Holmes, W., Wilczenski, F., Baliga, S., Lester, J., & Priest, R. (2003). Meaning in the lives of caregivers of individuals with Parkinson's disease. *Journal of Clinical Psychology in Medical Settings*, *10*, 17–26.^o
- *Kosberg, J. I., Cairl, R. E., & Keller, D. M. (1990). Components of burden: Interventive implications. *The Gerontologist*, *30*, 236–242.ⁿ
- *Kosmala, K., & Kloszewska, I. (2004). The burden of providing care for Alzheimer's disease patients in Poland. *International Journal of Geriatric Psychiatry*, *19*, 191–193.^{n,o}
- *Kramer, B. J. (1993). Expanding the conceptualization of caregiver coping: The importance of relationship-focused coping strategies. *Family Relations*, *42*, 383–391.^{a,f,g,i,j,k,l,o}
- *Kramer, B. J. (1997). Differential predictors of strain and gain among husbands caring for wives with dementia. *The Gerontologist*, *37*, 239–249.^{a,f,g,i,j,k,n}
- *Kramer, B. J. (2000). Husbands caring for wives with dementia: A longitudinal study of continuity and change. *Health & Social Work*, *25*, 97–107.^f
- Laaksonen, M., Prättala, R., Halasojas, V., Uutela, A., & Lahelma, E. (2003). Income and health behaviours. Evidence from monitoring surveys among Finnish adults. *Journal of Epidemiology and Community Health*, *57*, 711–717.
- *Lee, H. S., Brennan, P. F., & Daly, B. J. (2001). Relationship of empathy to appraisal, depression, life satisfaction, and physical health in informal caregivers of older adults. *Research in Nursing and Health*, *24*, 44–56.^{n,o}
- *Leutbecher, M. (1998). *Subjektive Belastungen pflegender Angehöriger: Entwicklung einer Selbstbeurteilungsskala und empirische Prüfung* [Caregiver burden: Development and empirical testing of a rating scale]. Unpublished doctoral dissertation, Universität Nürnberg-Erlangen.ⁿ
- *Li, L. L., Seltzer, M., & Greenberg, J. S. (1997). Social support and depressive symptoms: Differential patterns in wife and daughter caregivers. *Journal of Gerontology: Social Sciences*, *52B*, S200–S211.^{a,b,g,i,j,l,o}
- *Li, L. L., Seltzer, M., & Greenberg, J. S. (1999). Change in depressive symptoms among daughter caregivers: An 18-month longitudinal study. *Psychology and Aging*, *14*, 206–219.^{c,h}
- *Losada, A., Montorio, I., Marquez, M., & Izal, M. (2005, November). *The role of dysfunctional thoughts about caregiving in the stress process of dementia family caregiving*. Paper presented at the 58th annual meeting of the Gerontological Society of America, Orlando, FL.^{a,c,d,i,j,l,n,o}
- *Lu, Y., & Wykle, R. (2002, November). *Effects of caregiving stress on functional capability and health promoting behavior in elderly caregivers*. Paper presented at the 55th annual Meeting of the Gerontological Society of America, Boston, MA.ⁿ
- *Lyons, K. S., Zarit, S. H., & Sayers, A. G. (2002). Caregiving as a dyadic process: Perspectives from caregiver and receiver. *Journal of Gerontology: Psychological Sciences*, *57B*, P195–P204.^{e,m,o}
- *Lyons, K. S., Stewart, B. J., Archbold, P. G., Carter, J. H., & Perrin, N. A. (2004). Pessimism and optimism as early warning signs for compromised health for caregivers of patients with Parkinson's disease. *Nursing Research*, *53*, 354–362.^{a,f}
- *Macera, C. A., Eaker, E. D., Goslar, P. W., Deandrade, S. J., Williamson, J. S., & Cornman, C., et al. (1992). Ethnic differences in the burden of caregiving. *American Journal of Alzheimer's Disease and Other Dementias*, *7*, 4–7.ⁿ
- *Mahoney, R., Regan, C., Katona, C., & Livingston, G. (2005). Anxiety and depression in family caregivers of people with Alzheimer disease: The Laser-AD Study. *American Journal of Geriatric Psychiatry*, *13*, 795–801.^o
- *Maidment, R., Regan, C., Katona, C., & Livingston, G. (in press). Anxiety and depression in family caregivers of people with Alzheimer's disease—The LASER-AD Study. *American Journal of Geriatric Psychiatry*.^o
- *Markowitz, J. S., Guterman, E. M., Sadik, K., & Papadoplus, G. (2003). Health-related quality of life for caregivers of patients with Alzheimer disease. *Alzheimer Disease and Associated Disorders*, *17*, 209–214.^{a,b,d,j,l}
- *Marks, R. (1987). The family dimension in long-term care: An assessment of stress and intervention. *Journal of Long-Term Home Health Care*, *3*, 18–26.ⁿ
- *Martire, L. M., Stephens, M. A., & Atienza, A. A. (1997). The interplay of work and caregiving: Relationships between role satisfaction, role involvement, and caregivers' well-being. *Journal of Gerontology: Social Sciences*, *52B*, S279–S289.^{d,n,o}
- *Matthews, B. A., Baker, F., & Spillers, R. L. (2003). Family caregivers and indicators of cancer-related distress. *Psychology, Health & Medicine*, *8*, 45–56.^{a,f,j,k,n}
- *Matthews, B. A., Baker, F., & Spillers, R. L. (2004). Family caregivers' quality of life: Influence of health protective stance and emotional strain. *Psychology and Health*, *19*, 625–641.^{a,f,k,n}
- McCann, J. J., Hebert, L. E., Bienias, J. L., Morris, M. C., & Evans, D. A. (2004). Predictors of beginning and ending caregiving during a 3-year period in a biracial community population. *American Journal of Public Health*, *94*, 1800–1806.
- *McConaghy, R., & Caltabiano, L. (2005). Caring for a person with dementia: Exploring relationships between perceived burden, depression, coping, and well-being. *Nursing and Health Sciences*, *7*, 81–91.ⁿ
- *McLaughlin, L. A. (2002). *Factors that contribute to stress among Japanese-American and Caucasian-American family caregivers of frail elders*. Unpublished doctoral dissertation, University of Hawai'i.^{l,m,o}
- *Meier, D., Ermini-Fünfschilling, D., Monsch, A. U., & Strählin, H. B. (1999). Pflegendes Familienangehörige von Demenzpatienten: Ihre Belastungen und ihre Bedürfnisse [Caring for a family member with dementia: Burden and support needs]. *Zeitschrift für Gerontopsychologie und Psychiatrie*, *12*, 85–96.^{n,o}
- *Miller, B. (1989). Adult children's perception of caregiver stress and satisfaction. *Journal of Applied Gerontology*, *8*, 275–293.ⁿ
- *Miller, B., Campbell, R. T., Farran, C. J., Kaufman, J. E., & Davis, L. (1995). Race, control, mastery, and caregiver distress. *Journal of Gerontology: Social Sciences*, *50B*, S374–S382.^{g,i,k,n,o}
- *Miura, H., Arai, Y., & Yamasaki, K. (2005). Feelings of burden and health-related quality of life among family caregivers looking after the impaired elderly. *Psychiatry and Clinical Neurosciences*, *59*, 551–555.ⁿ
- *Montgomery, R. J., & Kamo, Y. (1989). Parent care by sons and daughters. In J. A. Mancini (Ed.), *Aging parents and adult children* (pp. 213–230). Lexington, MA: Lexington Books.ⁿ
- *Morrissey, E., Becker, J., & Rubert, M. P. (1990). Coping resources and depression in the caregiving spouses of Alzheimer patients. *British Journal of Medical Psychology*, *63*, 161–171.^{g,i,n,o}
- Moritz, D. J., Kasl, S. V., & Ostfeld, A. M. (1992). The health impact of living with a cognitively impaired elderly spouse: Blood pressure, self-rated health, and health behaviors. *Journal of Aging and Health*, *4*, 244–267.
- Mui, A. C. (1995). Perceived health and functional status among caregivers of frail older persons. *Journal of Aging and Health*, *7*, 283–300.
- *Navaie-Waliser, M., Feldman, P. H., Gould, D. A., Levine, C., Kuerbis, A. N., & Denelan, K. (2002). When the caregiver needs care: The plight of vulnerable caregivers. *American Journal of Public Health*, *92*, 409–413.^{a,c,d,e,f,j,m}
- Neugarten, B. L. (1969). Continuities and discontinuities of psychological issues into adult life. *Human Development*, *12*, 121–130.
- *Neundorfer, M. M. (1991). Coping and health outcomes in spouse caregivers of persons with dementia. *Nursing Research*, *40*, 260–265.^{i,n,o}
- *Neundorfer, M. M., McClendon, M. J., & Smyth, K. A. (2001). A longitudinal study of the relationship between levels of depression among persons with Alzheimer's disease and levels of depression of their caregivers. *Journal of Gerontology: Psychological Sciences*, *56B*, P301–P313.^{b,g,o}
- *Neundorfer, M. M., McClendon, M. J., Strauss, M. E., & Smyth, K. A. (2001, November). *Effect of prior history of depression on depression as a caregiving outcome in spouses of persons with Alzheimer's*

- disease. Paper presented at the 54th annual meeting of the Gerontological Society of America. Chicago, IL.ⁿ
- *Nijboer, C., Triemstra, M., Tempelaar, R., Sandman, R., & van den Bos, G. A. (1999). Measuring both negative and positive reactions to giving care to cancer patients: Psychometric qualities of the Caregiver Reaction Assessment (CRA). *Social Science and Medicine*, *48*, 1259–1269.^{a,c,n,o}
- *Nijboer, C., Tempelaar, R., Triemstra, M., Sanderman, R., & van den Bos, G. A. (2001). Dynamics in cancer caregivers' health over time: Gender-specific patterns and determinants. *Psychology and Health*, *16*, 471–288.^{a,c,g,k,n}
- *Nygaard, H. A. (1988). Strain of caregivers of demented elderly people living at home. *Scandinavian Journal of Primary Health Care*, *6*, 33–37.ⁿ
- *Oberst, M. T., Thomas, S. E., Gass, K. A., & Ward, S. E. (1989): Caregiving demands and appraisal of stress among family caregivers. *Cancer Nursing*, *12*, 209–215.ⁿ
- *O'Reilly, F., Finnan, F., Allwright, S., Smith, G., & Ben-Shlomo, Y. (1996). The effects of caring for a spouse with Parkinson's disease on social, psychological, and physical well-being. *British Journal of General Practice*, *46*, 507–512.^d
- *O'Rourke, N., Cappeliez, P., & Guindon, S. (2003). Depressive symptoms and physical health of caregivers of persons with cognitive impairment: Analysis of reciprocal effects over time. *Journal of Aging and Health*, *15*, 688–712.^{g,i,n,o}
- Patterson, T. L., & Grant, I. (2003). Interventions for caregiving in dementia: Physical outcomes. *Current Options in Psychiatry*, *16*, 629–633.
- *Penning, M. J. (1998). In the middle: parental caregivers in the context of other roles. *Journal of Gerontology: Social Sciences*, *53B*, S188–S197.
- *Phillips, L. R., de Ardon, E. T., Kommenich, P., Killeen, M., & Rusniak, R. (2000). The Mexican American caregiving experience. *Hispanic Journal of Behavioral Sciences*, *22*, 296–305.^b
- Pinquart, M. (1998). *Das Selbstkonzept im Seniorenalter* [Self-concept in old age]. Weinheim, Germany: Beltz.
- Pinquart, M. (2001). Correlates of subjective health in older adults: A meta-analysis. *Psychology and Aging*, *16*, 414–426.
- Pinquart, M., & Sörensen, S. (2003a). Differences between caregivers and noncaregivers in psychological health and physical health: A meta-analysis. *Psychology and Aging*, *18*, 250–267.
- Pinquart, M., & Sörensen, S. (2003b). Predictors of caregiver burden and depressive mood: A meta-analysis. *Journal of Gerontology: Psychological Sciences*, *58B*, P112–P128.
- Pinquart, M., & Sörensen, S. (2005). Ethnic differences in stressors, resources, and psychological outcomes of family caregiving for older adults: A meta-analysis. *The Gerontologist*, *45*, 90–106.
- Pinquart, M., & Sörensen, S. (2006). Gender differences in caregiver stressors, social resources, and health: An updated meta-analysis. *Journal of Gerontology: Psychological Sciences*, *61B*, P33–P45.
- *Pot, A. M., van Dyck, R., & Deeg, D. J. H. (1995). Ervaren druk door informele zorg: Constructie van een schaal [Self-perceived pressure from informal care: Construction of a scale]. *Tijdschrift voor Gerontologie en Geriatrie*, *26*, 214–219.ⁿ
- *Pot, A. M., Deeg, D. J. H., vanDyck, R., & Jonker, C. (1998). Psychological distress of caregivers: The mediator effect of caregiving appraisal. *Patient Education and Counseling*, *34*, 43–51.^{b,c,i,n}
- *Pratt, C., Wright, S., & Schmall, V. (1987). Burden, coping and health status: A comparison of family caregivers to institutionalized Alzheimer's patients. *Journal of Gerontological Social Work*, *10*, 99–112.ⁿ
- *Pruchno, R. A., & Resch, N. L. (1989). Husbands and wives as caregivers: Antecedents of depression and burden. *The Gerontologist*, *29*, 159–165.^{a,n,o}
- *Pruchno, R. A., Kleban, M. H., Michaels, J. E., & Dempsey, N. P. (1990). Mental and physical health of caregiving spouses: Development of a causal model. *Journal of Gerontology: Psychological Sciences*, *45*, P192–P199.^f
- *Rabins, P. V., Fitting, M. D., Eastham, J., & Fetting, J. (1990). The emotional impact of caring for the chronically ill. *Age & Aging*, *19*, 185–190.^{b,i}
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Journal of Applied Psychological Measurement*, *1*, 385–401.
- *Rapp, S. R., Shumaker, S., Schmidt, S., Naughton, M., & Anderson, R. (1998). Social resourcefulness: Its relationship to social support and well-being among caregivers of dementia victims. *Aging & Mental Health*, *2*, 40–48.^{l,o}
- *Rapp, S. R., & Chao, D. (2000). Appraisals of strain and gain: Effects on psychological wellbeing of caregivers of dementia patients. *Aging & Mental Health*, *4*, 142–147.^{a,i,i,n}
- Raudenbush, S. W. (1994). Random effects models. In C. Cooper & L.V. Hedges (Eds.), *The handbook of research synthesis* (pp. 301–321). New York: Sage.
- *Raveis, V. H., Karus, D. G., & Siegel, K. (1998). Correlates of depressive symptomatology among adult daughter caregivers of a parent with cancer. *Cancer*, *83*, 1652–1663.ⁿ
- *Redinbaugh, E. M., MacCallum, R. C., & Kiecolt-Glaser, J. K. (1995). Recurrent syndromal depression in caregivers. *Psychology and Aging*, *10*, 358–368.^o
- *Reis, M. F., Andres, D., Gold, D. P., Markiewicz, D., & Gauthier, S. (1994). Personality traits as determinants of burden and health complaints in caregiving. *International Journal of Aging and Human Development*, *39*, 257–271.^{b,c,h,i,i,n}
- *Riemsma, R. P., Taal, E., Rasker, J. J., Klein, G., Bruyn, G. A., Wouters, J. M., et al. (1999). The burden of care for informal caregivers of patients with rheumatoid arthritis. *Psychology and Health*, *14*, 773–794.^{a,b,f,j,k,l}
- Rosenthal, R. (1991). *Meta-analytic procedures for social research*. Beverly Hills, CA: Sage.
- *Roth, D. L., Haley, W. E., Owen, J. E., Clay, O. J., & Goode, K. T. (2001). Latent growth models of the longitudinal effects of dementia caregiving: A comparison of African American and White family caregivers. *Psychology and Aging*, *16*, 427–436.^o
- Rowe, J. W., & Kahn, R. L. (1998). *Successful aging*. New York: Pantheon.
- *Sanders, G. F., Pittman, J. F., & Montgomery, J. E. (1986). Family caregivers of centenarians: Support for the very old. *Journal of Applied Gerontology*, *5*, 113–125.^a
- *Sansoni, J., Vellone, E., & Piras, G. (2004). Anxiety and depression in community-dwelling Italian Alzheimer's disease caregivers. *International Journal of Nursing Practice*, *10*, 93–100.^o
- *Scazuca, M., Menezes, P. R., & Almeida, O. P. (2002). Caregiver burden in an elderly population with depression in Sao Paulo, Brazil. *Social Psychiatry and Psychiatric Epidemiology*, *37*, 416–422.ⁿ
- Schreiner, A., Morimoto, T., & Asano (2000, November). *Caregiver burden and health related quality of life (HRQOL) in a sample of family caregivers of post-stroke elderly in Japan*. Paper presented at the 53rd annual meeting of the Gerontological Society of America, Washington, DC.^{a,d,f,j,i,n,o}
- *Schulz, R. (2003). Resources for enhancing Alzheimer's caregiver health 1996–2001 (ICPSR version) [Computer file]. Ann Arbor, MI: Consortium for Political and Social Research.^{a,b,d,e,f,g,h,i,j,k,l,m,o}
- *Schulz, R., Thomkins, C. A., Wood, D., & Decker, S. (1987). The social psychology of caregiving: Physical and psychological costs of providing support to the disabled. *Journal of Applied Social Psychology*, *17*, 401–428.^o
- Schulz, R., O'Brien, A. T., Bookwala, J., & Fleissner, K. (1995). Psychiatric and physical morbidity effects of dementia caregiving: Prevalence, correlates, and causes. *The Gerontologist*, *35*, 771–791.
- *Schulze, E., & Drewes, J. (2004). *Die gesundheitliche Situation von Pflegenden in der Bundesrepublik Deutschland* [Health of caregivers in the Federal Republic of Germany]. Wiesbaden: Bundesinstitut für Bevölkerungsforschung.^{a,i,j}
- *Schwarz, K. A. (1996). Home health care: Formal social support to family caregivers of older adults. *Family Perspective*, *30*, 47–61.^o
- *Shadden, B., DiBrezzo, R., & Powers, M. (2005, November). *Factors influencing perceived physical and emotional health impact of caregiving*. Paper presented at the 58th annual meeting of the Gerontological Society of American, Orlando, FL.ⁿ
- *Shaw, W. S., Patterson, T. L., Semple, S. J., Ho, S., Irwin, M. R., Haugler, R. L., et al. (1997). Longitudinal analysis of multiple indicators of health decline among spousal caregivers. *Annals of Behavioral Medicine*, *19*, 101–109.^{a,g,i}
- *Sheehan, N. W., & Nuttall, P. (1988). Conflict, emotions, and personal strain among family caregivers. *Family Relations*, *37*, 92–98.^{c,g,i,m,n,o}
- *Silver, H. J., Wellman, N. S., Galindo-Ciocon, D., & Johnson, P. (2004). Family caregivers of older adults in home external nutrition have

- multiple unmet task-related training needs and low overall preparedness of caregiving. *Journal of the American Dietetic Association*, 104, 43–50.^{a,d,e,f}
- *Sink, K. M., Covinsky, K. E., Barnes, D. E., Newcomer, R. J., & Yaffe, K. (2006). Caregiver characteristics are associated with neuropsychiatric symptoms of dementia. *Journal of the American Geriatrics Society*, 54, 796–803.¹
- *Sleath, B., Thorpe, J., Landerman, L., Doyle, M., & Clipp, E. (2005). African-American and White caregivers of older adults with dementia: Differences in depressive symptomatology and psychotropic drug use. *Journal of the American Geriatrics Society*, 53, 397–404.⁹
- *Smerglia, V. L., & Deimling, G. T. (1997). Care-related decision making satisfaction and caregiver well-being in families caring for older members. *The Gerontologist*, 37, 658–665.^{b,g,h,i,o}
- *Spaid, W. M., & Barusch, A. S. (1994). Emotional closeness and caregiver burden in the marital relationship. *Journal of Gerontological Social Work*, 21, 197–211.^{a,i,l,n}
- *Sparks, M. B., Farran, C. J., Donner, E., & Keane-Hagerty, E. (1998). Wives, husbands, and daughters of dementia patients: Predictors of caregivers' mental health and physical health. *Scholarly Inquiry for Nursing Practice*, 12, 221–234.^{a,b,f,h,n}
- *Speer, D. C. (1993). Predicting Parkinson's disease patient and caregiver adjustment: Preliminary findings. *Behavior, Health, and Aging*, 3, 139–146.^{l,n,o}
- *Stephens, M. P., Ogrocki, P. K., & Kinney, J. M. (1991). Sources of stress for family caregivers of institutionalized dementia patients. *Journal of Applied Gerontology*, 10, 328–342.ⁿ
- *Stone, R., Cafferata, G. L., & Sangl, J. (1987). Caregivers of the frail elderly: A national profile. *The Gerontologist*, 27, 616–626.^{b,1}
- Stoller, E. P. (1994). Teaching about gender: The experience of family care of frail elderly relatives. *Educational Gerontology*, 30, 679–697.
- *Strawbridge, W. I., Wallhagen, M. I., Shema, S. J., & Kaplan, G. A. (1997). New burdens or more of the same? Comparing grandparents, spouse, and adult-child caregivers. *The Gerontologist*, 37, 505–510.^b
- *Stuckey, J. C., Neundorfer, M. M., & Smyth, K. A. (1996). Burden and well-being: The same coin or related currency? *The Gerontologist*, 36, 686–693.^{b,k,n,o}
- *Stull, D. E., Kosloski, K., & Kercher, K. (1994). Caregiver burden and generic well-being: Opposite sides of the same coin? *The Gerontologist*, 34, 88–94.^{e,g,h,n}
- *Svetlik, D., Dooley, W. K., Weiner, M. F., Williamson, G. M., & Walters, A. S. (2005). Declines in satisfaction with physical intimacy predict caregiver perceptions of overall relationship loss: A study of elderly caregiving spousal dyads. *Sexuality and Disability*, 23, 65–79.^{a,c,h}
- *Tang, Y. Y., & Chen, S. P. (2002). Health promotion behaviors in Chinese family caregivers of patients with stroke. *Health Promotion International*, 17, 329–339.^{a,b,f,g,j,k,l,n}
- *Tennstedt, S., Cafferta, G., & Sullivan, L. (1992). Depression among caregivers of impaired elders. *Journal of Aging and Health*, 4, 58–76.^{b,c,e,g,l,m,n,o}
- 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, 622–631.
- *Tracy, K., Hochberg, M., & Fredman, L. (2002, November). *Effects of race and marital status on health of elderly male caregivers*. Paper presented at the 55th annual meeting of the Gerontological Society of America, Boston, MA.^b
- *Uchino, B., Kiecolt-Glaser, J. K., & Cacioppo, J. T. (1992). Age-related changes in cardiovascular response as a function of a chronic stressor and social support. *Journal of Personality and Social Psychology*, 63, 839–846.^{a,1}
- *van Exel, N. J., Brouwer, W. B., van den Berg, B., Koopmanschap, M. A., & van den Bos, G. A. (2004). What really matters: An inquiry into the relative importance of dimensions of informal caregiver burden. *Clinical Rehabilitation*, 18, 683–693.ⁿ
- *Vitaliano, P. P., Maiuro, R. D., Ochs, H., & Russo, J. (1989). A model of burden in caregivers of DAT patients. In E. Light & B. Lebowitz (Eds.), *Alzheimer's disease treatment and family stress* (pp. 267–291). Washington, DC: National Institute of Mental Health.ⁿ
- *Vitaliano, P. P., Russo, J., Young, H. M., Teri, L., & Maiuro, R. D. (1991). Predictors of burden in spouse caregivers of individuals with Alzheimer's disease. *Psychology and Aging*, 6, 392–402.ⁿ
- Vitaliano, P. P., Zhang, J., & Scanlan, J. M. (2003). Is caregiving hazardous for one's physical health? A meta-analysis. *Psychological Bulletin*, 129, 946–972.
- *Wagenfeld, M. O., Baro, F., Gallagher, T. J., & Haepers, K. (1998). The correlates of coherence in caregivers to demented and nondemented elderly in Belgium. In H. McCubbin & E. A. Thompson (Eds.), *Stress, coping, and health in families: Sense of coherence and resiliency* (pp. 249–263). Thousand Oaks, CA: Sage.^h
- *Walker, A. J., Martin, S. K., & Jones, L. L. (1992). The benefits and costs of caregiving and care receiving for daughters and mothers. *Journal of Gerontology: Social Sciences*, 47, S130–S139.^{a,c,e,f,k,n}
- Ware, J.E., & Sherbourne, C. D. The MOS 36-Item Short-Form Health Survey (SF-36): Conceptual framework and item selection. *Medical Care*, 30, 473–83.
- *Wei, F. W. (1993). *The effects of stressors on mental health and life satisfaction of caregivers of elderly*. Unpublished doctoral dissertation, University of Texas, Arlington.^o
- *Whitlatch, C. J., Feinberg, L. F., & Sebesta, D. S. (1997). Depression and health in family caregivers. *Journal of Aging and Health*, 9, 222–243.^{1,1}
- *Wijeratne, C., & Lovestone, S. (1996). A pilot study comparing psychological and physical morbidity in carers of elderly people with dementia and those with depression. *International Journal of Geriatric Psychiatry*, 11, 741–744.^{b,1}
- *Williams, A. M., Forbes, D. A., Mitchell, J., Essar, M., & Corbett, B. (2003). The influence of income on the experience of informal caregiving: Policy implications. *Health Care for Women International*, 24, 280–291.^k
- *Wright, L. K., Hickey, J. V., Buckwalter, K. C., Hendrix, S. A., & Kelechi, T. (1999). Emotional and physical health of spouse caregivers of persons with Alzheimer's disease and stroke. *Journal of Advanced Nursing*, 30, 552–563.^{f,g,o}
- *Wyller, T. B., Thommessen, B., Sodrings, K. M., Sveen, U., Pettersen, A. M., Bautz-Holter, E., et al. (2003). Emotional well-being of close relatives to stroke survivors. *Clinical Rehabilitation*, 17, 410–417.^{d,g,h,n}
- *Yamada, H. (1994). *The effects of social support on the well-being of spouse caregivers of demented elders*. Ann Arbor, MI: UMI Dissertation Services.^{a,b,g,j,k,l,n,o}
- *Yatman, R. (1993). Is caring for elderly relatives with depression as stressful as caring for those with dementia? A pilot study in Melbourne. *International Journal of Geriatric Psychiatry*, 8, 339–342.^c
- *Young, F. R., & Kahana, E. (1989). Specifying caregiving outcomes: Gender and relationship aspects of caregiver strain. *The Gerontologist*, 29, 660–666.^b
- *Yue-Feng, L., & Wykle, M. (2001, November). *Caregivers' stress and self-care behavior response to symptoms*. Paper presented at the 54th annual meeting of the Gerontological Society of America, Chicago, IL.ⁿ
- *Zanetti, O., Magni, E., Sandri, C., Frisoni, G. B., & Bianchetti, A. (1996). Determinants of burden in an Italian sample of Alzheimer's patient caregivers. *Journal of Cross-Cultural Gerontology*, 11, 17–27.^{n,o}
- *Zank, S., & Schacke, C. (2004). *Entwicklung eines standardisierten Messinstruments zur Erstellung von Belastungsprofilen und zur Evaluation von Entlastungsangeboten für pflegende Angehörige demenziell Erkrankter* [Development of a standardized measure of burden profile and for evaluating services for caregivers of dementia patients]. Berlin: Free University of Berlin.^{c,n}
- *Zarit, S. H., Reever, K. E., & Bach-Petersen, J. (1980). Relatives of the impaired elderly: Correlates of feelings of burden. *The Gerontologist*, 20, 649–655.

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