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The Relationship among Caregiving Characteristics, Caregiver Strain, and Health-Related Quality of Life: Evidence from the Survey of the Health of Wisconsin

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Abstract

Purpose—In order to better understand how family caregiving may contribute to poor health outcomes, this study sought to determine 1) if and to what extent caregiving characteristics were associated with caregiver strain and health-related quality of life (HRQoL), and 2) whether caregiver strain mediated this association.

Methods—Data were from the 2008–2010 Survey of the Health of Wisconsin, a representative sample of Wisconsin adults aged 21–74 years. Participants completed questionnaires about their caregiving, sociodemographics, and HRQoL; 264 caregivers were identified. Staged generalized additive models assessed the associations between caregiving characteristics, caregiver strain, and HRQoL; survey weights were applied to account for the complex sampling design.

Results—More hours per week of care and greater duration of caregiving were associated with higher levels of strain. Greater caregiver strain was in turn associated with worse mental HRQoL. However, most caregiving characteristics were not directly associated with mental or physical HRQoL.

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CONFLICTS OF INTEREST

The authors have no conflicts to report.

Conclusions—The findings suggest a chains-of-risk model in which caregiving may increase strain, which may in turn adversely influence mental HRQoL. Using this perspective to refine interventions may improve our ability to support caregivers on practice and policy levels.

Keywords

caregiver strain; quality of life; population-based; lifecourse

INTRODUCTION

The number of adults and children requiring informal care is expected to dramatically increase over the next 30 years due to the aging of the population and greater survival of individuals with disabilities and chronic illnesses [1–3]. Although many caregivers perceive benefits from informal caregiving (defined as providing unpaid care to a family member or friend with an illness or disability) [4], the role has also been associated with increased levels of stress and poor physical and mental health [5]. It is therefore critical to understand the correlates of poor health outcomes among caregivers, and explore the pathways by which these outcomes may occur.

Theory suggests that the adverse health impacts of caregiving occur through psychological stress and caregiver strain or burden [6,7], defined as the psychological stress specifically attributable to caregiving [8, p. 119,9]. Specifically, these theories posit that the effects of caregiving stressors (such as living with a care recipient or providing many hours of informal care, referred to here as “caregiving characteristics”) depend in full or in part on the caregiver’s appraisal of these factors as stressful. Empirically, caregiver strain and burden have been associated with poor health outcomes [10–14]. While caregiving is detrimental at high levels of strain, it may be protective when perceived strain is low, possibly due to psychological benefits of caregiving (e.g., feeling needed; feeling a sense of purpose in life) [12,13,15–17]. Based on these theories and empirical work, there is a need to explore the role of strain in the pathway between caregiving characteristics and caregiver health outcomes. Among the extant caregiving literature, however, most studies that have examined these relationships have been conducted in convenience or clinic-based samples [18–30]. In addition, only a few such studies have examined health-related quality of life (HRQoL) as an outcome [27–30]. As HRQoL may deteriorate early in the trajectory of health decline, and may influence or be predictive of future health problems, understanding the impact of caregiving on this “upstream” factor in a population-based sample may help inform timely intervention.

In order to address these gaps, the purpose of this study was to examine the associations between caregiving characteristics, caregiver strain, and HRQoL in a population-based sample. We hypothesized that caregiving characteristics would be associated with strain, and with both mental and physical HRQoL, and that this relationship would be mediated by strain. Alternatively, as the associations between caregiving characteristics and caregiver HRQoL may be weak [31], the relationships among these factors may suggest a “chains-of-risk” model [32] in which caregiving characteristics do not directly influence HRQoL and instead contribute to greater strain which in turn leads to worse HRQoL. Findings from this

study will further our knowledge of the role of strain in these relationships, and inform the development of targeted interventions to improve the health and well-being of caregivers and their families.

MATERIALS AND METHODS

Data Source

This study used data from the 2008–2010 Survey of the Health of Wisconsin (SHOW). The SHOW is an annual survey of civilian non-institutionalized adults aged 21–74 years, representative of the state of Wisconsin. A detailed description of SHOW procedures is available elsewhere [33]. Briefly, participants were selected from a random sample of households using two-stage cluster sampling. Participants provided informed consent and completed face-to-face interviews, self-administered questionnaires (including the caregiving questionnaire), and a physical exam. Detailed demographic, behavioral, lifestyle, occupational, household characteristics, and self-reported global stress, HRQoL, and caregiving data were collected through interviews and a self-administered questionnaire.

Informal caregivers in the SHOW were identified by the question: “There are situations in which people provide regular unpaid care or assistance to a family member (including children) or a friend who has a long-term illness or a disability. In the past 12 months, did you provide any such care or assistance to a family member or friend living with you or living elsewhere?” This question has been used by the National Alliance for Caregiving and the AARP (formerly the American Association of Retired Persons) [34] since 1997 to track caregiving prevalence. All participants who reported informal caregiving in the past 12 months (n=264) were eligible for the present study. This study was approved by the Health Sciences Institutional Review Board of the University of Wisconsin-Madison.

Measures

Independent Variables

Caregiving characteristics: Caregivers self-reported their duration of caregiving (years), hours of care per week, distance from the care recipient (co-resident, 0–20 minutes away, or > 20 minutes away), relationship to the care recipient (spouse, adult-child, parent, or other friend/relative), the care recipient’s condition (dementia, recovery from surgery, injury, or acute illness, or other condition), age and gender, number of care recipients in the past year, and whether they were currently providing care.

Caregiver strain: A 12-item version of the *Caregiver Strain Index* [35] was used to evaluate perceived strain among caregivers. This version asked respondents whether 12 statements applied to them because of caregiving (e.g., “It is inconvenient for you”). The number of endorsed items was summed (0–12). Cronbach’s α was 0.81. Higher scores indicated greater strain.

Dependent Variable—The *Short Form-12 (SF-12) version 2*, a widely used measure of health status, was used to assess the overall mental and physical HRQoL of participants [36–38]. The SF-12 has eight subscales that were condensed into two summary scales: the

physical health and the mental health component scores, standardized to population norms (mean=50; standard deviation=10). Higher scores indicate better HRQoL.

Covariates

Sociodemographic characteristics: Participants self-reported their age, gender, race/ethnicity (white [non-Hispanic] versus other), annual income, educational attainment, employment status (coded as employed, unemployed in the past week and looking for a job, or not working last week not looking for a job), type of insurance (coded as none, public, private, or mixed public/private), marital status (married/partnered, divorced/widowed/separated, or never married) and the number of adults and children in the household. Participants reported their combined annual family income before taxes categorically (e.g., \$25,000 to \$29,999). These were recoded to the midpoint of the category to approximate a continuous measure; those who reported the highest category of income (\$200,000 or more) were recoded to an income of \$392,396 by assuming a Pareto distribution of income [39]. Educational attainment was reported as the highest grade or level of school completed and recoded as years of education.

Prior health conditions: Caregivers reported whether they had ever been diagnosed by a medical professional with stroke, heart attack, diabetes, high blood pressure, or high cholesterol and the date on which the diagnosis had been made. Those diagnosed with one or more of these conditions prior to the start of caregiving were coded as having a prior health condition.

Analytic Approach

All analyses were conducted in R 2.15.0. Multiple imputation with predictive mean matching and a donor-sampling weight of 0.2 was used to predict values of missing data [40]; five imputations were conducted. Non-linear transformations were allowed when predicting missing values of continuous variables with respect to all other variables in the imputation model. All analyses were conducted using the imputed datasets. Estimates and standard errors were combined using Rubin's rules [41,42].

Income, hours of care per week, and duration were log-transformed to account for the skewed distribution of these variables. Descriptive statistics were used to examine the frequency distributions of sociodemographic factors, caregiving characteristics, strain, and HRQoL among caregivers. Correlations were calculated among the caregiving characteristics (data not shown). Multivariable analyses were conducted using semi-parametric generalized additive models (GAMs) with thin plate regression splines [43]. Continuous variables (duration of care, hours per week of care, strain, income, education, and age) were tested as non-linear terms. Estimated degrees of freedom for non-linear parameters were determined using generalized cross-validation [43]. First, GAMs were constructed to examine the association between caregiving characteristics and strain; caregiving characteristics were included individually ("bivariate adjusted") and simultaneously ("multivariate adjusted"), controlling for covariates; while none of the caregiving characteristics were correlated at >0.65 (Supplementary Figure 1), they were modeled individually and simultaneously in the GAMs to ease interpretation given the

potential collinearity. Models were then constructed to examine the associations between 1) caregiving characteristics and HRQoL (Model 1); 2) caregiver strain and HRQoL (Model 2); and 3) both caregiving characteristics and strain, and HRQoL (Model 3), controlling for covariates. Separate models were used for mental and physical HRQoL. The relationship between caregiving characteristics and HRQoL was determined to be mediated by strain if 1) there was moderate to strong evidence that the characteristic was associated with HRQoL in Model 1, and 2) the regression coefficient was attenuated and the evidence for the association was reduced to weak (p -value>0.05) with the inclusion of strain in Model 3. Mediation was formally tested using Imai's Causal Mediation Analysis approach [44,45].

In order to account for the complex survey design, these models were then run using sampling weights. Non-linear terms were included as natural cubic splines, with fixed degrees of freedom estimated from the GAMs and rounded to the nearest integer. The knots were evenly spaced throughout the distribution of the non-linear terms.

RESULTS

This study identified 264 caregivers in the SHOW (Table 1). Caregivers had a mean age of 51.7 years. The majority of caregivers were female (65%) and white (non-Hispanic) (89%). On average, caregivers had been providing care for 4.5 years and provided 17 hours of care per week (Table 2). Forty-four percent were caring for a parent, while 15% provided care to a spouse, 13% cared for a child, and 29% cared for some other relative or a friend. Caregivers reported an average of 4.7 points on the Caregiver Strain Index, ranging from 0 to 12. On average, care recipients were 61.6 years of age, ranging from infants to 97 years. The majority of care recipients were female (62%).

Associations between Caregiving Characteristics and Caregiver Strain

Table 2 reveals the association between caregiving characteristics and caregiver strain, controlling for covariates. In the bivariate adjusted models (i.e., models with each caregiving characteristics entered individually and controlling for sociodemographic characteristics and prior health conditions), there was evidence that caring for a friend, parent or other relative or a female care recipient was associated with lower levels of strain. There was very strong evidence that those who lived 0–20 minutes from the care recipient had less strain than those co-residing with the care recipient. Caring for a greater number of care recipients was associated with more strain, as were a greater duration and more hours per week of care (Supplementary Figure 2, Panels A and B).

When all caregiving characteristics were included in the model simultaneously (Table 2, Multivariate Adjusted), there was very strong evidence that duration of caregiving (see also Supplementary Figure 2, Panel C) and more hours of care per week (Supplementary Figure 2, Panel D) were associated with greater strain, and weak evidence that caring for a greater number of friends or relatives was associated with greater levels of strain. There was weak evidence that caring for a child was associated with higher levels of strain.

Associations between Caregiving Characteristics, Strain, and Mental HRQoL

Table 3 depicts the relationships among caregiving characteristics, strain, and mental HRQoL. Contrary to our hypotheses, there was little evidence that caregiving characteristics were independently associated with mental HRQoL (Model 1), although the associations were primarily in the expected directions. In Model 2, strain alone had very strong evidence of being associated with worse mental HRQoL. When caregiving characteristics and strain were included in the model simultaneously (Model 3), very strong evidence remained of an association between greater strain and worse mental HRQoL, such that there was nearly a one standard deviation decrease in mental HRQoL between the lowest and the highest levels of strain. There was no evidence for associations between caregiving characteristics and mental HRQoL in this model, although some point estimates were attenuated or reversed after the inclusion of strain.

Associations between Caregiving Characteristics, Strain, and Physical HRQoL

Table 4 depicts the relationship between caregiving characteristics, strain, and physical HRQoL. In Model 1, there was moderate-to-weak or weak evidence that providing care for those who were older, female, or recovering from surgery or an illness was associated with worse physical HRQoL. In Model 2, there was little evidence that strain was associated with worse physical HRQoL. When caregiving characteristics and strain were included in the model simultaneously (Model 3), there was weak evidence for an association between strain and physical HRQoL. The regression coefficients of the caregiving characteristics that displayed associations with physical HRQoL in Model 1 were not substantially reduced by the inclusion of strain, and a formal test of mediation confirmed that there was little evidence that the weak associations between these caregiving characteristics and physical HRQoL were mediated by strain.

DISCUSSION

This study sought to determine the role of caregiver strain in the development of poor HRQoL. Findings indicate that although caregiving characteristics were associated with strain, and strain was independently associated with mental (but not physical) HRQoL, few caregiving characteristics were directly associated with HRQoL. These findings point to a chains-of-risk [32] model of the association of caregiving characteristics and strain with HRQoL. If confirmed longitudinally, the findings suggest that research and interventions to improve caregiver health should focus on high-strain caregivers rather than individual characteristics of the caregiving experience, with important implications for practice, policy, and research.

This study found that several caregiving characteristics were associated with caregiver strain, supporting our hypothesis. This confirms previous studies of the predictors of caregiver burden and strain [46–49]. Previous studies also indicate that spousal caregivers report greater strain than others, although this work has been conflicting [50,51,48,49]. The present study, however, indicated that *parental* caregivers (those caring for their child) may have the greatest strain, controlling for other caregiving characteristics. Parental caregivers may experience more worry, uncertainty, or other psychosocial factors that may contribute

to higher levels of strain, or may have fewer resources (e.g., financial, life experience) to draw upon to reduce strain. Future work should confirm this finding and examine the caregiving, psychosocial, and behavioral factors that may contribute to disparately high levels of strain in this population.

Contrary to our hypotheses, this study did not find most caregiving characteristics to be associated with mental or physical HRQoL. The associations between such characteristics and caregiver outcomes have been shown to be quite weak [31], which may explain the lack of evidence for these associations in this and other studies (e.g., [20,18,52]), although some studies report positive associations (e.g., [14]).

Overall, the associations between caregiving characteristics and strain, and between strain and mental HRQoL, point to a “chains-of-risk” model. This interpretation extends previous studies, which have shown indirect effects of caregiving characteristics on HRQoL through strain [29,28], but have not reported mediation [30,27]. Specifically, chains-of-risk refers to the accumulation of risk factors over time, which tend to lead to one another [32]. In this case, caregiving characteristics can be conceptualized as a cluster of risk factors that, in theory, may independently or synergistically contribute caregiver strain in coordination with caregiver demographics and resources. We posit that caregiver strain, in turn, may trigger the development of poor mental HRQoL, potentially through additional mediating pathways. In other words, caregiving characteristics and other sociodemographic, psychosocial, and contextual factors may aggregate through strain in order to adversely affect caregiver health and well-being. Future longitudinal findings will be needed to confirm this model.

The findings also point to the complexity of these processes in different types of caregivers. For example, many caregiving characteristics exhibited wide confidence intervals, highlighting the variability in HRQoL for those with any given caregiving characteristic. Such complex heterogeneity has been observed in several studies [5,55–60,48,61–63]. Although the current study was unable to examine caregiver subgroups, we show that these factors may impact mental HRQoL through their effect on caregiver strain. Examining caregiver strain in relation to health outcomes may therefore help to succinctly capture the effects of caregiving, even if caregiver subgroups cannot be adequately evaluated.

The findings from this study have important implications for practice, policy, and research. Our findings suggest that targeting caregivers with high levels of strain, regardless of their sociodemographic or caregiving characteristics, may be effective in improving outcomes on a population level. From a practice perspective, this study provides support for screening and monitoring caregiver strain and stress in the clinical setting. Identifying high-risk caregivers by their level of strain may be an effective means of referring caregivers to additional health and social services. Relying on caregiver characteristics to identify those in need of additional services may overlook caregivers in demographics considered lower risk who need support. Many state and national policies supporting caregivers, including the National Family Caregiver Support Program, are primarily targeted to those caring for older adults or those with dementia or who are severely disabled [64–66]. While these are undeniably large and high-needs groups, expanding such services to high-strain caregivers

in other subgroups may enhance resource distribution and produce improved outcomes on a population level.

This work also has several implications for future research. First, studies of caregivers should incorporate measures of perceived strain, burden, or stress in order to better understand the effect of caregiving on health outcomes. Studies that focus solely on caregiving characteristics as risk factors may provide inaccurate estimates of the effects of caregiving on health, leading to interventions, policy and practice changes that may not be fully effective. Second, new and innovative interventions are needed to reduce caregiver strain and improve caregiver outcomes. Despite our growing knowledge about the predictors of strain, current interventions to reduce caregiver strain have met with only moderate success [67–69]. Additional research is needed to evaluate heterogeneity in the development of caregiver strain, and to determine new modifiable risk and protective factors amenable to intervention. Additionally, future research should seek to better understand the biological, behavioral, and psychosocial pathways by which caregiver strain influences caregiver mental health, as interventions targeted at these pathways may mitigate the deleterious effects of caregiver strain on health outcomes.

This study has several potential limitations. Due to the observational and cross-sectional nature of this study, we could not evaluate the directionality of the relationships under examination, or the influence of transitions into and out of the caregiving role over time. Further, the strain experienced by caregivers may have influenced their caregiving situation over time, as caregivers experiencing high levels of strain or poor physical or mental HRQoL may have dropped out of caregiving or adjusted the amount of care they provide. Second, this study was unable to examine the effect of some caregiving factors, such as behavior problems or level of impairment, which have been shown to be associated with strain and health outcomes [31,46]. Third, the distribution and size of the sample in this study prohibited us from examining heterogeneity of the effect of caregiving, or interactions between caregiving characteristics. Finally, while this study found few direct associations between caregiving characteristics and caregiver mental or physical HRQoL, the broader literature has reported such associations. Future work with larger sample sizes should therefore confirm our findings. Studies examining the role of psychological problems and cultural differences in these relationships would also benefit the field.

This study also has several strengths. This was the first study to examine the relationship between caregiving characteristics, strain, and HRQoL in a population-based sample and using state-of-the-art face-to-face survey methods. Further, this study examined a variety of caregiving characteristics and utilized a measure of strain that incorporates multiple domains, improving our ability to accurately assess these factors.

Conclusions

In conclusion, this study found evidence for a chains-of-risk model to explain the associations between caregiving characteristics, caregiver strain, and mental HRQoL: caregiving characteristics contributed to caregiver strain, which in turn led to poor mental HRQoL. Focusing policy and practice interventions on high-strain caregivers may help to

improve the population-level burden of poor health outcomes for caregivers and their families.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Characteristics of caregivers (Survey of the Health of Wisconsin, 2008–2010)

	Mean (SD), or %	Range
<i><u>Sociodemographics</u></i>		
Age	51.7 (12.5)	21–74
Gender		
Female	65.3%	--
Male	34.7%	--
Race/Ethnicity		
White (non-Hispanic)	88.6%	--
Other	11.4%	--
Income (in thousands)	71.2 (80.5)	5–392
Educational Attainment (years)	14.1 (2.4)	7–20
Employment Status		
Employed	64.7%	--
Unemployed	35.3%	--
Marital Status		
Married/Partnered	73.5%	--
Divorced/Widowed/Separated	17.7%	--
Never Married	8.8%	--
Type of Insurance		
None	5.8%	--
Public	10.7%	--
Private	64.8%	--
Mixed	18.6%	--
Adults in the Household	2.2 (0.9)	1–9
Children in the Household	0.7 (1.1)	0–5
Prior Health ^a		
0 Prior Conditions	57.4%	--
1 or more Prior Conditions	42.6%	--
<i><u>Health Outcomes</u></i>		
Mental HRQoL	49.5 (9.4)	18.6–67.0
Physical HRQoL	47.5 (10.3)	14.4–66.2

^a stroke, heart attack, diabetes, high blood pressure, and/or high cholesterol HRQoL: Health-related quality of life

N=264 caregivers; survey weights were used to calculate means, standard deviations, and frequencies.

Relationship between caregiving characteristics and caregiver strain in the Survey of the Health of Wisconsin, 2008–2010

Table 2

	Distribution	Bivariate Adjusted ^a			Multivariate Adjusted ^a			
		Mean (SD), or %	Estimate	Lower	Upper	Estimate	Lower	Upper
Linear Terms								
Hours of Care per Week (logged) ^b		17.1 (29.3)	--	--	--	0.58	0.25	0.90
Relationship with Care Recipient								
Spouse	14.7%		REFERENCE			REFERENCE		
Adult-Child (caring for a parent)	43.5%		-1.36	-2.76	0.04	-0.61	-2.56	1.34
Parent (caring for a child)	12.9%		0.20	-1.57	1.96	1.64	-0.29	3.57
Other	28.8%		-1.93	-3.39	-0.46	-0.99	-2.88	0.90
Distance from Care Recipient								
Co-resident	32.9%		REFERENCE			REFERENCE		
0–20 minutes	48.8%		-2.50	-3.50	-1.50	-1.17	-2.70	0.36
More than 20 minutes	18.3%		-0.63	-2.38	1.12	0.59	-1.45	2.63
Care Recipient's Condition								
Dementia	14.6%		0.39	-0.95	1.72	0.59	-0.56	1.74
Recovery from Surgery/Illness	7.9%		-0.64	-2.74	1.45	-0.44	-2.15	1.28
Other	77.4%		REFERENCE			REFERENCE		
Care Recipient Age	61.6 (26.6)		-0.01	-0.04	0.02	0.01	-0.02	0.04
Care Recipient Gender								
Male	38.1%		REFERENCE			REFERENCE		
Female	61.9%		-0.76	-1.74	0.21	-0.56	-1.51	0.40
Number of Care Recipients	1.2 (0.5)		0.57	-0.39	1.54	0.76	-0.05	1.57
Caregiver Status								
Current Caregiver	60.53%		0.05	-0.95	1.06	-0.25	-1.24	0.74
Caregiving in the Past 12 Months	39.47%		REFERENCE			REFERENCE		
Non-linear Term								
Duration of Care (logged years)	4.5 (5.8)		REFERENCE			REFERENCE		
Hours of Care per Week (logged) ^b	17.1 (29.3)		REFERENCE			REFERENCE		

All analyses control for: age, gender, race/ethnicity, employment status, logged income, educational attainment, marital status, insurance type, number of adults and children in the household, and presence of one or more health conditions prior to caregiving, and current caregiver status; survey weights were used

Bivariate adjusted: caregiving characteristics modeled separately; Multivariate adjusted: caregiving characteristics modeled jointly

Hours of care per week was non-linear in the bivariate adjusted analysis, but linear in the multivariate adjusted analysis

Association between caregiving characteristics, caregiver strain, and mental health-related quality of life among caregivers in the Survey of the Health of Wisconsin, 2008–2010

Table 3

	Model 1			Model 2			Model 3		
	Estimate	Lower	Upper	Estimate	Lower	Upper	Estimate	Lower	Upper
(Intercept)	28.92			36.46			34.72		
<i>Caregiver Strain</i>									
Strain				−0.80	−1.21	−0.39	−0.74	−1.22	−0.27
<i>Caregiving Characteristics</i>									
Duration (logged years)	−0.70	−1.75	0.36				−0.42	−1.44	0.60
Hours per week (logged)	−0.09	−1.00	0.81				0.32	−0.56	1.20
Relationship with care recipient (vs Spouse)									
Adult-Child (caring for a parent)	1.82	−3.74	7.37				1.44	−3.64	6.52
Parent (caring for a child)	1.15	−5.73	8.02				2.11	−4.10	8.33
Other	2.29	−3.19	7.78				1.54	−3.59	6.67
Distance from care recipient (vs. Co-resident)									
0–20 minutes	1.46	−3.48	6.40				0.42	−4.53	5.37
More than 20 minutes	−0.74	−6.49	5.00				−0.48	−5.61	4.65
Care Recipient's Condition (vs Other)									
Dementia	1.25	−2.95	5.45				1.75	−2.27	5.77
Recovering from surgery	−0.28	−6.19	5.63				−0.53	−6.10	5.04
Care Recipient's Age	−0.01	−0.09	0.07				0.00	−0.07	0.07
Care Recipient's Gender (vs Male)									
Female	1.07	−1.67	3.81				0.73	−1.91	3.36
Number of Care Recipients	−1.42	−4.13	1.30				−0.85	−3.78	2.09
Caregiver Status (vs Caregiving in the Past 12 Months)									
Current Caregiver	0.94	−1.62	3.49				0.66	−1.63	2.95

CI: Confidence Interval

Controlling for: Age, gender, income, employment status, marital status, type of insurance, race/ethnicity, educational attainment, number of adults and children in the household and presence of prior health conditions. Survey weights were used in all models

Table 4

Association between caregiving characteristics, caregiver strain, and physical health-related quality of life among caregivers in the Survey of the Health of Wisconsin, 2008–2010

	Model 1			Model 2			Model 3		
	Estimate	Lower	Upper	Estimate	Lower	Upper	Estimate	Lower	Upper
(Intercept)	38.17			29.28			42.92		
<i>Caregiver Strain</i>									
Strain				-0.42	-0.96	0.13	-0.47	-1.00	0.06
<i>Caregiving Characteristics</i>									
Hours per week (logged)	-0.13	-1.21	0.96				0.15	-0.96	1.26
Relationship with care recipient (vs Spouse)									
Adult-Child (caring for a parent)	3.45	-1.31	8.21				2.73	-2.00	7.45
Parent (caring for a child)	-3.80	-9.82	2.22				-3.98	-9.83	1.87
Other	0.21	-5.00	5.42				-1.00	-6.53	4.53
Distance from care recipient (vs Co-resident)									
0–20 minutes	0.61	-3.90	5.12				0.74	-4.23	5.71
More than 20 minutes	0.30	-4.89	5.49				1.39	-3.89	6.66
Care Recipient's Condition (vs Other)									
Dementia	0.16	-3.98	4.31				-0.05	-3.96	3.85
Recovering from surgery	-5.22	-10.85	0.40				-5.19	-10.71	0.33
Care Recipient's Age	-0.07	-0.15	0.00				-0.08	-0.16	0.00
Care Recipient's Gender (vs Male)									
Female	-2.91	-6.39	0.56				-2.91	-6.33	0.51
Number of Care Recipients	-1.56	-4.35	1.23				-1.86	-4.27	0.54
Caregiver Status (vs Caregiving in the Past 12 Months)									
Current Caregiver	-0.55	-3.59	2.50				-0.31	-3.31	2.68

CI: Confidence interval

Controlling for: Age, gender, income, employment status, marital status, type of insurance, race/ethnicity, educational attainment, number of adults and children in the household, presence of prior health conditions, and duration of caregiving (non-linear term). Survey weights were used in all models