Predictors of Dementia Caregiver Depressive Symptoms in a Population: The Cache County Dementia Progression Study

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Objectives. Previous research has consistently reported elevated rates of depressive symptoms in dementia caregivers, but mostly with convenience samples. This study examined rates and correlates of depression at the baseline visit of a population sample of dementia caregivers (N = 256).

Method. Using a modified version of Williams (Williams, I. C. [2005]. Emotional health of black and white dementia caregivers: A contextual examination. The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 60, P287–P295) ecological contextual model, we examined 5 contexts that have contributed to dementia caregiver depression. A series of linear regressions were performed to determine correlates of depression.

Results. Rates of depressive symptoms were lower than those reported in most convenience studies. We found fewer depressive symptoms in caregivers with higher levels of education and larger social support networks, fewer health problems, greater likelihood of using problem-focused coping, and less likelihood of wishful thinking and with fewer behavioral disturbances in the persons with dementia.

Discussion. These results suggest that depression may be less prevalent in populations of dementia caregivers than in clinic-based samples, but that the correlates of depression are similar for both population and convenience samples. Interventions targeting individuals with small support networks, emotion-focused coping styles, poorer health, low quality of life, and those caring for persons with higher numbers of behavioral problems need development and testing.

Key Words: Caregiving—Dementia—Depression—Population study.

MAINTAINING or improving caregiver well-being is a crucial public health issue. Caregivers with high levels of depressive symptoms are likely to institutionalize their relatives more rapidly (Coelho, Hooker, & Bowman, 2007), and caregivers with recurrent depression experience more rapid health declines than nondepressed caregivers (O’Rourke, Cappeliez, & Neufeld, 2007).

Dementia caregiver samples display elevated depressive symptoms compared with the general population (Schoenmakers, Buntinx, & Delepeleire, 2010; Schulz, O’Brien, Bookwala, & Fleissner, 1995) and specifically compared with matched non-caregiver samples (Roth, Haley, Owen, Clay, & Goode, 2001; Schulz & Beach, 1999; Schulz et al., 1997). A British community study found that 10.5% of caregivers met criteria for depression (Mahoney, Hons, Katona, & Livingston, 2005). Despite these findings, population studies assessing depressive symptoms in dementia caregivers are relatively rare (see review by Cuijpers, 2005). Understanding depressive symptoms and their correlates in population-based studies is important, as identified in the meta-analysis by Pinquart and Sörenson (2003), which found that caregivers reported lower psychological and physical health than non-caregivers, but that this relationship was stronger in nonrepresentative samples of caregivers and non-caregivers than it was in representative samples of these groups.

Caregiver characteristics that are associated with dementia caregiver depression include lower education (Covinsky et al., 2003), lower income (Schulz et al., 1995), being a spouse caregiver (Pinquart & Sörenson, 2011), being woman (Alspaugh, Stephens, Towsend, Zarin, & Greene, 1999), and being Caucasian (compared with being African American; Haley et al., 1995). Psychosocial predictors of depressive symptoms include poorer self-rated health (Cuacciare, Gray, Azar, Jimenez, & Gallagher-Thompson, 2010), smaller social networks (Williams, 2005), and use of dysfunctional (emotion-focused) coping (Li, Cooper, Bradley, Shulman, & Livingston, 2012). Caregiver stress...
(including role overload, captivity, or burden) both mediates (Clyburn, Stones, Hadjistavropoulos, & Tuokko, 2000) and contributes directly to depressive symptoms (Wright et al., 2010).

Care recipient characteristics associated with caregiver depression include increased behavioral problems (Covinsky et al., 2003), higher dependence in activities of daily living (ADL; Pinquart & Sörenson, 2003), and poorer cognitive functioning (Schoenmakers et al., 2010). This study examined predictors of depression among dementia caregivers in a population-based sample using a modified ecological contextual model (Williams, 2005). This model includes five distinct contexts that influence caregiver mental health.

The sociocultural context includes caregiver gender, marital status, education, and employment status. The situational context comprises the cognitive, functional, and behavioral statuses of the care recipient. The temporal context examines timing of the caregiver role by examining caregiver age and kin relationships to care recipients to determine whether or not caregiving is an “on” or “off” time experience (Williams, 2005). The interpersonal context examines formal and informal support received by the care dyad. Finally, the personal context includes psychosocial characteristics of caregivers or their personal situations that affect mental health. Figure 1 shows the modified conceptual model.

Using this model, we hypothesize that higher depressive symptoms are associated with being a female spousal caregiver, lower education, poorer health and social support, higher use of emotion-focused coping, and greater exposure to behavioral problems in the care recipient.

**METHODS**

**Sample Recruitment**

The Cache County Dementia Progression Study (DPS; Tschanz et al., 2011) is a longitudinal cohort study of persons with dementia identified from the Cache County Study on Memory in Aging (Breitner et al., 1999). Since 2002, DPS followed 328 persons with dementia and their caregivers (Norton et al., 2009), collecting semiannual measures of cognition, function, health, and behavior in persons with dementia (care recipients), and assessments of health and psychosocial characteristics of caregivers. Caregivers were defined as persons who provided the most assistance to the person with dementia. Both members of the care dyad had to agree to participate in the study (87% participation rate).

**Sample**

The final sample was 256 caregivers who completed the Beck Depression Inventory II (BDI-II; Beck, Steer, & Brown, 1996) at baseline. The 63 caregivers without BDI data (excluded from analyses) had, on average, older care recipients ($t = 3.16, df = 333, p = .002$) but otherwise did not differ sociodemographically from caregivers completing the BDI-II. Nine additional caregivers who were missing covariates were excluded from analyses.

The caregiver sample was 76% female, 45% spouses, with an average age of 67.5 years ($SD = 14.34$). Caregivers averaged 14.2 years of education ($SD = 2.4$). Mean length of time providing dementia care was 3.9 years at baseline ($SD = 4.5$), and two thirds of caregivers either co-resided...
or had daily contact with the care recipient. Co-residence included 23% of adult children/children-in-law and 94% of spouse caregivers.

Persons with dementia were 58% female, 50% parent/parent-in-law, had an average age of 85.4 years (SD = 5.5), and a mean education level of 13.3 years (SD = 2.9). Seventy-five percent of care recipients had incident dementia (n = 191) and 24% (n = 65) had prevalent dementia. Mean dementia duration at baseline was 3.7 years (SD = 1.9). Dementia diagnoses included 60% Alzheimer’s disease (AD) only, 14% vascular dementia without AD, and 16% other dementia.

**DPS Procedures**

At 6-month intervals, caregivers provided information regarding care recipients’ current medical conditions, medications, nutrition, neuropsychiatric symptoms, and leisure activity, as well as their own physical and mental health, coping styles, and activities. Care recipients were assessed via neuropsychological test battery.

**Measures**

Caregiver depressive symptoms were measured with the 21-item Beck Depression Inventory II (Beck et al., 1996). Scores ranged from 0 to 63 (higher scores indicating greater depressive symptoms). Cutoff scores were 14 for mild depression, 20 for moderate, and 29 for severe depression. Reliability for this sample was α = .90.

**Sociocultural context.**—Caregiver’s years of education, gender, employment status (employed, unemployed/retired/housewife), and marital status were measured.

**Situational context.**—The Mini Mental Status Exam (MMSE; Folstein, Folstein, & McHugh, 1975) assessed global cognitive functioning in the care recipient. Caregivers also rated assistance needed in basic and instrumental ADL (Lawton & Brody, 1969). Behavioral problems were measured with the Neuropsychiatric Interview (NPI; Cummings et al., 1994). Caregivers reported the presence of 12 behavioral disturbances exhibited by care recipients. The NPI has content and concurrent validity, and excellent between-rater and test–retest reliability (Cummings et al., 1994). Finally, the clinical dementia rating (CDR) scale (Hughes, Berg, Danziger, Cohen, & Martin, 1982) sum of boxes assessed dementia severity. The CDR has wide acceptance as a valid and reliable global assessment of function (Morris, 1993).

**Personal context.**—Religiosity, financial resources, and quality of life were measured with single items. Caregivers self-reported their number of health problems diagnosed in the past 6 months and completed the SF-12 items for physical functioning (Ware, Kosinski, & Keller, 1996). The Revised Ways of Coping checklist, with excellent psychometric properties (Vitaliano, Russo, Young, Teri, & Mauaro, 1991) measured coping. In our sample, the religiosity (α = .6) and count blessings (α = .66) subscales were dropped from analyses because of low reliability. Stress appraisal was garnered from the NPI (Cummings et al., 1994) where, for each behavioral symptom endorsed, caregivers were asked “To what extent does this behavior bother you?” (0 = not at all through 5 = very severely). A maximum distress score across NPI domains was used for analysis.

**Temporal context.**—We measured caregiver age and kin relationship to the care recipient (spouse, adult child/child-in-law, and other [grandchild, friend—the reference group]).

**Interpersonal context.**—Caregivers reported whether or not they had used any of 14 formal support services during the past 6 months. The six-item SSQ-SR (Sarason, Sarason, Shearin, & Pierce, 1987) assessed caregivers’ size and satisfaction of their social support network (α = .93 in this sample). We used the six-item scale developed by Whitlatch, Schur, Noelker, Ejaz, and Looman (2001) to assess caregiver-reported closeness with the care recipient both before dementia onset and at present (α reliability in this sample = .9).!

**Data Analysis**

Because BDI-II scores were highly skewed, we used the log-transformed variable in regression analyses. The untransformed variable is used in descriptive statistics.

Based on Williams’ (2005) model, five blocks of variables (sociocultural, personal, temporal, situational, and interpersonal) were examined separately, then together. Variables within a block were examined for collinearity using r > .6 as criterion. There were no collinear variables in the sociocultural context, but in the personal context, avoidance-coping and wishful thinking-coping were correlated at r = .6, p < .001. Wishful thinking was retained for regression models because of its higher association with BDI. In the temporal context, caregiver age was associated with relationship, r = .86, p < .001 and relationship was retained. In the situational context, both ADL and MMSE were correlated with CDR Sum of Boxes score (r = .68, p < .001 and r = −.8, p < .001, respectively); so, we retained CDR Sum of Boxes. In the interpersonal context, the prior and present relationship closeness scores were correlated r = .69, p < .001; so, present relationship was retained for regression models.
FINDINGS

Baseline and Longitudinal Depression

The average untransformed baseline BDI-II score was 8.26 (SD = 9.11, n = 256). Depression rates in these caregivers were low: 83.6% (214) were not depressed, 6.3% (16) were mildly depressed, and 10.2% (26) were moderately or severely depressed.

Baseline Predictors of Depression: Williams’ Model

For the sociocultural context, only caregiver education was significant (β = −0.18, p < .02) and retained in the final model. Retained for the final model from personal context included the following: number of health problems (β = 0.22, p < 0.05), quality of life (β = −0.32, p < 0.001), problem focused (β = −0.35, p < 0.001), and wishful thinking coping strategies (β = 0.37, p < 0.001). In the temporal context, the spouse category had statistically significant higher depression than the other category (β = 0.35, p < 0.05). Adult child versus other was not statistically significant (β = 0.29, p < 0.06) but was carried forward to the final model, as it was part of the relationship variable.

For the situational context, only the NPI was statistically significant (β = 0.20, p < 0.01) and for the interpersonal context, only support network was statistically significant (β = −0.18, p < 0.05). All of these variables were rerun in the final combined model, and all remained statistically significant predictors of depressive symptoms except caregiver relationship. The final model (Table 1), explained 38% of the variance in depression scores.

DISCUSSION

To our knowledge this study is the first U.S. population-based study of depression in dementia caregivers with such an extensive battery of predictors, and a very high participation rate of 87% (cf. 67%–78% in most studies; Thompson, Heller, & Rody, 1994). Results support past research (Pinquart & Sörenson, 2003), which together suggest that dementia caregivers from population-based studies may have lower depressive symptoms than those in clinic-based studies.

We identified seven correlates of caregiver depressive symptoms at baseline, all with associations in the expected directions. Specifically, caregivers with lower education, social support and quality of life, poorer health, and who are more likely to use wishful thinking and less likely to use problem-focused coping experience increased depressive symptoms. Caregivers assisting those with higher numbers of behavioral problems also reported more depressive symptoms. These findings support those of Covinsky and colleagues (2003) with respect to caregiver education, Williams (2005) with respect to social network size, and Alspaugh and colleagues (1999), Covinsky and colleagues (2003), and Pinquart & Sörenson (2003) with respect to behavioral problems. Targeting individuals with these risk factors might improve efficacy of caregiver interventions. Interventions that include specific assessments of and strategies to address caregiver burden and depression, such as the TCARE program (Montgomery, Kosloski, Kwak, & Valuch, 2011) have been effective in work with dementia caregivers.

Relatively few dementia caregiver studies investigate coping strategies beyond the dichotomy of problem versus emotion focused coping (Folkman & Lazarus, 1986). Our study included problem-focused and multiple, specific emotion-focused coping strategies. We suggest that this approach offers a more detailed understanding of specific coping strategies in caregiver well-being, specifically wishful thinking and avoidance strategies.

This study has several limitations. Analyses were cross-sectional; so, causation cannot be inferred. We utilize depressive symptoms and these do not constitute a clinical diagnosis of depression. Our study lacked non-caregivers and non-dementia caregivers as comparison groups. Generalizability may be limited, given that our sample was mostly Caucasian and members of The Church of Jesus Christ of Latter-day Saints (LDS). Although our battery of predictors was theory driven and expansive, it was not exhaustive, and we may have omitted key predictors of depressive symptoms (e.g., burden). Although we have evidence that care-related variables predict depressive symptoms, we cannot disentangle whether depressive symptoms were role specific or global.

Conclusions

Results suggest that dementia caregivers from population-based studies may have lower depressive symptoms than those in clinic-based studies; however, correlates of depressive symptoms in population-based samples largely mirror the existing literature. Social support and coping strategies are prominent predictors, and are modifiable, suggesting opportunities for targeted interventions.

| Table 1. Final Regression Model for Predictors of Caregiver Depressive Symptoms |
|---------------------------------|---------|----------|--------|
| Variable                        | B       | b       | SE     | p value |
|---------------------------------|---------|----------|--------|
| Intercept                       | 3.386   | .667     | .080   |
| Caregiver education             | −.062   | −.144    | .030   | .036    |
| Number of health problems       | .106    | .154     | .048   | .029    |
| Number of behavioral disturbances| .013    | .151     | .006   | .021    |
| Wishful thinking coping          | 4.117   | .290     | .988   | .000    |
| Problem focused coping          | −2.376  | −.209    | .772   | .002    |
| Social support network size     | −.017   | −.223    | .005   | .001    |
| Quality of life                 | −.227   | −.153    | .107   | .036    |
| Spouse caregiver                | .213    | .097     | .320   | .508    |
| Adult child/child in law caregiver | .133  | .063     | .304   | .663    |

Note. $R^2 = .38$.  
*Reference group was “Other.”
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