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Dementia caregivers' coping strategies and their relationship to health and well-being: The Cache County Study

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Abstract

Objectives—Prior research identifies that psychological outcomes among dementia caregivers are associated with their use of coping strategies. Few studies have tested the association of coping and health longitudinally.

Method—This study examined factors associated with the use of coping strategies over time and their associations with physical and mental health outcomes in a population-based sample of 226 dementia caregivers in Cache County, Utah. Caregivers annually completed the Ways of Coping Checklist-Revised, the Beck Anxiety Inventory, and a health interview. Care-recipient cognitive and functional abilities were obtained using the Mini-Mental State Exam and the Clinical Dementia Rating. Neuropsychiatric symptoms were assessed using the Neuropsychiatric Inventory.

Results—Caregivers most frequently identified providing care as a problem (37.6%). Linear mixed models of caregiver coping strategies found that the use of most strategies were stable

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except for increasing Avoidance among adult child caregivers ($\beta = 0.14, p = 0.048$). On average, increased Wishful Thinking ($\beta = 2.48, p < 0.001$) or Blames Self ($\beta = 1.06, p = 0.002$) was associated with higher anxiety scores. Increased use of Blames Others among males (interaction, $\beta = 0.28, p = 0.02$) and greater use of Wishful Thinking among younger caregivers (interaction, $\beta = -0.01, p = 0.01$) was associated with more health conditions in the caregiver. Coping strategies were not associated with caregivers' change in anxiety or number of health conditions over time.

Conclusion—Our results emphasize the importance of caregiver coping strategies on caregiver health and well-being and may identify subgroups of persons at risk for worse outcomes.

Keywords

dementia; caregiver coping; problem focused coping; dementia caregiving; caregiver medical conditions; caregiver psychological outcomes

Introduction

Although the prevalence of dementia is increasing, the majority of care continues to be provided by informal caregivers such as spouses and adult children (Cantor, 1983). Caregivers often report higher rates of depression, anxiety, and emotional burden relative to non-caregiving controls (e.g. Schulz, Boerner, Shear, Zhang, & Gitlin, 2006). Similarly, the stress of caregiving is linked to physical health outcomes; caregivers report poorer global health relative to non-caregivers (Haley, Levine, Brown, Berry, & Hughes, 1987), and caregivers report nearly twice as many chronic conditions as non-caregivers (45% versus 24%, Ho, Collins, Davis, & Doty, 2005). Moreover, one study found that spouse dementia caregivers have a 63% higher mortality rate than non-caregivers (Schulz & Beach, 1999).

Stress plays an important mechanistic role in the caregiver and health relationship (for a meta-analysis, see Vitaliano, Zhang, & Scanlan, 2003). For example, in one study of dementia caregivers, higher caregiver stress was a mediator between caregiving and cardiovascular disease (Patterson & Grant, 2003). How caregivers cope with stress may affect their mental and physical health over time. Thus, while the associations between caregiver stress and poorer mental and physical health have been identified in research, the purpose of this study was to evaluate associations between coping strategies and caregiver mental and physical health, cross-sectionally and over time. We also sought to understand how demographic characteristics and exposure to behavioral symptoms are associated with caregivers' coping strategies. Understanding the role that coping strategies play in caregiver health may provide additional insight into the promotion of positive health and well-being for persons with this responsibility.

The strategies individuals use to cope with stress may affect their overall well-being including their physical health. Coping with stress is embedded in several stress-process-based models (generalizable to all populations and specific to caregiving). In non-caregiving samples, the revised stress and coping model (Folkman, 1997) suggests that appraisals of the stressor, coping resources, coping styles and the positive emotions felt when coping provide relief from distress and management of stress. Pearlin, Mullan, Semple, and Skaff (1990) proposed that caregivers experience primary stressors that directly influence the caregiver

(e.g., characteristics of the care recipient, including behavioral disturbances or neuropsychiatric symptoms, dependence of daily living activities, cognitive impairment), while secondary stressors are experienced indirectly by the caregiver's role (e.g., economic strain, occupation or social conflicts). In this model, coping strategies and seeking social support act as potential mediators between the caregiver stressors and caregiver health outcomes.

Coping strategies have been traditionally conceptualized into two major categories: problem-focused coping and emotion-focused coping categories (Kramer, 1993; Vitaliano, Russo, Carr, Maiuro, & Becker, 1985). Problem-focused coping styles were defined as those methods in which individuals take action to change the relationship between themselves and their environment (Lazarus & Folkman, 1984) and to change the individuals' relationship to the stressor (Carver, Scheier, & Weintraub, 1989). Emotion-focused coping styles involve reducing the level of emotional distress experienced after the stressor, and may be effective when individuals think they cannot avoid the source of stress (Carver et al., 1989). Emotion-focused strategies are notably diverse and heterogeneous in nature; traditional examples include wishful thinking, avoidance, counting blessings, and blaming one's self, and more recently, spirituality (e.g. Revheim, & Greenberg, 2007), and forgiveness (Worthington & Scherer, 2004). In a revision to the problem and emotion-focused model, Folkman (1997) added a third style - meaningful focused coping - which emphasizes the role of positive emotions in resolving stress and sustaining coping resources over the duration of the stressor. Social coping (seeking emotional support and seeking practical support from others) may be considered either as a subset of other major coping styles (like emotion-focused), or a distinct fourth main type of coping (see Folkman & Moskowitz, 2004). Conclusions on either the broader two-category approach (problem and emotion-focused), or the expanded four-category approach (adding meaningful and social-focused), support that coping styles are not easily classified as fundamentally *good* or *bad*, but may have positive or negative repercussions depending on the situation or stressor with which the individual is coping (Folkman & Moskowitz, 2004).

The discussion of coping styles is not limited to these two- or four broader categories and their sub-styles. Other researchers have conceptualized coping according to features such as 'active/passive' or 'approach/avoidance,' 'primary/secondary control processes' or 'assimilation/accommodation' as higher order categories that subsume individual coping strategies (Skinner, Edge, Altman, & Sherwood, 2003). There is significant overlap between the nomenclature used in these various approaches to identifying coping styles (Folkman & Moskowitz, 2004). More modern conceptualizations of coping have led to a hierarchical structure that encompass several families of coping strategies to address various dimensions of threat to an individual (Skinner et al., 2003).

Coping Strategies and Caregiver Outcomes: Mental and Physical Health

Given the significant stress inherent in dementia caregiving (Pearlin, 1990), individual coping strategies have been identified as moderators of caregiver mental health and emotional outcomes. Kramer (1993) and Kneebone and Martin (2003) found that problem-focused, direction-action related coping was generally associated with caregiver well-being

and positive outcomes, including more satisfaction in the caregiving role. Di Mattei et al. (2008) also found that caregivers' whose style of coping was most strongly defined by focusing on the problem experienced lower psychological distress relative to those who did not use a problem-focused strategy. Kramer (1993) found that emotion-focused coping (defined by Lazarus and Folkman (1984) as minimizing emotional distress caused by one's interaction with the environment), as well as negative relationship-focused coping (defined as damaging and disruptive behavior in social relationships), were both associated with depression and negative psychological outcomes for the coping individual. Similar findings were reported in studies looking at other coping strategies aimed at reducing emotional distress, including those labeled as 'avoidant' and 'dysfunctional' (Zucchella, Bartolo, Paasotti, Chiapella, & Sinforiani, 2011; Di Mattei et al., 2008), and 'wishful thinking,' especially with regard to caregiver reported burden (Papastavrou et al., 2011). However, Cooper et al. (2008) found other emotion-focused strategies of acceptance, emotional support, humor, positive reframing, and religion, mediated the association between caregiver burden and *reduced* anxiety over a period of one year. This finding was contrary to the study's original hypothesis, although the authors raised the possibility that the identified coping strategies may be helpful when there are disruptive factors that are out of the control of the caregiver. Additionally, Mausbach et al. (2006) found that caregivers' use of escape-avoidant coping strategies partially mediated the association between care recipients' problematic behavioral symptoms, including medication non-adherence, incontinence, repetitive behaviors, and neuropsychiatric symptoms, and the caregivers' depressive symptoms. Conversely, Gallagher et al. (2011) found that the emotion-focused coping strategies of getting emotional support from others, acceptance, humor, positive reframing, and religious coping, were independent predictors of reduced caregiver depression, while problem-focused coping strategies (defined by this study as active coping, getting instrumental support, and planning) were not associated with caregiver depression. Thus, the research findings are mixed with respect to coping strategies and caregiver outcomes, and specific types of emotion-focused coping may lead to negative outcomes while others may lead to positive outcomes. Other factors that may affect the relationship between coping and caregiver outcomes are whether coping strategies are employed consistently across varying situations (similar to 'traits') or less consistently, depending upon the stressor and situation (similar to 'states;' Powers, Gallagher-Thompson, & Kraemer, 2002). Additionally, there are potential age differences in the use of certain coping strategies. For example, Folkman, Lazarus, Pimley, and Novacek (1987) found that younger individuals were more likely to use 'active, interpersonal, problem-focused coping' strategies, such as seeking social support and planful problem solving, while older individuals were more likely to use 'intrapersonal, emotion-focused' coping strategies, such as distancing and positive reappraisal, and that older individuals perceived their situations as 'less changeable' than younger individuals.

The Current Study—Our prior work on coping styles in caregivers has found that most dementia caregivers were relatively stable in their use of eight coping strategies over time even when considering different stressors (Tschanz, et al., 2013). We also found that, cross-sectionally, rates of depressive symptoms were lower in caregivers who used less wishful thinking but more problem-focused coping strategies. (Piercy et al., 2012). The purpose of this study was to examine the association of caregivers' coping strategies with changes over

time in their mental and physical health. We expand upon prior literature on caregiver coping and mental health outcomes by examining anxiety in caregivers, which has been reported as a more common outcome than depression among dementia family caregivers (Mahoney, Regan, Katona, and Livingston, 2005), and which has been studied less extensively as a longitudinal outcome. In addition, while coping styles have been found to be associated with physical health outcomes (e.g. effects of active versus avoidant coping on subjective health, blood pressure, and heart rate in Kim, Knight, & Longmire, 2007), we are among the first to examine this relationship both cross-sectionally and *longitudinally* in a caregiver population. We also add to the literature in our examination of whether use of specific coping strategies varied by caregiver factors such as co-residence, kin-relationship, age, and education as well as care recipient characteristics such as the severity of dementia or presence of neuropsychiatric symptoms. Thus, using a population-based, longitudinal design, this study followed individuals with dementia and their caregivers for up to five years and examined caregiver and care recipient factors associated with use of caregiver coping strategies over time, and associations between caregiver coping styles and caregiver health and anxiety.

Method

The Cache County Dementia Progression Study (DPS) is an ongoing, population-based study designed to examine factors associated with outcomes for individuals with dementia and their caregivers. The study uses a longitudinal design to follow-up with caregivers and care recipients after the care recipient is identified as having dementia through the Cache County Study on Memory in Aging (CCSMA; Tschanz et al., 2005). A brief description of the procedures to identify persons with dementia in the parent study, CCSMA, follows. Approximately 90% (5,092) of the 5,657 residents of Cache County, Utah, who met the age requirement (>64 years old) and were 'permanent' residents of the county, participated in the first wave of the CCSMA. During each of four respective waves, individuals were assessed for dementia status using a multi-staged screening and assessment protocol (Breitner et al., 1999). Briefly, participants were screened with an adapted version of the 100-point 3MS, and those who scored below 60 were selected to have a proxy interview to acquire more information, using the Informant Report of Cognitive Decline in the Elderly (IQCODE; Jorm & Jacomb, 1989). Individuals who screened positive using the 3MS or IQCODE, who were aged 90 or greater, or who were selected as members of a weighted, stratified subsample based on age, gender, and Apolipoprotein E genotype were asked to complete a semi-structured interview utilizing the Dementia Questionnaire. The Dementia Questionnaire was scored by consensus of at least two clinicians, and individuals who were rated with questionable or probable dementia were further examined with a clinical assessment. The clinical assessment consisted of neuropsychological testing, physical examination, and clinical and health interview with a knowledgeable informant. The results were reviewed by a geropsychiatrist and neuropsychologist, at which time preliminary diagnoses of dementia or other cognitive disorders were assigned. Those individuals diagnosed with dementia or its prodrome were also asked to complete neuroimaging (MRI) and laboratory tests, and a physician examined those individuals with suspected dementia. Final dementia diagnoses and type of dementia were diagnosed using the DSM-III-R (APA, 1987) criteria by consensus of a panel of experts in neurology, geropsychiatry,

neuropsychology, and cognitive neuroscience. Alzheimer's Disease was diagnosed using NINCDS-ADRDA criteria (McKhann et al., 1984). The age of dementia onset was estimated by the panel as the year when all DSM-III-R criteria for dementia were met (Breitner et al., 1999).

Persons identified with dementia from the CCSMA and their caregivers were invited to participate in a follow-up longitudinal study (the Dementia Progression Study, DPS) which is the dataset for these analyses (Tschanz et al., 2011). Assessment visits for DPS were scheduled semiannually with a home visit from a trained research nurse and neuropsychological technician. Due to time limitations, some measures were given on alternating visits. As such, the caregivers' coping strategies and psychological factors were assessed once annually, while health conditions were assessed at each visit. Data for the present analyses used only annual visits.

The individual with dementia (care recipient) and their caregiver were examined at each visit. Care recipient information included physical and mental health status, neuropsychological performance, and cognitive and functional abilities. Caregiver information included demographics, physical and mental health status, kin relationship to the care recipient, frequency of contact with care recipient, coping strategies, and utilization of services. All procedures were approved by the Institutional Review Boards of Utah State and the Johns Hopkins Universities. The measures used in this study are described below.

Caregiver Coping Strategies

Caregiver coping strategies were assessed using the Ways of Coping Checklist – Revised (Vitaliano et al., 1985). This measure asks caregivers to rate on a four-point scale from 0 (*Never*) to 3 (*Regularly*) the extent to which they used various coping strategies for each of 57 situations. Prior to completing the questionnaire for this study, caregivers were asked to describe a problem/stressor with which they were currently dealing but were not prompted to think of their caregiving role. For example, the questionnaire asks caregivers how often they 'avoided my problem' or 'made of plan of action and followed it.' The measure is scored to yield eight coping strategy categories: Problem-Focused, Seeks Social Support, Avoidance, Wishful Thinking, Blames Self, Blames Others, Counts Blessings, and Religious coping. Each of these scales was calculated by finding the mean of all items within the scale. As reported previously (Tschanz et al., 2013), if individuals were missing less than 10% of the items within a scale, missing values were addressed by utilizing the mean value of the remaining items. If individuals were missing more than 10% of items within a scale, they were excluded from analysis.

Caregiver Outcome Variables

Caregiver anxiety—Caregivers reported their global anxiety symptoms using the Beck Anxiety Inventory (BAI; Beck & Steer, 1990). The BAI is a 21-item self-report measure of common symptoms of anxiety in adults. The caregiver rated each item based on feelings over the past week. Each of the 21 items uses a 4-point response scale based on how severely the individual has been bothered by each symptom, with higher numbers indicating more severe anxiety symptoms. The scale has a maximum total score of 63 points.

Caregiver comorbidity—Each caregiver's health status was assessed through a medical/health questionnaire accompanied by a review of medications. This questionnaire was administered to the caregiver by a research nurse who probed for information regarding current and past symptoms of illness, as well as diagnoses of specific conditions. The health conditions assessed by this questionnaire included the experience of pain, gastrointestinal conditions, respiratory problems, stroke or Transient Ischemic Attack (TIA), neurological conditions, cardiovascular problems, thyroid disorders, diabetes, major surgeries, colds and flus, or other medical conditions. For the purpose of these analyses, the total number of medical conditions endorsed by the caregiver was calculated.

Covariates

Other caregiver factors—The relation of the caregiver to care recipient was recorded at the first visit. Additionally, the caregivers were asked to report their frequency of contact and interaction with the care recipient, which included living arrangements as well as in-person and phone contact.

Care recipient factors—The baseline cognitive and functional status of the person with dementia was utilized in this study to examine whether these factors were associated with caregiver coping strategies. Cognitive status was assessed using the score on the Mini-Mental State Exam (MMSE (Folstein, Folstein, & McHugh, 1975). Dementia severity was rated using the Clinical Dementia Rating scale sum of boxes (CDR; Morris et al., 1997), which is a sum of ratings on six domains including memory, orientation, judgment and problem solving, community affairs, home and hobbies, and personal care. The presence of neuropsychiatric symptoms was assessed using the total Neuropsychiatric Inventory (NPI; Cummings et al., 1994). The NPI assess presence and severity of 12 neuropsychiatric symptoms that may occur in dementia, including delusions, hallucinations, depression, anxiety, irritability, agitation/aggression, aberrant motor behavior, disinhibition, euphoria, apathy and sleep and appetite disturbance. Additionally, the duration of time over which the person met criteria for a diagnosis of dementia was estimated time (in years) from the age of dementia onset to the age at baseline.

Analyses

A series of linear mixed models with random intercepts and slopes were used to examine whether the use of each caregiver coping strategy changed over time, and both caregiver and care recipient factors that were associated with the use of each strategy. A separate series of linear mixed models examined how caregiver coping strategies were associated with caregiver outcomes of anxiety and number of health conditions. Covariates tested in these analyses included caregiver age, gender and education and care recipient dementia duration. Each predictor or covariate (and interactions) was examined for statistical significance examining the individual Wald type test and retained if there was significant improvement in model fit ($p < 0.05$) between a model with the predictor and a model without the predictor, as determined by -2 log-likelihood chi-square test. Statistical analyses were completed using SPSS Version 20 statistical software

Results

There were 226 total caregivers, of whom 135 had at least one follow-up visit. Those with follow-ups had mean (SD) follow-up times of 2.62 (1.32) years, and a maximum follow-up of 6.29 years (see Table 1 for caregiver sample characteristics). Because each of the outcomes were analyzed in separate statistical models in order to maximize use of available data, there were different numbers of caregivers included in each of the analyses because of differences in missing values. Table 2 shows the numbers of missing caregiver reports at baseline and differences in caregiver characteristics and frequency of contact with the care recipient for those excluded from analyses. There were no significant differences between the included/excluded caregivers for number of medical conditions. However, caregivers missing scores on coping strategies were significantly older ($M = 74.14$; $SD = 11.59$) than those who were included in the analyses ($M = 65.20$; $SD = 14.27$; $t = 4.65$, $p < 0.001$). Linear mixed models of caregiver coping strategies found that the use of most strategies were stable except for increasing Avoidance among adult child caregivers ($\beta = 0.14$, $p = 0.048$). Caregivers' frequency of contact with the care recipient differed for the use of problem-focused coping, such that increased caregiver and care recipient contact was associated with greater use of problem-focused coping ($\chi^2 = 7.05$, $p = 0.029$).

The majority of care recipients were female (55.3%) and Caucasian (99.1%). Care recipients completed an average of 13.47 ($SD = 2.84$) years of education. The average age of dementia onset for care recipients was 82.03 ($SD = 5.72$) years, and the average time since dementia onset at the baseline visit was 3.50 ($SD = 1.86$) years. At baseline, care recipients' average MMSE score was 20.30 ($SD = 7.06$), their average global CDR score was 1.25 ($SD = 0.82$), indicative of mild dementia. Their total average NPI score was 12.25 ($SD = 11.23$).

Predictors of caregiver coping strategies

Providing care was the most frequently reported type of problem identified by caregivers when they were asked to report a life problem with which they were currently coping (37.6%). Due to multicollinearity between caregiver kin-relationship, caregiver age, and frequency of contact (co-residence), each of these caregiver factors and longitudinal use of coping strategies was examined separately. Table 3 provides a summary of the caregiver and care recipient factors that were associated with caregiver coping strategies. Most baseline factors were associated with overall use of caregiver coping strategies. Only adult child caregivers (compared to other family/friend) increased use of Avoidance coping over time ($\beta = 0.14$, $p = 0.048$). Few care recipient factors were associated with caregivers' use of coping strategies (see Table 3).

Association between Caregiver Coping Strategies and Anxiety

Greater use of Wishful Thinking and Blames Self was associated with greater caregiver anxiety ($\beta = 2.477$, $p < 0.001$; $\beta = 1.063$, $p < 0.002$, respectively). This association held with the inclusion of dementia duration as a covariate. See Table 4 for the results of the linear mixed effects model for caregiver anxiety.

Caregiver coping strategies and number of health conditions

A significant interaction between caregiver gender and use of Blames Others ($\beta = 0.276$, $p = 0.02$) and a significant interaction between caregiver age and Wishful Thinking coping ($\beta = -0.011$, $p = 0.01$; see Table 4) were found in predicting the number of caregiver-reported medical conditions. Specifically, male caregivers who reported greater use of Blames Others reported a higher number of health conditions, whereas this pattern was reversed among female caregivers. Additionally, younger caregivers who reported greater use of Wishful Thinking reported a fewer number of health conditions (see Figure 1). This pattern also was reversed at older ages.

Discussion

In this population-based sample of persons with dementia, we found that caregivers' use of eight coping strategies were generally stable over time, consistent with our previous findings (Tschanz et al., 2013). The caregivers' use of coping strategies was related to caregiver characteristics of age and gender, care-related stressors of care recipient neuropsychiatric symptoms, as well as caregiver outcomes of health and anxiety. Specifically, Wishful Thinking and Blames Self coping strategies were associated with overall higher levels of anxiety in caregivers, which was also higher with longer duration of dementia in the care recipient. The former finding coincides and strengthens our previous cross-sectional study that linked Wishful Thinking with higher symptoms of depression among caregivers (Piercy et al., 2012). It may be prudent to identify, and target for intervention, caregivers using Wishful Thinking and Blames Self as a primary coping strategies so as to improve outcomes of caregiver psychological health.

The use of the Wishful Thinking was also associated with reports of greater number of medical conditions in older caregivers while Blames Others was associated with overall higher number of health problems in male caregivers. This is consistent with previous studies that reported negative impacts of chronic stressors, such as caring for someone with dementia over a long period of time (Schulz & Martire, 2004; Vitaliano, Zhang, & Scanlan, 2003), and is also consistent with prior research linking coping strategies with poorer health in non-caregiver samples (e.g. Kim et al., 2007). However, associations between coping strategies and health outcomes were not universal: we note that many coping styles were *not* predictive of health outcomes. The interaction with gender warrants further investigation. There is limited research on male caregivers, although a review of the literature suggests there are gender differences in reported burden and in the ways in which caregivers seek services (Baker & Robertson, 2008). Notably, this review suggested that male caregivers more frequently used problem-focused coping strategies, such as 'acceptance' and 'instrumental coping,' whereas female caregivers more frequently used emotion-focused strategies, such as 'wishfulness.' However, previous studies failed to differentiate between male spousal caregivers and male adult child caregivers, who may differ in their use of coping strategies owing to age preferences in coping styles as discussed previously (Folkman et al., 1987). Additionally, in a review of the literature, Baker and Robertson (2008) found that 19 studies reported gender differences in caregivers' use of coping strategies, while four found no differences. They argued that the 'general publication bias

against reporting non-significant results' may affect the number of studies in the literature where gender differences are found (p. 416). In our sample, we found that the use of Wishful Thinking as a coping strategy also differed by caregiver age; thus both age and gender may be important factors to examine in studying the relationship between coping strategies and caregiver outcomes.

In addition to studying how caregiver coping strategies were related to caregiver outcomes, we also examined how coping strategies used by dementia caregivers varied by caregiver demographic characteristics and neuropsychiatric symptoms of the care recipient. Notably, in the present study, higher care recipient neuropsychiatric symptoms at baseline were associated with less use of Wishful Thinking and Avoidance by caregivers. However, more frequent use of Wishful Thinking was associated with increased anxiety among caregivers. The underlying reason for this association is unclear and may depend on the specific type and nature of neuropsychiatric symptoms. Others report that care recipient neuropsychiatric symptoms are consistently identified as a major contributing factor to caregiver burden and increased caregiver depressive symptoms (Etters, Goodall, & Harrison, 2008). One may speculate that ineffective coping strategies employed in the face of higher stress associated with neuropsychiatric symptoms may influence caregiver burden and lead to poorer caregiver outcomes, such as greater depression, more physical illness, and decreased caregiver quality of life (Schulz et al., 2006). Additionally, it may be that the reduced use of Avoidance in caregivers in our sample is not as adaptive in this situation. Our limited sample size precludes our ability to test the statistical interactions required for further examination of the role of the specific types and nature of neuropsychiatric symptoms, but identifies an area for future studies.

Limitations and Strengths

There are a few limitations to the findings in the present study. First, the sample consisted of a relatively small number of male caregivers that limited our ability to examine other gender differences in the association of coping strategies and caregiver outcomes. Second, we did not test the stress process models as a whole, thus we do not have data on caregiver's appraisal of stress, which is an important component of stress process models (Lazarus & Folkman, 1984; Pearlin et al., 1990), and is an important factor in examining the utility of coping strategies (Folkman, Lazarus, Gruen, & DeLongis, 1986). We did not include positive emotions or meaningful coping styles, which are integrated into the revised stress process model (Folkman, 1997) and conceivably related to caregiver health outcomes. Thus, this study offers insight into a piece of the stress process for caregivers related specifically to coping styles, but future studies may wish to incorporate these findings into broader models. In addition, missing data in coping (from 37 (16.3%) to 72 (31.9%) caregivers missing on various strategies) and medical health outcome (59 caregivers (26.1%) missing) measures may have limited statistical power to detect differences and to examine some interactions, like with neuropsychiatric symptoms in a more detailed way. Finally, the population in Cache County is predominantly Caucasian, which may limit the generalizability of our results to more diverse populations. The strengths of this study include the population-based sample, inclusion of both adult child and spouse caregivers, high overall participation rates, and longitudinal data on both mental and physical health outcomes.

Implications

As the coping literature moves forward with a more ‘positive psychology’ approach, incorporating positive affect and meaningful coping styles (Folkman & Moskowitz, 2007), taking a strength-based approach to such caregiver intervention may be a particularly useful approach. For instance, researchers found that strength-based interventions that focused on educational training and cognitive rehabilitation skills were associated with positive caregiver well-being, as measured by increased caregiver emotional health and mastery, and reduced relationship strain, anxiety, and depression (Judge, Yarry, Looman, & Bass, 2012). Our study shows that the use of certain emotion-focused coping strategies may play a role in physical and mental health outcomes, and that these findings are not universal but are moderated by demographic characteristics. These and other findings may support the use of interventions for caregivers to reduce the use of these specific coping strategies and promote the use of problem-focused coping strategies which have been found to be associated with better caregiver outcomes, including less depression, increased life satisfaction, and greater self-rated health status (Piercy et al, 2012; Haley, Levine, Brown, & Bartolucci, 1987). Several studies have examined the impact of specific interventions on caregiver coping strategies. For example, Chang (1999) found that cognitive-behavioral interventions reduced caregiver depression over time and were associated with reduced caregiver anxiety and use of emotion-focused coping strategies. Caregiver interventions aimed at increasing the use of a problem-focused approach may be beneficial not only to the caregivers (Piercy et al., 2012), but also to the care recipient in decreasing the rate of cognitive and functional decline in dementia (Tschanz et al., 2013).

In summary, we report that certain emotion-focused coping strategies are associated with higher overall reports of anxiety and health conditions in dementia caregivers. Future studies are needed to further examine how interventions aimed at altering caregiver coping methods may affect caregiver outcomes such as health and anxiety, and examine whether other factors (e.g., caregiver gender or age) may affect response to interventions.

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Figure 1.
Number of medical conditions as a function of caregiver age and Wishful Thinking coping

Table 1

Caregiver demographics and characteristics at baseline

	M (SD) or Number (%)
Total	226
Female	172 (76%)
Age	68.05 (14.08)
Education	14.11 (2.35)
Frequency of contact	
Lives with subject	127 (56%)
Visits or phones daily	28 (12%)
Visits or phones several times a week	42 (19%)
Visits or phones once a week or less	27 (12%)
Not reported	2 (1%)
Kin relationship	
---Spouse	107 (47%)
---Adult Child	98 (43%)
---Other	21 (10%)
Beck Anxiety Inventory	5.20 (5.58)
Affect Balance Scale	7.47 (2.00)
Number of Medical Conditions	2.47 (1.77)
Ways of Coping *	
Problem Focused	1.97 (0.55)
Seeks Social Support	1.70 (0.73)
Blames Self	1.12 (0.90)
Wishful Thinking	1.47 (0.67)
Avoidance	1.14 (0.57)
Blames Others	0.81 (0.75)
Counts Blessings	2.26 (0.55)
Religious Coping	1.77 (0.69)

* On a scale of 0 – 3 where 0 = never, 1 = rarely, 2 = sometimes, 3 = regularly, averaged across all items within the given coping domain.

Table 2

Comparison of Caregiver Demographics for Caregivers with Missing Data

	Included Caregivers	Missing Caregivers	Age*	Gender (χ^2)	Kin Relationship (χ^2)
Number of Medical Conditions	167	59	NS	NS	NS
Anxiety (BAI)	221	5	--	--	--
Coping Scales					
Problem Focused	154	72	I: 65.20 (14.27); E: 74.14 (11.59); $t=4.65, p<0.001$	NS	16.17, $p<0.001$
Seeks Social Support	180	46	I: 66.34 (14.23); E: 74.72 (11.34); $t=3.70, p<0.001$	NS	7.93, $p=0.019$
Blames Self	158	68	65.85 (14.40); E: 73.14 (11.93); $t=3.67, p<0.001$	3.83, $p=0.050$	6.77, $p=0.034$
Wishful thinking	187	39	I: 66.53 (14.18); E: 75.30 (11.15); $t=3.63, p<0.001$	7.61, $p=0.006$	7.68, $p=0.022$
Avoidance	176	50	I: 65.25 (14.29); E: 74.36 (11.34); $t=3.69, p<0.001$	NS	9.54, $p=0.008$
Blames Others	158	68	I: 66.12 (14.07); E: 72.53 (13.14); $t=3.20, p=0.002$	NS	6.99, $p=0.030$
Counts Blessings	189	37	I: 66.83 (13.91); E: 74.25 (13.44); $t=2.98, p=0.003$	9.11, $p=0.003$	4.71, $p=0.090$
Religiosity	181	45	I: 67.04 (14.29); E: 72.09 (12.55); $t=2.17, p=0.031$	5.96, $p=0.015$	NS

* I: Included caregivers; E: Excluded caregivers

Table 3

Coping Strategies

	Problem Focused	Blames Others	Blames Self	Avoidance	Wishful Thinking	Seeks Social Support
CG Kinship						
Spouse	-0.32 ↓	-0.280↓	-0.376↓			
Adult Child				0.14*↑	0.36↑	
Other family/ friend (ref)						
Frequency of Contact						
Co-reside	-0.20↓	-0.329↓	-0.243↓	-0.19↓	-0.219↓	-0.234↓
Daily			-0.271↓	0.04↓		
Several times weekly or less (ref)						
CG Age	-0.01↓	-0.016↓	-0.011↓	-0.009↓	-0.011↓	-0.008↓
CG Education	0.04↑					0.036↑
CR Functional Impairment			0.015↑			
CR Neuropsychiatric symptoms				-0.003↓	-0.004↓	

CR = Care Recipient; CG= Caregiver; Only significant results at p < 0.05) reported. The arrows show the direction of effect.

* Coping strategies that increased with time.

Table 4

Linear Mixed Models for CG Anxiety and Medical Conditions

<i>Model Term</i>	Anxiety			Medical Conditions		
	<i>Estimate (SE)</i>	<i>t</i>	<i>Sig.</i>	<i>Estimate (SE)</i>	<i>t</i>	<i>Sig.</i>
Intercept	1.90 (0.90)	2.12	0.035	1.67 (0.98)	1.70	0.09
Time	0.18 (0.21)	0.84	0.40	0.05 (0.02)	3.20	0.002
Wishful Thinking	2.48 (0.49)	5.05	<0.001	0.83 (0.29)	2.89	0.004
Blames Self	1.06 (0.34)	3.09	.002	--	--	--
Dementia duration	-0.46 (0.17)	-2.74	.007	--	--	--
Blames Others	--	--	--	-0.16 (0.05)	-3.07	0.003
CG Males	--	--	--	-0.68 (0.28)	-2.45	0.015
CG Age	--	--	--	0.04 (0.01)	4.01	<0.001
CG Education	--	--	--	-0.14 (0.12)	2.35	0.003
CG Males*	--	--	--	0.28 (0.12)	2.35	0.02
Blames Others	--	--	--	--	--	--
CG Age*	--	--	--	-0.01 (0.004)	-2.60	0.01
Wishful Thinking	--	--	--	--	--	--