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Association Between Anticipatory Grief and Problem Solving Among Family Caregivers of Persons with Cognitive Impairment

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Abstract

Objective—Measure perceived involvement in medical decision making and determine if anticipatory grief is associated with problem solving among family caregivers of older adults with cognitive impairment.

Method—Retrospective analysis of baseline data from a caregiver intervention (n=73). Multivariable regression models testing the association between caregivers' anticipatory grief, measured by the Anticipatory Grief Scale (AGS), with problem solving abilities, measured by the Social Problem Solving Inventory – Revised: Short Form (SPSI-R: S).

Results—47/73 (64%) of caregivers reported involvement in medical decision making. Mean AGS was 70.1 ($\pm$ 14.8) and mean SPSI-R:S was 107.2 ($\pm$ 11.6). Higher AGS scores were associated with lower positive problem orientation ($P=0.041$) and higher negative problem orientation scores ($P=0.001$) but not other components of problem solving- rational problem solving, avoidance style, and impulsivity/carelessness style.

Discussion—Higher anticipatory grief among family caregivers impaired problem solving, which could have negative consequences for their medical decision making responsibilities.

Keywords

Caregivers; Dementia; Alzheimer's disease; Anticipatory grief; Problem solving; Medical decision making

Introduction

Caregivers of older adults with cognitive impairment face a number of complex decisions that require the use of problem solving skills (Livingston et al., 2010). Some of the most difficult decisions that caregivers must make are about medical care for the patient (Lewis et al., 2000). Situations in which family caregivers are asked to participate in or make medical decisions occur throughout the course of the disease and include decisions about treatment

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and management of dementia symptoms, prevention and treatment of new and acute conditions, treatment and management of comorbid conditions, and decision about life-sustaining treatments. Although some medical decisions may be easy to make because there is one clear “best option” to choose, many are more difficult because no best option exists (Sepucha & Mulley, 2009) and tradeoffs between risks and benefits for patients with cognitive impairment are not well understood. In addition to feeling negative emotions, caregivers frequently report feeling emotional distress about making medical decisions. (Hirschman, Kapo, & Karlawish, 2006). Given the significant role that family caregivers play in medical decision making for older adults with cognitive impairment, it is important to understand the relationship between their emotions and decision making. A better understanding of caregiver emotion is important in the design of interventions aimed at improving the quality of problem solving and medical decision making for older adults with cognitive impairment.

Decision making has been identified in previous work as an important component of problem solving (D’Zurilla & Nezu, 1985). Problem solving is the process by which an individual copes with a problem by attempting to adapt solutions to a given event or situation. The other components include problem orientation, problem definition and formulation, generation of alternatives, and solution implementation and verification (Nezu et al., 1998). These five components, comprising the specific skills of problem solving, are qualitatively different; yet interact to provide an effective outcome to a problem.

Previous work in health psychology has investigated the role of problem solving in patients’ own medical decision making and has used measures of problem-solving abilities. For example, in a study of cancer patients, those who had positive and diverse problem solving strategies were more likely to be actively involved in decision-making (Sainio et al., 2001). In a study of patients with HIV, positive problem orientation was found to predict a patient’s level of adherence to medical treatment (Johnson, Elliott, Neilands, Morin & Chesney, 2006).

In the basic behavioral and social sciences, research has shown that negative emotions affect problem solving and decision making, even when the emotions are incidental and not directly related to a decision at hand (Dolgin et al., 2007; Loewenstein & Lerner, 2003). Research also shows that outcomes of decisions are influenced by whether decision makers are in an emotionally aroused or unaroused affective state (Lerner, Goldberg, & Tetlock, 1998; Lerner & Keltner, 2001; Lerner, Small, & Loewenstein, 2004; Loewenstein & Lerner, 2003; Loewenstein, Weber, Hsee, & Welch, 2001; Rick and Loewenstein, 2008).

Different negative emotions may have different effects on decisions. For example, anxiety and fear of loss can cause people to avoid making a decision, particularly when the decision itself may generate a negative emotion (Vandes et al., 2008). Fear and anger, whether naturally occurring or experimentally induced, differentially influence risk perceptions and risk preferences (Loewenstein et al., 2001). While fear increases risk perceptions and leads to more risk-averse choices, anger has the opposite effects (Lerner & Keltner, 2001; Loewenstein et al., 2001). While depression has been linked with slower decision making (Reyna, 2004), fear and anger have been linked with greater impulsivity and the tendency to discount future outcomes more than immediate ones (Loewenstein & Lerner, 2003).

An emotion that has been widely studied among family caregivers of patients with dementia is anticipatory grief, which is the process of experiencing the phases of normal bereavement in advance of the loss of a loved one (Theut, Jordan, Ross, & Deutsch, 1991; Rando, 2000). These phases include mourning, coping, planning, and psychosocial reorganization. For the caregiver, the anticipatory grief is related to actual and anticipated loss of the loved one’s

personhood and of the relationship shared with the loved one (Rando, 1986). The grief may extend over many years; may assume different manifestations while the caregiver witnesses a deterioration of the loved one's cognitive, social, and physical functioning (Ponder & Pomeroy, 1996; Theut et al., 1991); and may lead to depression, strain, and burden (Marwit & Meuser, 2005).

Previous work on the grief of caregivers following the death of a family member with dementia has emphasized the caregivers' vulnerable psychological state (Gentry & Goodwin, 1995) and susceptibility to depression (Schulz, O'Brien, Bookwalla, & Fleissner, 1995) and complicated grief (Schulz et al., 2003). However, there has been little, if any, exploration of how their anticipatory grief early in the caregiving role affects their ability to solve problems and make decisions, which are crucial and important aspects of caregiving. The purpose of the retrospective data analysis reported here was to measure involvement of caregivers in medical decision making and to test the hypothesis that anticipatory grief is negatively associated with problem solving among relatively new caregivers of older adults with mild cognitive impairment (MCI) or dementia.

Design and Method

Study population

For the retrospective analysis, we used baseline data from a clinical trial that was conducted from January 2007 to December 2010 in a large, urban, tertiary referral center. The trial was designed to test the feasibility of a caregiver self-management intervention among relatively new family caregivers, and it included 73 family caregivers of individuals who had been diagnosed with MCI or dementia within the past 6 months at the Alzheimer Disease Research Center (ADRC) of the University of Pittsburgh. The caregivers were eligible to participate if they were the family member who was most likely to provide care and assistance, lived with the cognitively impaired person, and if they provided informed consent.

During the 46-months of subject recruitment, 203 people were diagnosed with MCI or dementia at the ADRC. Of those, 12 (5.9%) indicated in the ADRC research registry that they were not interested in caregiver studies. Of the remaining 191 potential subjects, 29 did not have a family caregiver, and 28 did not meet other study eligibility criteria and were excluded from the study (22 lived more than 300 miles away and 6 did not reside with the cognitively impaired family member). This resulted in a pool of 134 eligible caregivers, of whom 61 (45.5%) declined participation. Reasons for declining study participation included, a lack of interest or time for participation in a multi-session intervention study (n=47; 77%), their own health status precluded participation (n=7; 11.5%), and distress over their family member's new MCI or dementia diagnosis (n=7; 11.5%). Thus, 73 (54%) eligible family caregivers were enrolled. The final sample consisted of 43 new MCI and 30 new dementia family caregivers. Details about the trial and the sample of participants have been published elsewhere (Garand et al., 2011). Both the trial and our analysis were approved by the University of Pittsburgh Institutional Review Board.

Sociodemographic and clinical data

Patient and caregiver age, race, gender, and education were included in the analysis. Caregiver variables in the analysis include the caregiver's employment status (employed or unemployed) and the caregiver's relationship to the patient (spouse or non-spouse). The sample of caregiver's consisted of 55 (75%) spouses or partners, 16 (22%) adult-child or child in-law and 2 (3%) siblings. Other variables in the analysis include: annual household income (<\$50,000 or \$50,000); the presence of other family or non-family members living in the household other than the person with cognitive impairment and the caregiver subject

(yes or no); and the severity of the patient's cognitive impairment as measured by their Clinical Dementia Rating score (CDR) (0, 0.5, 1 or 2) (Morris, 1997).

Study measures and instruments

Our primary outcome was problem solving skills, as indicated by a total standardized score and by individual standardized scores on the five scales the Social Problem-Solving Inventory–Revised: Short Form (SPSI-R:S) (D’Zurilla, Nezu, & Maydeu-Olivares, 2002). For older adults, the total standardized scores range from 29 to 139 and a higher total score on the SPSI-R:S implies more adaptive problem solving. In the current study, the SPSI-R:S had an internal consistency reliability (Cronbach’s alpha) of 0.80. The SPSI-R:S sums across five scales that provide a broad assessment of two different problem-orientation dimensions and three different problem-solving core behavior dimensions. Each scale of the SPSI-R:S consists of five items, and each item is measured on a 5-point Likert scale, with scores ranging from 0 (“not at all true of me”) to 4 (“extremely true of me”). The five scales are positive problem orientation (PPO), negative problem orientation (NPO; reverse coded in the total score), rational problem solving (RPS), impulsivity/carelessness style (IPC; reverse coded in the total score), and avoidance style (AS; reverse coded in the total score). The PPO scale assesses general cognitive skills, which includes the tendency to view problems in a positive light, to see them as challenges rather than threats, and to be optimistic regarding the existence of a solution and one’s ability to detect and implement effective solutions. In contrast, the NPO scale assesses the presence of maladaptive problem-solving approaches and cognitive-emotional tendencies that prevent effective problem solving. The RPS scale assesses an individual’s tendency to use effective problem solving techniques systematically and deliberately. The ICS scale evaluates a tendency to solve problems by making overly quick decisions in an impulsive, incomplete, and haphazard manner. The AS scale measures maladaptive patterns of problem solving characterized by general passivity or putting the problem off and waiting for problems to resolve themselves (Nezu et al., 1998; Chang & D’Zurilla, 1996). Sample items in the SPSI-R:S include questions related to problem solving and decision making such as “When I have a decision to make, I try to predict the positive and negative consequences of each option,” or “When making a decision, I go with my ‘gut feeling’ without thinking too much about the consequences of each option.” Scores for each dimension can either be totaled and then combined and standardized by age into an overall SPSI-R:S score or assessed individually.

Our primary independent variable was level of anticipatory grief, as indicated by scores on the Anticipatory Grief Scale (AGS) (Theut et al., 1991). The instrument was developed for and originally validated in wives whose spouses had been diagnosed with dementia. Anticipatory grief is a multi-dimensional construct consisting of emotions such as anger, guilt, anxiety, irritability, sadness, feelings of loss, and decreased ability to function at usual tasks (Fulton & Gottesman, 1980; Rando, 1986). Items that reflect these elements were constructed from clinical experience with the wives of patients with dementia or were selected from grief scales (Faschingbauer, Devaul, & Zisook, 1977; Theut et al., 1989) and modified to reflect anticipatory grief. The AGS consists of 27 grief-related items. Each item is measured on a 5-point Likert scale, with scores ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). Examples of items include, “I am preoccupied with thoughts about my relative and his/her illness,” “I am planning for the future,” and “I feel it is unfair that my relative has dementia.” The overall AGS score ranges from 27 to 135, with higher scores indicating higher levels of anticipatory grief. In our sample of caregivers, the internal consistency reliability was 0.84.

Analytical approach

First, we used descriptive statistics to characterize patients and caregivers in terms of sociodemographic and clinical characteristics. Because the overwhelming majority of the patients and caregivers were white, we excluded race from our subsequent analyses. Second, we used *t*-tests or analyses of variance (ANOVAs) to determine the relationship of each variable to the total standardized SPSI-R:S score. Third, if a variable had a *P* value of <0.05 in the bivariate analyses, we included it in the stepwise multivariable regression model that we designed to determine the association between problem solving and anticipatory grief. Fourth, we conducted a stratified sensitivity analysis that measured the association between problem solving and anticipatory grief among only the caregivers who reported that they assist the patient with medical decision making.

All statistical analyses were performed using Stata, version 11 (Stata Corp., College Station, TX), and a *P* value of <0.05 was considered statistically significant.

Results

Descriptive results

The mean age of caregivers was 64.9 years (Table 1). Of the 73 caregivers, most were female (78.1%), were the spouse of the cognitively impaired person (75.3%), and had an annual household income of \$50,000 or more (65.8%). These sociodemographic characteristics are typical of samples recruited from the ADRC (Garand, Dew, Eazor, DeKosky, & Reynolds, 2005). Regarding their role in medical decision making, 47 (64.4%) caregivers reported that they help their family member with cognitive impairment make medical decisions and among those, 26 (35.6%) reported that this was new role for them since the start of the patient's cognitive impairment and 21 (44.6%) reported that they had always assisted with this task (not shown in Table 1). The caregivers' scores on the anticipatory grief and problem solving measures were higher than previously reported norms indicating that although our sample had more anticipatory grief they also had more effective problem solving. The mean standardized score on the SPSI-R:S for caregivers was 107.2 ($\pm$ 11.6). This mean score is within the average range for older adults, but slightly higher than previous scores reported for depressed older adults and slightly lower than mean scores for older adults without depression (Gibbs, 2009). The mean overall AGS score was 70.1 ($\pm$ 14.8). This average score is higher than the mean AGS score of 61.2 reported by Marwit and Mauser (2002) when they examined anticipatory grief among a sample of 87 family caregivers of people with Alzheimer's disease who had been providing care an average of 6 years since the dementia diagnosis.

Of the 73 patients, most were male (64.4%) with a mean age of 75.2 years (Table 1). Although the sample was fairly evenly split between caregivers of patients with a diagnosis of MCI compared with a diagnosis of dementia, slightly more than half of patients' had a CDR score of 0 or 0.5 (61.4%) which represents very mild cognitive impairment and 38.6% had a CDR score of 1 or 2 representing mild or moderate cognitive impairment (Morris, 1997). No patients had a CDR >2.

Regression results

Based on the results of bivariate analyses, the final multivariable model included AGS score, annual household income <\$50,000, the patient's CDR score as a measure of cognitive impairment severity, and if the caregiver was a spouse. Multivariable analysis (Table 2) showed total standardized SPSI-R:S scores were significantly associated with AGS scores (regression coefficient, -0.20; 95% confidence interval [CI], -0.41 to -0.00; *P*=0.05) and income (<\$50,000) (regression coefficient, -6.31; 95% confidence interval [CI], -12.02 to

–0.61; $P=0.03$). Results from the multivariable analyses (Table 3) of each of the five scales of the SPSI-R:S showed that higher anticipatory grief scores are significantly associated with lower PPO scores (regression coefficient, –0.23; 95% confidence interval [CI], –0.45 to –0.01; $P=0.041$) and higher NPO scores (regression coefficient, 0.33; 95% confidence interval [CI], 0.15 to 0.52; $P=0.001$). RPS, ICS, and AS were not significantly associated with anticipatory grief.

Results from the stratified analysis of caregivers who reported that they make medical decisions for the patient ($n=47$) demonstrated stronger associations with the total standardized SPSI-R:S score (regression coefficient, –0.34; 95% confidence interval [CI], –0.63 to –0.06; $P=0.018$), but given this reduced sub-sample, only the NPO scale was statistically significant (regression coefficient, 0.46; 95% confidence interval [CI], 0.23 to 0.69; $P<0.0001$) (results not shown in Table).

Discussion

Our findings add to the literature about the role of a common caregiver emotion, anticipatory grief, and its potential relevance to decision making for family caregivers of older adults with cognitive impairment. In our retrospective analysis of data from 73 relatively new caregivers of patients with MCI or dementia, we found that a majority of caregivers report that they assist the patient with medical decision making. In addition, higher levels of anticipatory grief were associated with a diminished ability to solve problems.

The anticipatory grief and problem solving skills in our sample were higher than in previously published samples. The mean AGS score in our sample of 73 caregivers was 70.1 compared to a previous study that reported a mean score of 61.2 in a sample of 87 family caregivers who had been providing care an average of 6 years since the patient's dementia diagnosis (Marwit & Mauser, 2005). This may reflect selection bias and/or sampling variability. Alternatively, it may be related to the patient's disease stage. It is possible that higher level of anticipatory grief reflect a heightened grief reaction at the earliest stages of AD caregiving, when the family member begins to realize the mild cognitive deficits result in loss of functional independence. Alternatively, the higher anticipatory grief levels in the current study may be due to the caregiving situation and exposure to daily stressors; all of our family caregivers lived with the care recipient while only 31% of the adult-child caregivers and 73% of the spousal caregiver lived with the care recipient in the Marwit & Meuser study (because many of the care recipients lived in nursing homes, assisted living facilities, or other arrangements (Garand, L. et al. 2011). Studies show that the place of residence significantly impacts anticipatory grief levels in family AD caregivers (Ott CH, et al 2007). AD caregivers residing with the care recipient face increased exposure to the burdensome aspects of providing care and assistance to a family member with cognitive impairment.

Our sample's total SPSI-R:S scores were all within what the scale creators call the “norm group average” to “above norm group average” range (D’Zurilla, Nezu, & Maydeu-Olivares, 2002) and we found significant associations between caregivers' anticipatory grief and their problem-solving abilities. Analyses of the five scales of the SPSI-R:S revealed that higher levels of anticipatory grief among caregivers are significantly associated with maladaptive problem solving (e.g., higher negative problem orientation scores) and lower anticipatory grief is significantly associated with better problem solving (e.g., lower positive problem orientation scores).

Nezu and colleagues (1998) define positive problem orientation as an approach to solving problems with an optimistic affect and less of a tendency to avoid a problem or attempt to

solve it impulsively. Included in this approach is the ability to accurately identify problems when they occur and to use emotions (i.e. anticipatory grief) and cognitions (i.e. negative thoughts) as cues that a problem exists. Conversely, negative problem orientation measures a dysfunctional emotional-cognitive set. Individuals with higher negative problem orientation scores tend to underestimate their ability to solve problems, experience more distress when confronted with a problem, and are more likely to perform problem solving ineffectively (D’Zurilla, 2002). Our findings about the relationship between anticipatory grief and problem orientation is important given the frequency that caregivers are faced with problem solving, such as making medical decisions in the presence of strong and sometimes negative emotions. This is especially true among the caregivers in our study who reported making medical decisions for the patient. Among this group we found that higher anticipatory grief is significantly associated with negative problem orientation and which may indicate more distress among these caregivers when confronted with a problem (D’ Zurilla, 2002).

Our findings about anticipatory grief and problem solving are in keeping with the results of other studies that have explored the connection between emotions and decision making (Bachara, 2004; Caron, Griffith, & Arcand, 2005; D’Zurilla, Nezu, & Maydeu-Olivares, 2002). The importance of our findings is also based on both the extensive role that family caregivers play in medical decision making for older adults with mild cognitive impairment and their evolving role as a decision maker along the course of the disease when the patient’s impairment becomes more severe. As the patient’s impairment worsens so does the likelihood that caregivers will be called upon to assist in decision making for the patient (Hirschman, Kapo, & Karlawish, 2006). Information about the role of emotion in problem solving, and in particular, medical decision making, can help guide the creation of decision making interventions that are focused on caregivers of older adults with cognitive impairment along the course of cognitive impairment. These findings suggest that family caregivers of persons with very mild cognitive deficits or a new AD diagnosis may benefit from interventions directly addressing their anticipatory grief in an effort to enhance their positive orientation to problem solving (the extent to which an individual appraises a problem as a challenge rather than a threat) and improve their decision making abilities. It is also possible that the addition of anticipatory grief to conceptual models of health care decision making will help investigators to clarify the manner by which family dementia caregivers’ make such decisions. For example, it would be interesting to determine if an intervention directed at reducing the caregiver’s level of anticipatory grief, early in the disease course and when the role of caregiving is new, positively impacts their decision making ability as their loved one’s cognitive abilities decline.

As indicated in a study by Baumgarten et al. (1992), caring for an adult with progressive cognitive impairment caused by dementia may be “one of the most demanding situations that can be encountered” because it includes physical, financial, emotional, and psychological demands (p. 61) and because its “unpredictability, long duration, and ambiguity” can lead to emotional and psychological stress (p. 61). Interventions aimed at reducing the burden and strain of caregivers provide evidence for programs that combine support, counseling and some education can reduce caregivers’ emotional burden and depression (Sorenson et al., 2002; Hepburn et al., 2001). Additionally, interventions focused on caregivers problem solving abilities have demonstrated that problem solving interventions are feasible and acceptable to caregivers and can increase caregivers’ problem solving confidence (Demiris et al., 2010) and reduce their maladaptive and dysfunctional problem-solving styles (Elliot and Berry, 2009). Given the range of physical and emotional demands involved in caring for patients with cognitive impairment, interventions that are designed to help caregivers solve problems, and participate in or make medical decisions will need to take emotional states into account. The identification of emotional states such as anticipatory grief could be addressed through support and counseling services and

acknowledged in tools, such as decision aids, that are intended to aid medical decision making (O'Connor, 2009).

Our analysis has several limitations that deserve mention. First, because our sample size was small, had relatively homogeneous sociodemographic characteristics, and because they were regionally recruited from an ADRC associated with a major academic center, our findings may not be generalizable to other groups of caregivers of patients with MCI or dementia. Second, our main outcome measure—problem solving abilities as measured by the SPSI-R:S—may not directly measure the cognitive processes associated with medical decision making. Third, the significant findings from our cross-sectional study do not support causation. While our results indicate significant differences among our variables of interest, further exploration is needed to determine what the score differences on the AGS and SPSI-R:S mean in a real-world clinical setting.

Implications

Our findings provide evidence that even relatively new caregivers for patients with MCI or dementia report medical decision making as one of their responsibilities and that anticipatory grief may be associated with the caregivers' problem-solving abilities. Despite study limitations, the current study points to the importance of considering anticipatory grief in the context of health care decision-making among dementia family caregivers. Our findings suggest that family caregivers of persons with mild cognitive impairment or a new AD diagnosis may be in need of interventions directly addressing issues related to their anticipatory grief.

An understanding of the influence of anticipatory grief, on problem solving and decision making should help researchers, clinicians, and others develop interventions to address the presence of emotions to improve the caregivers' ability to make medical decisions on behalf of patients with cognitive impairment.

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Table 1**Characteristics of the 73 Dyads of Caregivers and Patients**

Characteristic	Caregivers	Patients
Age, years, mean $\pm$ standard deviation (SD)	64.9 $\pm$ 11.28	75.2 $\pm$ 8.80
Race, No. (%)		
White	72 (98.6)	72 (98.6)
Black	1 (1.4)	1 (1.4)
Gender, No. (%)		
Female	57 (78.1)	26 (35.6)
Male	16 (21.9)	47 (64.4)
Caregiver's relationship to patient, No. (%)		
Spouse	55 (75.3)	—
Other family member	18 (24.7)	—
Caregiver's annual household income, No. (%)		
<\$50,000	23 (31.5)	—
\$50,000	48 (65.8)	—
Missing	2 (2.7)	—
Caregiver reports making medical decisions for the patient, No. (%)	47 (64.4)	—
Caregiver's Anticipatory Grief Scale score, mean (SD)	70.1 (14.8)	—
Caregiver's total standardized SPSI-R:S score, mean (SD)	107.2 (11.6)	—
Caregiver's standardized scale scores for SPSI-R:S, mean (SD)		
PPO	102.4 (12.7)	—
NPO	94.6 (10.7)	—
RPS	101.6 (14.1)	—
ICS	91.4 (14.3)	—
AS	94.0 (13.8)	—
Patient's CDR score, No. (%)		
0 or 0.5	—	48 (61.4)
1 or 2	—	25 (38.6)

Abbreviations: CDR score =Clinical Dementia Rating score; SPSI-R:S=Social Problem-Solving Inventory Revised Short; PPO= Positive Problem Orientation; NPO= Negative Problem Orientation; RPS= Rational Problem Solving; ICS= Impulsivity/Carelessness Style; AS= Avoidance Style

Table 2

Results of Multivariable Analysis of the Associations Between Problem Solving and Anticipatory Grief Among Caregivers

Variable	Regression Coefficient (95% Confidence Interval) β	P Value	Interpretation ^a
Anticipatory Grief Scale (AGS) score	−0.20 (−0.41, −0.00)	0.05	Higher levels of anticipatory grief and income <\$50,000 are significantly associated with lower problem solving abilities among caregivers.
Annual household income is <\$50,000	−6.31 (−12.02, −0.61)	0.03	
Patient CDR score is 1	−1.58 (−7.88, 4.71)	0.62	
Caregiver is a spouse	2.10 (−4.42, 8.63)	0.52	

^aTotal standardized scores for problem solving were derived from the Social Problem-Solving Inventory–Revised: Short Form (SPSI-R:S).

Abbreviation: CDR=Clinical Dementia Rating

Table 3

Results of Multivariable Analysis of the Associations Between the Five Components of Problem Solving and Anticipatory Grief Among Caregivers^a

Problem Solving Component ^b	Regression Coefficient (95% Confidence Interval) β	P Value
PPO	-0.23 (-0.45, -0.01)	0.04
NPO	0.33 (0.15, 0.52)	0.001
RPS	-0.05 (-0.31, 0.22)	0.73
ICS	0.01 (-0.26, 0.28)	0.94
AS	0.08 (-0.18, 0.33)	0.55

^a All five models controlled for annual household income <\$50,000, the patient's Clinical Dementia Rating score, and whether the caregiver was a spouse.

^b Scores for each component of problem solving were derived from five different models that tested the five scales of the Social Problem-Solving Inventory-Revised: Short Form (SPSI-R:S).

Abbreviations: SPSI-R:S=Social Problem-Solving Inventory Revised Short; PPO= Positive Problem Orientation; NPO= Negative Problem Orientation; RPS= Rational Problem Solving; ICS= Impulsivity/Carelessness Style; AS= Avoidance Style