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DETERMINANTS OF SUBJECTIVE MEMORY IN FIRST-DEGREE RELATIVES AND CARE PROVIDERS OF INDIVIDUALS WITH DEMENTIA

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Abstract

Subjective memory may help practitioners understand who pursues assessment and treatment for memory concerns. Two factors that are related to subjective memory are depressive affect and fear of dementia, and two groups of older adults who may be susceptible to these factors are first-degree relatives and care providers of patients with dementia. This study seeks to determine how depressive affect and fear of dementia influence the subjective memory of these two groups. Fifty-five adults ages 55 and older who were care providers and/or first-degree relatives of patients with dementia reported their perceptions of their own memory, feelings of depression, and dementia worry on a Qualtrics questionnaire. We anticipated that depressive affect would be a stronger predictor of subjective memory in care providers than in first-degree relatives, whereas dementia worry would be a stronger predictor of subjective memory in first-degree relatives than in care providers. Additionally, we hypothesized that the relationships between subjective memory and both depression and dementia worry would be strongest for individuals who were both first-degree relatives and care providers. Overall, our hypotheses regarding differential patterns of relationships across groups was not supported; however, results showed that depression was the strongest predictor of subjective memory, regardless of group affiliation. Additionally, correlation analyses revealed strong relationships between fear of dementia and depression among both care providers and first-degree relatives. By better understanding the lack of influence of a fear of dementia and the strong influence of depression on the subjective memory of these two populations, clinicians may be better equipped to support older adults with memory concerns.

Subjective memory, which includes the concept of memory self-efficacy, is a construct that has been given significant attention in the current literature. Memory self-efficacy has been defined as “beliefs about one’s own capability to use memory effectively in various situations” (Hertzog et al., 1989, p. 687). Subjective memory is important because it may help researchers and practitioners understand who seeks help for concerns about their memory. For example, one study compared 33 healthy individuals who sought help at memory clinics to 85 participants who did not. The

researchers found that those who presented to memory clinics with subjective complaints scored lower on a measure of memory self-efficacy than did their non-help-seeking peers (Ramakers et al., 2009). As such, gaining a better understanding of subjective memory may provide clinicians with useful information as they support and care for patients.

One important factor that influences subjective memory is depression (Cipolli et al., 1996; Dellefield & McDougall, 1996; Mendes et al., 2008; Niederehe & Yoder, 1989). Cipolli et al. (1996) reported that among 400 adults in the general population aged 50–88, depressed individuals had lower scores on all objective and subjective memory measures when compared to their nondepressed peers. Similarly, Dellefield and McDougall (1996) found that among 145 community-dwelling older adults, individuals with depression scored lower in memory self-efficacy than did nondepressed participants. The relationship between depressive affect and subjective memory holds even among nondepressed adults. Mendes et al. (2008) found significant correlations between self-reported symptoms of depression and subjective memory complaints in 292 healthy individuals in the general population.

Another factor that may influence subjective memory is older adults' concern about developing dementia in the future. These concerns are quite prominent in the general population. Across a sample of 219 adults aged 40 and older, nearly half were at least somewhat concerned about developing dementia (Bowen et al., 2018). These findings are nearly identical to those from another study of 193 adults aged 65 and older, in which close to half of the participants were at least "somewhat concerned" and one-sixth reported being "very concerned" that they would develop dementia at some point in the future (Norman et al., 2018). These same studies investigated the relationship between dementia worry and subjective memory and yielded consistently significant results. Bowen et al. (2018) found that dementia worry was associated with perceived memory capacity and perceived memory change in a sample of healthy older adults. Norman et al. (2018) also found that being more concerned about developing dementia was associated with a higher self-reported frequency of forgetting. Thus, there appears to be a robust relationship between stronger fears of developing a neurodegenerative disorder and lower memory self-efficacy.

Two groups of older adults who are particularly vulnerable to depression and concerns about developing dementia are family members and care providers of individuals with dementia. One common cause of dementia is Alzheimer's disease (AD), a neurodegenerative disease that progressively interferes with memory and other cognitive skills as well as the ability to carry out everyday tasks (National Institution for Aging, 2019). According to the CDC, in 2014, more than 5 million Americans were living with AD (2019). Because of AD's widespread nature, family caregivers are heavily involved in the daily lives of their loved ones, providing approximately 70% of healthcare to AD patients in the United States (Alzheimer's Disease International, 2010). As such, AD and other forms of dementia affect not only

the diagnosed patients but also their family members and care providers, who may be vulnerable to depression and anxiety about someday developing the disease themselves.

Many studies have examined the potential negative affective outcomes that can result from caring for an older adult with severe memory loss (Mausbach et al., 2013; Wang et al., 2015). Mausbach et al. (2013) found that spousal caregivers were more likely to meet the cutoff for clinically significant depression than were their non-caregiving peers, although not all studies demonstrate this effect (see, for example, Tang et al., 2015). Wang et al. (2015) also identified greater depression in individuals caring for a family member with dementia, documenting a significant effect of stress on caregivers' self-reported depression. Although together, these findings provide some understanding of how caring for a family member with dementia influences depression, research to date has not examined depression in non-care-providing first-degree relatives of dementia patients.

In contrast, research on dementia worry has centered more prominently on first-degree relatives than on care providers (Kessler et al., 2014; Rahman, 2016). Kessler et al. (2014) found a strong positive relationship between being a first-degree relative of a patient with dementia and dementia worry, such that first-degree family members have more concerns about developing dementia themselves than their peers do. To the contrary, Rahman (2016) found no statistically significant differences in fear of AD between participants who did and did not have a first-degree family member with dementia. Although concerns about developing dementia have not been directly investigated in care providers, given the prevalence of anxiety regarding dementia (Bowen et al., 2018; Norman et al., 2018), care providers are unlikely to be immune to dementia worry.

Given that first-degree relatives are highly prone to concerns about developing dementia (Kessler et al., 2014; Rahman, 2016), and given that these concerns are associated with lower memory self-efficacy (Bowen et al., 2018; Norman et al., 2018), it is, perhaps, not surprising that several studies have documented lower subjective memory in first-degree relatives of patients with dementia (Hausmann et al., 2018; Tsai et al., 2006). In a study by Hausmann et al. (2018), a group of 10 healthy older adults who were first-degree family members of patients with AD reported more concerns about their own memory than did a group of individuals without a family history of AD. This effect of shared genetics was also documented in a much larger-scale study by Tsai and colleagues (2006), who found a greater incidence of subjective memory complaints in 1203 first-degree relatives of patients with AD than in 296 spouses of similar patients. This effect has not always been consistently documented in the literature. A study by McPherson et al. (1995) did not find significant differences between first-degree family members and an age- and gender-matched control group with regard to memory complaints following a neuropsychological assessment. Another study, performed by Heun et al. (2003), compared the subjective memory of

first-degree relatives of AD patients, first-degree relatives of patients with major depressive disorder, and a control group and found no significant differences in subjective memory complaints across three groups of older adults once they controlled for age. The research regarding the nature of memory self-efficacy and subjective memory complaints in first-degree relatives thus remains inconclusive.

Although many studies have looked at depression, dementia worry, and subjective memory in either care providers or first-degree family members of patients with dementia, no research to date has combined all of these into a single study conducted with a population that includes both of these groups of older adults. As such, the current study seeks to further elucidate the ways in which depression and dementia worry affect subjective memory and to determine whether these relationships differ for care providers versus for first-degree relatives of patients with dementia. We anticipate that depressive affect will be a stronger predictor of subjective memory in care providers than in first-degree relatives whereas dementia worry will be a stronger predictor of subjective memory in first-degree relatives than in care providers. Additionally, we hypothesize that the relationships between subjective memory and both depression and dementia worry will be strongest for individuals who are both first-degree family members and care providers of individuals diagnosed with dementia.

Method

Participants

Participants included 55 adults (77.8% female; 87% White) aged 55 and older ($M = 63.5$, $SD = 5.40$) who were first-degree relatives (i.e., parent, child, or sibling) of patients with diagnosed dementia, care providers for patients with dementia, or both first-degree relatives of and care providers for patients with dementia. All participants provided informed consent before beginning the study. Eleven (11) participants were care providers, 23 were first-degree family members, and 21 were both. The three groups were statistically equivalent in race ($\chi^2 (n=55) = 4.94$, $p = .55$) and gender ($\chi^2 (n=55) = 0.43$, $p = .81$) distributions and in years of formal education ($F(2, 52) = 0.31$, $p = .73$). (See Table 1.) Average age across groups differed significantly ($F(2, 52) = 3.40$, $p = .04$), however, with those who were both care providers and first-degree relatives being significantly younger than those who were exclusively care providers, $p = .02$.

Table 1. Mean (SD) and Proportion Sociodemographic Characteristics of Participants

	<i>n</i>	Age	% White	% Female	Years of education
All participants	55	63.308 (5.42)	87.00	77.80	15.89 (2.32)
First-degree relatives	23	64.09 (4.45)	86.96	73.91	16.13 (2.26)
Care providers	11	66.00 (7.36)	100	81.81	15.45 (2.42)
Both	21	61.24 (4.60)	80.00	80.00	15.85 (2.41)

Note: No significant differences emerged between participant groups in terms of education, race, or gender. Those who were care providers alone were significantly older than those who were classified as both, $F(2, 52) = 3.40, p = .04$.

Materials

Fear of Alzheimer’s Disease Scale (FoADS; French et al., 2011; Rahman 2016).

This 30-item questionnaire measured the amount of concern participants have related to developing dementia. Some example items include “When I forget something, I am apt to think that I am getting Alzheimer’s disease”; “When I misplace things, I sometimes think that I may have Alzheimer’s disease”; and “I fear not recognizing family members.” Participants rated each item on a five-point Likert-type scale (1 = *never* to 5 = *always*). Possible scores ranged from 0 to 150, with higher scores signifying higher dementia worry.

Personal Beliefs about Memory Instrument (PBMI; Lineweaver & Hertzog, 1998)

This questionnaire measured three components of subjective memory: memory self-efficacy, change in memory over time, and perceived control over memory. Three items measured global memory self-efficacy. One example asked participants to compare their own memory to the memory of their same-aged peers. Additionally, an 8-item retrospective change subscale asked participants to compare their memory now to their memory 10 years ago and to their memory when they were 18 years old. Next, two 4-item subscales measured the amount of control that participants believed they exert over their current and future memory functioning.

The final 24-item subscale asked participants to rate their specific memory self-efficacy—that is, their ability to remember certain types of information (e.g., trivia, appointments, words in conversation, faces) on a scale from 1 (*very poor*) to 5 (*very good*). Across those subscales, higher scores reflected better memory self-efficacy, as well as beliefs in less retrospective change and higher levels of control over memory now and in the future.

Center for Epidemiological Studies-Depression (CES-D; French et al., 2011)

This questionnaire contained 20-items that measured depressive affect. Participants rated how often they had experienced symptoms associated with depression in the past week. Example items included “I did not feel like eating; my appetite was poor,” “I felt that I could not shake off the blues even with help from my family or friends, and “I felt that everything I did was an effort.” Participants responded to each statement on a four-point Likert-type scale from 0 to 3 (0 = *Rarely or None of the Time* to 3 = *Most or Almost All the Time*). Total scores ranged from 0 to 60, with higher scores indicating greater depressive symptoms.

Demographic Questionnaire

A demographic questionnaire created for the purposes of this study asked participants to report their race, age, gender, years of formal education, and relationships shared with people with dementia.

Procedure

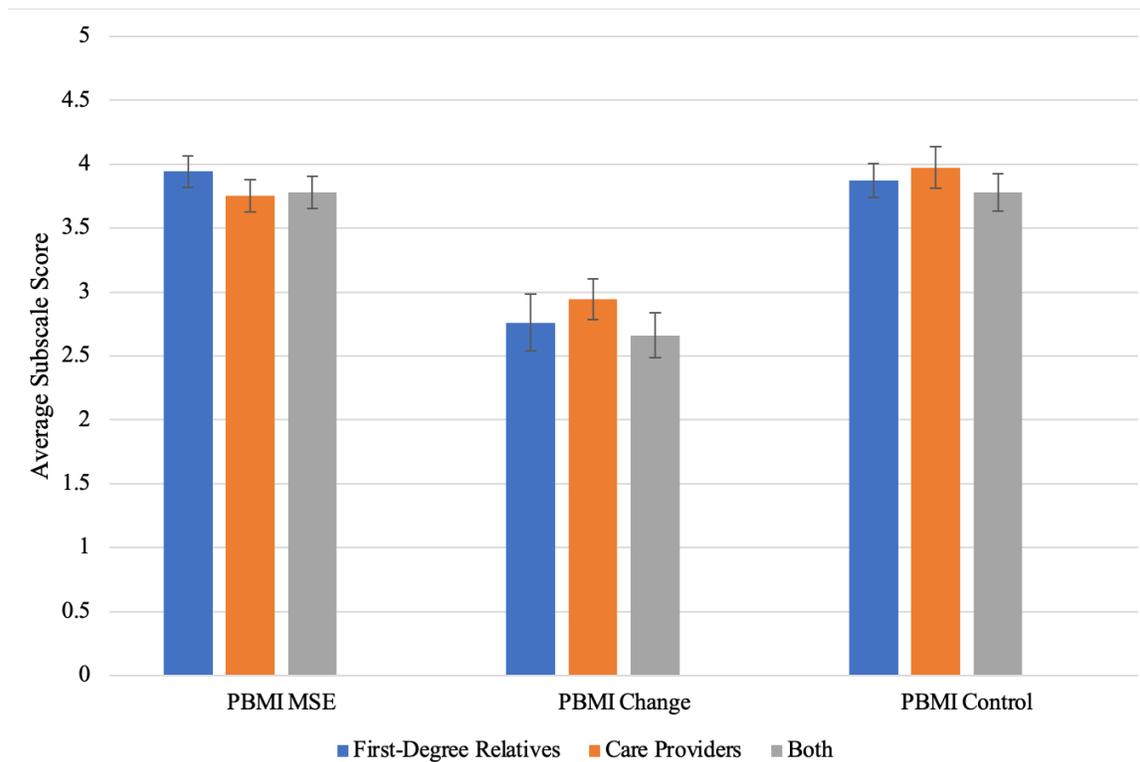
This study was conducted through an online survey created on Qualtrics. Each participant completed a series of questionnaires related to subjective memory, dementia worry, and depressive affect. Participants were recruited into this study through Mechanical Turk, an online recruitment platform on which participation in scientific studies is incentivized through Amazon credits. A large group of adults on the platform who were aged 55 and over completed an initial screening that included only the demographic questionnaire. These participants received 25 cents in pay. Those who were care providers and/or first-degree relatives then received an invitation to complete the full study for \$5 in Amazon credit. Another method of recruitment was through personal connections and local care provider networks. Care providers were e-mailed a flier listing the study criteria and instructions on how to access and complete the study. Upon completing the survey, all participants e-mailed the researcher a code that appeared after the final question. Payment via a \$5 Amazon eGift card was sent in response to e-mails that included the correct survey code.

Results

Group Averages Across Subjective Memory, Depression, and Fear of Alzheimer’s Disease

The average score for the three PBMI subscales, the CES-D, and the FoADS are illustrated in Figures 1, 2, and 3. The three groups were statistically equivalent in their self-reported memory self-efficacy ($F(2, 52) = 0.53, p = .59$), self-reported memory change ($F(2, 52) = 0.72, p = .49$), and self-perceptions of memory control ($F(2, 52) = 0.34, p = .71$) on the PBMI. The three groups were also statistically equivalent in their depression scores ($F(2, 52) = 1.19, p = .31$) and fear of dementia ($F(2, 52) = 2.30, p = .11$).

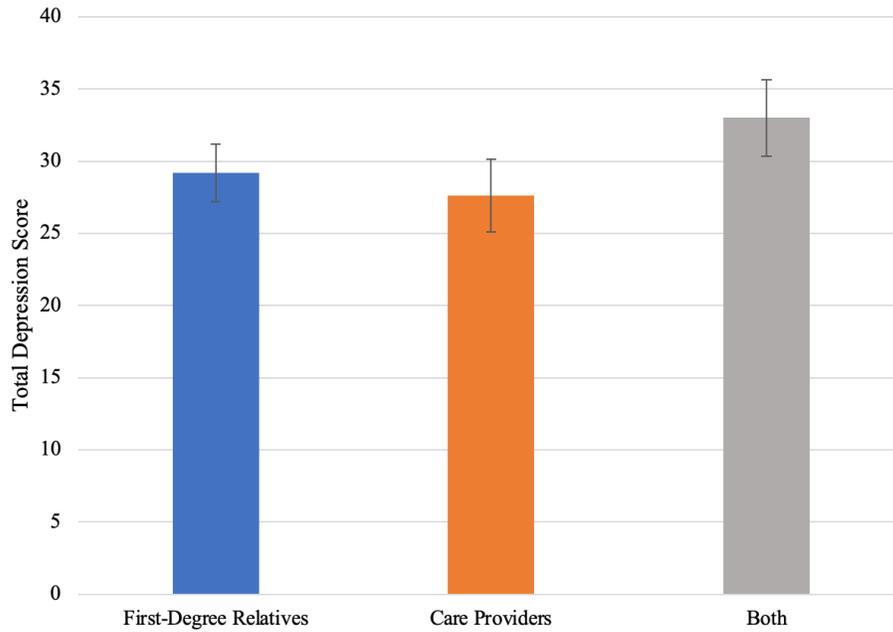
Figure 1. PBMI Means Across Groups



Note: The three groups did not differ significantly in their memory self-efficacy ($F(2, 52) = 0.53, p = .59$), self-perceived change in memory ($F(2, 52) = 0.72, p = .49$), or control beliefs ($F(2, 52) = 0.34, p = .71$).

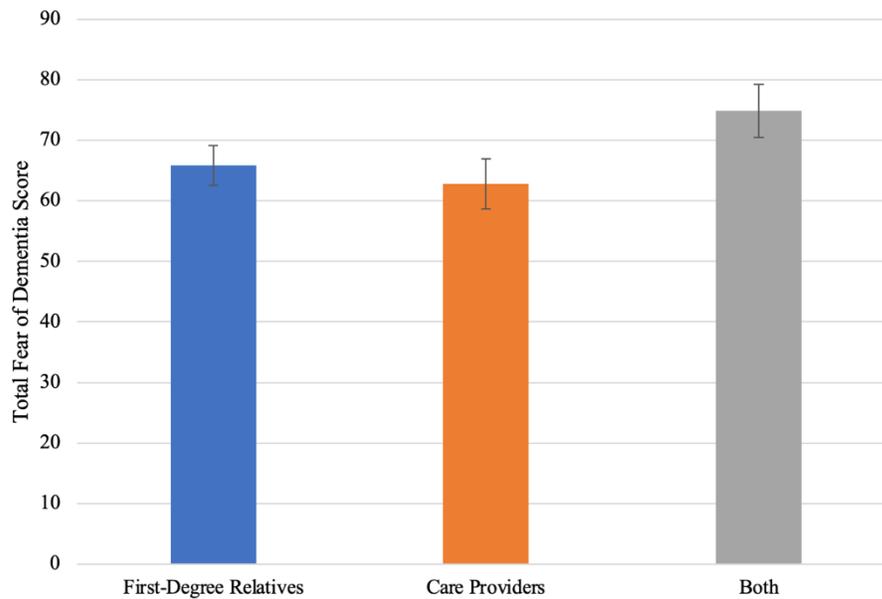
PBMI = Personal Beliefs about Memory Instrument; MSE = Memory Self-Efficacy.

Figure 2. CES-D Means Across Groups



Note: The three groups did not differ significantly in their depression scores, $F(2, 52) = 1.19, p = .31$. CES-D = Center for Epidemiological Studies-Depression Scale.

Figure 3. FoADS Means Across Groups



Note: The three groups did not differ significantly in their fear of dementia scores, $F(2, 52) = 2.30, p = .11$. FoADS = Fear of Alzheimer's Disease Scale.

Correlations Between Subjective Memory, Fear of Alzheimer’s Disease, and Depression

Standard correlation analyses explored the relationships between depression, fear of dementia, and subjective memory (memory self-efficacy, change in memory over time, and perceived control over one’s memory) in the full sample as well as in each of the subgroups of participants (Table 2).

Table 2. Correlations Between Subjective Memory, Depression, and Fear of Alzheimer’s Disease

	PBMI change	PBMI control	CES-D total	FoADS total
First-degree relatives (<i>n</i> = 23)				
PBMI MSE	.504*	.638**	-.341	-.200
PBMI change		.484*	-.048	-.298
PBMI control			-.360	-.388
CES-D total				.635**
Care providers (<i>n</i> = 11)				
PBMI MSE	.899**	.666*	-.563	-.338
PBMI change		.613*	-.553	-.290
PBMI control			-.787**	-.389
CES-D total				.608*
Both (<i>n</i> = 21)				
PBMI MSE	.695**	.717**	-.490*	-.104
PBMI change		.578**	-.301	-.393
PBMI control			-.458*	-.194
CES-D total				.011
All participants (<i>n</i> = 55)				
PBMI MSE	.641**	.666**	-.437**	-.180
PBMI change		.547**	-.270*	-.355**

PBMI control	-.473**	-.306*
CES-D total		.346**

Note: PBMI = Personal Beliefs about Memory Instrument; MSE = Memory Self-Efficacy; CES-D = Center for Epidemiological Studies-Depression Scale; FoADS = Fear of Alzheimer’s Disease Scale.

* Correlation is significant at the 0.05 level (two-tailed). ** Correlation is significant at the 0.01 level (two-tailed).

In the full sample, the three subjective memory measures from the PBMI were significantly related to one another, all $r_s \geq .547$, all $p_s < .01$. These relationships also reached significance for each of the three subgroups, all $r_s \geq .484$, all $p_s < .05$.

When examining the relationship that memory self-efficacy shared with depression and fear of dementia, memory self-efficacy negatively correlated with depression in the overall sample, $r = -.437$, $p < .01$; however, this relationship was significant only in the subgroup of participants who were both care providers and first-degree relatives, $r = -.490$, $p < .01$. Fear of AD did not have a significant relationship with memory self-efficacy in any of the subgroups. Perceived change in memory negatively correlated with both depression ($r = -.270$, $p < .05$) and fear of dementia ($r = -.355$, $p < .01$) in the general sample; however, this relationship was not significant among any of the subgroups.

In the full sample, perceived control over memory negatively correlated with both depression ($r = -.473$, $p < .01$) and fear of dementia ($r = -.306$, $p < .05$). The negative correlation between perceived control over memory and depression was also present in care providers ($r = -.787$, $p < .01$) and in participants with both genetic and caregiving relationships ($r = -.458$, $p < .05$).

Increased fear of dementia significantly corresponded with higher depression scores in both first-degree relatives ($r = .635$, $p < .01$) and care providers ($r = .608$, $p < .05$). Because of the lack of significant relationship between these constructs among the subgroup who shared both types of relationships with dementia patients, the significant relationship in the full sample is not as strong as that seen among the other two subgroups ($r = .346$, $p < .01$), although it still reached statistical significance.

Predictors of Subjective Memory in Care Providers and/or First-Degree Relatives

To more directly address the primary hypothesis, we ran multilevel regression analyses that included depression, fear of AD, and group (dummy coded) as predictors in the first model and added the interaction between group and the other predictors in the second model. We examined these models for memory self-efficacy, perceptions of memory change, and perceived control over memory. Inconsistent with our hypothesis, none of the interaction effects reached statistical significance, and adding

the interaction effects resulted in decreased model fit. This result indicates that the relationships between depression, dementia worry, and subjective memory were similar regardless of group membership.

Several main effects did reach significance in the initial models of the multilevel analyses. These results are summarized in Table 3. First, the model that predicted memory self-efficacy was significant, $R^2 = .213$, $F(4, 50) = 3.38$, $p < .05$. CES-D scores were the only significant predictor of memory-self efficacy. The model that predicted self-reported change in memory over time neared but did not reach significance ($R^2 = .157$, $F(4, 50) = 2.33$, $p = .069$), with fear of AD being a statistically significant predictor. Finally, for self-perceived control over memory, the model was significant, $R^2 = .249$, $F(4, 50) = 4.14$, $p < .01$. Again, self-reported depression was the only significant predictor of memory-control beliefs.

Table 3. Summary of Regression Analysis Results Examining Relationships Among Self-Report Measures

Outcome measure	CES-D β	CES-D p	FoADS β	FoADS p	Gp 1 vs. Gps 2 & 3 β	Gp 1 vs. Gps 2 & 3 p	Gp 2 vs. Gps 1 & 3 β	Gp 2 vs. Gps 1 & 3 p	R^2	F	df	p
PBMI MSE	-.434	.002	-.044	.749	.044	.762	-.120	.409	.213	3.38	4, 50	.016
PBMI change	-.163	.248	-.291	.046	-.025	.868	.067	.656	.157	2.33	4, 50	.069
PBMI control	-.421	.002	-.168	.217	-.046	.746	-.010	.945	.249	4.14	4, 50	.006

Note: Significant predictors are shown in boldface. CES-D = Center for Epidemiological Studies-Depression Scale; FoADS = Fear of Alzheimer’s Disease Scale; Gp = group; Gps = groups; PBMI = Personal Beliefs about Memory Instrument; MSE = Memory Self-Efficacy.

Discussion

This study aimed to build upon the previous literature examining the constructs of depression, fear of dementia, and subjective memory in those who share a significant relationship with an individual with dementia, and then to determine if depression and fear of dementia had a different predictive relationship with subjective memory depending upon if the individual was a first-degree relative and/or a care provider. We hypothesized that depression would be a stronger predictor of subjective memory for care providers than for first-degree relatives whereas fear of dementia would be a stronger predictor for first-degree family members than for care providers. We also predicted that these two constructs would be equally strong predictors of subjective memory for individuals who were both first-degree relatives and care providers.

Before examining the relationships among the primary variables in this study, we compared the three groups on the outcome measures. When comparing all of the groups, we found that they were all similar in their depression, fear of AD, and subjective memory, which had not been anticipated. The lack of a significant difference in depression scores contrasts with the findings of Mautsach et al. (2013) and Wang et al. (2015), who found that depression was more prevalent among care providers than among older adults in the general population who may or may not have also been first-degree relatives. Additionally, the lack of a significant difference for fear of AD is inconsistent with the findings of Kessler et al. (2014), who reported that first-degree relatives have increased dementia worry when compared to older adults without this relationship; however, Rahman (2016) did not find a significant difference in dementia worry between those who were and were not first-degree relatives, indicating that there is literature supporting the lack of significance difference in the current study. Finally, for subjective memory, Tsai and colleagues (2006) documented that first-degree relatives had more subjective memory complaints than spouses; however, this was the only study of note to directly compare the level of any of the key constructs across care providers and first-degree relatives. Although the current study did not replicate these findings, some of these differences may have reached statistical significance with a larger sample, especially the levels of dementia worry and depression that were higher but not significantly so in the group of participants who were both first-degree relatives and care providers.

When directly examining our hypothesis regarding the patterns of relationships among these variables, our hypothesis was not strongly supported, as group did not interact with the other predictor variables when examining any of the subjective memory outcome measures. Instead, the regression analyses pointed to depression as the strongest predictor of subjective memory, regardless of group membership; however, the correlational analyses do provide limited support for our postulation that depression would be a more significant predictor of subjective

memory in care providers than in first-degree relatives, as depression was the only significant correlate related to subjective memory in either group. Increased depression scores were associated with lower self-perceptions of control over one's memory in this subgroup. This is perhaps not surprising, given that in the literature, depression has been associated with a decreased sense of control (Bowen et al., 2018; Dellefield & McDougall, 1996). The current study expands these findings by relating them specifically to care providers of dementia patients.

In comparison, fear of AD did not correlate more strongly with subjective memory in the first-degree-relatives group than the care-provider group as we had predicted, as it was not significant in either analysis and the magnitudes of the correlations were highly similar. In the full sample, however, participants who reported greater dementia worry also perceived their memory to have changed more negatively and felt they had less control over their memory. The regression analysis also supported the significant correlation between perceived decline in memory and a concern about developing AD when all older adults in the sample were taken into account. These results support the findings of Bowen et al. (2018), who found a significant relationship between perceived memory decline and an increased fear of dementia in a sample of older adults. Because this study is correlational, it is impossible to know whether self-perceived decline in memory is fueling dementia worry or individuals with a greater fear of dementia are more sensitive to subtle changes in their memory across time. Future studies will be necessary to further examine the direction of this relationship.

Inconsistent with our third hypothesis, depression was the only significant correlate of subjective memory in the group of participants who were both family members and care providers. Similar to care providers, increased depression was related to less perceived control over memory. Additionally, increased depression also correlated with lower memory self-efficacy in this group. This supports the findings of decreased memory self-perceptions in depressed older adults according to Cipolli et al. (1996) and Dellefield and McDougall (1996). Many of these results were mirrored in the overall sample, where increased depression scores related to both lower memory self-efficacy and decreased control beliefs.

Although no connection existed between fear of AD and subjective memory, the correlational analyses revealed significant correlations between depression and fear of dementia, with the relationships reaching significance in the full sample, the care providers, and the first-degree relatives. This relationship raises the possibility that depression is a mediator between subjective memory and fear of dementia. More specifically, fear of dementia may lead to depression, which then influences subjective memory. The regression analyses may have allowed depression to emerge as a significant predictor but not fear of AD, because of potential shared variance between these two constructs. The sizeable but insignificant negative relationship between fear of AD and subjective memory lends support to this possibility. Although the

current study did not have enough power to adequately test this hypothesis, this relationship is one of interest for future studies with larger samples. Additionally, the current study examined only linear relationships among the variables. Future studies will be necessary to determine whether potential colinear or higher-order relationships exist between depression, fear of AD, and subjective memory in these three groups of older adults.

Limitations and Future Directions

Despite several significant results within our sample, an important limitation to recognize is the small sample size overall and particularly within each participant subgroup. This may influence the extent to which these results can be generalized to the larger population of care providers and/or first-degree relatives. With the care provider sample including only 11 individuals, the number of significant results discovered was surprising. Many recruitment strategies aimed at targeting more care providers ultimately resulted in an increase in the “Both” group because many known care providers had a family connection as well, even though that may not have been the individual they were caring for. Future studies should aim to gather a larger sample size overall and across each subgroup to determine the extent to which these findings apply to a broader population of care providers and/or first-degree relatives.

While the subgroups were not statistically different in race, gender, or years of education, the sample in this study is not representative of the overall population in these characteristics. The recruitment strategies used favored White, well-educated, and female participants in their early sixties. If socioeconomic background influences concerns regarding depression, dementia worry, and subjective memory, further examination of these constructs in a more diverse sample will better elucidate the nature of the relationship between these variables in care providers and/or first-degree relatives.

Last, the nature of the care-provider relationship that participants had with individuals with dementia was not broadly defined in the current study. The definition of *care provider* was not explained in detail, so it is likely that certain self-identified care providers were less involved than others. For example, some care providers in this study may not have been living with or providing daily care to the individual with dementia. Less-involved care providers could be less affected by this relationship and therefore have lesser depression, dementia worry, and subjective memory concerns than those who are more involved. Several studies have shown greater depressive affect, fear of dementia, and subjective memory concerns in older adults who share relationships with patients with dementia when compared to the average older adult (Hausmann et al., 2018; Kessler et al., 2014; Mausbach et al., 2013; Wang et al. 2015), but these studies set a minimum level of involvement (e.g., particular tasks the person had to perform or amount of time spent per week providing care) in the patients’ lives

in order to participate. Further research could improve upon the present study by either requiring participants to be daily or residential care providers or by examining if the extent of the relationship has an impact upon their depression, fear of dementia, and subjective memory.

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