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Antecedents of Physical Activity Among Family Caregivers

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Abstract

Objectives—We examined exercise behaviors among family caregivers and the degree to which aspects of the caregiving role influenced exercise behaviors. Understanding factors associated with caregiver physical activity provides practitioners the means to design and tailor interventions to be effective for caregivers.

Methods—Caregivers (N=208) participating in a self-care intervention to promote caregiving skills were surveyed at baseline, prior to training. Measures included caregiver characteristics, care recipient characteristics, attitudes and intentions toward exercise and levels of physical activity.

Results—Mental health variables and self-efficacy for exercise were significantly related to exercise levels in bivariate analyses. Regression analyses revealed that caregiver and care recipient characteristics accounted for a small percentage of the variance in exercise behavior.

Discussion—Caregiver vitality and self-efficacy for exercise were key variables most significantly related to exercise behaviors. Findings suggest that mental health factors and attitudes about exercise may be more important predictors of exercise than caregiving factors.

Keywords

caregivers; physical activity; exercise; self-efficacy; vitality

Introduction

Although family caregiving can be a rewarding and meaningful experience (Farran, 1997), the duties associated with this role are often harmful to the caregiver's physical and mental health. For example, caregivers experience elevated rates of mortality and depression (Schulz & Beach, 1999; Gallagher, Rose, Rivera, Lovett, & Thompson, 1989; Schulz, Visintainer, & Williamson, 1990), and decreased health-related quality of life (Markowitz, Gutterman, Sadik, & Papadopoulos, 2003).

Caregiver health can also be compromised via changes in their own self-care behaviors such as physical activity (Burton, Newsom, Schulz, Hirsch, & German, 1997; Gallant & Connell, 1997, 2003). Despite evidence that physical activity may relieve symptoms of depression and anxiety, improve health-related quality of life (McMurdo & Burnett, 1992; Katula, Blissmer, & McAuley, 1999) and reduce caregiver stress and blood pressure (King, Baumann, O'Sullivan, Wilcox, & Castro, 2002); most caregivers do not engage in recommended physical activity levels (Gallant & Connell, 1997, 2003; Burton, et al., 1997; Pate et al., 1995). Furthermore, older caregivers and those who spend the most time providing care are least likely to be physically active (Burton et al., 1997; Gallant & Connell, 1997).

Barriers to physical activity reported by older adults in general and caregivers in particular include depression (Castro, Wilcox, O'Sullivan, Baumann, & King, 2002), limitations in activities of daily living (Burton et al, 1997), lack of motivation and interest (Hays & Clark, 1999; Satariano, Haight, & Tager, 2000), lack of time (Heesch, Brown, & Blanton, 2000) concern about ability (Lachman et al., 1997), limited social support for maintaining an exercise routine (Janevic & Connell, 2004), and low self-efficacy for self-care in general and physical activity in particular (Gallant & Connell, 1997).

Several theoretical approaches have informed the caregiving literature, including studies that focus on self-care behavior. For example, a stress and coping framework represents the caregiving experience in terms of objective demands and stressors, contextual factors, appraised stress, mediators such as coping and social support, and physical and mental health outcomes (Connell, Janevic, & Gallant; Gallant & Connell, 1998). Using this framework (which incorporates characteristics of both the caregiver and care recipient), physical activity could be viewed as both a mediator of caregiver stress and as a health outcome.

Two additional theoretical frameworks, the Transtheoretical Model (TTM) and Social Cognitive Theory (SCT), both of which have been used extensively in identifying factors associated with exercise among older adults, were used to guide this study. TTM provides a framework for planning the design and content of physical activity interventions (Sarkin, Johnson, Prochaska, & Prochaska, 2001). Social Cognitive Theory (SCT) posits that behavior is determined by expectancies and incentives (Bandura, 1977). The key construct of SCT is self-efficacy, described as the confidence that a person feels about performing a particular activity (Baranowski et al., 1997).

Guided by SCT and TTM, and findings from the caregiver health behavior literature, the present study examined factors associated with physical activity among caregivers. The following research questions were examined: Q₁ Are caregiver, caregiving, and care recipient characteristics significantly associated with caregiver attitudes and intentions related to exercise and caregiver physical activity/exercise? Q₂ Is caregiver mental health associated with caregiver attitudes and intentions related to exercise and caregiver physical activity/exercise? Q₃ Are caregiver attitudes and intentions related to exercise significantly associated with caregiver physical activity/exercise?

Methods

This study was conducted in conjunction with the evaluation of a caregiver skill-building intervention, Powerful Tools for Caregivers (PTC). PTC is a 6-week community based program designed to improve psychological health among caregivers by enhancing caregiver skills, self-confidence, self-esteem, and overall health status. Although physical activity is not a direct focus of PTC, the program was thought to facilitate optimal self-care practices, including physical activity (Boise, Congleton, & Shannon, 2005). Caregivers who enrolled in PTC between April, 2003 and January, 2004 and completed the baseline evaluation were included in this study. Human subject protection was obtained from the University of Illinois at Chicago and Mather LifeWays Institutional Review Boards (# 2003-0498).

Measures

The baseline survey administered as part of the PTC evaluation included caregiver and care recipient demographics, extent of caregiving experiences, and an assessment of caregiving self-efficacy, well-being, and role competence. Additional questions were added to assess caregiver exercise behaviors and attitudes and intentions related to exercise.

Caregiver characteristics included demographics (gender, age, race, educational status, marital status), and self-rated health (excellent, very good, good, fair, and poor). *Caregiving experience* measures included: relationship to care recipient (spouse, adult child or child-in-law, or other); time spent caregiving (years providing care and hours providing assistance each week); use of formal support (from a checklist including adult day services, transportation, and case management); living situation: whether the care recipient lived with the caregiver; and the total number of services performed by the caregiver (from a checklist including personal care, household help, arranging for care, and taking family member to the doctor/other appointments).

Care recipient characteristics, reported by the caregiver, included demographic characteristics (gender, age, race, educational status, and marital status), health and functional status, mental health, and cognitive status. Number and types of chronic conditions were recorded from a checklist of 10 conditions. The SF-36® physical functioning scale was included to assess the care recipient's ability to perform such tasks as climbing stairs, walking distance, and engaging in activities; it is scored on a scale of 0 to 100, with higher scores indicative of better functioning (Cronbach's $\alpha = .84$ to .96, McDowell, 2006). Caregivers completed three measures to assess the care recipients' mental

and cognitive status. A single item created for this study addressing severity of impairment (none, mild, moderate, or severe) was added. Number of problem behaviors was derived from subscales of the Revised Memory and Behavior Problems Checklist (Cronbach's $\alpha = .84$ for the full checklist; and $\alpha = .67$ to $.80$ for the subscales), including if the care recipient asks the same question over and over, loses or misplaces things, engages in behavior that is potentially dangerous to self or others, is aggressive to others verbally, appears sad or depressed, expresses feelings of hopelessness or sadness about the future, or argues, is irritable, and/or complains) (Teri, Truax, Logsdon, Uomoto, Zarit, & Vitaliano, 1992). A third measure of care recipient cognitive impairment was adapted from a cognitive status subscale of objective indicators of primary stressors (Pearlin, Mullan, Sempke, & Skaff, 1990). This measure assesses the care recipient's ability to remember recent events, know what day of the week it is, remember his/her home address, remember words, understand simple instructions, find his/her way around the house, speak sentences, recognize people that s/he knows (Cronbach's $\alpha = .86$ for the subscale).

Caregiver mental health was assessed using two measures: the SF-36® Vitality scale and the 10-item CES-D (Center for Epidemiologic Studies Depression) scale (Irwin, Artin, & Oxman, 1999). The SF-36® Vitality scale is a subscale of the MOS SF-36® (Ware, 1993) and includes 4-items that assess a person's levels of energy and fatigue; it is scored on a scale of 0 to 100 with higher scores associated with more vitality. (Cronbach's $\alpha = .83$ to $.96$, McDowell, 2006). The CES-D includes a 10-item survey of which is scored on a scale of 0-10 with higher scores indicating individuals at risk of depression (Cronbach's $\alpha = .92$ and test-retest reliability ($r = .83$; Irwin, et al., 1999). The recommended cutoff score of 4 or greater was used to indicate presence of depressive symptoms (Irwin et al., 1999).

Caregiver self-perceptions of self-care were assessed using two unpublished scales: "Takes Care of Own Health" and "Makes Time for Self" (Edelman, Fulton, Kuhn, & Kavanagh, 2002). "Takes Care of Own Health" measured responses to three items: "I don't take care of my health as much as I should," "I often feel that I lack the energy to care for my health needs the way I would like to," and "I tend to neglect my personal needs." The five-point scale ranged from *strongly agree* to *strongly disagree* with higher scores indicating taking better care of health. "Makes Time for Self" included responses to "How often were your needs met over the past week for: having time for recreation, having time for yourself, enjoying a hobby, and treating or rewarding yourself." Responses to the 5-point scale ranged from *almost never* to *almost always*, with higher scores indicating better self-care. The researchers demonstrated the internal consistency of the two scales (Cronbach's $\alpha = .86$ and $.88$, respectively) (Edelman, Fulton, Kuhn, & Kavanagh, 2002).

Caregiver attitudes and intentions related to exercise were assessed by decisional balance and self-efficacy for exercise. The Decisional Balance scale (Marcus, Rakowski, & Rossi, 1992) measured positive (PROS) and negative (CONS) perceptions about exercise and has acceptable internal consistency (Cronbach's $\alpha = .89$ for pros and $.83$ for cons, respectively; (J. S. Rossi, personal communication, February 10, 2006). A 3-item scale, based on Lorig et al. (1996) was developed to assess self-efficacy for exercise in the context of caregiving. Specifically, "How confident are you that you can" (a) do regular exercise 3 to 4 times per week, (b) increase your level of physical activity, and (c) exercise without affecting the care

you provide? Responses were on a scale of 1 to 10 with higher scores indicating higher levels of self-efficacy for exercise (Cronbach's $\alpha = .81$ for this study). Self-efficacy was dichotomized to "low" (0-5) or "high" (5.01 – 10) due to the non-normative distribution of the scores.

Caregiver physical activity, the primary dependent measure, was taken from a measure used in the Chronic Disease Self-Management Program which addressed types and intensity of aerobic, flexibility, and resistance training physical activities (Lorig et al., 1996). Respondents indicated which of nine activities they performed along with the duration of the activity per week. Duration was assessed using five response options: none, less than 30 minutes per week, 30 to 60 minutes per week, 1 to 3 hours per week, and more than 3 hours per week. Scoring procedures required taking the median of the response category (e.g. 1 to 3 hours = 2 hours) and then summarizing the median times for a total time in physical activity (e.g. 1 to 3 hours = 2 hours + 30 to 60 minutes = 45 minutes for a total of 2:45). While it is recommended that all items be added for a total time of physical activity per week, activities were separated into three categories; strength/resistance activities, aerobic activities and walking. Given the differences between aerobic and strength training among older adults and the importance of both types of activity to the health of older adults (Prohaska, Belansky, Belza, Buchner, Marshall, McTigue, et al., 2006) aerobic and strength activities were analyzed separately, as was walking, given that it is the most common form of exercise among older adults (Simpson et al., 2003). Total time for activity was dichotomized into two categories: (a) sedentary: < 30 minutes per week or (b) active: 30 minutes per week. Stage of readiness for exercise was assessed based on one question with five response options reflecting each stage (Precontemplation, Contemplation, Preparation, Action, and Maintenance) (Nigg & Riebe, 2002). Stage of readiness for exercise was used to examine the validity of the three activity measures (strength, aerobic and walking minutes). Significant associations were found between the five stages measure with the two levels of activity (sedentary, active) for each of the three activity measures $\chi^2(4, N=206) = 39.9$, strength; 70.6 aerobic; 48.5 walking, respectively).

Analyses

Bivariate analyses were conducted among the independent variables (caregiver characteristics, caregiving experiences, caregiver mental health and self-perceptions of self-care, caregiver attitudes and intentions related to exercise) and between the dependent and independent variables, via correlation matrices. Multivariate analyses, including binary logistic regression for categorical variables, and linear regression for continuous variables were also conducted. Data were analyzed using SPSS 15.0 and an alpha level of $p < .05$ was used in all tests of statistical significance.

Results

A total of 405 eligible caregivers enrolled in PTC during the study period. Of those, 226 (56%) returned a baseline survey instrument, of which 18 (8%) were eliminated due to missing data on key outcome measures. No significant demographic or caregiving

differences were discovered between those with complete and incomplete data. Missing data was minimal, averaging less than 5% for any variable.

Caregiver Characteristics, Mental Health and Self-perceptions of self-care

The mean age of the caregivers was 60.8 years. The majority (90%) were female, White (81%), and married (70%) (Table 1). Almost half (48%) had a college degree and 80% reported their health to be excellent, very good, or good and 45 percent of the care givers were employed either part or full time. Caregiver mean SF-36® Vitality scores were 48.1 (of 100), comparable to 50.2, the population norm for females ages 55-64 (Ware, 1993). Overall, caregivers reported relatively low levels of self-perceptions of self-care, with scores on the “Takes Care of Own Health” and “Makes Time for Self” scales of 2.82 and 2.64 respectively. CES-D scores indicated 60% of caregivers reported symptoms of depression which is comparable to other caregiver samples (Gray, 2003). Caregiver assistance was extensive; 31% had been providing care for 6 or more years; and 32% provide care 40 hours or more per week.

Caregiving Experiences—All caregivers were related to the care recipient with just over half (54%) adult children/in-law, and 33% were spouses. About one half of the caregivers (51%) lived with the care recipient (Table 1). Caregiving was extensive, as 32% reported providing care more than 40 hours per week and almost one third having provided care for six or more years. Co-residing status was approximately equal with 51% reporting living with the care recipient. Finally, caregivers reported providing an average of 8.2 services, with adult day programs, help with insurance forms, legal advice or financial planning and case management services being the three most common services reported.

Care Recipient Characteristics—The mean age of care recipients was 82 years; 56% were female, and a majority were White (83%) (Table 1). The majority (87%) of caregivers reported that the care recipient was memory impaired and almost half reported a diagnosis of Alzheimer’s Disease or dementia. Care recipients had on average 2.3 chronic conditions (range 0-6) and 2.6 problem behaviors (range 0-7) by the care recipient. The care recipient’s average assessed SF-36® physical functioning score was 28.4, indicating they were limited in performing most activities.

Physical activity /Attitudes toward exercise—The mean number of minutes of exercise reported for strength training, aerobic activity and walking was 9.4, 33.0, and 20.4 respectively (Table 2). Few caregivers reported exercising for 30 minutes or more per week with 16 % reporting strength training, 39% walking for exercise and 55% doing any aerobic exercise for 30 minutes or more. Responses to self-efficacy for exercise were in the moderate range (5.7 to 6.6), with a mean score of 6.0 across the three items (range 0-10; SD 2.5). Decisional balance scores indicated that caregivers believed the benefits of exercise outweighed the drawbacks ($t(191) = 26.1, p < .001$) (Decisional balance pros mean= 17.8 (SD: 5.5) and decisional balance cons: mean: 7.0, (SD 3.0)).

Bivariate Correlates of Physical Activity

Overall, few caregiver, caregiving, and care recipient characteristics were significantly related to the three exercise outcome scales -- strength training, walking, and aerobic minutes. (Table 3). However, caregiver race ($p = .02$) and self-rated health ($p = .002$) along with care recipient race ($p < .01$) and total number of chronic conditions ($p = .03$) were significantly related to strength training minutes. White caregivers, those in better health, and those providing care to a White care recipient with fewer chronic conditions were more likely to engage in strength training.

In terms of caregiver attitudes and intentions related to physical activity, caregiver age and education were significantly associated with the caregiver's decisional balance pros score, ($p < .01$; and $p < .01$) respectively. Older caregivers and those with more education were more likely to have higher decisional balance pros scores. Caregiver age and self-rated health were significantly associated with self-efficacy for exercise ($p = .03$; and $p = .03$). Older caregivers and those in better health were more likely to have higher self-efficacy for exercise.

Relationship to care recipient and care recipient living situation were also significantly associated with the decisional balance pros score, ($p < .01$; and $p < .01$, respectively). Caregivers providing care to someone other than a parent or spouse were more likely to report higher decisional balance pros. Contrary to expectations, if the care recipient lived with the caregiver, the caregiver was more likely to report higher decisional balance pros scores. Relationship to care recipient, ($p < .01$), and hours per week spent caregiving were significantly related to self-efficacy for exercise, ($p < .01$). Spouse caregivers and those who spent more than 40 hours per week providing care were more likely to have lower self-efficacy for exercise scores.

Care recipient gender and marital status were significantly related to decisional balance pros scores and to self-efficacy for exercise ($p < .01$). Caregivers providing care to males were more likely to have higher decisional balance pros scores and self-efficacy for exercise. Caregivers providing care to a care recipient who was neither married nor widowed were more likely to report higher decisional balance pros scores but lower self-efficacy for exercise.

Caregiver vitality was significantly and positively correlated with all three types of exercise, strength training, ($p < .01$), walking, ($p < .01$), aerobic, ($p < .01$) and self-efficacy for exercise. Compared to caregivers reporting low levels of vitality, those with higher vitality scores were more likely to report engaging in all three types of exercise; strength training, ($p < .01$), walking, ($p < .01$) and aerobic, ($p < .01$). "Makes Time for Self" also showed a significant, positive relationship with walking minutes ($p = .02$). "Takes Care of Own Health" had a significant, negative relationship with decisional balance cons ($p < .01$). Similarly, caregivers who were depressed had higher decisional balance cons scores ($p = .04$). "Makes Time for Self" had a significant, positive relationship with self-efficacy for exercise. Depressive symptoms were not significantly related to any type of exercise.

Self-efficacy for exercise was also significantly and positively related to the three types of exercise: strength training, ($p < .01$), walking, ($p < .01$), and aerobics, ($p < .01$). Caregivers with higher self-efficacy for exercise were more likely to engage in all types of exercise, compared to caregivers with lower self-efficacy for exercise. Finally, those with higher scores on the decisional balance pros scale were more likely to engage in strength training ($p = .03$).

Multiple Regression

Logistic binomial regression analyses were completed using a model which included only those variables which were significant at the bivariate level (Table 4). Higher SF-36® Vitality scores were significantly related to more minutes of strength training ($p = .04$) and walking ($p = .01$). Higher scores on the “Takes Care of Own Health” scale were significantly ($p = .01$) related to increased aerobic minutes whereas higher self-efficacy for exercise scores were significantly related to increased walking and aerobic minutes ($p = .02$ for both forms of exercise). Persons with higher self-efficacy were more than twice as likely to engage in more than 30 minutes per week of both walking and aerobic forms of exercise.

Linear and logistic regression models were also tested using caregiver attitudes and intentions related to physical activity as the dependent variables, and using only those variables which were significant at the bivariate level as independent variables. There were no significant findings in the models (data not shown).

Discussion

Consistent with past research, the majority of caregivers in this study (60%) were not engaged in consistent, regular physical activity. Less than 24% ($N=49$) of caregivers met or exceeded current recommendations for regular physical activity, that is, 30 minutes per day, five days per week (Pate et al., 1995). This low level of physical activity was also reported by King and Brassington (1997), who found that only 6.7% of female caregivers and 17.6% of male caregivers engaged in regular exercise three or more times per week for 30 minutes at a time.

Few caregiver or care recipient characteristics were significantly associated with strength training, walking, or aerobic activities. On the other hand, caregiver mental health and self-perceptions of self-care were strongly associated with caregiver physical activity. Clearly, health status and ability to have control over one's time is associated with the ability to perform physical activity in this sample. Finally, self-efficacy for exercise was strongly related to all types of physical activity, consistent with the literature that demonstrates the power of self-efficacy in predicting exercise outcomes among older adults (Allison & Keller, 2004).

Results indicate that caregiver and care recipient characteristics and experiences were associated with attitudes and intentions to exercise. For example, care recipient gender and marital status were both associated with self-efficacy and decisional balance pros scores. Caregiver vitality was positively associated with self-efficacy for exercise. Similarly, both vitality and “Takes Care of Own Health” were positively related to all exercise measures.

Findings suggest that caregiver mental health and perceptions of self-care, potentially modifiable characteristics, are more important indicators of physical activity than caregiver characteristics or the caregiving context.

Results from this study also demonstrate the need to emphasize positive aspects of exercise for program initiation. With 48% of the sample in the contemplation or preparation stage for exercise, it appears that caregivers would be receptive to encouragement and/or practical assistance or coaching to identify suitable, convenient programs.

This study did not find hypothesized associations between aspects of the caregiving experience and caregiver exercise behavior. The results seem to be inconsistent with theories posed by some researchers that aspects of the caregiving experience (e.g. burden) affect a person's ability to engage in positive health behaviors (Gallant & Connell, 1997; Burton et al, 1997; Connell, 1994; Connell & Gallant, 1999). However, the results from self-perceptions of self-care are consistent with Miller, McFall, and Montgomery (quoted in Gallant & Connell, 1997) that "Caregivers who feel more confident about their ability to take care of themselves and their spouse are less likely to report negative health behavior change, supporting the importance of self-efficacy as a psychosocial predictor of caregiver outcomes" (p. 390).

Results of this study advance caregiver and physical activity research with respect to identifying factors associated with caregiver exercise and suggest important methods to utilize in future research, such as the need for longitudinal data and examination of different types of exercise. In summary, this study demonstrated that components of caregiver well-being as well as self-efficacy for exercise are important variables in explaining caregiver exercise behaviors.

Several factors limit the generalizability of findings. This was a cross-sectional survey. Thus, it was not possible to examine causal relationships over time. This sample was healthy, active, well-educated, and had limited minority representation, limiting generalizability. Future studies would benefit from more diverse samples that would enable health professionals to design culturally sensitive programs promoting caregiver health. Assessment of constructs such as objective burden or subjective burden, was not possible but may have more appropriately measured the caregiving experience. Proxy measures such as "Makes Time for Self" and "Takes Care of Own Health" assessed some level of burden, but did not specifically measure burden associated with caregiving. Transformation of exercise minutes from the Lorig et al. (1996) scale was not an exact measure of exercise frequency or duration. The Lorig et al. (1996) scale used an ordinal approach to determine time spent in physical activity per week. This methodology could potentially under- or overestimate the actual duration of physical activity, compared to continuous variables. Finally, the survey response rate of 56% was not as high as anticipated, though not unusual in a caregiving population. Many PTC non-respondents may have simply felt too busy to respond to surveys, hence it is possible that the most burdened caregivers may not have completed surveys.

Identifying characteristics of caregivers who do and do not exercise is critical for developing appropriate health education efforts. Findings from this study affirm the importance of attitudes and intentions and their relationship to health behaviors. It is essential to recognize the unique situation of caregivers and to include motivational components in future health promotion efforts. Improving caregivers' perceptions and attitudes about physical activity, especially self-efficacy for exercise, is vital for increasing exercise adoption.

Diverse caregiver populations also need to be studied. Most caregivers studies are comprised of White women and results cannot be generalized to other populations. Dementia caregivers should be given special attention as the prevalence of Alzheimer's disease is expected to increase, and dementia caregivers are affected more negatively by caregiving than non-dementia caregivers (MetLife Mature Market Institute®, 2006).

Despite limitations, this study obtained important evidence about caregiver physical activity. Most factors pertaining to the caregiving situation were not significantly related to exercise. Rather, caregiver vitality, how much caregivers reported taking care of their own health, and self-efficacy for exercise were key variables that explained exercise behaviors. These findings indicate that mental health factors and attitudes and intentions related to self-care and exercise, which are mutable factors, may be more important predictors of exercise than factors intrinsic to the caregiving role. The results of this study advance what is known about caregiver health behaviors, and identify critical variables to include in future research.

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Table 1

Caregiver characteristics, caregiver mental health, caregiving experience, and care recipient characteristics, (N=208)

Caregiver Characteristics & Mental Health	<i>n</i>	(%)	<i>M</i>	<i>SD</i>
Female	187	(90)		
Age in years			60.8	12.4
Married	145	(70)		
College graduate or above	100	(48)		
White, non-Hispanic	169	(81)		
Self-rated health (excellent/very good/good)	166	(80)		
Work status				
Full or part-time	94	(45)		
Not working/Never worked	113	(54)		
SF36® Vitality			48.1	20.3
Takes Care of Own Health ^a			2.8	1.0
Makes Time for Self ^a			2.6	0.8
CES-D 4 (depressed)	123	(60)		
CES-D <4 (not depressed)	83	(40)		
Caregiving Experience				
Relationship to care recipient				
Adult child or in-law	113	(54)		
Spouse	69	(33)		
Time spent caregiving				
2-5 years	96	(46)		
6 or more years	65	(31)		
Hours per week spent providing care				
More than 40 hours per week	56	(32)		
10-40 hours per week	81	(46)		
Use of formal supports (meals, etc.) ^b				
Uses 0 or 1 support	90	(43)		
Uses 2 or more supports	118	(57)		
Living situation				
Lives with "me"	98	(51)		
Lives with other	94	(49)		
Services performed (personal care, etc.) ^c			8.2	2.0
Care recipient characteristics				
Female				
Male	91	(44)		
Age in years			82.0	8.8
Marital status				
Married	85	(41)		

Caregiver Characteristics & Mental Health	<i>n</i>	(%)	<i>M</i>	<i>SD</i>
Widowed	107	(51)		
Education level				
High school graduate or less	105	(51)		
White, non-Hispanic	171	(83)		
SF-36® Physical functioning score (0-100)			28.4	28.6
Memory impairment	181	(87)		
Alzheimer's disease/Dementia	101	(49)		
Cognitive impairment measure			2.0	0.9
Number of problem behaviors (0-7)			2.6	1.9
Number of Chronic conditions (0-6)			2.3	1.3

Table 2

Exercise frequency and attitudes and intentions about exercise (N=208)

Caregiver physical activity measures	Mean	SD	<u><30 min/week</u>		<u>30 min/week</u>	
			<i>n</i>	(%)	<i>n</i>	(%)
Strength training	9.4	25.7	65	(79)	34	(16)
Walking	20.4	35.8	22	(59)	80	(39)
Total aerobic ^a	33.0	49.9	1	(44)	114	(55)

Caregiver attitudes and intentions related to exercise		<i>n</i>	(%)
Self-efficacy for exercise			
0-5.00		71	(34)
5.01-10		118	(57)
Decisional balance			
Pros (mean)	17.8	5.5	
Cons (mean)	7.0	3.0	

^aTotal aerobic includes: walking, swimming, biking or other aerobic equipment

Table 3

Bivariate correlation coefficients (N=208)

Variable	Caregiver physical activity measures			Caregiver attitudes and intentions related to physical activity		
	Strength	Walking	Aerobic	Decisional balance PROS	Decisional balance CONS	Self-efficacy for exercise
Caregiver characteristics						
Caregiver age ^c	.01	.13	.10	-.26	-.07	-.16
Caregiver education ^a	.05	.01	.05	.30	-.06	.17
Caregiver race/ethnicity ^a	.15	.05	.04	-.02	-.12	-.09
Caregiver self-rated health ^a	-.20	-.04	-.004	-.01	.10	-.16
Caregiving experience						
Relationship to care recipient ^a	.12	-.06	-.05	.30	.08	.22
Hours/week spent caregiving ^a	.02	.04	-.01	.12	-.08	.25
Living situation (me v. other) ^a	-.07	.07	.08	-.20	.04	-.07
Care recipient characteristics						
Care recipient gender ^a	-.05	.08	.04	-.25	-.06	-.23
Care recipient marital status ^a	.04	.02	.001	.23	.04	.21
Care recipient race/ethnicity	.17	.10	.05	-.04	-.09	-.01
Memory ^a	-.09	-.03	-.07	.10	.12	-.06
Caregiver mental health and self-perceptions of self-care						
SF-36 Vitality score	.27	.32	.25	.01	-.09	.25
Depression	-.10	-.12	-.12	.07	.15	-.13
Takes Care of Own Health	.29	.23	.28	-.05	-.21	.12
Makes Time for Self	.14	.17	.19	.02	-.06	.19
Caregiver attitudes/intentions						
Decisional balance PROS	.16	.01	.08	-	.08	.20
Self-efficacy for exercise	.20	.26	.24	.20	-.08	-

Bold = significant $p < .05$

Bold, italics = significant $p < .01$

^a categorical variable

Table 4

Multivariate binomial regression results for physical activity measures (N=208)

Variable	Strength			Walking					
	β	SE	OR	Aerobic			β	SE	OR
Caregiver race	0.90	1.20	2.46	-0.87	1.20	0.42	0.51	0.95	1.67
Caregiver health ^a	-	-		0.61	0.50	1.84	0.92	0.47	2.51
Care recipient race	0.79	1.53	2.20	1.62	1.27	5.05	0.04	0.97	1.04
Care recipient total chronic conditions	-0.88	0.53	0.41	-0.19	0.37	0.83	-0.11	0.36	0.90
SF-36® Vitality	0.03	0.02	1.03	0.03	0.01	1.03	0.02	0.01	1.02
Takes care of own health	0.45	0.25	1.57	0.25	0.21	1.28	0.53	0.22	1.70
Makes time for self	-0.11	0.35	0.90	-0.05	0.27	0.95	-0.02	0.25	0.98
Decisional balance PROS	0.12	0.06	1.13	-0.01	0.03	0.99	0.01	0.03	1.01
Self-efficacy for exercise	0.69	0.56	1.99	0.97	0.41	2.64	0.89	0.37	2.44

* Bold = significant, $p < .05$

^a Caregiver health not included in strength model due to collinearity. There were no caregivers reporting poor health who also engaged in strength training