

# The Effects of Adult Day Services on Family Caregivers' Daily Stress, Affect, and Health: Outcomes From the Daily Stress and Health (DaSH) Study

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**Purpose:** We examine the effects of use of adult day service (ADS) by caregivers of individuals with dementia (IWD) on daily stressors, affect, and health symptoms. Participants were interviewed for 8 consecutive days. On some days, the IWD attended an ADS program and on the other days caregivers provide most or all of the care at home. **Methods:** Participants were 173 family caregivers of IWDs using an ADS program. Daily telephone interviews assessed care-related stressors, noncare stressors, positive events, affect, and health symptoms. Multilevel models with data nested within persons were used to examine effects of ADS use on daily stressor exposure, affect, and health symptoms. **Results:** Caregivers had lower exposure to care-related stressors on ADS days, more positive experiences, and more noncare stressors. ADS use lowered anger and reduced the impact of noncare stressors on depressive symptoms. **Implications:** The findings demonstrate that stressors on caregivers are partly lowered, and affect is improved on ADS days, which may provide protection against the effects of chronic stress associated with caregiving.

**Key Words:** Caregivers, Daily stress, Adult day services

levels of care-related stressors on a daily basis, which have adverse effects on their health and emotional well-being (Aneshensel, Pearlin, Mullen, Zarit, & Whitlatch, 1995). Prior studies suggest that use of adult day services (ADS) and other types of respite care reduce the exposure that caregivers have to care-related stressors by as much as 40% (Zarit, Kim, Femia, Almeida, Savla, & Molenaar, 2011). This present study extends this work by assessing on a new sample the effects of ADS days and daily stressors and their interactive effects on daily affect and health symptoms. Specifically, interviews were conducted with caregivers of IWDs over eight consecutive days. On some of those days, the IWD attended ADS, and on some other days, the IWD did not attend ADS. We compared whether caregivers' exposure to care-related stressors is lower on ADS than on non-ADS days and whether lower exposure to stressors is associated with improved daily affect and health symptoms. We also considered caregivers' exposure to daily stressors not related directly to providing care and to positive events on ADS and non-ADS days and their associations with daily affect and health symptoms. Prior research has shown that the impact of daily stressors may be greatest on the day those events occurred (Almeida, 2005).

Family caregivers, particularly those assisting an individual with dementia (IWD), encounter high





not attend ADS. The resulting sample was 173 people (86.5% of eligible participants).

### Procedures

ADS programs were identified through their regional and state associations in five areas: Northern and Central New Jersey, the greater Philadelphia area, the greater Pittsburgh area, Northern Virginia, and Denver, Colorado. Meetings were held to explain the study to representatives of the ADS programs. Programs that agreed to participate in the study received fliers for potential participants, which contained information about the study and the e-mail and telephone number of the study's research coordinator. We also placed announcements in newsletters of participating programs and gave reminders and study updates to staff. A total of 57 programs provided referrals over a 3-year recruitment period.

Family caregivers who contacted the research coordinator were told about the study and screened for eligibility. Eligible caregivers were scheduled for an initial interview, which was nearly always conducted in the caregiver's home, although phone interviews were used in a few instances. The interviewer obtained signed consent and gathered sociodemographic information and baseline data on a number of measures. The Penn State Survey Research Center conducted the daily interviews. Calls took place in the evenings. Participants received payments for completing the initial interview and the eight daily interviews.

### Measures

*Type of Day.*—Type of day, that is, whether the IWD used ADS (ADS = 1) or did not use ADS (ADS = 0), was confirmed at the end of each day during the telephone interview.

*Daily Stressors.*—We gathered information on two types of daily stressors: care-related stressors and stressors not involving daily care.

*Care-related Stressors.*—We focused on BPSD, which are found by caregivers as the most challenging and upsetting in their daily care (Teri, 1997). The daily record of behavior (DRB), which was designed specifically for use in a daily interview format (Fauth, Zarit, Femia, Hofer, & Stephens, 2006; Femia, Zarit, Stephens, & Greene, 2007), measured BPSD. The version of the DRB in this

study includes 19 items drawn from six behavioral categories: resistance to help with activities of daily living (ADL), restless behaviors, reality problems, depressive behaviors, disruptive behaviors, and memory-related behaviors. Up to three other care-related behavioral events could be added by caregivers.

To assist caregivers in reporting daily behavior problems, the day is divided up into four periods: waking to 9:00 a.m., 9:00 a.m. to 4:00 p.m., 4:00 p.m. to bedtime, and overnight. This time frame corresponded to the modal period (9:00 a.m. to 4:00 p.m.) during which caregivers use ADS. For each period, caregivers were asked if a behavior had occurred, and if yes, to rate the subjective severity of the behavior along a 5-point scale ranging from 1 (*not at all stressful*) to 5 (*very stressful*). If the behavior occurred more than once during the time period, caregivers reported on the most stressful occurrence. We summed the total number of behaviors reported each day and computed the mean score for subjective severity for all occurrences.

The DRB was administered during the eight daily phone interviews. Caregivers reported IWDs' behaviors for the previous 24 hr from the time of the call. For the purposes of analyses, we constructed complete days from the reports. Prior work indicates adequate psychometric properties of the DRB (Fauth et al., 2006). Internal reliability for BPSD occurrence in the current sample was high ( $\alpha = 0.90$ ).

*Noncare Stressors.*—Noncare daily stressors were assessed through the Daily Inventory of Stressful Events (DISE, Almeida, 1998; Almeida, Wethington, & Kessler, 2002). Caregivers reported on the occurrence of eight items over the previous 24-hr period. They were instructed to report events they experienced as stressful other than events encountered while assisting their IWD. Items included arguments with other people, avoiding an argument, stressors affecting friends or family, health-related issues, financial issues, work-related events, or any other incidents. Caregivers rated the subjective severity of each event on a 5-point scale ranging from 1 (*not at all stressful*) to 5 (*very stressful*). We summed the number of events reported each day and computed the mean subjective severity for all daily events.

*Positive Events.*—Using items from the DISE (Almeida, 1998), we asked if any of five positive

events had occurred in the past day: share a good laugh with someone, a positive experience at home, a positive experience with a close friend or relative, a positive experience at work, and any other positive experience. The number of positive events that occurred each day was summed.

### Daily Affect and Health Symptoms

**Daily Affect.**—We measured daily psychological distress using an adapted inventory from the Non-Specific Psychological Distress Scale (Kessler et al., 2002; Mroczek & Kolarz, 1998). The 22-item scale assesses four affective domains relevant to caregivers: anxiety symptoms, anger, depressive symptoms, and positive affect. Positive affect was supplemented with two items (interested, attentive) from the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) to create a broader assessment of positive emotions. Respondents reported the frequency of each emotion over the past day along a 5-point scale from 1 (*none of the day*) to 5 (*all day*).

A factor analysis was performed that replicated the four affective domains. Four items were dropped because they did not load on any scale or loaded approximately equally on two or more domains. The final scales included the following: anxiety symptoms (three items,  $\alpha = 0.84$ ), anger (four items,  $\alpha = 0.83$ ), depressive symptoms (four items,  $\alpha = 0.84$ ), and positive affect (nine items,  $\alpha = 0.92$ ). The four scales represent dimensions usually included in models of affect: high-activation negative emotion (anger), low-activation negative emotion (depressive symptoms), trait-related negative emotion (anxiety symptoms), and positive affect (Watson & Tellegen, 1985).

**Daily Health Symptoms.**—Daily health symptoms were assessed using an adapted version of Larsen and Kasimatis' symptom checklist (Larsen & Kasimatis, 1991). We omitted items that overlapped with the psychological distress scale (e.g., "urge to cry"). The six clusters of symptoms were pain, gastrointestinal symptoms, upper respiratory symptoms, cardiovascular, fatigue, and symptoms not covered in the other items. Women were asked two additional items related to menopausal symptoms. Respondents indicated how often they experienced each symptom in the past day, using a 5-point scale that ranged between 1 (*none of the day*) and 5 (*all day*). Mean scores were calculated.

Internal reliability for the final scale was low ( $\alpha = 0.60$ ), which is typical of inventories of events, which occur independently of one another (Bollen & Lennox, 1991).

**Covariates.**—We included variables likely to affect levels of stressors and daily affect and health symptoms. Sociodemographic variables included age, gender, and employment status of caregivers. We also considered two variables representing the caregiving trajectory. First, we assessed duration of caregiving as reported by caregivers. Second, we assessed the extent of IWD's disability in activities of daily living (ADL). Caregivers were asked about the amount of assistance their IWD needed to perform 13 ADLs. Items were drawn from scales assessing personal ADL (Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963) and instrumental ADL (Lawton & Brody, 1969). Responses ranged from 1, indicating that the IWD could do the activity by him/herself and needs no help, to 4, indicating that the IWD is unable to do the activity by him/herself and needs help all the time. Mean scores of the items were calculated. Finally, we included total number of days the IWD used ADS during the eight interview days as a control variable.

### Analysis

We employed two-level multilevel models (SAS PROC MIXED) to examine daily diary data nested within persons (Littell, Miliken, Stroup, & Wolfinger, 1996). First, to address hypotheses 1 and 2 regarding effects of ADS on daily experiences, we modeled care-related stressors, noncare stressors, and positive events for  $d$ th day in the  $i$ th person as follows:

$$\text{Experience}_{di} = \beta_{0i} + \beta_{1i}(\text{ADS}_{di}) + e_{di}$$

Daily experience is a function of an intercept ( $\beta_{0i}$ , the average score on non-ADS days), ADS use ( $\beta_{1i}$ , the difference in daily experiences on ADS days compared with non-ADS days), and the person-specific deviations from the intercept ( $e_{di}$ ) at Level 1 (within person). At Level 2, we included six (between person) covariates: caregiver's age, gender, employment status, duration of care, IWD ADL impairment, and number of ADS days (out of 8 days).

To examine effects of ADS use and daily experiences on daily affect and health symptoms

(hypothesis 3), we parameterized the models of five daily well-being scores (positive affect, depressive symptoms, anger, anxiety symptoms, and health symptoms) for  $d$ th day in the  $i$ th person at Level 1 (within person):

$$\begin{aligned} \text{Well-being}_{di} = & \beta_{0i} + \beta_{1i}(\text{ADS}_{di}) \\ & + \beta_{2i}(\text{care-related stressor}_{di}) \\ & + \beta_{3i}(\text{noncare stressor}_{di}) \\ & + \beta_{4i}(\text{positive event}_{di}) + \beta_{5i}(\text{ADS}_{di}) \\ & \times (\text{care-related stressor}_{di}) \\ & + \beta_{6i}(\text{ADS}_{di}) \times (\text{noncare stressor}_{di}) \\ & + \beta_{7i}(\text{ADS}_{di}) \times (\text{positive event}_{di}) + e_{di} \end{aligned}$$

We first included ADS use ( $\beta_{1i}$ ) to examine differences in the well-being measures by type of day and then added occurrence scores for three daily experiences ( $\beta_{2i}$ ,  $\beta_{3i}$ , and  $\beta_{4i}$ ), which were centered at person-mean to represent the within-person effects (Hoffman & Stawski, 2009). To test buffering effects of ADS use on daily well-being (hypothesis 4), we computed interactions between ADS use and daily experiences ( $\beta_{5i}$ ,  $\beta_{6i}$ , and  $\beta_{7i}$ ). At Level 2 (between-person), we controlled six covariates (i.e., caregiver's age, gender, and employment status, duration of care, IWD's ADL impairment, and number of ADS days) as well as the person-mean levels of the three daily experiences.

## Results

Caregivers completed 98% of all daily interviews. An average of 4.09 interviews (standard deviation [ $SD$ ] = 1.46) were on ADS days and 3.77 interviews ( $SD$  = 1.43) were on non-ADS days. Characteristics of caregivers and IWDs are shown in Table 1.

Next, we tested differences in daily experiences, affect, and health symptoms on ADS and non-ADS days. Table 2 shows within-person means for each variable, intraclass correlations, and the effect of type of day. Multilevel models indicated that caregivers reported significantly lower care-related stressors on ADS days compared with non-ADS days (Standardized beta  $B$  = -1.12,  $p$  < .001). Subjective severity of care-related stressors did not differ across type of day. Analysis by what period of the day stressors occurred (data not shown in tables) indicated that stressor exposure was lower mainly during the time the IWD was at ADS. Noncare stressors were significantly higher on ADS days ( $B$  = 0.15,  $p$  < .01), as were positive events ( $B$  = 0.15,  $p$  < .01). Severity of noncare stressors

Table 1. Characteristics of Caregivers and Individuals with Dementia

	M	SD	Range
CG's characteristics			
Age	61.97	10.66	39–89
Education <sup>a</sup>	4.46	1.20	1–6
Income <sup>b</sup>	6.68	3.10	1–11
Duration of care (month)	61.12	45.55	3–264
Female (yes = 1)	0.87	0.34	0–1
Relation to IWD			
Spouse (yes = 1)	0.38	0.49	0–1
Child (yes = 1)	0.58	0.49	0–1
Others (yes = 1)	0.04	0.20	0–1
White (yes = 1)	0.73	0.45	0–1
Married (yes = 1)	0.69	0.46	0–1
Employed (yes = 1)	0.42	0.49	0–1
Number of daily interview days	7.86	0.65	3–8
Number of ADS days	4.09	1.46	1–6
Number of non-ADS days	3.77	1.43	2–7
IWD's characteristics			
Age	82.02	8.34	57–100
Female (yes = 1)	0.60	0.49	0–1
ADL impairment <sup>c</sup>	3.06	0.49	2–4

Notes: Participant  $N$  = 173; ADS = adult day services; CG = caregiver; IWD = individual with dementia.

<sup>a</sup>Rated on a 6-point scale ranging from 1 (*less than high school*) to 6 (*post college degree*).

<sup>b</sup>Rated on a 11-point scale ranging from 1 (*less than \$10,000*) to 11 (*\$100,000 or over*).

<sup>c</sup>Mean scores of 13 items rated on a 4-point scale ranging from 1 (*does not need help*) to 4 (*cannot do without help*); Cronbach's  $\alpha$  = 0.83.

did not differ by type of day. We further examined which noncare stressors increased on ADS days (data not shown in tables). Caregivers reported significantly more events affecting a friend or relative other than the IWD on ADS days than on non-ADS days (19% compared with 11%) and more work-related events on ADS days than on non-ADS days (11% compared with 4%). Analysis of positive events indicated that the difference among type of days was due to significant increases in caregivers' reports of positive experiences at work on ADS days compared with non-ADS days (24% vs 9%) and sharing a good laugh with someone (73% compared with 68%).

Turning to daily affect and health symptoms (Table 2), type of day had significant main effects for anger ( $B$  = -0.06,  $p$  < .05) and health symptoms ( $B$  = 0.03,  $p$  < .01). Anger was lower on ADS than on non-ADS days and health symptoms were higher.

We then constructed models that examined type of day and the measures of occurrence of care-related stressors, noncare stressors, and positive events as time-varying covariates on affect and









