

# A telehealth behavioral coaching intervention for neurocognitive disorder family carers

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**Objectives:** This study examined the differential impact of two telehealth programs for women caring for an older adult with a neurocognitive disorder. Outcomes examined were depressive symptoms, upset following disruptive behaviors, anxious and angry mood states, and caregiving self-efficacy.

**Methods:** Women cohabitating with a family member diagnosed with a neurocognitive disorder were assigned via random allocation to either of the following: (1) a 14-week behavioral intervention using video instructional materials, workbook and telephone coaching in behavioral management, pleasant events scheduling, and relaxation or (2) a basic education guide and telephone support comparison condition. Telephone assessments were conducted by interviewers blind to treatment condition at pre-intervention, post-intervention, and 6 months following intervention.

**Results:** For those providing in-home care at post-treatment, depressive symptoms, upset following disruptive behaviors, and negative mood states were statistically lower in the behavioral coaching condition than in the basic education and support condition. Reliable change index analyses for Beck Depression Inventory II scores favored the behavioral coaching condition. Caregiving self-efficacy scores for obtaining respite and for managing patient behavioral disturbances were significantly higher in the coaching condition. Effect sizes were moderate but not maintained at the 6-month follow-up.

**Conclusions:** This study provides some initial evidence for the efficacy of a telehealth behavioral coaching intervention compared with basic education and telephone support. Carers' abilities to maintain strategy use during progressive disorders such as Alzheimer's disease likely require longer intervention contact than provided in the current study. Dementia carers, including those living in rural areas, can benefit from accessible and empirically supported interventions that can be easily disseminated across distances at modest cost. © 2015 The Authors. *International Journal of Geriatric Psychiatry* Published by John Wiley & Sons, Ltd.

**Key words:** family caregiving; neurocognitive disorders; behavioral treatments; depression

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## Introduction

Family carers of individuals with Alzheimer's disease or another progressive neurocognitive disorder (NCD) experience increased risk for distress, depression, and negative health outcomes (Schulz and Monin, 2012; Mausbach *et al.*, 2013; Adelman *et al.*, 2014; Joling *et al.*, 2014). NCD carers can reduce distress and improve functioning using psychologically derived treatments that meet evidence-based criteria (Mittelman *et al.*, 2004; Van Mierlo *et al.*, 2012),

including skills training interventions utilizing cognitive-behavioral principles and strategies (Coon *et al.*, 2003).

Community-based programs are often inaccessible or burdensome because of the care recipient's need for ongoing supervision. Promising interventions often involve psychoeducational groups requiring travel to the program (Losada *et al.*, 2011; Savundranayagam *et al.*, 2011; Kurz *et al.*, 2013). Rural areas have additional challenges of a sparse population, few agencies with trained professionals, and uncoordinated services

(Buckwalter *et al.*, 2002). In-home programs are important and can affect a number of care outcomes (Huang *et al.*, 2003; Gitlin *et al.*, 2003a, 2003b; Kuo *et al.*, 2013) but also include challenges such as cost of individualized services and staff travel.

The current study sought to reduce these barriers through evaluating telehealth interventions for emotionally distressed female NCD family carers. We hypothesized that, compared with basic education and telephone support, a video instruction and telephone coaching condition would be more efficacious in reducing distress following problematic patient behaviors, depression, and negative mood, as well as increasing caregiving self-efficacy.

## Methods

### Procedure and sample

A single, blind, randomized controlled design was used, and all participants provided informed consent; the protocol was approved and followed ethical standards of the institutional review board of the principal investigator's university (IRB# 991123S).

Prospective participants were screened by telephone, with the following criteria: (1) female aged 30 + years; (2) responsible for a cohabitating family member diagnosed with an NCD; (3)  $\geq 2$  upsetting care-recipient memory/behavior problems (Teri *et al.*, 1992) in previous week; (4) three positive depressive symptoms on Center for Epidemiologic Studies-Depression Boston short form (Kohout *et al.*, 1992) in previous week; (5) no plans for placement in nursing care/hospice in the next 6 months; (6) no history of suicide attempts or current ideation; (7) alcohol use  $\leq 2$  drinks/day; and (8) receiving primary care. Women were exclusively targeted because of literature documenting gender differences in caregiving responses and preferences (Lauderdale and Gallagher-Thompson, 2002). Because of carers' experience of unique stressors when living with an NCD patient, we focused on behavioral and cognitive strategies to increase respite utilization and reduce upset following disruptive behaviors. Including only those living with a diagnosed individual allowed us to evaluate intervention impact on respite self-efficacy.

Inclusion criteria for the care recipient were as follows: (1) dementia/neurocognitive diagnosis confirmed by primary care clinician; (2) receiving primary care; and no lifetime history of (3) schizophrenia, (4) bipolar disorder, (5) suicide attempts, (6) Huntington's disease, (7) Korsakoff's disease, (8)

multiple sclerosis, (9) HIV, or (10) alcohol dependence. Recruitment was via Alzheimer's Association Chapters and Area Agencies on Aging throughout the Midwestern United States. Project staff activity occurred in a university lab setting, with telephone and mail/email contact with participants.

Of the 253 carers screened, 104 (41%) were eligible; 30 (29%) declined participation, resulting in a randomized sample of 74 participants. The primary reason for ineligibility was insufficient emotional distress following behavior problems; the primary reason for declining participation was unwillingness to commit the time required. A stratified random assignment procedure used computerized random number generator with blocks of 50 participants to maintain equal proportions of metropolitan versus nonmetropolitan residents across conditions. Allocation concealment involved separate individuals setting up randomization and enrollment. Randomized participants included 33 carers in the behavioral coaching intervention and 41 in the basic education condition; differences in group size were due to stratified allocation procedures and limited project time to recruit the full target of 100 participants (50 per group). The sample was split between spousal carers (52%) and adult children (48%). Participants reported mild to moderate levels of depressive symptoms, as measured by the Beck Depression Inventory II (BDI-II; Beck *et al.*, 1996;  $M = 15.7$ ;  $SD = 8.3$ ). Sample characteristics are shown in Tables 1 and 2.

### Interventions

Behavioral coaching condition ( $n = 33$ ) participants received 10 video segments, each lasting 30 min, a workbook, 10 weekly telephone calls, and 2 maintenance calls from a trained coach. The multi-component video series (DVD or VHS) and workbook included instruction and examples of female carers utilizing strategies for increasing the following: (a) behavioral activation for both the carer and care recipient (Teri *et al.*, 1997; Moore *et al.*, 2013); (b) management of disruptive behaviors (Teri *et al.*, 1998; Burgio *et al.*, 2003); (c) relaxation during caregiving situations (Coon *et al.*, 2003); and (d) caregiving self-efficacy (Bandura, 2004). The workbook provided didactic and experiential materials reinforcing each video and weekly monitoring forms. Participant received weekly 30- to 50-min phone calls by their designated coach. The first 10 weekly calls reviewed material in each video session, workbook chapter, and completed worksheets and troubleshooted challenging patient

Table 1 Participant characteristics ( $N = 74$ )

	Mean (SD)	Range
Length of caregiving (months)	33.4 (23.4)	3–95
Age (years)	60.3 (10.8)	35–87
Income (median)	\$40 000	\$5–70K
Education (years)	14 (1.8)	(9–17)
	<i>N</i>	Percent
Female	74	100
Began living with care recipient to provide care	32	43
Race		
African-American	15	20
White	59	80
Census designation		
Metropolitan	51	68.9
Nonmetropolitan	23	31.1
Marital status		
Never married	6	8.0
Currently married/cohabitating	50	67.6
Divorced/separated	13	17.6
Widowed	5	6.8
Employment status		
Homemaker	18	24.3
Working full time outside home	18	24.3
Working part time outside home	9	12.2
Retired	27	36.5
Unemployed—looking for work	2	2.7
Affordability of basics		
Not difficult at all	28	37.8
Not very difficult	16	21.6
Somewhat difficult	22	29.7
Very difficult	8	10.9

Table 2 Care-recipient characteristics ( $N = 74$ )

	Mean (SD)	Range
Age (years)	77.4 (9.4)	(56–95)
Activities of daily living impairment	2.0 (1.8)	(0–6)
No. of memory and behavior problems	11.5 (3.3)	(4–20)
Relationship to caregiver	<i>N</i>	Percent
Husband/partner	35	52.2
Mother	28	37.3
Father	4	6.0
Other	7	9.5
Diagnosis		
Alzheimer's	46	62.2
Vascular	6	8.0
Mixed Alzheimer's and vascular	3	4
Dementia with Lewy bodies	2	2.7
Parkinson's dementia	2	2.7
Unspecified dementia	15	20.3
Health status (per caregiver report)		
Excellent	4	5.4
Very good	11	14.9
Good	28	37.7
Fair	24	32.4
Poor	7	9.5

behaviors. The last two calls were biweekly and emphasized maintenance of skills developed during the intervention. Staff used a coach manual providing scripts for reviewing didactic materials/assignments, assessing

homework compliance, and applying concepts to specific problems. Calls averaged 40 min in length.

The basic education and support condition ( $n = 41$ ) was designed to function as a “treatment as usual” comparison, using information and support interventions common to nonprofit agencies (Corbett *et al.*, 2012). Because services typically rely on standardized content and less intensive staff contact than in psychoactive interventions, this condition is intentionally weaker in content and staff contact than the coaching intervention. Participants in this condition received by mail a 37-page *Basic Care Guide* (Alzheimer's Association Education Institute, 2005), which included information on dementia and suggestions for responding to specific care challenges. Suggestions for using this educational booklet were provided, with specified pages matching the concerns reported during intake. Carers received seven telephone calls scheduled every other week; staff checked on the safety of the carer and family member, discussed suggestions from the guide, and responded to questions. Calls averaged 20 min in length.

Interventionists were one licensed doctoral-level clinical psychologist and five masters-trained clinicians. All assessment and intervention phone contacts were audiotaped. To confirm treatment adherence and competence, we randomly identified one session each for a random selection of 10 behavioral coaching participants and 10 basic education participants. These 20 tapes were evaluated by a clinical geropsychologist unaffiliated with the project, using adherence and competence scales developed for this study. All sessions met protocol requirements.

## Measures

The three assessment points were intake, post-intervention, and 6 months post-intervention. Outcomes reported in this paper were obtained during audiotaped telephone interviews by staff blind to intervention condition; additional measures not included in this report were collected via paper-and-pencil questionnaires sent to participants and returned. To assist telephone interviews, participants received response cards prior to the interview.

*Demographic and care-related variables.* Assessed characteristics included carer and care-recipient ethnicity, marital status, education, age, and relationship characteristics. The Index of Independence in Activities of Daily Living Scale (Katz *et al.*, 1963) measured reports of care recipients' functional impairments in basic

activities (e.g., bathing and dressing). The living and residential status of the patient was tracked at each assessment as follows: (1) living with the same family carer, (2) moved to live with another family member, (3) moved to long-term care, or (4) deceased. When a patient entered long-term care or died during the intervention, carers were discontinued from the intervention but followed at all assessment points and offered referrals for support resources in their local community.

*Patient diagnostic status.* Participants signed an authorization for the patient's primary care clinician or specialist (e.g., psychiatrist and neurologist) to inform project staff of the dementia diagnosis. This authorization was mailed to the provider to report diagnosis and then sign and return. Rate of return was 96% (71/74), all signed by an MD physician. For the three cases not returned, authorizations were faxed to the office nurse who provided verbal diagnostic information to our staff. Participants started intervention prior to confirmation, and no cases were later deemed ineligible.

#### Primary outcome measures

*Upset following memory and behavior problems.* The Revised Memory and Behavior Problem Checklist (RMBPC; Teri *et al.*, 1992) assessed bother or upset following specific patient behaviors over the previous week (Likert scale of 0, *not at all*, to 4, *extremely*). A total score was created by summing (rather than averaging) these upset ratings, as recommended by Roth *et al.* (2003).

*Depressive symptomatology.* The BDI-II (Beck *et al.*, 1996) measured depressive symptomatology over the past 2 weeks.

#### Secondary outcome measures

*Negative mood.* Level of global negative mood was assessed by the Negative Affect Scale (Watson *et al.*, 1988); 10 adjectives representing negative emotions were rated for the past 2 weeks and totaled. Self-reported levels of state anxiety and state hostility were assessed with the short version of the Multiple Affect Adjective Check List-Revised (MAACL-R) Anxiety and Hostility subscales (Zuckerman and Lubin, 1985) assessed over the previous 2 weeks.

*Caregiving self-efficacy.* The Obtaining Respite and Responding to Disruptive Behaviors subscales of the Revised Scale for Caregiving Self-efficacy (Steffen *et al.*, 2002) assessed carers' confidence in managing specific care challenges on a scale of 0 to 100.

#### Analysis

A series of independent *t*-tests and chi-square analyses evaluated group differences in demographic and baseline variables. When cell sizes were  $<5$  for categorical variables, Fisher's exact tests were used. Any baseline scores that varied between groups at  $p \leq .10$  were included as potential covariates and retained if significant in the model. Intervention impact was tested using two-group (behavioral coaching/basic education) repeated-measures multivariate analysis of variance (MANOVA) or multivariate analysis of covariance, with  $p \leq .05$  signifying statistical significance. The sample size was lower at 6-month follow-up because of changes in patient living/residential status; analyses were run separately for pre-intervention to post-intervention and for pre-intervention to 6-month follow-up. Cohen's *d* effect size was estimated for outcome variables, using Cohen's (1988) method for converting partial eta squared values to Cohen's *f* and *d* values [ $f = \sqrt{\eta^2 / (1 - \eta^2)}$ ;  $d = 2 \times f$ ], where effect sizes of 0.2, 0.5, and 0.8 are considered small, medium, and large, respectively. We used the reliable change index (RCI) to assess the clinical significance of pre-intervention to post-intervention changes for each participant (Jacobson and Truax, 1991). An RCI critical value was formulated for the BDI-II (11.35) using descriptive data from the pre-intervention assessment (mean and standard deviation) as clinical norms, along with community norms (mean and standard deviation) for older women reported by Segal *et al.* (2008). For RCI analyses, participants were coded by whether scores at post-intervention and 6-month follow-up did the following: (a) moved from above to below 11.35, (b) moved below to above 11.35, (c) stayed above 11.35, or (d) stayed below 11.35.

## Results

### Randomization check

Independent *t*-tests and chi-square analyses revealed no significant group differences (i.e.,  $p < .05$ ) at intake for participant age, education, ethnicity, difficulty paying for household expenses, relation to care recipient, months as a carer, number of memory and behavior

problems in the care recipient, or pre-treatment values for outcome variables. Because two outcomes approached significance for group differences at pre-treatment (i.e., BDI-II and RMBPC Upset), these intake values were entered as covariates in relevant analyses.

Completion rates

Figure 1 depicts flow of participants through the study. Of 74 randomized carers, 11 (15%) did not complete the intervention phase; withdrawals were due to three patient deaths, four nursing home placements, and four dropouts for other reasons (e.g., poor timing and disinterest in continuing). There were no differences

between the behavioral coaching intervention ( $n=6$ ; 18%) and the basic education condition ( $n=5$ ; 12%) in distribution of non-completers ( $X^2(1, N=74)=0.52, p=.47$ ). Non-completers continued to be assessed; one withdrawn participant was lost to follow-up.

Outcome analyses utilized all participants known to be providing in-home care at the time of post-intervention assessment ( $n=66$ ); this included three of the five participants who withdrew for any reason other than placement or death of patient. One patient was placed with another family member, and one carer was lost to follow-up. An intent-to-treat approach (pre-intervention scores carried forward) was used to handle the missing data from the one lost case; linear mixed modeling was not deemed necessary given the small extent of missing data.

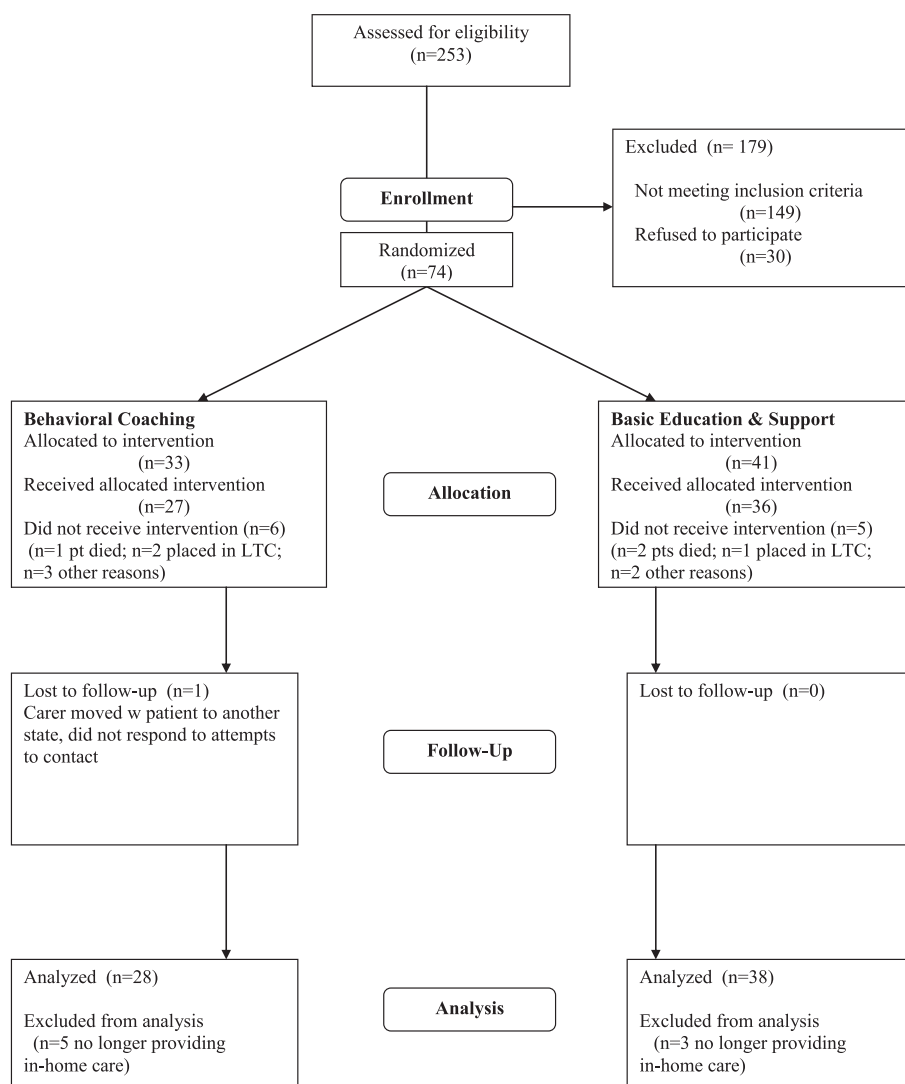


Figure 1 CONSORT study flowchart. LTC, long-term care.



## Primary post-intervention outcomes

**Depressive symptoms.** A repeated-measures analysis of covariance (ANCOVA) tested change in BDI-II scores, using a 2 (condition: behavioral coaching/basic education)  $\times$  2 (time: baseline/post-intervention) model with intake BDI-II scores as a significant covariate. Post-intervention Cohen's *d*, adjusted cell means, and standard deviations are shown in Table 3. The Condition  $\times$  Time statistic for BDI-II was significant (Wilk's  $F(1, 63) = 4.11, p \leq .05, \eta^2 = .06$ ), indicating greater efficacy of the behavioral coaching condition in reducing depressive symptoms across the active intervention phase of the study; Cohen's  $d = 0.50$  represents a medium effect.

Although participants were not required to have clinically elevated depressive symptoms to be eligible for the study, we examined whether conditions differed in proportions of carers with post-intervention BDI-II scores above or below the RCI cutoff of 11.35. At the post-intervention assessment, a higher proportion of behavioral coaching participants (71.4%) than basic education participants (42.1%) had reliably low BDI-II scores ( $X^2(1, N = 66) = 5.59, p \leq .05$ ). This represents a greater proportion of carers in the basic education than in the behavioral coaching condition whose BDI-II scores either remained clinically significant (52.6% vs. 28.6%) or changed from low to high (5.3% vs. 0%) ( $X^2(3, N = 66) = 8.76, p \leq .05$ ).

**Upset following behavior problems.** A repeated-measures ANCOVA was run with a 2 (condition: behavioral coaching/basic education)  $\times$  2 (time: baseline/post-intervention) model retaining intake RMBPC upset scores as a significant covariate. Cohen's *d*, adjusted cell means, and standard deviations are shown in Table 3. The multivariate Condition  $\times$  Time statistic was significant (Wilk's  $F(1, 63) = 4.29, p \leq .05, \eta^2 = .06$ ) with greater post-intervention reductions in upset for participants in the behavioral coaching condition; Cohen's  $d = 0.50$  represents a medium effect.

## Secondary post-intervention outcomes

**Negative mood.** A repeated-measures MANOVA with a 2 (condition: behavioral coaching/basic education)  $\times$  2 (time: baseline/post-intervention) design evaluated intervention effects for the Negative Affect Scale, MAACL Anxiety, and MAACL Hostility scores. No covariates were included; Table 3 displays post-intervention Cohen's *d*, unadjusted cell means, and standard deviations. The multivariate Condition  $\times$  Time statistic was significant (Wilk's  $F(3, 62) = 2.82, p \leq .05, \eta^2 = .12$ ). Univariate tests revealed a significant time-by-condition interaction for Positive and Negative Affect Schedule (PANAS) Negative Affect scores ( $F(1, 64) = 6.92, p \leq .05, \eta^2 = .10$ ) and MAACL anxiety scores ( $F(1, 64) = 6.34,$

Table 3 Post-intervention Cohen's *d*, means, and standard deviations by intervention condition

	Behavioral coaching ( $n = 28$ )			Basic education and support ( $n = 38$ )		
	Intake ( $n = 28$ )	Post ( $n = 28$ )	6 months ( $n = 22$ )	Intake ( $n = 38$ )	Post ( $n = 38$ )	6 months ( $n = 30$ )
Primary outcomes <sup>a</sup>						
BDI-II (Cohen's $d = 0.50$ )	15.4 (0.0)	9.8 (1.3)	10.3 (1.3)	15.4 (0.0)	13.2 (1.1)	9.4 (1.1)
RMBPC upset (Cohen's $d = 0.50$ )	19.3 (0.0)	10.7 (1.4)	10.1 (1.8)	19.3 (0.0)	14.5 (1.2)	13.3 (1.5)
Secondary outcomes <sup>b</sup>						
Negative Affect Scale (Cohen's $d = 0.66$ )	24.5 (6.9)	17.6 (4.4)	20.1 (7.3)	24.1 (7.3)	22.0 (7.0)	21.7 (7.6)
MAACL Anxiety (Cohen's $d = 0.63$ )	4.8 (2.3)	3.5 (2.2)	4.4 (2.6)	4.6 (2.3)	5.0 (2.7)	4.2 (2.6)
MAACL Hostility (Cohen's $d = 0.39$ )	5.1 (2.6)	3.9 (2.6)	4.3 (2.9)	6.3 (3.2)	6.2 (3.2)	5.5 (3.5)
Self-efficacy: Respite (Cohen's $d = 0.55$ )	47.3 (26.0)	57.4 (30.8)	49.0 (31.9)	53.5 (30.5)	50.1 (28.6)	58.6 (31.1)
Self-efficacy: Behavioral Management (Cohen's $d = 0.46$ )	68.1 (20.1)	75.6 (16.9)	76.4 (17.7)	65.9 (20.8)	66.6 (19.7)	68.5 (19.8)

BDI-II, Beck Depression Inventory II; RMBPC, Revised Memory and Behavior Problem Checklist; MAACL, Multiple Affect Adjective Checklist.

<sup>a</sup>Post-intervention and 6-month follow-up scores adjusted for intake value.

<sup>b</sup>Original means are shown.

$p \leq .05$ ,  $\eta^2 = .09$ ), with lower levels of negative mood and anxiety at post-intervention for participants in the behavioral coaching condition. Cohen's  $d$  scores were moderate for Negative Affect ( $d = 0.66$ ) and MAACL Anxiety ( $d = 0.63$ ) and smaller for MAACL Hostility ( $d = 0.39$ ).

**Caregiving self-efficacy.** A repeated-measures MANOVA with a 2 (condition: behavioral coaching/basic education)  $\times$  2 (time: baseline/post-intervention) design evaluated intervention effects for the *Respite* and *Behavior Management* subscales of the Revised Scale for Caregiving Self-efficacy (SE). No covariates were included; Table 3 displays post-intervention Cohen's  $d$ , unadjusted cell means, and standard deviations. The multivariate Condition  $\times$  Time statistic was significant (Wilk's  $F(2, 63) = 3.74$ ,  $p \leq .05$ ,  $\eta^2 = .11$ ). Univariate tests revealed a significant time-by-condition interaction for SE-Respite scores ( $F(1, 64) = 4.43$ ,  $p \leq .05$ ,  $\eta^2 = .07$ ) and that approached significance for SE-Behavior Management scores ( $F(1, 64) = 3.61$ ,  $p = .06$ ,  $\eta^2 = .05$ ), with relatively greater increases in caregiving self-efficacy at post-intervention for participants in the behavioral coaching condition. Cohen's  $d$  scores indicated a moderate effect for SE-Respite ( $d = 0.55$ ) and for SE-Behavior Management ( $d = 0.46$ ).

**Caregiving status.** The two intervention conditions did not differ in caregiving status changes, either immediately post-intervention ( $X^2(2, N = 74) = 1.70$ ,  $p = .43$ ) or 6 months post-intervention ( $X^2(2, N = 73) = 0.22$ ,  $p = .90$ ).

**Six-month follow-up.** At the 6-month follow-up, 52 (70%) participants continued as in-home carers. The behavioral coaching ( $M = 4.8$ ,  $SD = 2.9$ ) and basic education ( $M = 5.8$ ,  $SD = 2.6$ ) conditions were similar in months from intake to placement for patients entering long-term care ( $t(1, 14) = 0.65$ ,  $p = .53$ ). Using RCI analysis, behavioral coaching and basic education participants were equally likely at 6 months post-intervention to have reliable decreases, increases, or stability in BDI-II scores ( $X^2(3, N = 52) = 4.84$ ,  $p = .18$ ).

Repeated-measures MANOVA and multivariate analysis of covariance examined changes in primary and secondary outcome variables from pre-intervention to 6 months post-intervention. Multivariate Condition  $\times$  Time statistics were non-significant, with groups similar to each other in depressive symptoms (Wilk's  $F(1, 49) = 0.26$ ,  $p = .61$ ,  $\eta^2 = .01$ ), level of upset following patient behavior problems (Wilk's  $F(1, 49) = 1.87$ ,  $p = .18$ ,  $\eta^2 = .04$ ), negative mood (Wilk's  $F(3, 48) = 0.21$ ,  $p = .89$ ,  $\eta^2 = .01$ ), and caregiving self-efficacy (Wilk's  $F(2, 49) = 0.43$ ,  $p = .66$ ,  $\eta^2 = .02$ ).

Examination of cell means suggests that, in general, behavioral coaching participants maintained post-intervention gains while basic education participants continued to improve.

## Discussion

A telehealth behavioral coaching intervention was evaluated (in a randomized trial format) for female NCD family members actively involved with in-home care and experiencing emotional distress. This behavioral approach identified specific concerns and tailored strategies to individual needs, consistent with the empirical literature (Gallagher-Thompson and Coon, 2007) and meeting practice guidelines for dementia care (Vasse *et al.*, 2012). Carers report such types of support as important and preferred (Alwin *et al.*, 2010). Participants reported viewing segments and complying with between-session assignments.

Compared with the basic education and support condition, the video/workbook/telephone coaching intervention led to statistically significant reductions in depressive symptoms, negative mood, and upset following disruptive patient behaviors. RCI analyses of BDI-II scores indicate that the behavioral coaching intervention was reliably superior to the basic education/support condition in pre-intervention to post-intervention change of depressive symptoms. The behavioral coaching intervention also showed greater improvements in caregiving self-efficacy to respond to disruptive behaviors and seek respite assistance. Effect sizes were moderate for the primary outcome measures of BDI and RMBPC upset scores, as well as for most of the secondary outcomes (i.e., negative affect, anxiety, and caregiving self-efficacy). Thus, the study provides support for a telehealth mechanism to deliver psychoeducational interventions for NCD carers. These initial improvements were generally maintained at the 6-month follow-up for behavioral coaching participants, at which time carers in the comparison condition also reported lower distress. "Booster" sessions were not included during follow-up; future studies of similar interventions should consider strategies for building upon initial post-intervention benefits.

Among the limitations to this research is the small sample that reduced power and precluded additional analyses such as examining moderator effects (e.g., spousal versus adult children and ethnically diverse subgroups). To strengthen recruitment and generalizability, eligibility criteria for dementia diagnoses included "unspecified dementia," which comprised

20% of our sample. Dementia detection without a documented NCD diagnosis is alarmingly frequent (Connolly *et al.*, 2011); excluding such cases would have rendered our sample different from families struggling with current diagnostic practices in primary care. Timely diagnosis and documentation of NCDs are important for the health of individuals and families (Connolly *et al.*, 2011; George and Steffen, 2014) and economically important for healthcare systems (Brooker *et al.*, 2014). Interventions that facilitate appropriate diagnostic and documentation practices need immediate attention by investigators and policy makers.

Focusing on women living with the identified dementia patient increased our recruitment challenges during this relatively brief pilot trial and limited generalizability of findings. It is unclear whether cohabitation is needed to effectively target respite and behavioral management domains associated with dementia caregiving or if other contact requirements would improve recruitment and yield comparable results. Families of cognitively impaired elders in a variety of settings have needs; future interventions might focus on communication between families and health providers and effective management of chronic health conditions in older adults with NCDs, among other outcomes.

The behavioral coaching intervention was designed for accessibility and dissemination to community agencies. For such programs to be sustainable, agencies require business models for staffing telephone coaches. We found masters-level students across a range of disciplines (e.g., clinical and counseling psychology, social work, nursing, and occupational therapy) to be effective behavioral coaches when provided training and supervision. Utilizing volunteer paraprofessionals is worth future exploration.

Distance-based interventions (e.g., telephone, video, Internet, and bibliotherapy) hold promise for family carers, especially those living in rural or metropolitan areas with limited transportation. Similar to the findings of Davis *et al.* (2011) in their study of telephone interventions, carers reported valuing the time they spent discussing their concerns with intervention staff. The development and evaluation of telehealth interventions easily accessible to NCD family carers continue to be important and worth the sustained effort.

### Conflict of interest

None declared.

### Key points

- This study examined the differential impact of two telehealth programs for women caring for an older adult with a neurocognitive disorder.
- Outcomes including depressive symptoms, upset following disruptive behaviors, and negative mood states were statistically lower in the behavioral coaching condition than in the basic education and support condition. Caregiving self-efficacy for obtaining respite and managing patient behavioral disturbances was significantly higher in the coaching condition.
- Dementia carers, including those living in rural areas, can benefit from accessible and empirically supported interventions that can be easily disseminated across distances at modest cost.

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