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Short-term Effects of a Gain-Focused Reappraisal Intervention for Dementia Caregivers: A Double-Blind Cluster-Randomized Controlled Trial

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Running Head: Benefit-finding intervention

Key Words: dementia caregiving; depression; positive aspects of caregiving; cluster-randomized controlled trial

ABSTRACT

Objectives: To examine the effects of a benefit-finding intervention, the key feature being the use of gain-focused reappraisal strategies to find positive meanings and benefits in caring for someone with dementia. **Design:** Cluster-randomized double-blind controlled trial. **Setting:** Social centers and clinics. **Participants:** 129 caregivers. Inclusion criteria were (a) primary caregiver aged 18+ and without cognitive impairment, (b) providing ≥14 care hours per week to a relative with mild-to-moderate Alzheimer's disease, and (c) scoring ≥3 on the Hamilton Depression Rating Scale. Exclusion criterion was care-recipient having parkinsonism or other forms of dementia. **Interventions:** The benefit-finding intervention was evaluated against two treatment-as-usuals, namely, simplified psychoeducation (lectures only) and standard psychoeducation. Each intervention lasted eight weeks, with a 2-hour session per week. Randomization into these conditions was based on center/clinic membership. **Measurements:** Primary outcome was depressive symptom. Secondary outcomes were Zarit Burden Interview, role overload, and psychological well-being. Self-efficacy beliefs and positive gains were treated as mediators. Measures were collected at baseline and posttreatment. **Results:** Regression analyses showed BF treatment effects on all outcomes when compared with SIM-PE, and effects on depressive symptoms and Zarit burden when compared with STD-PE. Effect sizes were medium-to-large for depressive symptoms (d=-0.77– -0.96), and medium for the secondary outcomes (d=|0.42–0.65|). Furthermore, using the bootstrapping method, we found significant mediating effects by self-efficacy in controlling upsetting thoughts and positive gains, with the former being the primary mediator. **Conclusions:** Finding positive gains reduces depressive symptoms and burden and promotes psychological well-being primarily through enhancing self-efficacy in controlling upsetting thoughts.

INTRODUCTION

The majority of persons with dementia reside in the community and are cared for mainly by family members. The caregiver's job is usually very long-term, sometimes on a round-the-clock basis, and comes with many sacrifices including giving up a "normal life." Over time, the burden of caregiving and the chronic exhaustion from it place an individual at elevated risk for various physical and psychological morbidities, including cardiovascular diseases, depression, dementia, and early mortality.[1-3] The challenge faced by caregivers may be more pronounced in developing countries where training capacity severely limits the availability of well-qualified workers[4] and where the emphasis on family responsibility discourages the development of formal services.[5]

Although the task of dementia caregiving is very stressful indeed, the level of stress felt is not solely determined by objective stressors such as the care recipient's behavior problems, but also by the way the caregiver evaluates the situation. In fact, whether the caregiver finds a situation more or less stressful, or even benign, depends on his or her appraisal of the situation.[6-8] A positive appraisal may lead to positive gains (a.k.a. positive aspects of caregiving) such as getting closer to the relative, feeling needed, a sense of mastery and gratification, personal growth, increased patience and tolerance, insights about hardship, a sense of purpose, and so on.[9,10]

Against this background, there is a need to develop more effective intervention approaches that alter caregivers' appraisal strategy. The interventions should also permit deliveries at different levels of competence. In fact, given the anticipated dementia pandemic and the demand for workers in this field, the scalability of personnel qualification will prove to be a desirable feature in intervention programs even in the most developed countries.

Hence, we developed a *benefit-finding intervention* program[8,11] and tested it in a randomized controlled trial. As the name implies, the intervention aims to promote positive gains in

caregivers as a way to change their day-to-day appraisals. The key intervention activities were exercises in positive reappraisal; that is, caregivers would nominate situations that they had found stressful and attempted to provide alternative, positive appraisals of the situations. The aim was to come up with as many *alternative* appraisals as possible for each identified situation, but whether one appraisal was necessarily better than the other was not the focus. Thus we were training caregivers for cognitive reappraisal ability in the context of discovering or constructing more positive aspects of caregiving. Caregivers did not just work on their own problematic experiences, but were invited to contribute ideas to each other's situations as well. Hypothetical scenarios were also provided. During intervention sessions, there were times when caregivers were divided into subgroups and competed for the greatest number of alternative appraisals. These activities were supplemented by diaries up to three times a week in which the caregivers picked one or more events of the day and discussed reappraisals of the event(s). To bolster their self-confidence in finding benefits, they were shown videos of former caregivers who talked about their positive experiences.

It should be stated that the positive reappraisal exercises were not the only activity in the intervention program. In fact, such exercises were integrated into a traditional psychoeducation program. Like other psychoeducation programs, our program included basic information on dementia and BPSD, recognizing emotional reactions to caregiving situations, stress management and muscle relaxation, caregiver self-care (taking care of own health), activity scheduling for self and care-recipient, tactics to manage BPSD (including environmental modification), techniques for handling activities of daily living (ADL) impairments, and help-seeking (whether from relatives, friends, or service providers). The positive reappraisal exercises were grounded on discussions about the ADL and BPSD challenges. Thus, on top of learning practical techniques to manage these issues, caregivers were asked to reflect on the manner by

which they would evaluate the situation, and what alternative appraisals they could come up with. For instance, when having to accompany a wandering care-recipient, caregivers may treat it as an enjoyable moment together, treasure the fact that the care-recipient is still relatively healthy and mobile, cherish the memories when visiting old places which may also help to stimulate cognitive functions in the care-recipient, appreciate nature when walking in parks, think about it as a good physical exercise (for both care-recipient and self), and so on. Spouse caregivers may also think of it as a romantic stroll, whereas adult child caregivers may appreciate what it was like for the parent to take them here and there in childhood days.

This approach was different from the cognitive-behavioral therapeutic approach pioneered by Gallagher-Thompson and colleagues.[12,13] Although the two approaches were similar in the sense that they both aim at thought modification, our approach, though providing a background about the thought-emotion-behavior maintenance cycle and the role of dysfunctional beliefs in engendering negative emotions, does *not* attempt to tackle person-specific dysfunctional beliefs. Thus, we did not ask participants to complete the dysfunctional thought record worksheet at home or during sessions and did not attempt to uncover the underlying core beliefs. Instead, we asked participants to focus on positive meanings (a.k.a. meaning-based coping[7]) as a way to alter their perceptions of, and reactions to, events. It would not eliminate the negative thoughts, but is expected to increase the availability of positive thoughts that may neutralize the effects of negative thoughts. We felt that such an approach was justifiable because challenging dysfunctional thoughts might not be essential for therapeutic success[14] and because self-efficacy in cognitive reappraisal had been found to mediate treatment outcomes in cognitive-behavioral therapy.[15]

STUDY OBJECTIVES

This study evaluated the effects of the benefit-finding (BF) program against two treatment-as-usual conditions. The first treatment-as-usual condition was a standard psychoeducation (STD-PE) program commonly found in the mainstream literature that had all the BF components except the parts on dysfunctional thoughts, the maintenance cycle, and positive reappraisal. The second treatment-as-usual was called "simplified" psychoeducation (SIM-PE) which had all the STD-PE components but the delivery remained at the didactic lecture level and the practical elements were dropped. For instance, information about how to do muscle relaxation was given and there was demonstration about how to do it, but the participants were not given the chance to practice it during the sessions and were asked to "try it at home." SIM-PE was created to mimic the kinds of intervention commonly found in developing societies where resources are limited and the interventions tend to be brief and didactic. In other words, SIM-PE is a control intervention contextualized in the local system. Both were active controls and hence provided a rigorous test of the treatment efficacy of the BF program.

This article reports the outcome at posttreatment, with depressive symptom as the primary outcome, and burden and psychological well-being as secondary outcomes. In addition, we tested whether caregiver self-efficacy and positive gains mediated the treatment outcome. For the former, we examined the roles of self-efficacy in obtaining respite, self-efficacy in responding to disruptive behaviors, and self-efficacy in controlling upsetting thoughts.[16,17] We hypothesized that self-efficacy in controlling upsetting thoughts, but not the other two self-efficacy beliefs, would mediate the treatment effect due to the nature of the BF intervention.

METHODS

Participants and Procedure

129 caregivers from 15 social centers for older people or clinical units (e.g., memory clinics) who met the inclusion/exclusion criteria provided informed consent to participate. They were referred by the staff or doctors on board. All completed the same assessments before and after treatment with a roughly 2-month interval in-between (see Figure 1). According to Sample Size Calculator ver. 2, assuming cluster-level intraclass correlation=0.05, five clusters per treatment condition and eight participants per cluster would be sufficient to detect a large treatment effect equivalent to Cohen's *d*=0.80 at alpha=0.05 (two-tailed) and power=0.80.[18] Although interventions for caregivers tend to yield small-to-medium effect sizes,[19] well-conducted interventions that incorporate psychotherapeutic methods, especially cognitive-behavioral approaches, yield effect size >1 on average.[20]

The inclusion criteria were: (a) primary caregiver aged 18+ and without cognitive impairment, (b) providing ≥14 care hours per week to a care-recipient with mild-to-moderate Alzheimer's disease (physician diagnosed or applying the NINCDS–ADRDA criteria for possible Alzheimer's disease[21]), with stage of dementia confirmed by Clinical Dementia Rating,[22] and (c) scoring ≥3 on the Hamilton Depression Rating Scale.[23-25] The exclusion criterion was the care-recipient having parkinsonism or other forms of dementia.

Interventions

As said, there were three treatment arms, namely, SIM-PE, STD-PE, and BF. To control for the amount of treatment exposure, all three groups had the same duration (i.e., eight weekly sessions of approximately 120 minutes each), meaning that the same contents were delivered in a

faster pace in the BF group to make room for positive reappraisal exercises. Contents of the different sessions have been reported elsewhere.[8] To summarize, participants received information on dementia and stress management in the first two sessions, and causes and coping strategies for BPSD and home-based activities in the next two sessions. Skills for helping with activities of daily living, creating an appropriate home environment for the care-recipient, and community resources were covered in sessions 5-7. In the final session, caregivers went through the things learned and set goals for improvement. From time to time, there were opportunities for mutual sharing of caregiving experiences and learning. As said earlier, practical elements were removed from the SIM-PE group which used lectures and discussions as the primary medium for learning. For the BF participants, the cognitive basis for the way they responded to challenging situations and how to alter their thoughts, as well as the practice of keeping journals of reappraisal attempts and benefit-finding, were introduced starting session 1. The training on positive reappraisal became more rigorous starting session 3, in line with the coverage on BPSD and activities of daily living issues, while video sharings by experienced caregivers were provided in session 5,6 and 8 to reinforce their emerging sense of efficacy in positive reappraisal. BF participants were also invited to share positive gains with each other.

Participants met in groups of 7-11, with an average group size of 8.6 persons. The instructors were research assistants with an undergraduate degree in psychology or a related field, who were trained and supervised by the first author. Ethics approval was obtained from the Joint CUHK-NTEC Clinical Research Ethics Committee and the Central Research Committee of the Hong Kong Institute of Education. The trial was registered with the Chinese Clinical Trial Registry (identifier# ChiCTR-TRC-10000881).

Randomization and Blinding

Participants were randomized by center/clinic to one of the treatment conditions using a true random number generator, hence a cluster-randomized controlled trial with five clusters per treatment arm. Total number of participants was 45 for SIM-PE, 42 for STD-PE, and 42 for BF. It was a double-blind trial as both participants and raters were blind to the treatment assignment.

Measures

Depressive symptom was measured by the 17-item Hamilton Depression Rating Scale (α=0.78).[23] *Burden* was measured by (a) the 22-item Zarit Burden Interview rated on a scale of 0=*not at all* to 4=*extremely* (α=0.90)[26] and (b) a 4-item measure of role overload, rated on a scale of 1=*not at all* to 4=*completely* (α=0.78).[27] *Psychological well-being* was measured by the 18-item version of Ryff's Psychological Well-being Scale which measures self-acceptance, autonomy, environmental mastery, positive relatedness, life purpose, and personal growth;[28] the items were rated from 1=*strongly disagree* to 5=*strongly agree* and negatively worded items were reverse-scored prior to summation (α=0.79).

Self-efficacy beliefs were measured using a brief version of the Revised Scale for Caregiving Self-Efficacy,[16,17] with three items each (rated 0-100) measuring self-efficacy in obtaining respite (α=0.94), in responding to disruptive behaviors (α=0.88), and in controlling upsetting thoughts (α=0.80).

The measure of *positive gains* deserves more detailed explanation. Existing measures of positive gains tend to yield scores that are highly negatively skewed, with most scores clustering at the high end[17,29,30] and hence would not be sensitive to possible increases over time. Alternatively, we introduced a qualitative method. We first prompted participants with the following statement: *There are many difficulties when taking care of a relative with dementia.*

But there are positive gains as well. Please describe your gains. Then, we asked participants to talk freely and openly by beginning with this sentence stem: *Taking care of my relative with dementia makes me…* The question was repeated until the participant had nothing more to add. The narratives were audiotaped and transcribed verbatim, and were then coded for benefit words. Three research assistants read through the scripts and created, under the supervision of the first author, a list of 1,447 words/terms and phrases that denote relationship gains, personal growth, insights, competence and mastery, finding purpose, emotional rewards, and miscellaneous benefits. On the basis of this coding scheme, two research assistants practiced coding several scripts until they reached almost perfect agreement. Then the scripts were split into two halves, with each research assistant responsible for one half. A word/term or phrase was coded as benefit only when it appeared in the context of describing the caregiving experience. 15% of the scripts were also randomly selected for independent coding by the two assistants, and the interrater reliability was r=0.89.

Covariates measured included the caregiver's age, sex (0=*male*, 1=*female*), education, marital status (0=*single*, 1=*married*), employment (0=*unemployed*, 1=*employed*), household income, relationship with the care-recipient (0=*spouse or sibling*, 1=*child, child-in-law, or niece/nephew*), whether living together with the care-recipient (0=*apart*, 1=*together*), caregiving duration, caregiving hours per week, and number of chronic illnesses (sum total of 21 conditions), as well as the care-recipient's BPSD and functional health. BPSD was measured by the Neuropsychiatry Inventory,[31] the total score of which equals the product of the frequency (scored 1=*occasionally or less than once a week* to 4=*very frequently, once or more per day or continuously*) and severity (scored 1=*mild* to 3=*severe*) across 12 symptoms (α=0.91). Functional health was assessed by a modified version of the OARS Multidimensional Functional Assessment Questionnaire[32,33] which contains 7 items for instrumental ADL and 7 more for ADL,

rated on a scale of 1=*dependent*, 2=*needs assistance*, 3=*independent* (α=0.91).

Data Analysis

Alphas were set at 0.05, two-tailed, throughout. Chi-square tests and ANOVAs were used to compare the groups at baseline. Treatment effect size was estimated by calculating Cohen's *d*, using pooled SD of the adjusted means, when a group difference was statistically significant.

Across the four outcome measures, intraclass correlations were 0.000–0.019 (average=0.005), suggesting that cluster memberships did not account for the correlations between observations. Hence we analyzed the data without regard to cluster membership. We first selected covariates by regressing, in a stepwise fashion, each of the outcome measures on the covariates listed at the end of the Measures subsection. (For employment status, income, whether living together, weekly care hours, chronic illnesses, BPSD, and ADL, the posttreatment values were used.) Only NPI, ADL, and the caregiver's age, sex, chronic illnesses were significant predictors for one or more of the outcome variables, and they were included in subsequent analyses.

We then created a dummy variable, coding BF as 1 and the two control conditions as 0, and examined BF treatment effects in two series of regression analysis. In the first series, SIM-PE was the reference condition while dropping STD-PE participants. In the second one, SIM-PE participants were removed, with STD-PE coded as the reference category. The outcome measures at posttreatment were each regressed on the dummy variable and the selected covariates, as well as their own baseline values.

As said, self-efficacy beliefs and benefit words were considered potential mediators. To qualify as a mediator, the variable has to (a) correlate with the outcome measure, (b) be affected by the treatment condition, and (c) reduce the treatment effect after its entry into the equation.

The mediating effect will be estimated using the bias-corrected bootstrapping method which yields unbiased estimates for multiple mediating pathways simultaneously;[34] 5,000 bootstrap samples were generated for each analysis. A statistically significant mediating effect is identified when the 95% CI does not contain the value zero. Furthermore, because the idea was to see whether the treatment effects on the outcomes were due to changes in the mediating variables, the mediators' posttreatment values as such were not optimal for this purpose. We regressed the posttreatment score of the mediator on its baseline score and entered the residualized score (i.e., the portion of the posttreatment score that was not explained by the pretreatment score, representing the change from before to after treatment) into the regression models examining mediating effects.

RESULTS

The baseline characteristics of the three groups are shown in Table 1. No significant group difference on any variable was found.

Examining Treatment Effects

The treatment effects, along with the effects of the covariates, are shown in the upper half of Tables 2 and 3. As one can see, there were significant treatment effects on all outcome measures when BF was compared with SIM-PE, and effects on depressive symptoms and Zarit burden when compared with STD-PE. The regression coefficients showed the differences between BF and the comparison group. The descriptive statistics of the outcome variables for the three treatment arms at posttreatment, adjusted for the covariates and their baseline values, are displayed in Table 4. When a BF treatment effect was found, it was a reduction of depressive symptoms (d=-0.77 vs. SIM-PE, d=-0.96 vs. STD-PE), Zarit burden (d=-0.47 vs. SIM-PE, d=-0.65 vs. STD-PE), and role overload (d=-0.43 vs. SIM-PE), but an increase in

psychological well-being (*d*=0.42 vs. SIM-PE).

Examining Mediation Mechanisms

Among the potential mediating variables, only self-efficacy in controlling upsetting thoughts and benefit words significantly correlated with any of the outcome measures (the correlational coefficients can be obtained from the first author). We then examined whether BF produced changes in these two variables in the same way we had analyzed the other outcome variables as described above. Controlling for their baseline values and the covariates, BF resulted in higher self-efficacy in controlling upsetting thoughts (against SIM-PE: B=31.21, 95% CI=13.67–48.75, $t(80)=3.54$, $p<0.001$, $d=0.74$; against STD-PE: B=44.29, 95% CI=25.31–63.28, $t(77)=4.65$, $p<0.001$, $d=0.78$) and more benefit words (against SIM-PE: B=3.12, 95% CI=1.46–4.79, $t(80)=3.73$, $p<0.001$, $d=0.97$; against STD-PE: B=3.66, 95% CI=2.25–5.08, $t(77)=5.15$, $p<0.001$, $d=1.08$).

In light of the above, we included self-efficacy in controlling upsetting thoughts and benefit words in the equations assessing BF treatment effects (only in cases where significant BF treatment effects were found). As one can see from the bottom half of Tables 2 and 3, self-efficacy in controlling upsetting thoughts emerged as the significant predictor in these analyses except in one situation. When BF depressive symptom was evaluated against SIM-PE depressive symptom, benefit word count was the significant predictor. Moreover, the BF treatment effects diminished and became nonsigificant in all but one case. When BF was compared with STD-PE with depressive symptoms as the outcome, the BF treatment effect remained significant, though noticeably reduced. Taken together, these results suggested that there were different mediators for different outcomes and group comparisons. The bootstrap estimates of the mediating effects (when a mediator was found to be significant in the regression analysis), as shown at the bottom of Tables 2 and 3, were all significant.

Although the nonsignificant treatment effects, after controlling for the mediators, might suggest full mediation, the strength of a mediating effect (i.e., the proportion of treatment effect due to mediation) can be estimated by dividing the mediating effect by the total treatment effect (as indicated by the BF regression coefficient prior to the inclusion of the mediators). These estimates are provided at the bottom of Tables 2 and 3. As can be seen, the mediating pathways accounted for nearly one-third to three quarters of the different BF treatment effects.

DISCUSSION

The study showed that finding positive gains through positive reappraisal reduced depressive symptoms and burden and promoted psychological well-being primarily through enhancing self-efficacy in controlling upsetting thoughts. Interestingly, positive gains only mediated the effect of BF on depressive symptoms when it was compared with STD-PE. Rather, the main mediator, across the outcome measures and analyses, was self-efficacy in controlling upsetting thoughts. Thus, it appeared that the training on positive reappraisal enhanced the caregivers' confidence in avoiding preoccupation with negative thoughts, while promoting positive gains at the same time. In this sense, the focus on benefit-finding provided a platform to engage caregivers in thought modification, but benefit-finding itself was not the main force driving the treatment effects.

We believe that the benefit-finding intervention addresses a gap in the current field of caregiver intervention that has reducing skill deficits in managing challenging demands as the central focus. Such skills are often what caregivers come to training for, and are indispensable components in any intervention program. Yet, no matter how competent caregivers are, they are bound to feel overwhelmed and defeated from time to time. This is where emotion regulation through cognitive reappraisal comes in. In fact, it is conceivable that caregivers with better

emotional control are more effective caretakers and problem-solvers as well.

Although tackling the automatic dysfunctional thoughts and underlying core beliefs is normally considered the key strategy in cognitive change in cognitive-behavioral therapy, we demonstrated that this strategy is not essential to achieving therapeutic outcomes. In fact, we consider the lack of attention to the automatic thoughts and core beliefs to be a strength of our approach. This way, we avoid the need to recruit clinical psychologists or certified cognitive-behavioral therapists, who are relatively few in developing regions, as trainers, and enhance the likelihood that the intervention can be successfully translated to clinical and social service settings.

A few limitations need to be mentioned. First, the sample size, though not atypical in the caregiver intervention literature, was relatively small. Second, outcomes were only assessed at posttreatment. A longer-term follow-up is needed. Third, the caregivers were, on the average, only mildly depressed, for whom a reduction of 3 points on the Hamilton scale yielded large effect sizes. Future studies should examine whether the intervention works for more depressed caregivers. Finally, the gain-focused reappraisal intervention involves many components, such as a verbal element that focuses on positive reappraisal, modeling benefit-finding through videos, and keeping journals of daily reappraisal. Future studies should pinpoint which of these components independently or jointly drive the reported treatment effect. Nevertheless, our mediation findings suggest that components that increase self-efficacy in controlling upsetting thoughts and self-reported positive gains should be more effective.

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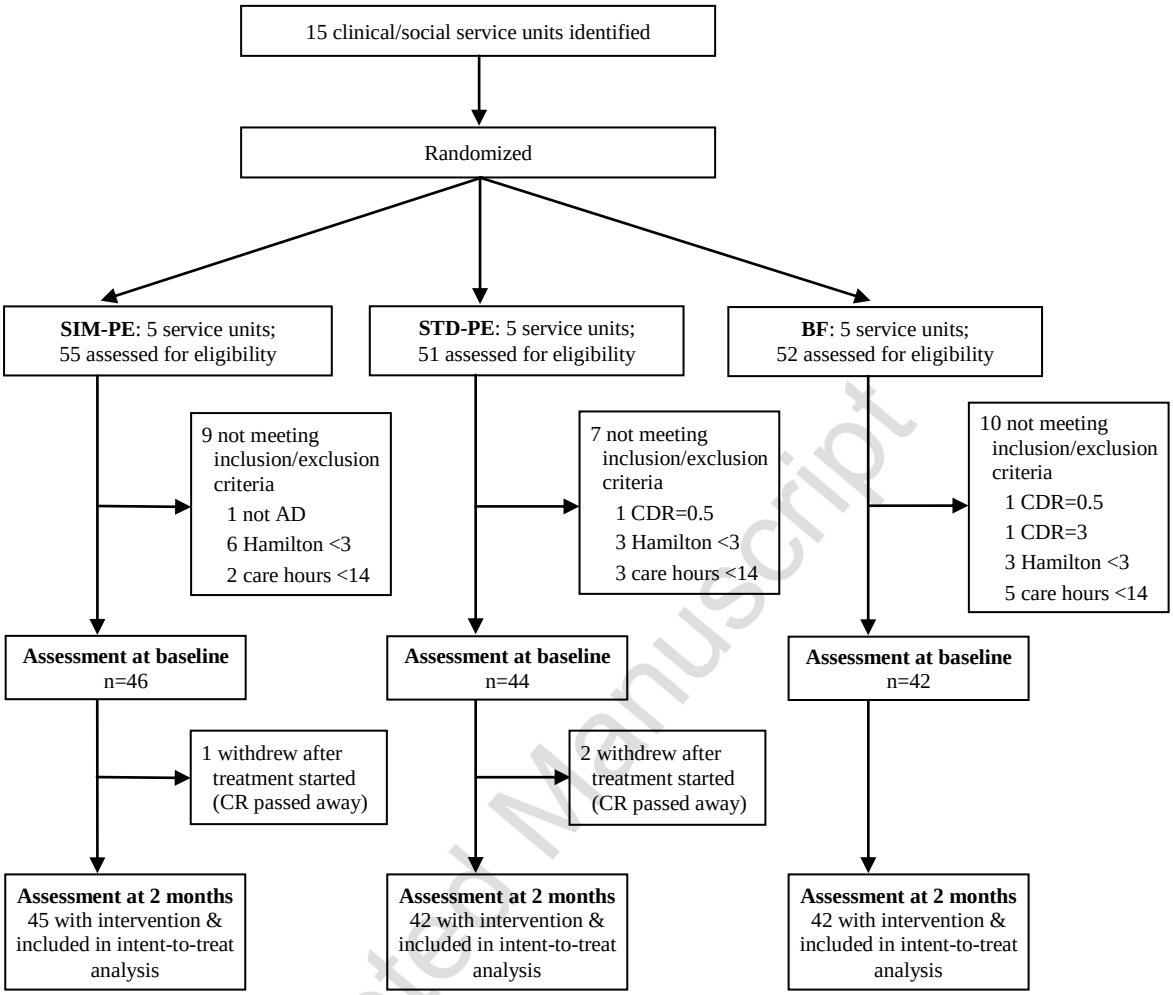

FIGURE 1. Study flow chart. AD = Alzheimer's disease, CDR = Clinical Dementia Rating, CR = care-recipient.

TABLE 1. Baseline Sample Characteristics

	SIM-PE	STD-PE	BF	*F*	χ^2	df	p
Caregiver variables							
Age, M (SD)	52.98 (10.67)	56.67 (11.14)	56.00 (10.86)	1.43		2, 126	0.243
Sex (female), %	88.9	83.3	85.7		0.56	2	0.754
Married, %	71.1	73.8	69.0		0.23	2	0.889
Educational level, %					4.34	4	0.362
Primary or below	22.2	26.2	35.7				
Secondary	57.8	54.8	57.1				
Tertiary	20.0	19.0	7.1				
Employed, %	31.1	28.6	33.3		0.22	2	0.895
Relationship with CR, %					0.49	2	0.781
Spouse/sibling	24.4	26.2	31.0				
Child/child-in-law/nephew/niece	75.6	73.8	69.0				
Living together with CR, %	64.4	59.5	78.6		3.75	2	0.153
Caregiving duration (years), M (SD)	2.20 (1.62)	2.44 (2.08)	1.96 (1.73)	0.72		2, 126	0.490
Caregiving hours per week, M (SD)	86.71 (55.29)	84.69 (57.25)	86.86 (54.85)	0.02		2, 126	0.980
No. of chronic illnesses, M (SD)	0.89 (1.17)	0.79 (0.98)	1.26 (1.52)	1.72		2, 126	0.183
Hamilton depression, M (SD)	6.36 (4.22)	6.14 (3.36)	6.98 (4.12)	0.51		2, 126	0.600
Zarit Burden Interview, M (SD)	35.04 (16.70)	35.05 (14.23)	33.69 (16.57)	0.10		2, 126	0.902
Role overload, M (SD)	11.56 (2.88)	10.98 (2.57)	10.52 (2.86)	1.51		2, 126	0.225
Psychological well-being, M (SD)	64.98 (10.35)	64.05 (9.48)	66.76 (8.32)	0.90		2, 126	0.410
SE – obtaining respite, M (SD)	165.67 (104.86)	184.52 (100.78)	178.81 (98.11)	0.40		2, 126	0.672
SE – responding to disruptive behaviors, M (SD)	179.78 (64.37)	185.60 (59.92)	194.29 (48.45)	0.68		2, 126	0.507
SE – controlling upsetting thoughts, M (SD)	188.11 (63.11)	205.95 (59.10)	187.38 (61.80)	1.24		2, 126	0.344
Benefit words, M (SD)	6.73 (5.52)	7.88 (6.97)	7.00 (5.25)				0.647
Care-recipient variables							
Clinical Dementia Rating, %					0.50	2	0.778
1 (mild)	51.1	50.0	57.1				
2 (moderate)	48.9	50.0	42.9				
BPSD, M (SD)	20.24 (13.48)	20.26 (17.50)	24.19 (24.47)	0.60[a]		2, 78.27	0.549
Functional health, M (SD)	29.56 (5.66)	30.79 (5.34)	31.93 (6.43)	1.81		2, 126	0.168

Note: SE = self-efficacy, CR = care-recipient.
[a]Brown-Forsythe *F* test for unequal variances.

TABLE 2. Regression of Posttreatment Outcome Measures on Baseline Measures, Covariates, and Treatment Conditions (BF vs. SIM-PE), With or Without Mediators

	Posttreatment measures							
	Depression		Zarit burden		Role overload		Psychological well-being	
	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p
Excluding mediators								
Baseline measure of dependent variable	0.296 (0.110, 0.483)	0.002	0.566 (0.412, 0.720)	<0.001	0.432 (0.237, 0.628)	<0.001	0.613 (0.466, 0.760)	<0.001
Age	-0.025 (-0.113, 0.064)	0.579	-0.407 (-0.762, -0.700)	0.007	0.002 (-0.060, 0.065)	0.940	-0.015 (-0.182, 0.152)	0.861
Sex (female)	-1.054 (-3.242, 1.135)	0.341	-0.876 (-8.077, 6.325)	0.809	0.624 (-0.942, 2.191)	0.430	4.677 (0.581, 8.772)	0.026
Chronic illnesses	1.337 (0.444, 2.229)	0.004	2.777 (-0.192, 5.746)	0.066	0.284 (-0.335, 0.902)	0.364	-1.606 (-3.282, 0.070)	0.060
BPSD	0.022 (-0.022, 0.065)	0.321	0.264 (0.117, 0.410)	<0.001	0.023 (-0.008, 0.054)	0.148	-0.039 (-0.119, 0.041)	0.338
Functional health	-0.074 (-0.196, 0.049)	0.234	-0.302 (-0.707, 0.102)	0.141	-0.041 (-0.129, 0.046)	0.348	-0.061 (-0.290, 0.168)	0.598
BF	-2.696 (-4.166, -1.226)	<0.001	-5.411 (-10.236, -0.586)	0.028	-1.056 (-2.094, -0.018)	0.046	2.785 (0.025, 5.545)	0.048
R^2	0.383		0.636		0.389		0.560	
Including mediators								
(Covariates and baseline measure)								
SE – controlling upsetting thoughts (residualized)	-0.012 (-0.030, 0.006)	0.184	-0.123 (-0.181, -0.065)	<0.001	-0.021 (-0.034, -0.008)	0.002	0.051 (0.017, 0.085)	0.004
Benefit words (residualized)	-0.212 (-0.403, -0.021)	0.030	-0.412 (-0.998, 0.174)	0.166	-0.035 (-0.168, 0.098)	0.604	0.264 (-0.087, 0.616)	0.138
BF	-1.630 (-3.281, 0.020)	0.053	-0.372 (-5.351, 4.608)	0.882	-0.341 (-1.467, 0.786)	0.549	0.456 (-2.543, 3.455)	0.763
R^2	0.434		0.714		0.466		0.616	
Bootstrap estimates of mediating effects								
via SE – controlling upsetting thoughts (residualized)	—		-4.104 (-6.655, -1.553)		-0.746 (-1.380, -0.111)		1.777 (0.461, 3.093)	
via Benefit words (residualized)	-0.763 (-1.634, -0.109)		—		—		—	
Proportion of treatment effect due to mediation	0.283		0.758		0.706		0.638	

Note: The posttreatment values of chronic illnesses, BPSD, and functional health were used as covariates. P values were based on *t* tests with df=80 for equations without mediators and 78 for equations including mediators. — = not tested.

TABLE 3. Regression of Posttreatment Outcome Measures on Baseline Measures, Covariates, and Treatment Conditions (BF vs. STD-PE), With or Without Mediators

	Posttreatment measures							
	Depression		Zarit burden		Role overload		Psychological well-being	
	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p
				Excluding mediators				
Baseline measure of dependent variable	0.242 (0.041, 0.444)	0.019	0.508 (0.329, 0.688)	<0.001	0.446 (0.236, 0.656)	<0.001	0.500 (0.336, 0.665)	<0.001
Age	-0.050 (-0.136, 0.035)	0.246	-0.192 (-0.489, 0.106)	0.204	0.023 (-0.036, 0.082)	0.444	-0.023 (-0.194, 0.147)	0.785
Sex (female)	0.149 (-1.956, 2.254)	0.888	3.714 (-3.589, 11.018)	0.314	0.916 (-0.574, 2.405)	0.225	0.726 (-3.441, 4.894)	0.729
Chronic illnesses	1.843 (0.929, 2.758)	<0.001	-0.145 (-3.357, 3.068)	0.929	0.342 (-0.281, 0.965)	0.278	-0.913 (-2.738, 0.911)	0.322
BPSD	0.014 (-0.029, 0.057)	0.507	0.179 (0.025, 0.334)	0.023	0.028 (-0.002, 0.058)	0.071	-0.031 (-0.115, 0.053)	0.470
Functional health	-0.019 (-0.148, 0.111)	0.777	-0.178 (-0.641, 0.284)	0.445	-0.039 (-0.133, 0.055)	0.408	-0.092 (-0.347, 0.163)	0.474
BF	-3.393 (-4.824, -1.961)	<0.001	-7.616 (-12.561, -2.671)	0.003	-0.593 (-1.578, 0.392)	0.234	1.625 (-1.251, 4.501)	0.264
R^2	0.402		0.522		0.399		0.399	
				Including mediators				
(Covariates and baseline measure)								
SE – controlling upsetting thoughts (residualized)	-0.023 (-0.039, -0.006)	0.009	-0.077 (-0.135, -0.018)	0.011	—		—	
Benefit words (residualized)	-0.111 (-0.335, 0.113)	0.327	-0.576 (-1.345, 0.193)	0.140	—		—	
BF	-1.921 (-3.632, -0.210)	0.028	-2.140 (-7.948, 3.669)	0.465	—		—	
R^2	0.470		0.584					
				Bootstrap estimates of mediating effects				
via SE – controlling upsetting thoughts (residualized)	-1.130 (-2.305, -0.045)		-3.727 (-6.947, -0.507)		—		—	
via Benefit words (residualized)	—		—		—		—	
Proportion of treatment effect due to mediation	0.333		0.489					

Note: The posttreatment values of chronic illnesses, BPSD, and functional health were used. Coefficients for covariates are not shown in the equations with mediators. P values were based on *t* tests with df=77 for equations without mediators and 75 for equations including mediators. — = not tested.

TABLE 4. Adjusted Descriptive Statistics at Posttreatment

	Depression			Zarit burden			Role overload			Psychological well-being		
	Mean	SD	SE	Mean	SD	SE	Mean	SD	SE	Mean	SD	SE
SIM-PE	5.137	3.476	0.518	32.544	11.431	1.704	10.705	2.478	0.369	63.867	6.559	0.978
STD-PE	5.833	3.432	0.530	34.749	11.886	1.834	10.243	2.387	0.368	65.027	6.894	1.064
BF	2.441	3.499	0.540	27.133	11.704	1.828	9.650	2.424	0.374	66.652	6.753	1.042

Note: Means, SDs and SEs were adjusted for the simultaneous effects of covariates and baseline values of the dependent variable.