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Research Article

A Controlled Pilot Study of the Wish Outcome Obstacle Plan Strategy for Spouses of Persons With Early-Stage Dementia

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Abstract

Objectives: Behavioral interventions can reduce distress for couples coping with early-stage dementia. However, most interventions are limited in accessibility and fail to address individualized goals. This pilot study examined the dyadic effects on multiple indicators of well-being of the Wish Outcome Obstacle Plan (WOOP) intervention, which guides participants to use Mental Contrasting with Implementation Intentions to achieve attainable goals in their daily lives.
Methods: This randomized controlled trial included 45 older persons with early-stage dementia (PWD) and their spousal care partners (CPs: $n = 90$ individuals). CPs were assigned randomly to WOOP training immediately after baseline (WOOP) or after a 3-month follow-up interview (Control; CON). Both groups received a dementia care education booklet. WOOP CPs were instructed to practice WOOP at least once a day for 2 weeks. All CPs and PWDs completed home surveys (baseline, 2 weeks, and 3 months), measuring perceived stress, depressive symptoms, quality of life, and affect.
Results: Mixed-effects models showed significant intervention × time interaction effects with large effect sizes for CPs on three of the five outcomes over 3 months. Compared with CON, WOOP CPs had decreased perceived stress ($\delta = 1.71$) and increased quality of life ($\delta = 1.55$) and positive affect ($\delta = 2.30$). WOOP PWD showed decreased perceived stress ($\delta = 0.87$) and increased quality of life ($\delta = 1.26$), but these effects were not statistically significant.
Discussion: WOOP is a promising, brief intervention to improve dementia CPs' well-being that may also positively affect their partners with dementia.

Keywords: Affect, Behavioral interventions, Caregiving, Dementia, Mental contrasting with implementation intentions

Older adults living with early-stage dementia are most likely to receive assistance from a spouse or romantic partner (Arbel et al., 2019), and spousal care partners are especially vulnerable to the negative health effects of dementia caregiving. Compared with other types of family care partners, spouses have a greater risk of psychological morbidity (Hawkley et al., 2020), functional disability, and cognitive decline (Vitaliano et al., 2011). This increased risk has been partially explained by spouses' older age, provision of greater hours of care, and greater emotional distress in response to the suffering of the partner (Arbel et al., 2019; Monin et al., 2015). Furthermore, negative mental health symptoms in care partners predict decreased longevity in their partners with dementia (Lwi et al., 2017).

Early-stage dementia is an important time to intervene with spousal care partners. Romantic couples often face the dementia diagnosis and the emotional consequences stemming from the uncertainty of the trajectory together (Herrmann et al., 2018). Challenges include changes in communication that can conjure feelings of loss and anxiety (Braun et al., 2010). Couples experience the loss of shared friendships from social discomfort with the emerging dementia symptoms (Harris, 2013). These challenges for the couple often occur in the isolation of their home without support from their broader social network.

Behavioral interventions for care partners of persons with dementia are often utilized late in the trajectory of the disease when caregiver burnout is less amenable to intervention (Ducharme et al., 2014). Early-stage clinical care prioritizes medical discussions of dementia diagnosis, trajectory, and treatment rather than caregiver resources and symptom management (Peterson et al., 2016). Behavioral interventions that build resiliency in care partners are often overlooked until symptoms become more difficult to manage. Easy-to-use and accessible interventions that combine disease education and mental strategies to manage daily obstacles (especially those that involve communication with the partner) and accomplish self-care goals are needed. Interventions should be amenable to dissemination with easy workflow integration in primary care offices (Gitlin et al., 2015).

A promising intervention for spousal care partners of persons with dementia is the Wish Outcome Obstacle Plan (WOOP) strategy. It is self-guided and aimed at promoting behavior change that improves well-being. Specifically, WOOP helps people understand and attain their goals and has been applied to multiple health contexts including back pain (Christiansen et al., 2010), stroke (Marquardt et al., 2017), physical activity (Stadler et al., 2009), eating behaviors (Stadler et al., 2010), behavior change in children with Attention Deficit Hyperactive Disorder (ADHD; Gawrilow et al., 2012), relationship dysfunction (Houssais et al., 2013), and emotion regulation (Schweiger-Gallo et al., 2018).

WOOP involves a set of straightforward steps individualized to a person's needs and contexts that ultimately form protective cognitive and behavioral patterns (Oettingen, 2014). These mental steps are as follows: identifying a feasible **W**ish, identifying the desired **O**utcome and imagining it, identifying a central inner **O**bstacle to fulfilling that wish and imagining it, and making an "if … obstacle, then I will … behavior to overcome obstacle" **P**lan, or implementation intention (Gollwitzer, 1999, 2014) to accomplish the wish. (WOOP turns wishes and dreams about a desired future into goals that people strongly commit to and then actively pursue. As wishes can be considered goals with weak commitment, to keep the terminology simple, in this article we use the term goal for both wishes and goals.) WOOP can be taught to people with a brief training session (Stadler et al., 2010). It can also achieve beneficial results without formal training, as there is a book, a series of videos, a mobile app, and a website explaining the steps of WOOP and their application in daily life. WOOP can be used as a 5-minute daily exercise that has lasting benefits on health and well-being, shown in multiple longitudinal and experimental studies (Oettingen, 2014). It is a highly feasible, acceptable, and scalable intervention.

The principal components of WOOP are *Mental Contrasting with Implementation Intentions* or *MCII*. In MCII, *mental contrasting* of the desired future and the inner obstacle standing in the way translates dreams about desired and feasible futures into strong goal commitments with subsequent goal striving and goal attainment. Although the desired future provides the direction of action, identifying and imagining the inner obstacle provides the energy and points the way to surmount the obstacle. Subsequently, the inner obstacle is addressed by *implementation intentions* linking the obstacle to the actions to overcome it (i.e., *if* … obstacle, *then I will* … behavior to overcome obstacle). MCII is an integrative strategy for autonomous behavior change and is more effective than either MC or II alone (Adriaanse et al., 2010; Kirk et al., 2013).

There are key differences that separate WOOP from similar therapeutic approaches such as motivational interviewing and cognitive behavior therapy (CBT). First, WOOP uses conscious imagery to change behavior by directly affecting nonconscious cognitive, motivational, and emotional processes; they run outside of people's awareness and mediate behavior change (Kappes & Oettingen, 2014; Kappes, Oettingen, et al., 2012; Kappes, Singmann, et al., 2012; Kappes et al., 2013; Oettingen et al., 2009; Wittleder et al., 2019).

Specifically, the mental contrasting part of WOOP (i.e., WOO) strengthens the associative links between the desired future outcome and the obstacle of reality as well as between the obstacle and the behavior to overcome the obstacle (Kappes & Oettingen, 2014). It allows people to nonconsciously recategorize their reality as an obstacle (Kappes et al., 2013), which provides the energy needed to overcome the obstacle (Oettingen et al., 2009). Finally, mental contrasting helps to process the information contained in setbacks, while it protects against loss of one's sense of competence (Kappes et al., 2012). All these nonconscious mechanisms mediate the effects of mental contrasting on goal attainment.

WOOP affects behavior change without the need to heighten beliefs (e.g., self-efficacy) or attitudes (e.g., incentive; Oettingen et al., 2001, 2009) in contrast with theories of change by cognitive motivational interviewing (MI). Indeed, studies show that self-efficacy is not affected by WOOP (e.g., Oettingen et al., 2001). WOOP can influence the attainment of goals and behavior change across contents and framing. For example, it can lead to the attainment of goals geared to learning (e.g., learning when and how to apply a prescribed medicine to one's partner) and performance goals (e.g., the partner benefitting from the correct application of the medicine), specific goals and "do your best" goals, and promotion and prevention goals. After behavioral improvements, changes in attitudes and beliefs can follow. Third, people can use WOOP autonomously to regulate their cognition, emotion, and action without the need of a therapist as in CBT or MI (Marquardt et al., 2017; Mutter et al., 2020; Stadler et al., 2009, 2010; Valshtein et al., 2020; Wittleder et al., 2019).

WOOP also differs from problem-solving therapy (PST), another therapeutic approach for caregivers of persons with mild cognitive impairment (Garand et al., 2014). PST involves coaching with the following instructions: (a) writing a clear description of the problem; (b) setting a realistic goal; (c) brainstorming solutions; (d) listing pros and cons of each solution; (e) choosing a solution; (f) developing an action plan; and (g) evaluating progress. Missing in PST are several steps that are inherent to MCII. For example, MCII demands the search for a strongly desired future as the first step, the identification and vivid imagery of the best outcome as the second step, and the search for and vivid visualization of the critical internal and thus controllable obstacle of reality as the third step. What is additionally missing in PST is the plan in the form of "if … obstacle, then I will … behavior to overcome the obstacle." This type of plan is geared toward overcoming particularly challenging obstacles. Implementation intentions have been found to make people automatically act in a prespecified way once the critical situation (e.g., obstacle) occurs (i.e., a behavioral response is immediate, efficient, and demands no further intention; for a summary of the vast literature on implementation intentions see Gollwitzer, 1999, 2014).

There are more specific differences between the procedures of PST and MCII. For example, when people learn MCII, they are asked to find and imagine the internal (vs. external) obstacle of reality that may hinder them from obtaining their wish (e.g., an emotion, irrational belief, or ingrained habit). This is because an internal rather than an external obstacle can be more readily identified and surmounted (e.g., my impatience can be changed, but the behavior of my spouse is harder to change). Note that generating an inner obstacle of reality is different from PST encouraging people to deliberate the pros and cons of possible future outcomes.

Furthermore, in MCII, it is critical to observe the order of the steps. For example, people need to first find the wish and imagine the desired future outcome and only then focus on the obstacle of reality. Exchanging the order of the two Os (i.e., first mentally elaborating the obstacle of reality and then mentally elaborating the future outcome) fails to create the effects of MCII and the setting of realistic goals (Kappes & Oettingen, 2014). In sum, because of these different instructions in PST and MCII (WOOP), we cannot assume that PST and MCII will evoke the same mechanisms of behavior change. We cannot even assume that people taught PST might spontaneously use MCII as only about 10%–20% use mental contrasting of future and reality spontaneously (summary by Oettingen & Sevincer, 2018).

WOOP has multiple features that make it especially well suited to spouses of persons with early-stage dementia. Its accessibility and ease of use are important factors, as care partners are often overburdened and particularly stressed. WOOP has greater benefits for people who report experiencing more severe symptoms of ADHD (Gawrilow et al., 2012), hazardous alcohol consumption (Wittleder et al., 2019), and heavy smoking (Mutter et al., 2020) compared with people who have less severe symptoms in each context. WOOP is tailored to the individual; the individual chooses their own goal. Such individualized interventions are important for care partners as their needs are highly heterogeneous (Gitlin et al., 2015). Though WOOP has been found to reduce stress in nurses (Gollwitzer et al., 2018), no published studies have tested the feasibility and efficacy of the WOOP intervention in care partners of persons with dementia.

The aims of this pilot randomized controlled trial (RCT) were to examine the feasibility and efficacy of WOOP compared with "an education booklet and supportive phone call control with delayed WOOP training" with 45 persons with early-stage dementia and their spouses. Outcomes (perceived stress, depressive symptoms, quality of life, and positive and negative affect) were measured in both the care partners and persons with early-stage dementia at three time points at home (baseline, 2 weeks, and 3 months; Gérain & Zech, 2019). Participant characteristics (e.g., sociodemographics, health, cognitive functioning) were measured at baseline. We first assessed feasibility descriptively with the number of WOOP cards completed. A WOOP card is a small worksheet that helps the participant write their wish, outcome, obstacle, and if–then plan, and it typically takes 5–10 minutes to complete. Next, we examined the hypothesis that there would be a significant intervention × time interaction effect such that WOOP care partners and persons with dementia would show a significant decrease in perceived stress, depressive symptoms, and negative affect and an increase in quality of life and positive affect over time compared with CON care partners and persons with dementia.

Method

Participants

Couples were recruited from an established network of geriatricians, home health care, and adult day service contacts as well as flyers posted in the community. The study was also listed on clinicaltrials.gov and the Alzheimer's Association's TrialMatch sites. Eligibility criteria were as follows: (a) the couple was married or in a cohabiting, committed relationship, (b) one partner was told by a clinician they had Alzheimer's disease or a related dementia (ADRD), (c) the person with suspected ADRD scored ≥ 16 and ≤ 27 on the Mini-Mental State Examination (MMSE; Folstein et al., 1975), (d) the spouse care partner scored a 27 or higher on the MMSE, (e) both participants agreed to participate, and (f) both partners were 55 years of age or older. Our previous work shows that persons with ADRD can complete interviews reliably with an MMSE score of 16 or higher (Schulz et al., 2010).

Sixty couples (n = 120 individuals) were screened for eligibility. Couples were ineligible due to lack of cognitive impairment (n = 1), the inability of a person with dementia to complete interviews due to mid and late stage of disease (n = 3), the person with dementia not being comfortable participating (n = 2), too much of a time commitment for the couple (n = 2), unable to schedule (n = 6), or decided to do a different study (n = 1). Forty-five couples (n = 90 individuals) met eligibility criteria and were randomized to WOOP (n = 24 couples) and CON (control; n = 21 couples) groups, and an intent to treat analysis was used (Figure 1). See Table 1 for participant characteristics.

Interventions and Procedure

This study employed an RCT design where participants completed baseline surveys, were randomized to a control (CON) group or a treatment (WOOP) group, followed for 16 days, and then completed postintervention evaluation. Participants were randomized to their group after they completed the baseline surveys. The same interventionist (L.D.) completed all home visits and phone calls for all participants except the first four couples, which were completed by the principal investigator (J.K.M.). L.D. or J.K.M. was present when the care partners and persons with dementia privately completed the self-report surveys in separate rooms at the home visits. Some persons with dementia needed assistance, and L.D. or J.K.M. sat near them, read them the questions, and helped record their answers.

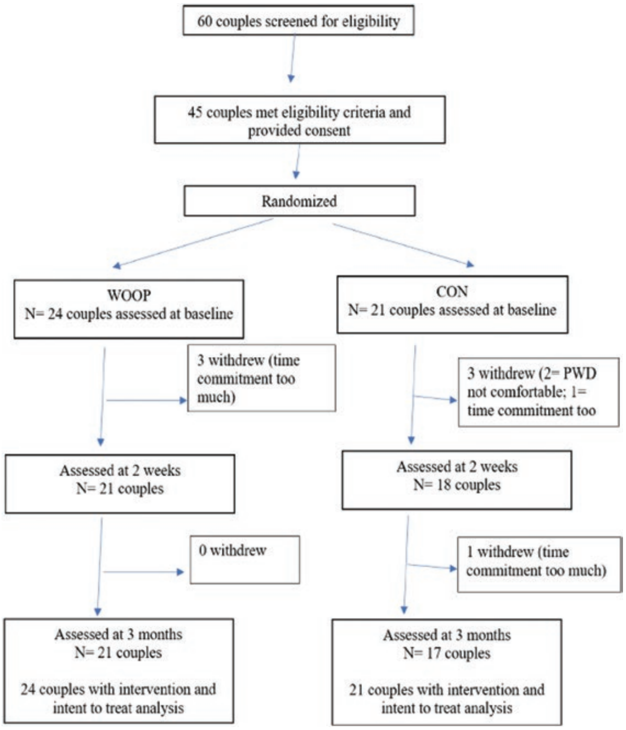

Figure 1. Study flow chart. WOOP = Wish Outcome Obstacle Plan group; CON = wait list control group; PWD = person with dementia. Due to the coronavirus disease 2019 restrictions, one couple in the intervention group and one couple in the waitlist group completed their questionnaires through the mail with support from video-chat.

The control group consisted of a brief education discussion guided by the NIA guide "Caring for a Person with Alzheimer's Disease" at the baseline home visit; the WOOP group consisted of the same discussion and booklet plus the WOOP training. During this education discussion, the spousal care partner was invited to share their experience, and the interventionist pointed to sections of the guide that would be useful for them to read. Both trial arms included four check-in phone calls by the interventionist to the care partner during the 2 weeks after the baseline home visit. Participants in CON group were given the opportunity for delayed WOOP training.

In addition to the education, the WOOP care partners received the ~1 hour guided WOOP training at their home, were given a stack of 16 WOOP daily cards (see Figure 2), and they received phone calls (ranging 5–20 minutes) every 3 days for 2 weeks asking about their most recent WOOP card so the interventionist could provide regular feedback. The CON group also received phone calls in which they talked about their recent challenges and received emotional and practical support from the interventionist. The CON group received the ~1 hour guided WOOP training at their home after completing their 3-month survey.

WOOP training involved the following: (a) Think aloud WOOP: The interventionist walked the care partner through one *mental (thinking aloud)* WOOP exercise (the WOOP steps of the Wish, Outcome, Obstacle, Plan) pertaining to a challenging but feasible wish they had for their well-being in the next *3 months*. (b) Written WOOP 1: The interventionist walked the care partner through one *written* WOOP exercise using the *next week* timeframe. (c) Written WOOP 2: The care partner practiced another *written* WOOP exercise using the *next 24 hours* as the timeframe, with the interventionist providing guidance and feedback. Essentially, the interventionist practiced the WOOP exercise in various ways with the participant to make sure they were proficient in following the instructions. (d) WOOP cards: The care partner was given a stack of WOOP cards and instructed on how to use them (Figure 2). Care partners were also provided with a paper WOOP instruction manual explaining the steps to help with their home practice.

To be specific, care partners were asked to use the WOOP steps any time they wanted, either mentally or in written form, for any wish they wanted, small or large, short term

Table 1. Participant Characteristics at Baseline

	Care partners (N= 45)		Persons with dementia (N = 45)		Difference tests
	WOOP (n = 24)	CON (n = 21)	WOOP (n = 24)	CON (n = 21)	
Gender, *n* (%)	Female: 17 (71) Male: 7 (29)	Female: 14 (67) Male: 7 (33)	Female: 8 (33) Male: 15 (63) Not reported: 1 (1)	Female: 8 (38) Male: 13 (62)	CP: $\chi^2(1) = 0.90$, $p = .76$ PWD: $\chi^2(2) = 0.95$, $p = .62$
Race, *n* (%)	White: 22 (92) Black: 1 (4) Puerto Rican: 1 (4)	White: 19 (90) Black: 2 (10)	White: 20 (84) Black: 1 (4) Puerto Rican: 1 (4) No primary: 1 (4) Not reported: 1 (4)	White: 19 (90) Black: 2 (10)	CP: χ^2 (2) = 1.36, $p = .51$ PW: χ^2 (4) = 3.17, $p = .53$
Hispanic, *n*	1	0	1	0	N/A
Same-sex couple, *n*	1	0	1	0	N/A
Age in years (mean, *SD*)	72.3 (7.1)	76 (6.9)	75.8 (7.5)	77.2 (7.4)	CP: $t(43) = 1.78$, $p = .08$ PWD: $t(43) = 0.63$, $p = .53$
Age in years: frequencies	57: 1 60–69: 7 70–79: 12 80–89: 4	60–69: 3 70–79: 10 80–89: 8	60–69:5 70–79: 15 80–89: 3 99: 1	60–69: 4 70–79: 10 80–89: 6 92: 1	N/A
Education, *n* (%)	<High school: 0 (0) High school: 3 (12) Some college: 4 (17) Associate's: 1(4) Bachelor's: 4 (17) Some grad school: 7 (29) Professional: 5 (21)	<High school: 0 (0) High school: 3 (14) Some college: 5 (24) Associate's: 0 (0) Bachelor's: 3 (14) Some grad school: 3 (14) Professional: 7 (33)	<High school: 0 (0) High school: 2 (8) Some college: 7 (29) Associate's: 1 (4) Bachelor's: 2 (8) Some grad school: 4 (17) Professional: 7 (29) Not reported: 1 (4)	<High school: 2 (10) High school: 4 (19) Some college: 5 (24) Associate's: 0 (0) Bachelor's: 1 (5) Some grad school: 1 (5) Professional: 8 (38)	CP: χ^2 (5) = 3.00, $p = .70$ PWD: χ^2 (7) = 7.03, $p = .43$
Employment, *n* (%)	Full time: 2 (8) Part time: 1 (4) Homemaker: 2 (8) Retired: 19 (80) Not employed: 0 (0)	Full time: 1 (5) Part time: 3 (14) Homemaker: 1 (5) Retired: 14 (66) Not employed: 1 (5) Not reported: 1 (5)	Retired: 22 (92) Not employed: 1 (4) Not reported: 1 (4)	Retired: 19 (90) Not employed: 2 (10)	CP: χ^2 (5) = 4.24, $p = .52$ PWD: χ^2 (2) = 1.36, $p = .51$
Number of chronic conditions, mean (*SD*)	3.3 (1.5)	5.0 (2.4)	2.7 (2.5)	3.2 (2.5)	CP: $t(43) = 2.96$, $p = .005$* PWD: $t(43) = 0.78$, $p = .44$
MMSE, mean (*SD*)	28.8 (1.2)	29.1 (1.3)	22.1 (6.3)	23.1 (4.6)	CP: $t(42) = 0.59$, $p = .55$ PWD: $t(43) = 0.61$, $p = .55$

Table 1. Continued

	Care partners (N= 45)		Persons with dementia (N = 45)		Difference tests
	WOOP (*n* = 24)	CON (*n* = 21)	WOOP (*n* = 24)	CON (*n* = 21)	
MMSE scores: frequencies	26: 1 27: 3 28: 3 29: 8 30: 8	26: 1 27: 3 28: 1 29: 5 30: 11	<16: 2 16:1 17:3 19: 1 20: 1 21–24: 6 25–27: 5 28–30: 5	<16: 1 16: 1 17:1 18:1 20:1 21–24: 5 25–27: 9 28–30: 2	N/A
CP report of Neuropsychiatric Inventory Number of symptoms of PWD, mean (*SD*)	n/a	n/a	5.6 (3.3)	4.3 (3.2)	$t(43) = 1.38, p = .17$
Marital length in years, mean (*SD*)	42.3 (16.5)	44.7 (18.0)	n/a	n/a	$t(43) = 0.47, p = .64$
Has children, *n* (%)	Yes: 20 (83) No: 4 (17)	Yes: 16 (76) No: 3 (14) Not reported: 2 (10)	n/a	n/a	χ^2 (2) = 2.40, $p = .30$

Notes: CON = control; CP = care partner; MMSE = Mini Mental State Exam; n/a = not applicable; PWD = person with dementia; WOOP = Wish Outcome Obstacle Plan.

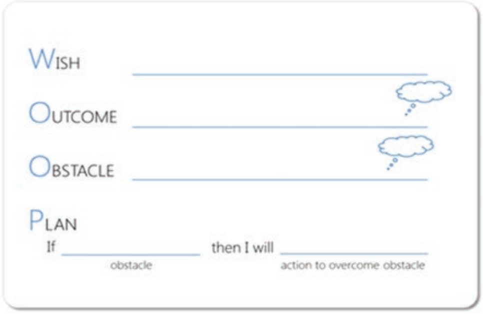

Figure 2. Wish Outcome Obstacle Plan card.

or long term. The interventionist also asked that they at least complete one WOOP card per day that would be returned to the study team. They were provided with 16 cards because the follow-up survey for the study was at Day 16. Participants were free to photocopy more cards for their own use or to write the WOOP steps on a blank sheet of paper or in a notebook for use beyond the 16 cards. They were told they were free to co-construct wishes with their partner with dementia; however, no participants reported doing so. Additional supportive resources were provided to facilitate WOOP adoption beyond the printed WOOP manual. These included videos, mobile app, and the website (www.woopmylife.org).

Yale University's Human Subjects Research board approved this study (HIC# 2000021852).

Measures

Participant-reported outcomes were obtained from both partners and included perceived stress, depressive symptoms, quality of life, and positive and negative affect over the past week. Perceived stress was measured with the 10-item Perceived Stress Scale (Cohen et al., 1983). Depressive symptoms were measured with the 10-item Center for the Epidemiological Studies of Depression Short Form (Andresen et al., 1994). Quality of life was measured with the Quality of Life in Alzheimer's Disease (QOL-AD; Logsdon et al., 2002). The QOL-AD consists of 13 items that capture multiple aspects of a person's quality of life in the context of dementia. It can also be used to examine the quality of life of family members of persons with dementia. Participants rate on a 4-point scale from poor to excellent the degree to which they feel about different aspects of their life (e.g., physical health, energy, mood, memory, family). Ten positive (e.g., enthusiastic, proud) and 10 negative (e.g., irritable, distressed) adjectives were measured with the Positive and Negative Affect Scale (Watson et al., 1988).

Participant characteristics included age, gender, education, employment, marital length, number of children, income, and physical health conditions measured at baseline. Eight instrumental activities of daily living were measured at all time points (Miller et al., 2000). The MMSE (Folstein et al., 1975) assessed cognitive functioning in

Table 2. Wish Outcome Obstacle Plan Intervention (vs. Control) Effects for Care Partners and Persons With Dementia on Study Outcomes

Study outcome measure														
Perceived stress			Depressive symptoms			Quality of life			Positive affect			Negative affect		
Est.	*SE*	*p*	Est.	*SE*	*p*	Est.	*SE*	*p*	Est.	*SE*	*p*	Est.	*SE*	*p*
Care partners														
15.53	1.61	<.001	7.67	1.18	<.001	39.19	1.46	<.001	3.74	0.18	<.001	0.68	0.09	<.001
1.35	2.18	.534	0.71	1.68	.672	−0.20	1.92	.917	−0.07	0.24	.763	−0.02	0.13	.902
0.63	0.38	.097	0.48	0.39	.218	−1.57	0.46	.001	−0.16	0.06	.014	−0.06	0.03	.081
−1.89	**0.77**	**.014**	−1.36	0.67	.042	**2.43**	**0.76**	**.001**	**0.23**	**0.08**	**.003**	−0.04	0.05	.337
Person with dementia														
12.54	1.55	<.001	6.01	0.91	<.001	39.09	1.23	<.001	2.94	0.15	<.001	0.36	0.07	<.001
−0.66	2.01	.745	0.02	1.52	.988	−2.18	1.67	.192	0.10	0.21	.619	0.01	0.10	.937
0.74	0.55	.178	−0.48	0.31	.126	−0.49	0.40	.214	0.03	0.09	.727	0.03	0.03	.372
−1.55	0.94	.098	−0.21	0.48	.672	1.14	0.61	.063	0.02	0.11	.864	−0.01	0.05	.901

Notes: Care partner models included a covariate to adjust for the only baseline difference found between WOOP and CON conditions—in care partner number of health conditions. Note that results and associated *p* values were quite similar with or without this adjustment. Bold font indicates statistically significant treatment effects after correcting for familywise error using Holm's sequential Bonferroni procedure (Holm, 1979). CON = control; WOOP = Wish Outcome Obstacle Plan.

both couple members at baseline and 3 months, and the Neuropsychiatric Inventory (NPI) (Bakker et al., 2011) was used to assess specific types of dementia symptoms in the person with dementia as reported by the caregiving spouse at all time points. Physical health conditions were measured with the 24-item Physical Comorbidity Index, which asks about the presence of common chronic conditions (e.g., high blood pressure, history of heart attack, history and presence of cancer, history and presence of psychiatric problems; Katz et al., 1996). See Table 1 for means, *SD*, and Cronbach's α of outcome measures at baseline.

Data Analysis Plan

All analyses were conducted using mixed-effects dyadic and longitudinal data analysis techniques within the Mplus software package (Mplus 8.1, 1998–2018). With interdependent data such as those found within couple and longitudinal data, it is essential to account for the interdependence in outcomes in all analyses. Mixed-effects (or multilevel) modeling handles interdependence of outcome residuals for each member of a couple (dyad), as well as accounting for the correlation of repeated measures within individuals. Missing data were handled using Full Information Maximum Likelihood Estimation, an appropriate modeling-based correction for missingness that is considered equivalent to multiple imputation and much less problematic than listwise deletion (Allison, 2001). As long as at least one dyad member has a measure at one timepoint, their data were retained in all analyses. Thus, each couple with baseline data is retained in all analyses.

A multivariate dyadic linear growth curve model was used to predict the trajectories of psychological well-being (Raudenbush et al., 1995). This model estimates a latent trajectory of change for each type of partner (care partners [CP] vs. persons with dementia [PWD]) and accounts for interdependency of partners' residuals as well as the correlation among repeated assessments at Level 1, with dyadic clustering accounted for at Level 2. Models were conducted separately for each outcome (perceived stress, depressive symptoms, quality of life, and positive and negative affect), and *p* values were corrected for familywise error using Holm's sequential Bonferroni procedure (Holm, 1979). Equations for the model are provided below:

Level 1 (within couples):

$$
\begin{aligned}
&\text{Outcome}_{ij} = \\
&\beta_{1j} * \text{CP} + \beta_{2j} * \text{CP\_Time} + r_{\text{cp}ij} \\
&\beta_{3j} * \text{PWD} + \beta_{4j} * \text{PWD\_Time} + r_{\text{pwd}ij}
\end{aligned}
$$

Level 2 (between couples):

$$
\begin{aligned}
\beta_{1j} &= \gamma_{10} + \gamma_{11} * \text{WOOP} + u_{1j} \\
\beta_{2j} &= \gamma_{20} + \gamma_{21} * \text{WOOP} + u_{2j} \\
\beta_{3j} &= \gamma_{30} + \gamma_{31} * \text{WOOP} + u_{3j} \\
\beta_{4j} &= \gamma_{40} + \gamma_{41} * \text{WOOP} + u_{4j}
\end{aligned}
$$

Within each dyad, a CP and PWD intercept and linear trajectory of growth are estimated at Level 1, with Time centered at baseline. These are summarized as averages via the fixed effects ($\gamma_{10}, \gamma_{20}, \gamma_{30}, \gamma_{40}$) and variability via the random effects ($u_{1j}, u_{2j}, u_{3j}, u_{4j}$) for each partner type at Level 2. The WOOP intervention is a couple-level indicator (couples in the WOOP intervention had a value of 1, and those in the CON condition had a value of 0) entered as a predictor at Level 2. The main effect of WOOP tests differences between WOOP and CON in their baseline values of the outcome (γ_{11} and γ_{31} for CP and PWD, respectively). The key tests for the study hypotheses are represented as the effect of the WOOP intervention as a predictor of change in outcomes over the study period ("intervention × time" effects), in bold font (γ_{21} and γ_{41} for CP and PWD, respectively). Thus, the model simultaneously estimates distinct intervention effects for each partner role (CP vs. PWD), while appropriately accounting for the interdependence in partners' outcomes by allowing both residual variances at Level 1 and all random effects variances at Level 2 to covary (Kenny et al., 2006). Standardized effect size δ was calculated for each significant effect. This statistic is calculated by dividing the unstandardized difference between the treatment groups on the rate of change (i.e., the γ_{21} *or* γ_{41} coefficient) by the standard deviation of the change slope (Spybrook et al., 2011). Interpretation of this effect size is akin to that of Cohen's *d* interpretation, with small (0.2), medium (0.5), and large (0.8 and above) rules of thumb for effect magnitudes. Simple slopes were estimated for the WOOP condition to understand whether the outcome change for the WOOP group was significantly different from zero (Aiken & West, 1991).

Results

Twenty of 24 dyads were adherent to the study protocol. Excluding four care partners who completed zero homework cards, the remaining 20 care partners completed an average of 11 (*SD* = 5.01) cards in the 16-day period with a range of 2–21. No significant baseline group differences were found across variables (Table 1) except for the number of chronic conditions in care partners at baseline. CON care partners had more conditions on average than WOOP care partners. Thirteen of 21 care partners in the CON condition had five or more health conditions, whereas five care partners of 24 in the WOOP condition had five or more health conditions. However, there were no significant differences in the number of care partners in the WOOP and CON conditions who had mental health conditions (χ^2 (1) = 0.92, p = .34) or cancer (χ^2 (1) = .40, p = .53) at baseline, which are conceptualized as being the most relevant potential confounders between the groups to the present hypotheses. A small fraction of the sample did not meet the original MMSE criteria but were included in the analysis. (Two persons with dementia in the WOOP arm and one in the CON arm had an MMSE score of less than 16. Five persons with dementia in the WOOP arm and two persons with dementia in the CON arm scored above a 27 with care partners reporting their partner's diagnosis and NPI scores for these individuals: 4, 7, 3, 9, 5, 1, and 1. We included these couples in the analysis to be more inclusive and for therapeutic and compassionate reasons.) See Supplementary Table 1 for intercorrelations between all outcome variables.

Table 2 presents results from the primary analyses, which modeled baseline level and linear change in the outcome for the CON group and tested whether those in the WOOP intervention differed significantly from these estimates. As we found a significant baseline difference between WOOP and CON caregivers in their chronic conditions, we included this as a covariate in all reported analyses. Treatment effect results and associated *p* values of these effects were quite similar in models without the covariate. Results showed no significant differences between the WOOP and CON groups in baseline levels of any outcome, supporting the claim that the randomization was effective.

Largely supporting the overall hypothesis, results indicated significant differences between couples in the WOOP versus CON conditions in change over time in three of the five outcomes. First, there was a significant intervention × time interaction effect such that WOOP care partners showed significant decreases in perceived stress over time ($\delta = 1.71$), whereas CON care partners showed no significant change in perceived stress (see Figure 3, solid lines). Persons with dementia in the WOOP condition showed declines in perceived stress, but this failed to reach statistical significance ($\delta = 0.86$), whereas persons with dementia in the CON condition showed nonsignificant increases in perceived stress across the same study period (see Figure 3, dashed lines).

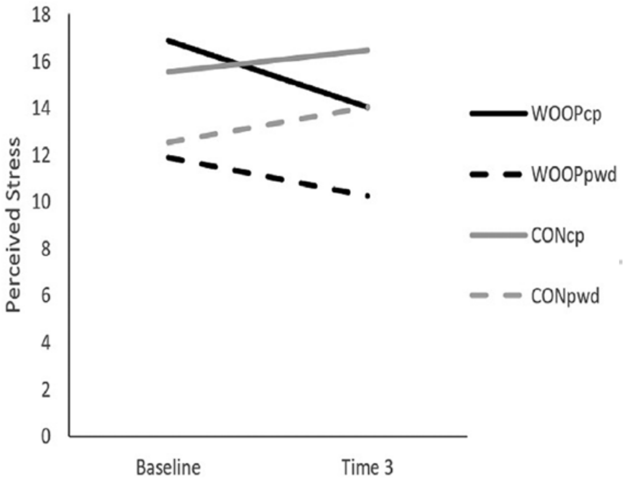

Figure 3. Perceived stress changes from baseline to 3 months for care partners and persons with dementia in WOOP and CON conditions. WOOP = Wish Outcome Obstacle Plan group; CON = control group; PWD = person with dementia; CP = care partner; Time 3 = 3-month visit.

Care partners in the WOOP condition showed declines in depressive symptoms over the study period (p = .04), but this effect fell below the threshold of statistical significance after correcting for familywise error (δ = 0.98). Persons with dementia in the WOOP condition showed no significant change in depression over time.

Care partners in the WOOP condition had significant increases in quality of life relative to those in the CON condition (δ = 1.55). Persons with dementia in the WOOP condition showed statistically nonsignificant increases in quality of life over time relative to CON (δ = 1.28).

There was a statistically significant intervention × time interaction effect predicting positive emotions, such that WOOP care partners showed significant increases in positive affect over time compared with CON (δ = 2.30), whereas no such difference was found for persons with dementia in the WOOP versus control conditions. The intervention × time interactions were also not statistically significant in predicting negative affect for either care partners or persons with dementia. See Table 2 for the statistical results. Post hoc power analyses were conducted using Monte Carlo simulation techniques to test how often studies with these parameters would yield statistically significant results. We found mixed evidence that we were powered to detect our hypothesized effects (see Supplementary Table 2 for details). Although low statistical power is a common problem in pilot study reporting, our power calculations indicate the findings here should be interpreted with some caution. See also Supplementary Table 3 for means across the time points.

Discussion

This study reports the outcomes over a 3-month period of a brief daily Mental Contrasting with Implementation Intentions intervention, called the WOOP tool to be more accessible to a community audience, for spouses of persons with early-stage dementia. We found that engaging in WOOP practice decreased spouses' perceived stress and increased their quality of life and positive affect over time. We found some preliminary evidence that their partners with dementia may have also benefitted in terms of decreased perceived stress and increased quality of life, although these effects did not reach statistical significance. We did not find evidence for intervention effects on negative affect nor depressive symptoms for either care partners or persons with dementia; however, they were in the hypothesized direction.

Our results showing significant intervention effects on perceived stress for care partners are promising and in line with the results of other behavioral caregiving interventions that utilize techniques such as mindfulness and CBT (Schulz et al., 2020). However, we also show effects on quality of life and positive affect. A shift from focusing on only negative clinical psychological outcomes is needed to more holistically address the mental health needs of couples coping with dementia. In addition, we need to better understand how changes in one partner affect the other (Monin, 2016).

Results of this study introduce the possibility that WOOP may be used for enhancing positive affect in dementia caregiving. This is consistent with a large body of evidence showing that WOOP is beneficial for mental health in a variety of health contexts (Oettingen, 2014). We extend past research on WOOP in a few ways. First, the feasibility of using WOOP in this setting was demonstrated through the successful completion of the study by 20 of 24 of the dyads. Second, we show some promising evidence that care partners engaging in WOOP may have implications for the mental health of their partner with dementia. Third, these findings demonstrate the lasting effects of WOOP over a 3-month period. Previous studies in other populations have followed participants over a shorter duration of WOOP practice.

In this first test of WOOP for dementia caregiving, it was necessary to train people to use WOOP in the most intense way possible to understand whether WOOP can improve care partners' mental health outcomes. This is why the training was one-on-one, in-person, and took an hour of an interventionist guiding care partners through multiple WOOP exercises and trouble-shooting along the way. However, once learned, the advantage of WOOP is that the strategy can be self-guided and only takes 5–10 minutes. It can be applied in any setting (e.g., home, bus, when taking a walk). Its effects have been shown with minimal teaching instructions in other studies; that is, materials were provided online in written form and an interventionist was not needed (e.g., Gollwitzer et al., 2018; Mutter et al., 2020; Wittleder et al., 2019).

A future step will be to test whether WOOP with minimal instruction has similar benefits specifically for care partners of persons with dementia in a rigorous, embedded pragmatic clinical trial. Pilot studies of targeted caregiver interventions have been limited by their rigor and have not found robust evidence for effects on caregiver outcomes, nor have they found added benefit of targeting the dyad versus the caregiver only (Cheng & Zhang, 2020). A future direction is to test whether using WOOP as an activity in support groups, where WOOP exercises can be shared and troubleshooted with peers, would have added positive effects beyond a more personal WOOP experience. Yet another future direction is to examine whether participants believed they attained each goal from their WOOP practices and whether attaining more goals or just the practice of thinking about attaining goals is associated with improved well-being. A larger trial should also examine whether fidelity to the intervention by participants completing the WOOP cards and accessing the materials on the internet moderated the efficacy of WOOP.

Although there are many strengths to this study, there are some limitations. First, this was a small sample without adequate power to make strong claims about efficacy. This may have led to our nonsignificant effects for persons with dementia. Second, we had wanted to teach WOOP to persons with dementia as well; however, the first two persons with dementia showed visible difficulty and distress in trying to work with the WOOP steps with the interventionist. To be safe, we discontinued teaching WOOP to persons with dementia so as not to further introduce harm. However, it may be possible to adapt or augment WOOP to be a shared activity and allow persons with dementia to directly address their own mental health needs. Third, our control condition consisted of a brief dementia care education training and check-in phone calls where we offered social support. Although we did not measure the length of the phone calls, anecdotally, the phone calls were often longer for the WOOP participants as they rehearsed the WOOP exercises. The CON participants varied in the extent to which they shared their experiences and sought emotional and informational support. Some CON participants were very thorough and grateful to have someone to talk to, whereas others' calls were brief. Also, in the control condition, WOOP training was provided at the end of the study after our final survey data were collected. It would have been better to engage CON participants in an active control condition or to compare WOOP to other goal-oriented training interventions. However, we were interested in whether WOOP was better than standard care, and unfortunately, the standard of care in most environments is still very brief dementia care education or no information at all. Next, this was not a double-blinded intervention, and the interventionist was also involved in collecting the outcome data. Although the interventionist was not in the same room as the care partner who completed their own questionnaires, there may have been bias during the home visit that influenced their answers. In addition, the interventionist assisted the person with dementia by reading the questionnaires and recording their answers when they had difficulty, which may have also introduced bias. We did this to limit the number of home visits needed in the study to minimize participant burden. However, in future studies, it will be necessary to keep data collection separate. Finally, this study used the MMSE to measure cognitive functioning in persons with dementia and care partners with a score of 26 and lower indicating possible dementia. Although this is common practice in medical settings, it is problematic from a psychometric and neuropsychological standpoint. Cognitive function is highly age-dependent. As a result, neuropsychological assessment relies on age-based normative data, such that using the same cut-point (i.e., MMSE score of 26) regardless of whether participants were 55 or 85 is not ideal. Furthermore, we did not have access to medical records and could not confirm diagnosis; we had to rely on self-reports. It will be important when testing efficacy to confirm medical record diagnosis and use strict cognitive functioning cutoffs. In this study, we prioritized therapeutic, compassionate care in allowing a small subset of couples to participate who did not meet the MMSE criteria after the initial screening was completed.

Taken together, this pilot RCT is the first to provide evidence that a brief Mental Contrasting with Implementation Intentions strategy called the WOOP tool can be taught to spousal care partners of persons with early-stage dementia and shows promising effects for their mental health and affect more broadly over time. The next step will be to show that WOOP can be used without intense instruction and can be easily disseminated by healthcare professionals.

Supplementary Material

Supplementary data are available at *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* online.

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Conflict of Interest

None declared.

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