The Effect of a Nurse-Led Cognitive Behavioral Protocol on Depressive Symptoms and Coping Strategies of Dementia Caregivers

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ABSTRACT

Background: Family caregivers of patients with dementia (PWD) often experience depressive symptoms and use poor coping strategies. Cognitive behavioral interventions may enhance positive appraisals of caregiving-related issues and the utilization of active coping strategies among caregivers, which may help prevent caregiver depression. However, there is a shortage of primary, community-based mental health services in China, and little research has been conducted on the effect of nurse-led mental health programs in this population.

Purpose: This study explored the effect of a nurse-led cognitive behavioral intervention on depressive symptoms and coping strategies among family caregivers of PWD in China.

Methods: This randomized controlled trial used data from a sample of 112 caregivers screened from 276 potential participants in a city in southeastern China. The sample was randomly assigned to an intervention group (n = 56) and a control group (n = 56). The intervention group received five monthly in-home, nurse-led cognitive behavioral sessions and telephone consultations after each session. The control group received five monthly, short, general conversations with nurse interventionists at the participants’ homes, in the hospital, or via telephone. Depressive symptoms, coping strategies, and the demographics of caregiving dyads were collected at Time 1 (baseline), Time 2 (the end of the 5-month intervention), and Time 3 (2-month follow-up). IBM SPSS Statistics Version 19.0 was used for data analysis.

Results: Eighty-two participants (intervention group: n = 35, control group: n = 47) completed the three evaluations. No significant group differences were found in baseline characteristics between the two groups. The general linear model repeated-measures analysis of variance indicated a significant difference in depressive symptoms and active coping between groups over time, with p < .001 for the interaction between depressive symptoms and active coping. A similar result did not occur for passive coping. The tests further supported a significant interventional effect on participants’ depressive symptoms and active coping.

Conclusions/Implications for Practice: This nurse-led cognitive behavioral intervention was effective in decreasing depressive symptoms and improving active coping among study participants. The findings suggest the improvement of mental health services and social policies in China to support family caregivers of PWD.

KEY WORDS: randomized controlled trial, cognitive behavioral intervention, family caregivers, patients with dementia, China.

Introduction

Caregiver Depression and Coping

The number of patients with dementia (PWD) is increasing rapidly worldwide, and family caregiving to PWD is stressful as patient’s cognitive and functional ability declines, accompanied by behavioral symptoms (Alzheimer’s Disease International, 2016). The prevalence of depression in family caregivers of PWD has been reported as between 14.9% and 80% globally (Alfakhi et al., 2018; Hashimoto et al., 2013; Schoenmakers, Buntinx, & Delepeleire, 2010). In China, the prevalence was 22.4%, but family caregiving may be more challenging than in Western countries (Liang et al., 2016). It has been estimated that China accounts for 20% of PWD worldwide. In China, there are expectations of family care because of the cultural value of filial piety, legal requirements, and disparity between care needs and service provisions in the community (Wu & Lam, 2016). Coupled with social stigma about dementia and a lack of mental health services in primary care, family caregivers may face difficulties in coping with PWD care needs and thus face a higher risk of depression.

Coping, an important concept in Lazarus and Folkman’s (1984) stress and coping theory, refers to “constantly changing cognitive and behavioral efforts to manage specific external or internal demands that are appraised as taxing or exceeding the resources.” Coping strategies are frequently categorized as active versus passive, problem-focused versus emotion-focused, or approach-based versus avoidance-based/dysfunctional...
(Lazarus & Folkman, 1984; Pearlin & Schooler, 1978; Xie, 1998). Overlaps exist among these categories. For example, active confrontation, seeking helpful resources, and positive appraisals are strategies of active coping that combine elements of problem-focused coping, approach-based coping, and emotion-focused coping, whereas acceptance and avoidance are strategies of passive coping that overlap with emotion-focused coping and avoidance-based/dysfunctional coping (Rodríguez-Pérez, Abreu-Sánchez, Rojas-Ocaña, & del-Pino-Casado, 2017; Snyder et al., 2015). Different coping strategies may affect the mental health outcomes of caregivers differently. For example, utilization of active coping has been reported to reduce depressive symptoms, and passive coping has been correlated with more depressive symptoms among caregivers (Gilhooly et al., 2016; Lu, Liu, Wang, & Lou, 2017; Roche, Croot, MacCann, Cramer, & Diehl-Schmid, 2015). Thus, mental health services that focus on coping strategies may help to prevent caregiver depression.

The Nature and Effectiveness of Cognitive Behavioral Therapy

Cognitive behavioral therapy (CBT), a psychosocial intervention, has been widely used to manage depression and coping among caregivers. The cognitive aspect of CBT helps caregivers through the use of positive reappraisals (Lazarus & Folkman, 1984). Identifying benefits is a powerful element of active and positive cognitive restructuring in which caregivers reflect on caregiving-related benefits, rewards, and positive changes. The intent is to help caregivers develop active coping skills such as problem-solving skills, promoting emotional closeness with PWD, using relaxation techniques, and balancing daily life to maintain their health. CBT, often conducted by psychologists, psychiatrists, or psychological therapists, has employed online communications, face-to-face meetings, and telephone consultations (Scott et al., 2016; Wilz & Soellner, 2016).

The evidence for the effects of face-to-face CBT on depressive symptoms and coping strategies among family caregivers of PWD is inconclusive. Although systematic reviews and meta-analyses indicate that CBT may decrease depressive symptoms, the format in which CBT is delivered must be explored further (Hopkinson, Reavell, Lane, & Mallikarjun, 2018). Prior studies have shown that CBT facilitates an adaptive coping response among caregivers (Kinnear, 2012), increases positive coping along with an increase in dysfunctional coping (Li, Cooper, Austin, & Livingston, 2013), or may reduce dysfunctional thoughts only (Kwon, Ahn, Kim, & Park, 2017). Despite these different findings, very few of the studies that were included in these systematic reviews or meta-analyses were performed in Asian countries.

Individual studies from Italy (Passoni et al., 2014) and Brazil (Aboulafia-Brakha, Suchecki, Gouveia-Paulino, Nitriti, & Ptak, 2014; Fialho, Köenig, dos Santos, Barbosa, & Caramelli, 2012) reported no significant changes in depressive symptoms of PWD caregivers after CBT, whereas other studies from Colombia (Arango-Lasprilla et al., 2014) and Spain (Vázquez et al., 2016) found a significant effect for CBT. Similarly, Fialho et al. (2012) found that family caregivers of PWD in Brazil were more optimistic and more focused on solving problems post-CBT. Moreover, Losada et al. (2015) revealed that CBT selectively affected the coping strategies of caregivers in Spain, resulting in a decrease in their dysfunctional thoughts but without a decrease in the use of avoidance.

These inconsistent findings may be caused by the limited rigor of the study designs. For example, Passoni et al. (2014) used no treatment control group for family caregivers of PWD, whereas Cheng et al. (2017) used a psychoeducation lecture group for comparison. Moreover, the focus of an intervention and its means of delivery may also be influential. An individual CBT program that focused on identifying benefits and a culturally sensitive group CBT program achieved positive effects in Chinese and Latino caregivers, respectively (Gonyea, López, & Velásquez, 2016). In contrast, a general group CBT program with education, sharing feelings, and pleasant activities was found to be ineffective (Aboulafia-Brakha et al., 2014). Finally, treatment intensity may not affect efficacy. Although duration of CBT varied between four and eight weekly or biweekly sessions, longer durations of CBT were not definitively associated with a better effect (Hopkinson et al., 2018; Vázquez et al., 2016).

Few studies by nurses have employed individual CBT among community-living family caregivers in China. Systematic reviews of relevant topics in the domestic literature have shown that coping-driven interventions increase active coping and decrease passive coping among caregivers, with their depressive symptoms relieved by multicomponent interventions. However, most studies have used group interventions in hospital settings. Studies that have used interventions similar to this study reported an effect on the depressive symptoms of Chinese family caregivers, but they were not conducted by nurses and were conducted in Australia and Hong Kong (Cheng et al., 2017; Leone et al., 2014).

Summary and Purpose of This Study

Community-based mental health nursing is urgently needed for the large number of family caregivers of PWD because of the shortage of primary mental health practitioners in China. As previously discussed, the effects of CBT on the depressive symptoms and coping strategies of caregivers are currently unclear, and little research has focused on nurse-led, individual-based cognitive behavioral interventions for community-living family caregivers in China. Thus, the purpose of this study is to explore the effect of a nurse-led cognitive behavioral intervention on depressive symptoms and coping strategies of family caregivers of PWD in China.

Methods

Study Design and Sample

This randomized controlled trial was approved by the Science and Technology Bureau (including the review of human
subjects protections) in the city in which the data were collected (Project no. 2016-4-017). A convenience sample of 112 family caregivers of PWD was recruited from community health centers and an 880-bed tertiary hospital (discharge lists of neurological units) in a city in southeastern China. Inclusion criteria for caregivers were as follows: (a) being 20 years old or above, (b) serving as a primary caregiver of a family member diagnosed with Alzheimer’s disease or vascular dementia or having a Mini Mental Status Examination (MMSE) score of less than 17, (c) living in the target city or its metropolitan area, (d) having a depressive symptom score of 10 or greater but less than 20, and (e) being able to understand and speak Mandarin. Individuals who showed signs of suicidal tendencies, history or evidence of a psychotic disorder, or intellectual deficits or were being treated at a mental health clinic were excluded.

Procedure
The researcher telephoned the administrators of the community health centers and the hospital to explain the study and obtain entry permission. The study was announced using flyers and word of mouth to health staff and community residents. The researcher contacted potential participants to confirm eligibility and obtain verbal consent. Research assistants administered the anonymous surveys by appointment at three time points, namely, Time 1 (baseline), Time 2 (the end of the 5-month intervention), and Time 3 (2-month follow-up), at either the participants’ homes or in hospital units during medical visits. Caregivers completed the questionnaires within 15–20 minutes, either independently according to instructions or with the help of research assistants, who also evaluated the cognitive status of PWD. A 5-month intervention period was adopted based on the duration of 2–7 months reported in previous studies and a minimum recommended intervention period of 3–4 months for an observable effect (Kwon et al., 2017). To maximize the effective time of intervention and minimize the possibility of dropouts, a 2-month follow-up was used.

After the initial assessment, participants were assigned to one of the five nurse interventionists based on area of residence. Nurses were trained in the intervention protocol and the relevant psychosocial skills and were instructed to follow the protocol. A WeChat group (Tencent, Shenzen, China) allowed the nurse interventionists to discuss procedural issues as a way to maintain intervention consistency. Participants were reminded at the initial session to keep each appointment; an additional appointment was amended over the subsequent few days if one was missed. Collected data were kept in a secure location. The data file was encrypted and stored in the researcher’s personal computer.

Sample Size Calculation
G*power (Heinrich Heine Universität, Düsseldorf, Germany) was used to calculate the sample size for this study. An F test, with three repeated measurements for two independent groups, a default effect size of 0.25, $\alpha = .05$, power = .85, and an expected $r = .5$ between measurements, yielded a sample size of 98. Considering a possible attrition rate of 10%–15%, the final sample size was set to 112.

Randomization and Masking
After oral consent was obtained from the participants, a computerized random number was generated at a ratio of 1:1 for the intervention-to-control group, with 56 participants in each. Group assignments were delivered to each participant in a sealed envelope. The participants and data collectors were blinded to the assignments. The data processing staff did not know the participants who were being studied. However, masking was not possible for the nurse interventionists when the treatment was initiated.

Cognitive Behavioral Intervention and Control

**Intervention group**
The cognitive behavioral intervention consisted of five monthly 60-minute, face-to-face, individual sessions with a 20- to 30-minute telephone consultation after each session. The face-to-face sessions were conducted by nurse interventionists early in the month. This five-module intervention (Table 1) was constructed based on the CBT strategy recommendations of Aboulafia-Brakha et al. (2014), Cheng et al. (2017), and Schinköthe and Wilz (2014). Details were flexible and tailored to the culture of family caregivers of PWD. Telephone consultations were conducted to obtain participant feedback, reinforce strategies, and answer questions.

**Control group**
Participants in the control group received five monthly, short, general conversations from nurse interventionists early in the month at participants’ homes, in the hospital units during medical visits, or via telephone contact. The conversation was a 5- to 10-minute casual chat about daily life and health. The interventionists responded naturally by showing concern but with no in-depth instructions. Participants did not receive any additional interventions, with the possible exception of regularly scheduled medical visits.

**Measures**

**Depression**
The 10-item Center for Epidemiological Studies Depression Scale (CES-D 10) was used to assess the frequency of caregiver’s depressive symptoms during the past week. An example of a CES-D 10 item is “My sleep is restless.” All items are rated on a 4-point scale that ranges from 0 (rarely or none of the time) to 3 (most of the time or all of the time). The scale score is the sum of item scores, with 10 or greater indicating the presence of clinical depression. The Chinese version of CES-D 10 has been applied among caregivers in China, with a Cronbach’s $\alpha$ of .82 (Pan, 2014).
# TABLE 1. The Nurse-Led Cognitive Behavioral Intervention Protocol

| Module/Purpose | Description of Session Content |
|----------------|--------------------------------|
| 1. Assessing/ Familiarize with caregivers’ situations and their perceptions | (1) Caregivers are encouraged to share their caregiving background such as personal data, family network and socioeconomic status, history of acquiring the caregiver role, patients' condition, caregiving demands, support, and daily routine.  
(2) Caregivers are encouraged to describe their perceptions of the caregiver role, caregiving dyadic relationship, family relationship related to caregiving, dementia, patients' behavioral symptoms, and the support resources available.  
(3) Caregivers are then invited to discuss issues related to dementia care such as social stigma and role demands, which may concern them the most. |
| 2. Diagnosing/ Clarify caregivers’ stressors, appraisals, and coping strategies | (1) Caregivers are encouraged to list a number of difficult caregiving scenarios and their previous management.  
(2) Caregivers are helped to reflect on these scenarios to identify caregiving stressors, appraisals, coping strategies, and the consequences.  
(3) Caregivers are then made aware of positive appraisals and active coping strategies that may facilitate stress reduction and promote problem-solving skills, along with negative appraisals and passive coping strategies that may increase stress and depressive symptoms. |
| 3. Cognitive training/ Elicit positive appraisals and avoid negative appraisals | (1) Caregivers are further encouraged to explore caregiving scenarios that are considered as successful or difficult and specifically discuss the positive or negative appraisals utilized.  
(2) Caregivers are taught how to identify benefits, such as looking at the positive sides of caregiving, caregiver role, caregiving relationship, and the PWD, and identify the benefits or gains experienced during caregiving.  
(3) Caregivers are encouraged to rehearse by identifying benefits in difficult caregiving scenarios and avoid negative appraisals, thoughts, or emotions. |
| 4. Coping behavioral training/ Reinforce active coping strategies and avoid passive coping strategies | (1) Caregivers are further encouraged to explore caregiving scenarios that are considered as successful or difficult and to discuss the active or passive coping strategies utilized.  
(2) Caregivers are guided to utilize active coping strategies in specific caregiving situations, such as building support, venting anxiety, seeking help to solve problems, and nurturing a good caregiver–care receiver relationship or a friendly caregiving environment.  
(3) Caregivers are reinforced with these active coping strategies in examples of specific challenging caregiving scenarios and also trained to avoid passive coping strategies. |
| 5. Relaxation and self-maintenance skill training/ Stress reduction and self-care | (1) Caregivers are taught with relaxation skills such as deep breathing, diary writing, music listening, exercising, and throwing soft pillows and allowed time to practice these skills.  
(2) More behavioral changes focused on personal health maintenance such as improving time management, assuming pleasant activities or hobbies, balancing nutrients, and employing sleeping tips.  
(3) Caregivers are encouraged to develop other personal skills beneficial to their health. |

## Session Procedures and Approximate Timing

| Session | Procedures and Approximate Timing |
|----------|----------------------------------|
| 1. Five 60-minute, face-to-face monthly sessions conducted early in the month | (1) Building rapport (3–5 minutes)  
(2) Conducting the session by reviewing of previous session content and making transient to new session. Following the list of session content and taking notes for each session (45–50 minutes)  
(3) Summarizing, assigning homework, and terminating (5–10 minutes) |
| 2. Five 20- to 30-min monthly telephone consultations in the middle of the month | (1) Building rapport (2–3 minutes)  
(2) Conducting the consultation by reviewing the previous session according to the session content list. Asking for feedbacks, reinforcing knowledge, positive appraisals or active coping skills, and taking notes for each consultation (15–20 minutes)  
(3) Summarizing, assigning homework, and terminating (3–5 minutes) |
Coping
The 20-item simplified coping scale (Xie, 1998) was developed with Chinese adults and used to measure caregiver coping strategies. Cronbach’s $\alpha$ was .90 for the full scale, .89 for the 12-item subscale of active coping, and .78 for the eight-item subscale of passive coping. Examples of scale items are “Try to identify several solutions to solve the problem” and “Try to forget the whole thing.” All items are rated on a 4-point scale that ranges from 0 (never used) to 3 (often used). The subscale scores are averages of the respective items. Higher scores for active coping are associated with better coping ability, whereas higher scores for passive coping are associated with poorer coping ability.

Care receivers' self-maintainance ability
The 14-item Activities of Daily Living Scale measures both basic and more complicated self-maintenance activities for PWD. One example of a scale item is “Are you having difficulty bathing?” All items are scored on a 4-point scale that ranges from 1 (perform without difficulty) to 4 (unable to perform). The scale score is the sum of item scores. Higher scores indicate lower functional ability. The Chinese version of this scale has been used in studies of disabled older adults in China, with a Cronbach’s $\alpha$ of .97 (Pan, 2014).

Care receivers' cognitive function
The cognitive function of PWD was assessed using the Chinese version of the MMSE, which has been widely tested with satisfactory psychometrics and used with older adults in China (Yu, Li, & Huang, 2012). The MMSE consists of 10 cognitive function domains such as orientation, memory, and calculation with a maximum score of 30 points. Higher scores indicate better cognitive function. The cutoff point for diagnosing cognitive impairment is 16–19 for those with less than primary education. Therefore, a recruitment criterion of 17 points was adopted.

Demographic and caregiving characteristics
A researcher-designed questionnaire was used to collect demographic data for participants and PWD, with caregiving characteristics listed in Table 2.

Data Analysis
Data were analyzed using IBM SPSS Statistics Version 19.0 (IBM, Armonk, NY, USA). Descriptive data were evaluated with frequencies and measures of central tendency. Group differences in the characteristics of caregiving dyads were analyzed using an independent-samples $t$ test for continuous variables that met the assumptions of normality and homogeneity and the Mann–Whitney $U$ test for variables that did not. The chi-square test was used for all categorical data.

The differences in depressive symptoms, active coping, and passive coping between the two groups over time (Time 1, Time 2, and Time 3) were evaluated, respectively, using general linear model repeated-measures analysis of variance (GLM repeated-measures ANOVA) with one within-subject factor (one of the three main variables studied) and one between-subject factor (groups) as the assumptions of normality, homogeneity, and sphericity were met. The differences in the study variables between groups were analyzed using independent-samples $t$ tests, and the pre-differences and post-differences for the study variables in the same group were analyzed using paired $t$ tests. Intention-to-treat analysis was not conducted because of the relatively large attrition rate.

Results
This study continued from mid-May 2016 to mid-March 2017. A sample comprising 112 family caregivers of PWD was enrolled after 276 potential participants were screened. This sample was randomly assigned to either the intervention group ($n = 56$) or the control group ($n = 56$). Eighty-two participants (intervention group: $n = 47$, control group: $n = 35$) completed all three evaluations (Figure 1). Demographic characteristics are shown in Table 2. No significant group differences were found in the characteristics of the caregiving dyads.

The GLM repeated-measures ANOVA, with one within-subject factor (depressive symptoms, active coping, or passive coping) and one between-subject factor (groups), indicated significant differences, respectively, in depressive symptoms and active coping between groups over time (Table 3). The $p$ value for the interaction between depressive symptoms and groups was $< .001$. The related mean plot showed a small difference in depressive symptoms between groups at Time 1, which became much larger at Time 2 and Time 3 (Figure 2). Active coping reflected a similar change, except that it increased at Time 2, and the $p$ value for the interaction between active coping and the groups was $< .01$ (Table 3, Figure 2). Conversely, no significance was found for the interaction between passive coping and groups ($p > .05$ for the interaction).

Table 3 shows no significant group differences in the study variables at Time 1. However, the independent-samples $t$ tests showed significant group differences in depressive symptoms ($t = -3.53, p < .01$) and active coping ($t = 4.20, p < .001$) at Time 2, with improvements in the intervention group, and the significance persisted at Time 3. However, similar changes did not occur in passive coping. The paired $t$ tests revealed significant decreases in depressive symptoms ($t = 10.12, p < .001$) and passive coping ($t = 2.29, p < .05$) and a significant increase in active coping ($t = -7.50, p < .001$) between Time 1 and Time 2 in the intervention group, with significance sustained between Time 1 and Time 3. In addition, significant changes were noted in depressive symptoms and passive coping in the control group at different times.

Discussion
Effect of the Intervention on Depressive Symptoms
This study found the nurse-led cognitive behavioral intervention to be effective in reducing depressive symptoms among
participants, as the mean differences in depressive symptoms differed significantly between groups over time (Table 3, Figure 2). This finding agrees with those reported by Arango-Lasprilla et al. (2014), Kwon et al. (2017), and Vázquez et al. (2016) but contradicts the findings of Passoni et al. (2014). The diversity of research designs in terms of number of subgroups, conditions of intervention or control, and means of delivery used in these studies may be largely responsible for these inconsistencies.

Several potential explanations exist for the decrease in depressive symptoms after the cognitive behavioral intervention. First, participants in the intervention group may have developed coping skills for problem solving and stress reduction. This explanation is supported by the work of Gallagher-Thompson, Gray, Dupart, Jimenez, and Thompson (2008), who reported that the use of coping skills and perceived helpfulness helped reduce depressive symptoms in caregivers after they had received CBT. Second, caregiving in China is a family responsibility with insufficient support and no pay, which may cause resentment among caregivers. The strategies of cognitive reappraisal used in the intervention group helped caregivers consider the benefits and rewards of caregiving, which may have enhanced their perceptions of the meaning of caregiving and self-worth. Third, family caregivers are often homebound, socially isolated, and neglected. Participants in the intervention

### TABLE 2.
**Sample Characteristics at Baseline (N = 112)**

| Variable                        | Total (N = 112) | Intervention Group (n = 56) | Control Group (n = 56) | t/χ²/Z | p       |
|---------------------------------|-----------------|-----------------------------|-----------------------|--------|---------|
| **Caregivers**                  |                 |                             |                       |        |         |
| Age (M ± SD)                    | 62.7            | 63.3                        | 62.1                  | 0.57   | .57     |
| Gender                          |                 |                             |                       |        |         |
| Male                            | 42              | 25                          | 17                    | 2.44   | .12     |
| Female                          | 70              | 31                          | 39                    |        |         |
| Relationships                   |                 |                             |                       |        |         |
| Spouse                          | 54              | 28                          | 26                    | 0.14   | .71     |
| Other family members            | 58              | 28                          | 30                    |        |         |
| Education                       |                 |                             |                       |        |         |
| Junior, middle school, and below| 100             | 50                          | 50                    | 0.001  | .99     |
| High school and above           | 12              | 6                           | 6                     |        |         |
| Monthly income (RMB)            |                 |                             |                       |        |         |
| ≤ 3,000                         | 92              | 43                          | 49                    | 2.19   | .14     |
| > 3,000                         | 20              | 13                          | 7                     |        |         |
| Number of CD (M ± SD)           | 1.1             | 1.3                         | 0.9                   |        |         |
| Living status                   |                 |                             |                       |        |         |
| Co-resident                     | 89              | 46                          | 43                    | 0.49   | .48     |
| Resides separately              | 23              | 10                          | 13                    |        |         |
| Duration of care (months; M ± SD)| 67.3            | 71.2                        | 63.3                  | -0.52  | .60     |
| Hours of care per day (M ± SD)  | 17.0            | 17.7                        | 16.4                  |        |         |
| Burden                          |                 |                             |                       |        |         |
| No or infrequent                | 15              | 6                           | 9                     | 0.69   | .40     |
| Frequent or very frequent       | 97              | 50                          | 47                    |        |         |
| **Care receivers**              |                 |                             |                       |        |         |
| Age (M ± SD)                    | 79.5            | 79.0                        | 80.0                  | -0.53  | .60     |
| Gender                          |                 |                             |                       |        |         |
| Male                            | 41              | 16                          | 25                    | 3.12   | .08     |
| Female                          | 71              | 40                          | 31                    |        |         |
| MMSE (M ± SD)                   | 6.5             | 6.5                         | 6.6                   | -0.18  | .86     |
| ADLs (M ± SD)                   | 43.9            | 42.9                        | 44.9                  |        |         |
| Psychobehavioral symptoms       |                 |                             |                       |        |         |
| Yes                             | 39              | 21                          | 17                    | 0.54   | .46     |
| No                              | 73              | 35                          | 39                    |        |         |
| History of hospitalization      |                 |                             |                       |        |         |
| Yes                             | 75              | 37                          | 38                    | 0.04   | .84     |
| No                              | 37              | 19                          | 18                    |        |         |

Note. MMSE = Mini Mental Status Examination; ADLs = activities of daily living; CD = chronic diseases; Z = Z score from the Mann–Whitney U test.
The group had a greater opportunity to privately express concerns regarding caregiving demands and to experience being the focus of others’ concern. Hence, they received more social support than their peers in the control group (Pan, 2014). Thus, mental health nursing services, such as the cognitive behavioral intervention reported in this article, are an important source of support for the family caregivers of PWD.

Although the group differences in depressive symptoms at both Time 2 and Time 3 were significant (Table 3, independent-samples t test), confirming the effectiveness of this cognitive behavioral intervention, depressive symptom scores dropped steeply at Time 2 but rose again at Time 3 (Figure 2). This trend is similar to the findings of Arango-Lasprilla et al. (2014) at a 3-month follow-up and contrary to the findings of Vázquez et al. (2016), who found a 12-month effect of CBT. Because of the varied length of follow-up periods among the different studies, it is difficult to conclude whether the rise in depressive symptoms at Time 3 represented a fluctuation in an overall downward progression or indicated an upward trend. Therefore, further investigation is necessary to determine the long-term effect of this intervention.

Furthermore, as caregiving situations are often complicated, multiple social factors such as the repeated hospitalizations of PWD may exacerbate caregiver depression and confound the interventional effect. Additional analysis using GLM repeated-measures ANOVA found a slight change in the significance levels of the interactions when the data were stratified by repeated PWD hospitalizations (yes/no). However, the work of Kuo et al. (2017) tended to support the idea that caregiver depression should remain stable despite the disruption of repeated hospitalizations, because depression is deeply rooted in the caregiving process. The intensity of the cognitive behavioral intervention provided in this study may be inadequate to

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**Figure 1.** Research process. NLCBI = nurse-led cognitive behavioral intervention; DC = discontinue.

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**Enrollment**
- Assessed for eligibility ($n = 276$ referred)
- Excluded ($n = 164$)
  - Not meeting inclusion criteria ($n = 158$)
  - Declined to participate ($n = 3$)
  - Other reasons ($n = 3$)
- Randomized ($n = 112$)

**Allocation**
- NLCBI group ($n = 56$)
  - Received allocated NLCBI ($n = 56$)
  - Did not receive allocated NLCBI ($n = 0$)
- Control group ($n = 56$)
  - Received allocated conversation ($n = 56$)
  - Did not receive allocated conversation ($n = 0$)

**Intervention (5 month)**
- Lost to follow-up ($n = 2$)
  - Relocated ($n = 1$)
  - DC intervention ($n = 1$; patient died)
- Follow-Up (2 month post-intervention)
- Lost to follow-up ($n = 7$)
  - DC caregiving ($n = 6$)
  - Patient died ($n = 1$)
- Analyzed ($n = 47$)
- Controls ($n = 35$)
- DC intervention ($n = 5$; patients died)

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eradicate depression. Instead, the intervention should occur regularly to effectively alleviate the depressive symptoms of caregivers over the long term and be subject to longer follow-ups to further confirm the effect.

Finally, depressive symptoms in the control group also decreased significantly at Time 2, although not as significantly as in the intervention group (Table 3, independent-samples t test). There are several potential explanations for this finding. Depressed caregivers may be more responsive to interventions than those who are not (Ho, 2017; Otero et al., 2015). The participants in this study had moderate depression, whereas most previous studies included both depressed and nondepressed caregivers. Another potential explanation is that, similar to Chang (1999), an unexpected placebo effect may have occurred. Furthermore, this phenomenon may illustrate that mental health services for caregivers of PWD in China are sufficiently meager so that even short general conversations have a measurable impact, implying that family caregivers are in great need of mental health nursing care.

**Effect of the Intervention on Active Coping**

The nurse-led cognitive behavioral intervention in this study significantly improved active coping skills among participants; there was a significant difference in active coping scores between the groups over time (Table 3, Figure 2). This finding is similar to Li et al. (2013) and Fialho et al. (2012). As Chinese caregivers are inclined not to ask for help even in difficult situations (Au, Shardlow, Teng, Tsien, & Chan, 2013), this nurse-led cognitive behavioral intervention aimed not only to increase participants’ positive appraisals and improve their ability to deal with emotions but also to encourage the use of strategies to solve caregiving-related problems. For example, after the intervention, participants may have felt less stigmatized

### TABLE 3.
**Within- or Between-Group Differences in Depressive Symptoms, Active Coping, Passive Coping, and Their Interactions With Group**

| Variable/Time/Group | n  | M  | SD | Independent t | Paired t | p   |
|---------------------|----|----|----|---------------|----------|-----|
| **Depressive symptoms** |    |    |    |               |          |     |
| Time 1              | 112| 13.9| 3.5| 1.15          |          |     |
| Intervention group  | 56 | 13.9| 3.5| -3.53**       |          |     |
| Control group       | 56 | 13.2| 3.1|              |          |     |
| Time 2              | 99 | 9.4 | 3.5| -2.30*        |          |     |
| Intervention group  | 54 | 12.0| 3.8| 10.12***      |          |     |
| Control group       | 45 | 12.1| 5.0| 2.80*         |          |     |
| Time 1              | 82 | 10.2| 3.0| 7.09***       |          |     |
| Intervention group  | 47 | 12.1| 5.0|              |          |     |
| Control group       | 35 |     |     | 0.75          |          |     |
| **Active coping**   |    |    |    |               |          |     |
| Time 1              | 112| 1.2 | 0.4| -0.37         |          |     |
| Intervention group  | 56 | 1.2 | 0.4|              |          |     |
| Control group       | 56 |     |     |              |          |     |
| Time 2              | 99 | 1.6 | 0.5| 4.20***       |          |     |
| Intervention group  | 54 | 1.3 | 0.4|              |          |     |
| Control group       | 45 |     |     |              |          |     |
| Time 1              | 82 | 1.5 | 0.5| 2.13*         |          |     |
| Intervention group  | 47 | 1.2 | 0.4|              |          |     |
| Control group       | 35 |     |     |              |          |     |
| **Passive coping**  |    |    |    |               |          |     |
| Time 1              | 112| 1.4 | 0.4| -0.21         |          |     |
| Intervention group  | 56 | 1.4 | 0.4|              |          |     |
| Control group       | 56 |     |     |              |          |     |
| Time 2              | 99 | 1.2 | 0.4| -0.44         |          |     |
| Intervention group  | 54 | 1.3 | 0.4|              |          |     |
| Control group       | 45 |     |     |              |          |     |
| Time 1              | 82 | 1.1 | 0.4| 0.52          |          |     |
| Intervention group  | 47 | 1.1 | 0.4|              |          |     |
| Control group       | 35 |     |     |              |          |     |

Note. Time 1 = baseline; Time 2 = end of the 5-month intervention; Time 3 = 2-month follow-up; I = intervention group; C = control group.

*Within-subject effects (sphericity assumed).

*p < .05. **p < .01. ***p < .001.
as a caregiver of a PWD, viewed their caregiving experience and relationships with PWD more positively, sought help and support, and developed caregiving and self-care skills. These findings support the stress and coping theory tenets (Lazarus & Folkman, 1984) that positive appraisals lead to active coping and better health outcomes. Therefore, this intervention was effective in improving the active coping strategies of participants, which may benefit family caregivers of PWD in China.

Effect of the Intervention on Passive Coping
This study did not reveal a significant interventional effect on passive coping, as indicated by the results of GLM repeated-measures ANOVA (Table 3, Figure 2). Nevertheless, passive coping in both groups declined significantly from Time 1 to Time 3 (paired t tests). This finding is inconsistent with the work of Li et al. (2013), in which CBT increased passive coping such as dysfunctional coping in caregivers, and partly in line with the work of Losada et al. (2015), in which CBT selectively decreased dysfunctional thoughts in caregivers.

Reasons for these differences are not clear but may be related to the research design of each study and the different control conditions, coping scales, sample characteristics, and sample ethnicities used. Furthermore, this may indicate that Chinese caregivers in both groups gradually accepted the fact that dementia is not curable and that some PWD were moving toward the end of life as the disease progressed. More investigations must be conducted to clarify the effect of this intervention on passive coping as well as its mechanisms and potential influencing factors.

Limitations, Future Directions, and Implications
This study investigated the effect of a nurse-led cognitive behavioral intervention on the depressive symptoms and coping strategies of family caregivers in China. Several limitations should be considered when interpreting the findings.

First, the relatively high attrition rate may have decreased the power of this study. The response rate was 84.0% (47 from 56) in the intervention group and 62.5% (35 from 56) in the control group (Figure 3). This may be because of participant relocating, seeking alternative care, or losing interest in this study or of patient death. Future recruitment plans should exclude caregivers with a high risk of withdrawal and patients with severe conditions.

Second, the PWD in this study were older (M = 79.5 years old) with chronic conditions. Most (67.0%) were hospitalized during the intervention period (Table 2). This may have interfered with the emotional experience of participants, as both the stress and the support received in the hospital environment, in transition, and at home vary. Therefore, future recruitment plans should focus on caregivers who are typical and stable.

Third, although the nurse interventionists were trained in relevant skills, participant adherence and treatment fidelity were not studied. Moreover, the effect of the intervention may be subject to participant trust in nurses, learning capacity, and adherence to the intervention as well as the nurses’ communication skills. Future studies should set goals for caregivers and nurses in each session to maintain the quality of the intervention.

This study has important implications for nursing practice. The intervention may be helpful in training family caregivers to develop active coping strategies that reduce their depressive symptoms. Countries like China, which has an increasing number of PWD but few primary mental health practitioners, are well positioned to benefit from related nursing interventions. Early detection, continuous monitoring, and support through nurse-led community service programs are essential to sustain the mental health of family caregivers.

Various ways to deliver this intervention are available, and face-to-face cognitive behavioral sessions with telephone consultations may be a feasible approach for homebound family caregivers. The caregiver-oriented nursing interaction
was based on cognitive behavioral training and developed a trusting relationship that gave nurses access to participant homes, which may have facilitated the positive results.

To confirm these results, future research on nurse-led cognitive behavioral interventions should recruit larger samples and/or adopt strategies to minimize dropouts, attempt to maintain treatment fidelity and caregiver adherence, lengthen the time frame because the effect of this intervention may be evident over a longer term, confirm the effect of this intervention on active and passive coping, and study the mechanisms that reduce depressive symptoms in caregivers.

This research has implications for social policy in China. As formal support is sparse, this study recommends that family caregivers of PWD be eligible for financial subsidies and regular mental health services. Strategies such as consultations, psychoeducation, cognitive behavioral interventions, and other supportive services should be developed for family caregivers in the community. Optimizing the health of family caregivers will have substantial social and economic benefits by decreasing the need to institutionalize PWD, which would not only honor the general preference of older adults to age in their homes but also greatly reduce the nationwide burden.

Conclusions
This nurse-led cognitive behavioral intervention was shown to be effective in reducing depressive symptoms and increasing active coping strategies in a sample of family caregivers of PWD in China. It is suggested that an appropriate mental health nursing program be initiated in the community and combined with social support for family caregivers who are at risk of depression as one strategy, to ameliorate the growing crisis in dementia care in China.

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