# Effect of Nature Videos on the Burden of Caregivers of Patients With Dementia

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## Abstract

**Objective:** Caregivers of people with dementia (PWD) often face burdens, but engaging in traditional mindfulness practices and spending time in nature can enhance positive emotions. This study aimed to assess the effectiveness and feasibility of nature videos in reducing burden, anxiety, and depression among caregivers of PWD in Thailand. As caregivers are often time poor, a brief 10-minute online mindfulness session was designed to make participation more feasible.

**Methods:** This randomized controlled trial assigned 47 eligible individuals to 2 groups. The experimental group received daily nature videos for 4 weeks, while the control group received daily self-care guidance. The 12-item Zarit Burden Interview (12-item ZBI), the Patient Health Questionnaire (PHQ-9), the 7-item Generalized Anxiety Disorder-7 (GAD-7), and the Connor Davidson Resilience Scale (CD-RISC) were used to assess caregivers' burden at baseline and the 4-week follow-up. Recruitment occurred from March 2023 to February 2024.

**Results:** The mean age was 50.59 years. On average, participants watched videos for 11.49 minutes per day, and the duration was 23 days. Both groups showed a significant decrease in burden at follow-up, but the between-group changes of 12-item ZBI were not significantly different. Brief mindfulness interventions reduced PHQ-9 scores by 4.14 points ($P < .001$) and increased CD-RISC scores by 5.68 points ($P = .001$). GAD-7 and PHQ-9 were significantly positively correlated with the 12-item ZBI ($r = 0.55$, $P < .001$, and $r = 0.42$, $P = .005$, respectively).

**Conclusion:** Brief mindfulness interventions through nature videos and receiving self-care advice can reduce the burden among caregivers of PWD and reduce levels of depression.

**Trial Registration:** Dataset from study at Thaiclinicaltrials.org identifier: TCTR20230216001.

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Dementia entails deterioration in cognitive and functional capacities, which requires caregiver assistance for daily activities and behavioral management. Caregivers generally experience considerable stress and burden,[1] which adversely affects their physical and mental well-being and overall quality of life.[2]

Mindfulness-based stress reduction (MBSR) focuses on being present without judgment.[3] MBSR is generally delivered in 8-week sessions of 120–150 minutes,[4] using various methods such as meditation, body scanning, and environmental awareness. Mindfulness enhances sleep quality and memory, reduces anxiety and depression, and prevents relapse in depression.[5,6] In addition, mindfulness helps reduce stress and improve mental health, thereby alleviating caregiver burnout. However, traditional mindfulness has limitations, including time, cost, and transportation issues for in-person attendance.[7]

To close those gaps, online mindfulness interventions have been developed to improve accessibility. A recent study demonstrated the feasibility of online mindfulness for older adult caregivers, with participants benefiting from improved sleep and reduced stress, anxiety, and emotional burnout.[8] Brief MBSR programs lasting less than 8 weeks can make a difference. While there is no standard protocol for brief mindfulness, a systematic review found that even single sessions lasting 5–25 minutes can offer positive mental health benefits.[9] A pilot study in the US comprising a brief 4-week online mindfulness intervention for family caregivers found a reduction in caregiver burden, with 70% of the participants completing at least 3 of the weekly 2-hour sessions.[10]

Spending time in natural environments also helps to enhance positive emotions. Research has indicated that people who spend 15 minutes in nature experience significantly more positive emotions compared to those who are confined indoors.[11] This has led to the hypothesis that practicing mindfulness in nature could be more beneficial than indoors. This was confirmed by Nisbet

**Editor's Note**

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## Clinical Points

- Although the burden of caregivers for patients with dementia (PWD) is well documented, trials of brief and low-resource interventions with guided mindfulness are lacking.
- Brief interventions with 10-minute nature videos plus audio-guided mindfulness can reduce caregiver burden and depression level among caregivers of PWD.

et al,[12] who found that practicing mindfulness in nature reduced negative emotions more than practicing mindfulness indoors or just walking in nature.

Caregivers' responsibilities often leave insufficient time for relaxing activities including regular mindfulness practice or outdoor pursuits, so an online brief mindfulness intervention with natural environment videos was designed to mitigate this. The author developed 10-minute mindfulness videos featuring natural scenes and audio guides for daily practice, aiming to study the efficacy and feasibility of this intervention in reducing caregiver burden and improving emotional well-being among Thai caregivers.

## METHODS

### Study Design and Participants

The study was a randomized controlled trial conducted between March 2023 and March 2024. The study was approved by the Siriraj Institutional Review Board (Si 060/2023), Faculty of Medicine Siriraj Hospital, Mahidol University, and was registered with the Thai Clinical Trials Registry (TCTR20230216001).

The study was advertised in psychiatric and geriatric outpatient clinics at Siriraj Hospital and on Facebook. Interested individuals could scan a QR code to access the enrollment form and provide consent via Google Forms. Recruitment occurred from March 2023 to February 2024. Participants were asked to complete self-reported questionnaires assessing burden using the Zarit Burden Interview (12-item ZBI). They were screened for depression using the Patient Health Questionnaire (PHQ-9); for generalized anxiety disorder using the Generalized Anxiety Disorder-7 (GAD-7); and for resilience using the Connor Davidson Resilience Scale (CD-RISC).

This study enrolled caregivers of people with dementia (PWD) aged ≥18 years who were able to use the Internet and the LINE mobile phone application and had moderate or high burden (12-item ZBI ≥10). Exclusion criteria were participants who (1) had severe depression (PHQ-9 >19) or severe anxiety (GAD-7 >14) and (2) were newly diagnosed with mental illness or had been prescribed new psychotropic medications or an adjusted dose within a 3-month period.

### Intervention and Control Groups

Participants in the intervention group received 10-minute daily videos for 4 weeks, which they were required to watch at least once a day, with the option to rewatch as desired. The nature videos were modified from www.pexels.com, which allows free use with modification. There were 2 sets of videos. The first set, offered every Monday, Wednesday, and Saturday, was a guided body scan to help participants focus on their current body sensations. The second set, provided every Tuesday, Thursday, Friday, and Sunday, included a narrative to help participants practice being present (in the here and now) through what they heard and saw.

We designed the study to use an active control group to minimize the placebo effect. The active control group received daily psychoeducation via the LINE platform in text format (1 or 2 sentences per day), which required less than 1 minute to complete and included advice on physical and mental health care, coping with stress, and problem-solving over a 4-week period.

### Outcome and Follow-Up

Demographic data included age, sex, marital status, education, employment, relationship with patients, duration of care, level of daily activities of patients, and impact of caregiving on career, financial, and social engagement. This was collected before the study began.

**Primary outcome: level of caregiver burden.** The 12-item ZBI, used to assess caregiver burden, has a Cronbach α coefficient of around 0.88, which indicates good reliability.[13] Each item is rated from 0 (never) to 4 (nearly always). The total score, which can range from 0 to 48, is interpreted as follows: 0–10 indicates "no or mild burden," 11–20 indicates "moderate burden," and scores above 20 indicate "high burden."

**Secondary outcomes: depression, anxiety, and resilience.** The PHQ-9 is used to evaluate the severity of depressive symptoms over the preceding 2 weeks, with a Cronbach α coefficient of around 0.79.[14] Each item scores from 0 (not at all) to 3 (nearly every day). Higher scores indicate higher levels of depression.

The GAD-7 is considered reliable for screening anxiety symptoms, with a Cronbach α coefficient of around 0.92.[15] The score for each item ranges from 0 (not at all) to 3 (nearly every day). Higher scores indicate greater levels of anxiety.

The CD-RISC, which consists of 10 items, is used to measure resilience. Each item is rated on a scale from 0 (not true at all) to 4 (true nearly all the time). Higher scores indicate greater resilience. The scale demonstrates a reliable Cronbach α coefficient of around 0.86.[16]

At the end of the 4-week period, all participants completed the post-assessment with the same set of questionnaires. The intervention group completed a questionnaire assessing feedback and satisfaction with nature environment videos covering aspects such as content, quality, length, attractiveness, accessibility, and utility of the video, rated on a 5-point scale from poor (0 point) to excellent (5 points). Additionally, there were 2 open-ended questions about challenges with watching and suggestions for improvement.

## Sample Size and Randomization

The general rule of thumb for a pilot study sample size is 20–40 individuals per group. According to Whitehead et al,[17] a sample size of 20 per group is sufficient for a pilot study with a small effect size and 80% power. Considering an expected dropout rate of 27%, as reported in Tahsin et al,[18] this study aimed to enroll 25 participants in each group.

After screening, the researcher created an anonymous list of participant ID numbers. The research assistants then randomly assigned participants to either the intervention group or the control group using computer-generated randomization. Subsequently, the researcher informed the participants of their group assignment via LINE and provided them with links to access the official LINE accounts to deliver the interventions or daily self-care guidelines.

## Statistical Analysis

The analysis was performed using the IBM Statistics Package for Social Science for Windows, version 29 (IBM Corp), with a per-protocol analysis. Baseline characteristics between groups were compared using the $\chi^2$ test or Fisher exact test for categorical measures and an independent $t$ test for continuous data. The analysis of changes in the primary and secondary outcomes between the 2 groups was based on per-protocol analysis using an independent samples $t$ test. Spearman rank correlation analysis was used to assess the relationships between baseline caregiver burden, depression, anxiety, and resilience. The mediation model was analyzed using the PROCESS Macro (Model 4) to examine the effect of resilience on the relationship between caregiver burden, depression, and anxiety. Feedback and satisfaction on mindfulness videos were reported using descriptive statistics.

## RESULTS

Of the 100 caregivers who were screened, 50 were eligible and 47 participated (Figure 1). The participants were predominantly women (86.4%) and had educational experience beyond a bachelor's degree (56.8%). They reported a 27.3% prevalence of chronic illnesses, but not of psychiatric disorders. There were no demographic differences between the 2 groups. The majority of caregivers were family members (informal caregivers), with 72.7% being adult-child caregivers. Of these, 59.1% spending more than 8 hours a day caregiving and 68.2% providing daily care (Table 1). The baseline of the 12-item ZBI score for the intervention and control groups was 24.23 and 20.27, respectively, indicating a high burden level (Table 2).

Participants in the intervention group watched videos for an average of 11.49 minutes per day over 23 days. At 4-week follow-up, the 12-item ZBI decreased significantly in both groups (11.27 points for the intervention group and 5.91 points for the control group), but there was no statistically significant difference between the total caregiver burden scores of the 2 groups. There were, however, significant changes in the intervention group in terms of depression and resilience, compared with the control group (Table 2).

Anxiety and depressive levels at baseline were positively correlated ($r = 0.75$, $P < .001$). Additionally, depression and anxiety were associated with the 12-item ZBI ($r = 0.42$, $P = .005$, and $r = 0.55$, $P < .001$, respectively). The mediation model analysis indicated that caregiver burden was significantly linked with both depression and anxiety ($\beta = .392$, $P = .006$, and $\beta = .506$, $P < .001$). When resilience was included as the mediator, these positive associations remained significant ($\beta = .399$, $P = .003$, in depression and $\beta = .509$, $P < .001$, in anxiety). Resilience was negatively correlated with depression ($\beta = -.358$, $P = .008$). However, the caregiver burden was not found to be associated with resilience (Figures 2 and 3). The total and direct effects of caregiver burden on depression were analyzed to determine the influence of resilience. The result revealed that the total effect of caregiver burden on depression was 0.218 ($P = .006$). When resilience was included, the direct effect of caregiver burden on depression was 0.222 ($P = .003$), remaining significant. This indicates that resilience was a partial mediator in the relationship between caregiver burden and depression.

Most participants rated the videos 4 out of 5 for content, quality, interest, and alignment with its objectives. In contrast, the videos' length, accessibility, and utility received a rating of 5 out of 5. The average overall satisfaction was 4.18 out of 5. Participants suggested the following improvements: (1) increase video variety, (2) simplify the narration, and (3) provide more viewing platforms. In addition, participants reported some obstacles to practicing mindfulness: (1) distracting thoughts and external distractions, (2) responsibilities related to caregiving, and (3) unstable internet connectivity.

Figure 1.
## Flow Diagram of the Randomized Controlled Trial
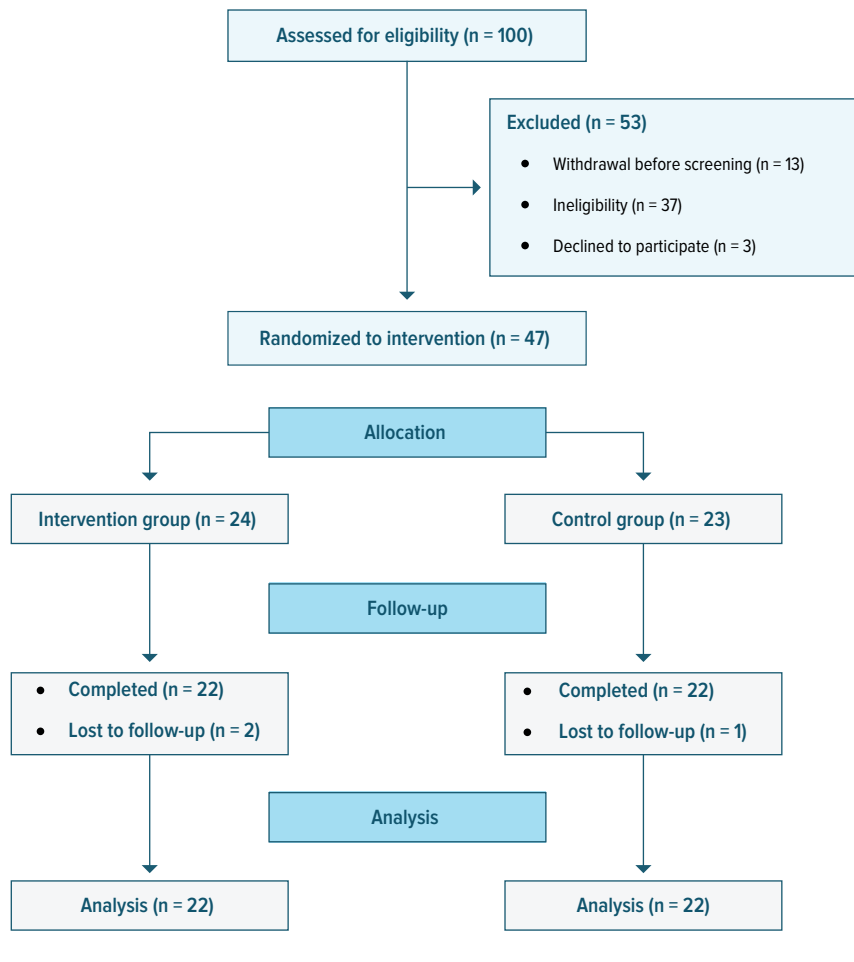


DISCUSSION

Our findings indicated that a 4-week brief mindfulness program led to a significant reduction in scores measuring caregiver burden. However, when compared with psychoeducation, no statistically significant differences were observed. The brief mindfulness intervention resulted in a significant reduction in depression and enhanced resilience compared with the psychoeducation group. The principles underlying these nature videos were rooted in mindfulness-based interventions, which emphasize present-moment awareness and nonjudgment through body scanning and grounding techniques. Repeated mindfulness practice assists in reducing rumination and decreasing negative thoughts, while improving self-awareness and emotional regulation. This leads to a reduction in stress and better problem-solving, thus alleviating the caregiver burden.[19]

An earlier systematic review and meta-analysis of mindfulness training for caregivers also reported no significant advantage in reducing caregiver burden compared to the control groups.[20] The probable explanation could be that receiving daily self-care guidelines contributed to a reduction in burden. This was consistent with the previous study which found that psychoeducation on dementia and care management strategies could alleviate caregiver burden[21]; thus, active control might diminish the effectiveness of the intervention.

Participants in this study engaged in the videos for an average of 11.49 minutes per day (ranging from 5.44 to 17.16 minutes) on an average of 23 days. Previous research on brief mindfulness interventions[9] has shown that session durations vary from 5 to 25 minutes. Traditional mindfulness practices can be challenging for caregivers due to time constraints, making it essential to determine effective practice durations. Although the study designed a program to track daily mindfulness practice, the effectiveness of mindfulness practice must also be considered, which was not evaluated in this research. Therefore, if caregivers

**Table 1.**

## Demographic Data and Characteristics of the Intervention and Control Groups

| | Total (n = 44) | Intervention group (n = 22) | Control group (n = 22) | P value |
|---|---|---|---|---|
| **Age, mean (SD), y** | 50.59 (10.31) | 50.18 (12.26) | 51.00 (8.18) | |
| **Sex, female, %** | 86.4 | 86.4 | 86.4 | 1.000[a] |
| **Marital status, %** | | | | .820[b] |
| Single | 52.3 | 45.5 | 59.1 | |
| Married | 38.6 | 45.5 | 31.8 | |
| Widowed | 4.5 | 4.5 | 4.5 | |
| Divorced/separated | 4.5 | 4.5 | 4.5 | |
| **Education, %** | | | | .330[b] |
| High school | 2.3 | 0.0 | 4.5 | |
| Vocational education/equivalent | 2.3 | 0.0 | 4.5 | |
| Bachelor's degree | 38.6 | 59.1 | 18.2 | |
| Postgraduate | 56.8 | 40.9 | 72.7 | |
| **Occupation, %** | | | | .617[b] |
| Unemployment | 18.2 | 18.2 | 18.2 | |
| Self-employment | 15.9 | 22.7 | 9.1 | |
| Employee | 15.9 | 9.1 | 22.7 | |
| Government official | 18.2 | 22.7 | 13.6 | |
| Retired | 11.4 | 13.6 | 9.1 | |
| Caregiver | 2.3 | 0.0 | 4.5 | |
| Health care worker | 2.3 | 0.0 | 4.5 | |
| Hired/part-time job | 15.9 | 13.6 | 18.1 | |
| **Relationship to the patient, %** | | | | .129[b] |
| Sibling | 6.8 | 0.0 | 13.6 | |
| Spouse | 9.1 | 13.6 | 4.5 | |
| Child | 72.7 | 77.3 | 68.2 | |
| Other relative | 6.8 | 13.6 | 0.0 | |
| Hired caregiver | 4.5 | 4.5 | 4.5 | |
| **Medical comorbidities, %** | 27.3 | 31.8 | 22.7 | .736[a] |
| **Psychiatric comorbidities, %** | 100.0 | 100.0 | 100.0 | |
| **Number of caregivers, %** | | | | .747[a] |
| 1 person | 31.8 | 36.4 | 27.3 | |
| >1 person | 68.2 | 63.6 | 72.7 | |
| **Hours of caregiving per day, %** | | | | .358[a] |
| ≤8 h | 40.9 | 31.8 | 50.0 | |
| >8 h | 59.1 | 68.2 | 50.0 | |
| **Days of caregiving per week, %** | | | | .380[b] |
| 3–4 d | 22.7 | 18.2 | 27.3 | |
| 5–6 d | 9.1 | 4.5 | 13.6 | |
| 7 d | 68.2 | 77.3 | 59.1 | |
| **Basic ADLs, %** | | | | .107[b] |
| Independent | 20.5 | 27.3 | 13.6 | |
| Partially dependent | 47.7 | 31.8 | 63.6 | |
| Totally dependent | 31.8 | 40.9 | 22.7 | |
| **Impacts on career, %** | | | | .499[b] |
| No impact | 27.3 | 27.3 | 27.3 | |
| Reduction in productivity | 52.3 | 45.5 | 59.1 | |
| Resign from work | 20.5 | 27.3 | 13.6 | |
| **Impacts on financial status, %** | | | | .790[b] |
| No impact | 31.8 | 36.4 | 27.3 | |
| Reduction in financial status | 52.3 | 50.0 | 54.5 | |
| Marked impact | 15.9 | 13.6 | 18.2 | |
| **Impacts on social engagement, %** | | | | 1.000[b] |
| No impact | 13.6 | 13.6 | 13.6 | |
| Decreased in socialization | 77.3 | 77.3 | 77.3 | |
| Limits of socialization | 9.1 | 9.1 | 9.1 | |

[a]Fisher exact test.
[b]Pearson $\chi^2$.
Abbreviation: ADL = activity of daily living.

**Table 2.**

**Average 12-Item ZBI, CD-RISC, GAD-7, and PHQ-9 Scores of the Intervention and Control Groups Before and After the Intervention**

| Measure | Intervention (N = 22) | | | | Control (N = 22) | | | | Mean difference (I − C) | P value |
|---|---|---|---|---|---|---|---|---|---|---|
| | Baseline mean (SD) | Follow-up mean (SD) | Mean difference | P value | Baseline mean (SD) | Follow-up mean (SD) | Mean difference | P value | | |
| 12-item ZBI | 24.23 (9.53) | 12.95 (6.99) | 11.27* | <.001 | 20.27 (8.14) | 14.36 (7.38) | 5.91* | .009 | 5.36 | .087 |
| CD-RISC | 20.05 (5.96) | 25.73 (4.87) | −5.68* | .001 | 24.05 (5.76) | 25.64 (7.07) | −1.59 | .317 | −4.09 | .073 |
| GAD-7 | 6.09 (2.74) | 3.55 (2.65) | 2.55* | .005 | 4.68 (4.18) | 3.55 (2.65) | 1.12 | .192 | 1.41 | .251 |
| PHQ-9 | 8.59 (5.24) | 4.45 (3.08) | 4.14* | <.001 | 5.18 (4.42) | 4.18 (3.10) | 1.00 | .330 | 3.14 | .035 |

*$P < .05$.

Abbreviations: 12-item ZBI = 12-item Zarit Burden Interview, CD-RISC = Connor Davidson Resilience Scale, C = control, GAD-7 = Generalized Anxiety Disorder-7, I = intervention, PHQ-9 = Patient Health Questionnaire-9.

did not have time to practice, adhering to the self-care guidelines provided to the control group could also help alleviate the burden. These guidelines would be a suitable alternative for those who are caregiving alone.

Our study revealed that video viewing led to a reduction in both depression and anxiety. These findings were consistent with previous research, which reported that MBSR effectively reduced stress, depression, and anxiety in family caregivers of individuals with dementia.[7] Research indicates that mindfulness affects brain activities and leads to changes in gray matter concentration in areas such as the left hippocampus, posterior cingulate cortex, temporoparietal junction, and cerebellum, which are involved in emotional regulation, self-referential processing, and attention.[22,23] One theory of how mindfulness affects depression and anxiety suggests that it shifts an individual's focus, thoughts, and emotions to the present moment, thus reducing rumination.[5]

Engaging with nature alone has been shown to enhance positive emotion.[11] Furthermore, a meta-analysis of nature-based mindfulness found that it had a more beneficial impact on psychological conditions compared to practice in nonnatural environments. This enhanced effect may arise from the fact that both exposure to nature and mindfulness share a common emphasis on present-moment awareness.[3,24] Natural environments may amplify the effects of mindfulness by reducing mind-wandering, promoting body awareness, and fostering a sense of decentering—a shift away from self-focused thought. A natural setting can facilitate present-moment attention and support the mindfulness process, particularly for individuals who are new to mindfulness.[25,26]

The previous study found that a higher degree of depression and anxiety was associated with greater caregiver burden.[27,28] This mirrors the results of our study, which, through the use of mediation analysis, also found a positive correlation between caregiver burden and both depression and anxiety. However, in our study, resilience was not found to be associated with caregiver burden, which is inconsistent with previous research.[29,30] This discrepancy may be due to the small sample size. On the other hand, resilience was found to act as a partial mediator in the relationship between care burden and depression, which aligns with findings from previous research on the caregivers of stroke patients.[29] One possible explanation is that higher resilience is associated with better problem-solving skills and psychological well-being.[6]

Mindfulness practice also improved resilience, as evidenced by higher CD-RISC scores, which is consistent with the previous study.[31] Within the framework of mindfulness and resilience, resilience is defined as the ability to recover and maintain psychological equilibrium in the face of adversity.[32] There are several key factors in developing resilience, including self-efficacy, self-awareness, emotional regulation, and cognitive flexibility.[33–35] Mindfulness practice supports this process by promoting present-focused awareness and encouraging acceptance without judgment.[3] It allows individuals to observe and distinguish their emotions and thoughts, rather than ruminate on past experiences or worry about the future, leading to greater self-awareness and better emotional regulation. Moreover, mindfulness training improves cognitive flexibility,[36] which is crucial for problem-solving and adapting to stressful situations. Consequently, individuals who engage in mindfulness practice tend to be more resilient and better able to manage stress more effectively without becoming overwhelmed by factors beyond their control. This may also help explain how the video intervention alleviated depression and anxiety by reducing caregiver burden and enhancing resilience.

Three participants dropped out of the study (2 in the intervention group and 1 in the control group). The dropout rates in this study were significantly lower than
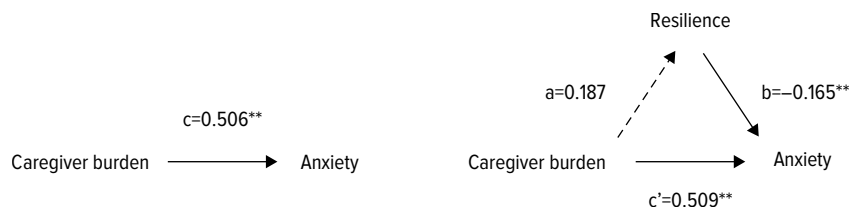
**Figure 2.**

**Serial Mediation Model for Indirect Effect of Caregiver Burden on Depression Through Resilience**[a]
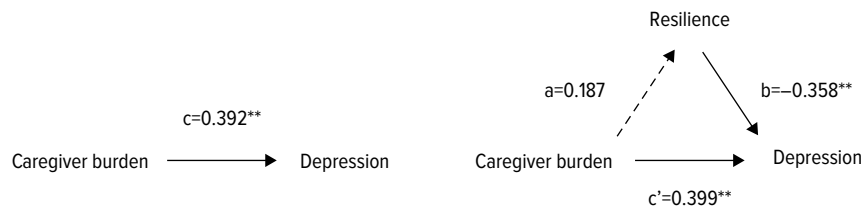


[a]*a* is the effect of caregiver burden on resilience; *b* is the effect of resilience on depression; *c* is the total effect of caregiver burden on depression; and *c'* is the direct effect of caregiver burden on depression. Values *a, b, c,* and *c'* are standardized regression coefficients. Solid lines indicate significant paths, and the dashed line indicates a nonsignificant path.
**P < .01, ***P < .001.

**Figure 3.**

**Serial Mediation Model for Indirect Effect of Caregiver Burden on Anxiety Through Resilience**[a]



[a]*a* is the effect of caregiver burden on resilience; *b* is the effect of resilience on anxiety; *c* is the total effect of caregiver burden on anxiety; and *c'* is the direct effect of caregiver burden on anxiety. Values are standardized regression coefficients. Solid lines indicate significant paths, and the dashed line indicates a nonsignificant path.
**P < .01, ***P < .001.

those reported in the study of mindfulness meditation efficacy (6.4% vs 27%–42%).[37,38] The lower dropout rate was probably due to daily video notifications and the availability of technicians to solve technical issues via the LINE platform 24 hours a day. Additionally, the brief mindfulness intervention which requires less time each day may be attractive among caregivers.

The strength of this study lay in its use of a brief online mindfulness practice using nature videos for caregivers of PWD—a novel approach in Thailand—that included tracking the duration and frequency of video viewing to evaluate engagement with the program. Goldberg and colleagues' study explored how practice quality acts as a mediator between practice time and outcomes in MBSR, finding that increased practice time leads to improved quality, which in turn enhances mindfulness.[39] However, our study did not assess the quality of practice, which may have influenced the findings. This limitation suggests the use of interactive practice to improve practice quality in future research. The participant demographic—primarily composed of

highly educated individuals and informal caregivers, particularly adult-child caregivers—may limit the generalizability of the findings to the broader population, such as spousal caregivers, who may benefit more from interventions aimed at enhancing social support or providing real-time intervention, rather than on-demand interventions.[40] Self-reported questionnaire-based outcomes offer convenience to participants but may be susceptible to recall bias or social desirability bias. The study did not account for factors that could influence caregiver burden, which may have affected the outcome. These factors include the severity of dementia, neuropsychological symptoms, the dependency needs of patients with dementia during the investigation, or caregivers' physical health conditions. An additional limitation is that the outcomes were assessed only after a 4-week intervention, leaving the long-term effects of the intervention unclear. Lastly, we performed per-protocol analysis for assessing the effectiveness of brief mindfulness for participants who practice mindfulness, although this may introduce some biases.

## Recommendations for Future Research

Several aspects should be considered for further investigation. A larger sample size and a more diverse group of caregivers would help determine the relative effectiveness of brief mindfulness videos and self-care advice and ensure that the samples accurately represent caregivers of people with dementia in Thailand. Research should also monitor factors associated with caregiver burden, such as changes in caregivers' health status, patient symptoms, or severity of the disease, to reduce confounder variables. In addition, further research is recommended to evaluate the quality of mindfulness, either through quantitative scales or qualitative assessment, such as interview, and to study long-term effects of brief mindfulness training. Finally, providing more viewing platforms could be beneficial for future applications.

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