Introduction

As older adult populations grow in numbers, the prevalence of individuals with dementia (e.g., Alzheimer’s, vascular, frontotemporal, Lewy body) is expected to increase from approximately 50 million worldwide to over 152 million by 2050 (World Health Organization, 2019). Those with dementia may experience cognitive decline that can manifest as apathy and/or a variety of psychological symptoms, such as irritability, agitation, mood disturbances, aggression, along with possible psychotic symptoms of delusions, hallucinations, and confusion (Rockford et al., 2019; World Health Organization, 2019).

Worldwide, dementia is contributing to a growing number of older adults who have become dependent on their families for various levels of custodial care and social functioning. At the late stage of the disease, many family caregivers will develop high levels of physical, as well as emotional, exhaustion and frequently seek a long-term care home to take over their role as caregivers (Canevelli et al., 2016; Chenoweth et al., 2019; Weisman et al., 2018; World Health Organization, 2019).

Sundown syndrome

Both institutionalized and community-dwelling individuals with dementia may experience a phenomenon called sundown syndrome, or sundowning, that can occur in the afternoon, evening, or into the night, that is recognized as an intensified state of agitation, disorientation, anxiety, pacing, aggression, and other accentuated behaviors (Canévell et al., 2016; Ford et al., 2019). Mayo Clinic (n.d.) defines sundown syndrome as, ‘occurring in the late afternoon and into the night, with behaviors, such as confusion, anxiety, aggression, with possible pacing or wandering.’ Boronat et al. (2019), in a scoping review of sundown syndrome research, found that there lacks an explicit defini-
tion for sundowning, but rather researchers identified clusters of worsening psychomotor symptoms, such as greater agitation, anxiety, and cognitive disturbances. Sundowning appears to be common for individuals with dementia, with prevalence rates reported as high as 66%, and is often a reason for institutionalization (Canevelli et al., 2016).

**Non-Pharmaceutical intervention**

To mitigate agitated and aggressive behaviors associated with dementia, many health care practitioners have prescribed pharmacological measures, such as anti-psychotic and benzodiazepine medications. These drugs have been found to be of limited effectiveness and have adverse side effects, including onset of diabetes, weight gain, gait disturbances with falls, cardiac effects, stroke, dysphagia, urinary retention, constipation, and increased cognitive impairment (American Psychiatric Association, 2016; Azermai et al., 2012; Evans et al., 2019). Consequently, there is a need for evidence-based non-pharmaceutical alternatives for individuals with dementia that assist in reducing agitation and promote improved mood without negative side effects (Austrom et al., 2018; Scales et al., 2018). Nature-based and music-based interventions are two non-pharmaceutical alternative approaches.

**Study purpose**

The purpose of this exploratory study was to examine the efficacy of using a short duration nature-based slideshow video with classical music to assist in mitigating difficult behaviors of individuals with dementia. Short duration interventions (i.e., 6–10 minutes) have been used in previous studies (Chung et al., 2014; Kim et al. 2017; Rados et al., 2020). It was hypothesized that participants manifesting an episode of sundown syndrome who viewed the research video with classical music would experience a greater positive effect on their tranquility levels than from the music alone intervention and that CNA observations of the participants would support these findings.

**Nature-Based intervention**

Nature is an important part of the human experience and is associated with psychological healing properties, such as a sense of renewal. In addition to benefits of experiencing natural beauty outdoors, merely viewing scenes of nature can improve positive emotions (Bossen, 2010; Lakhani et al., 2019). Rachel and Stephen Kaplan (1984, 1989, 1995) conducted landmark research in the area of landscape elements and their restorative abilities. Stephen Kaplan (1987) discusses that people often prefer settings with water, trees, and foliage. Nature-based activities, such as walking in nature, participating in horticulture, as well as viewing simulated nature (e.g., video or photographs), have appeared to improve the mood and reduce agitation for residents with dementia receiving long-term care (Bossen, 2010; Evans et al., 2019; Lakhani et al., 2019; Moeller et al., 2018). An example of simulated nature-based activity was conducted by Reynolds et al. (2018) that exposed 14 memory care residents (8 females age: 85.5 ± 2.1 years and 6 males age: 84.7 ± 5.8 years) with moderate to severe dementia to a 1-hour nature video of a waterfall with distant view of mountains as a treatment, and a vintage movie was used as a control. Residents received the procedure three times on alternating days for each condition using a wall-mounted flat screen TV in an activity room. Residents’ heart rates were significantly lowered, indicating calming effects, during the nature video compared to the control. In addition, observations of residents revealed less anxiety and more pleasure during the experimental condition.

**Music-Based intervention**

Music is one of the most studied activity interventions used to improve mood, such as agitation, and disruptive behaviors of individuals with dementia (Olley & Morales, 2017). Overall, music interventions for individuals with dementia have involved either defined ‘music therapy’ programs (e.g., singing, music improvisation, playing instruments, and creating music) conducted by a credentialed music therapist or consisted of passive ‘music listening’ (e.g., pre-recorded or live music) not requiring a music therapist (Vink & Hanser, 2018). Music activities such as singing, improvising, and listening to a playlist on an iPod have been used to improve mood for residents with dementia (Ford et al., 2019; Ijaopo, 2017; Ray & Gotell, 2018; Vink & Hanser, 2018). Gaviola et al. (2020) conducted a systematic review of individualized music listening preference intervention and found consistent beneficial effects for individuals with dementia but indicate more studies are needed to explore this issue. Classical music has been shown to be effective in mitigating difficult behaviors for individuals with dementia (Casby & Holm, 1994; Fang et al., 2017; Gerdner, 2000; Goodall & Etters, 2005; Rados et al., 2020). More specifically, pastoral classical music has been shown to optimize restorative benefits (Kim et al., 2017) and has been shown to increase levels of tranquility for individuals with dementia (Rados et al., 2020).

**Nature-Based and music-based interventions combined**

Kim et al. (2017) indicate ‘little empirical research has been done on which combinations of musical sounds and aesthetic natural images are more conducive to eliciting specific emotions.’ However, given the positive impact of both music and nature-based activities for individuals with dementia, several studies have attempted to combine these two modalities to create a combined effect, which is the approach we took in the current study. First, Chung et al. (2016) combined both nature photographs and music to create a series of short duration slideshow videos (i.e., 7–10 minutes in length) to study their effect on 23 nursing home residents with mild to severe dementia. Each participant viewed one video per day, three days a week, over four weeks. Although quantitative analysis of nursing records during the viewing period did not find significant changes in disruptive behaviors, participant comments collected 3 to 21 days after final viewings suggested the slideshow videos were calming and promoted relaxation and a sense of tranquility. Kim et al. (2017) studied how different types of photographs and music affected perceived tranquility for 102 nonrandomized college students who viewed 6 different 7- to 8-minute slideshow video combinations, consisting of 2 visual-auditory genres: ‘pastoral’ (nature photographs, with peaceful classical music) and
‘sublime’ (urban photographs, with awe-inspiringly classical music). Participants completed a six-item tranquility scale before and after each viewing and found pastoral nature photographs combined with pastoral classical music provided the highest perceived tranquility index. This finding is important because short duration interventions need to utilize an effective combination of elements. To assess the effect of a 6-minute nature-based slideshow video of pastoral nature photographs combined with pastoral classical music on tranquility, Rados et al. (2020) studied 10 residents (6 females, 4 males; 71–84 years old) living in a dementia care facility. Residents completed a standardized scale (Kim et al., 2017) to assess their tranquility levels both before and after they viewed the video. Resident comments were requested only after the viewing. In addition, each resident was assigned a certified nursing assistant (CNA) who observed the resident for approximately one hour before and after the resident viewed the video. Each CNA observer completed the same tranquility scale based on the CNA’s perceived tranquility levels of the resident, as well as made observation comments that were used to assess the actual effect of the video. Participant and CNA observers rated higher tranquility levels after the video, but most importantly, CNA observers’ comments identified improved resident attitudes and positive behaviors after the video intervention.

Activities for individuals with dementia
Activities can bridge a gap between routine care workers, volunteers, or family and the individual with dementia they are caring for by providing additional opportunities to promote quality interactions. Caregivers interacting in a positive way with residents with dementia can assist in reducing unmet psychosocial needs, possibly reducing interrelated feelings of boredom, as well as lowering the sense of being undervalued and frustrated, which can be interconnected with eliciting negative emotions (Sandvoll et al., 2020; Thériault & Grant, 2020). In addition to these direct therapeutic effects on individuals with dementia, enjoyable and simple activities of short duration integrated into routine caregiving can also positively influence well-being among caregivers and, subsequently, the quality of their care (e.g., Baker et al., 2012; Hanser et al., 2011; Rappe & Topo, 2007).

Research has indicated that short duration activities focusing on nature and music have the effect of increasing tranquility. This exploratory study extends the knowledge of the effect of nature-based photographs accompanied with classical music for individuals with dementia experiencing an episode of sundowning syndrome.

Methods
Design
This exploratory study used a one-group pre-test/post-test quasi-experimental design (Riddick & Russell, 2015) with mixed-methods data collection. Ten participants who experience sundownering living in a dementia care restricted unit (i.e., key code required for egress) within a Midwestern nursing home in the United States were selected for this study. Each participant individually experienced the research video intervention (see Protocol) during an episode of sundowning. Each participant’s tranquility level was measured using a six-item tranquility scale found to be reliable in defining states of tranquility (Kim et al., 2017; Rados et al., 2020) before and after they viewed the research video with music and then again approximately two weeks later; the same procedure was repeated with the music alone intervention.

Participants
The Institutional Review Board at the principal investigator’s university approved the research. The Dementia Care Unit memory care coordinator (MCC), who is also a certified dementia care practitioner and activity director recruited 12 participants who were documented by the facility as residents who regularly experience sundown syndrome based on the Mayo Clinic definition for sundowning (n.d.). Guardians of these residents provided informed consent in advance of research. Two participants were not included in the study due to extreme responses described in the data analysis section. The remaining 10 participants (9 females, 1 male) ranged in age from 72 to 96 years (average age of 88.5 years) and were all Caucasian. Specific types of dementia were unknown to the researchers due to privacy reasons. All participants were assessed by the facility using the Global Deterioration Scale of Primary Degenerative Dementia (Reisberg et al., 2018), with an average memory level of 4.76 (SD = 0.90), where 4 = ‘moderate cognitive decline’ and 5 = ‘moderately severe cognitive decline.’ Hearing and vision acuity were not tested.

Training
The principal investigator worked with the MCC during several face-to-face meetings (approximately two hours in total) to review and carry out the research protocol (see Protocol below). Communication with the MCC continued throughout the study. Two CNAs who regularly monitored residents voluntarily agreed to take part in this study. The CNAs who participated in the research were trained by the MCC (approximately 30 minutes) to secure informed consent/assent, to act as a participant observer, and to follow research protocol. The CNAs were given information on the tranquility scale used with participants including definitions of the six items representing each level of the scale.

Protocol
Video of nature photographs with classical music
The study investigated the effect of the research video of nature photographs with classical music on participants who were having an episode of sundown syndrome. This study used pastoral nature photographs as defined from Kim et al. (2017) as predominately rural and natural scenes with grasslands, rivers, and minimal human influence.

All participants who were identified as sundowners gave informed consent, and those with guardians provided informed consent for them. A research CNA began observing a participant when they appeared to begin sundowning. After approximately 20 to 30 minutes of observation, the CNA asked the participant if they would like to view the research video on a laptop. This intervention occurred...
wherever the participant was at in the unit at the time of sundowning. Thus, the use of the laptop made it possible to bring the research video directly to the participant. The CNA used a printed data form to write down general observations of the participant and their perceived level of tranquility using a six-item tranquility scale (Kim et al., 2017) before the intervention (see Appendix A). The CNA invited the participant to view the research video on a portable laptop computer without the use of headphones. The participant’s tranquility levels were measured before and after viewing the video in a self-report manner using the same six-item standardized tranquility scale as conducted by Rados et al. (2020), with the assistance of the CNA reading the items aloud and asking the participant to comment about the video. The CNA recorded tranquility ratings and each participant’s comments on the data collection form. After the participant experienced the intervention, the CNA followed the same procedure by observing the participant for an additional 20 to 30 minutes and entering comments and perceived tranquility ratings. All interactions took place within the memory care unit, with the intervention taking approximately 15 minutes to complete.

The intervention video with classical music only
To study the effect of the intervention’s classical music without the nature photographs, the same procedure described above was followed by the research CNAs, with the exception that the screen on the portable laptop was turned off (no visual images) and only the research video music could be heard by the participant. Past studies using a variety of types of music have shown positive effects from both simulated nature viewing and passive music listening (e.g., Moeller et al., 2018; Vink & Hanser, 2018), as well as combinations of both (e.g., Chung et al., 2016; Kim et al., 2017; Rados et al., 2020) for people with dementia. However, it remains unknown whether there is any synergistic effect between these two modalities; that is, does nature viewing reinforce the calming effect of listening to classical music, and vice versa, among those with dementia? Therefore, each participant went through the music-only intervention within the same memory care unit facility approximately two weeks after they experienced the full intervention video.

**Instruments**
The second author created the six-minute research video based on Kim et al. (2017) with the assistance of a video producer at the author’s institution. Forty pastoral still-nature photographs taken by a local professional photographer were utilized, based on the definition from Kim et al. (2017). This definition states, ‘pastoral landscapes are predominately rural and natural scenes with grasslands, rivers, and minimal human influence’ (Kim et al., 2017). These pictures featured local scenery, flora, and fauna covering all four seasons (Figure 1). Photographs were accompanied by pastoral classical music (Wolfgang Amadeus Mozart’s Serenade No. 10 in B flat K361 ‘Gran Partita’ III Adagio) suggested by the director of the school of music at the author’s university.

The tranquility questionnaire was directly adopted from Kim et al. (2017) and consisted of six items: ‘I currently feel: (a) calm, (b) relaxed, (c) restful, (d) peaceful, (e) serene, and (f) at ease.’ These terms were defined (Merriam-Webster’s Collegiate Dictionary, 2020) for the CNAs and utilized to assist participant's understanding of what was being asked of them. The tranquility questionnaire completed by the CNA observer about the participant read: ‘The participant appears to feel:’ and then the same six items. Each

![Figure 1: Sample nature pictures used in the nature video intervention.](image_url)
item was measured using a 5-point Likert type scale that ranged from 1 = Disagree to 5 = Agree. Our quantitative data contained four different pieces of information: tranquility assessed by the resident (with support of the MCC) before the interventions and after the interventions, as well as tranquility assessed by the care worker observer before and after the interventions.

Data analysis
The quantitative data was cleaned by examining missing values, suspicious response patterns, outliers, and non-normality. Two participants exhibited extremely zigzagging response patterns, as can be exhibited in some types of moderate to moderate-severe dementia (e.g., answering one tranquility item with 1 then the next item with 5, and so on). Considering cognitive issues inherent in the population, we eliminated these cases from our analyses, which made our final sample size 10. However, the original data screened were from the entire dataset of 12 participants. Another issue was that Shapiro-Wilks’s test detected significant negative skewness in the resident data after the nature and music intervention, even using a stringent .001 level. Thus, we opted for non-parametric Wilcoxon's signed-rank test for the following main analysis. Then, we calculated Cronbach’s alpha for each data point. For two data points (i.e., staff before the nature and music intervention and resident after the music-only intervention), the initial results suggested that deleting the ‘at-ease’ item would increase two relatively low coefficients, .60 and .62, respectively. With the other five items, the final reliability coefficients ranged from .64 to .98 (Table 1). We considered this as evidence for sufficient internal consistency (Schmitt, 1996).

Finally, we conducted four Wilcoxon's signed-rank tests between resident and staff data and between the nature and music-only interventions.

Results
Quantitative results
Resident data
Descriptive statistics of the resident data are displayed in the left side of Table 1. At the individual level, as bolded in Table 1, 6 out of the 10, after viewing the nature and music video individuals reported an increase in their tranquility by at least 1 point on the 5-point scale, although only 2 reported such increase in the music-only paradigm. Also noteworthy is that 1 individual reported a decrease by more than 1 point on the same scale after the music-only intervention. At the group level, Wilcoxon signed-rank tests suggested that the sample’s tranquility level significantly improved in the nature and music context (Z = −2.54, p = .011), while the changes in the music-only paradigm were non-significant (Z = −1.68, p = .092). For the significant increase in the nature and music intervention, the effect size r was −.58 (Pallant, 2007), indicating a moderate effect (Cohen, 1992).

CNA observer data
Descriptive statistics of the CNA observer data are shown in the right side of Table 1. At the individual level, as bolded in Table 1, after viewing the nature and music video, the CNAs observed an increase in tranquility among all 10 individuals by at least 1 point on the 5-point scale, although such increase was limited to only 3 individuals in the music-only context. Moreover, the staff observed a decrease in tranquility by at least 1 point on the same

Table 1: Sample Characteristics and Tranquility Level Changes.

<table>
<thead>
<tr>
<th>ID</th>
<th>Sex</th>
<th>Age</th>
<th>Memory level</th>
<th>Resident Data</th>
<th>CNA Data</th>
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<td>Post</td>
<td>Change</td>
<td>Pre</td>
<td>Post</td>
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<td>5.6</td>
<td>3.00</td>
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</tr>
<tr>
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<table>
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<tr>
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<tr>
<td>α</td>
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<td>.92</td>
<td>.95</td>
</tr>
</tbody>
</table>

Note: Resident data were collected in the self-report manner with support of the memory care unit coordinator. Pre refers to scores before the interventions; whereas, post scores are after the intervention. Change scores are the distances between pre and post scores, by subtracting pre scores from the corresponding post scores. Any change scores beyond an absolute value of 1 are either bolded (positive) or underlined (negative).
scale among 2 individuals after the music-only intervention. At the group level, Wilcoxon’s signed-rank tests indicated that the staff’s observation of tranquility among the residents significantly increased in the nature and music context (Z = -2.81, p = .005), although the change was non-significant in the music-only paradigm (Z = -0.68, p = .499). The effect size r for the former significant change was -.63 (Pallant, 2007), which also signifies a moderate to large effect (Cohen, 1992).

**Descriptive comments**

**Participant comments**

Participants were asked by the research CNA to provide comments after the intervention with video and music, as well as after the intervention with music only. Six participants had no comments, and of the four who commented, the statements were all positive. The comments included favorable responses, such as ‘the pictures were very pretty,’ ‘I liked the video,’ ‘very nice pictures,’ ‘I liked it,’ ‘the video was very relaxing,’ and ‘the video made me feel like I could rest.’ One participant had a reminiscence response stating, ‘it looked like my house.’ Two participants mentioned the concept of tranquility such as ‘relaxing’ and ‘rest’. Three of the participants used explicit references to imagery. Music was not mentioned by any participant.

Participants’ comments after the music only intervention included three responses. All were favorable, such as ‘that was nice,’ ‘I thought that was wonderful,’ and ‘I could listen to it a lot, it was quiet yet slow, but could listen to it a lot.’

**CNA observation comments**

CNA comments were all more positive after participants viewed the full video with music and represented two types of effects: more positive behaviors and improved attitudes. For example, before the viewing, a resident was described as acting very aggressively and packing up their belongings. After the viewing, the resident was observed folding and putting their belongings in place and was very respectful to everyone. Other participants’ improved behaviors included ‘no longer throwing himself onto the floor,’ ‘stopped exit seeking,’ ‘not thinking there were bugs in her room and in her bed,’ ‘doesn’t appear as confused and fearful,’ ‘no longer throwing drink cups,’ ‘now watching TV with others,’ ‘no longer desperately wandering around the facility,’ ‘resident now laying down in bed,’ and ‘she allowed staff to help her.’ Improved attitudes were represented in comments such as ‘resident now smiling and joking,’ ‘resident was more relaxed and patient,’ ‘resident is cheerful,’ ‘no longer signs of agitation,’ ‘resident seemed to have more patience,’ and ‘emotions were improved.’

CNA comments after the music only intervention were mixed, with two of the comments more negative such as, ‘resident appears not to have enjoyed the music throughout listening, she was shaking her head and put hands up like she didn’t care about it at all, down attitude throughout the music’ and ‘resident is confused about why she had to listen to music and what the point is.’ Two comments appeared to show positive behaviors: (1) ‘resident was at ease visiting with peers,’ while before, ‘resident was pacing anxious and looking for wife’ and (2) ‘resident sitting calmly listening to music,’ while before, ‘resident was shaking before but appears to be calmed down.’ There were no apparent attitude changes described by the CNA comments. The remaining eight participants were described as tired or sleeping after the intervention.

**Discussion**

The purpose of this exploratory study was to examine the efficacy of using a short duration nature-based slideshow video with classical music to assist in mitigating difficult behaviors of individuals with dementia. It was hypothesized that participants manifesting an episode of sundown syndrome who viewed the video would experience a greater positive effect on their tranquility levels than from the music alone intervention and that CNA observations of the participants would support these findings. Future studies could include photographs only intervention.

The quantitative findings based on participant and CNA ratings showed an increase in participants’ tranquility levels. It should be noted that quantitative statistics from participants were included, but due to possible impairment of critical thinking, these results should not be overemphasized. Specifically, the nature-based video with classical music resulted in a more pronounced positive effect than the music-alone intervention. Our music-only finding showed mixed results with two residents who did not appear to enjoy the music. This difference might be explained by individualized music preference (Gaviola et al., 2018). In addition to music preference, it is possible that the type of nature photographs, like forests, waterfronts, deserts, mountains, or other scenery, may represent another form of individualized preference. Future research might explore both areas.

It should be noted that researchers were not present during CNA observations for either type of intervention. Future studies can include a researcher or supervisory staff member to provide monitoring to ensure protocol is followed. Case in point, several of the CNA comments before the music only intervention did not appear to conform with the Mayo Clinic (n.d.) definition of sundowning. While all participants were known sundowners, it is unclear whether some were experiencing an episode of sundown syndrome during the music only intervention. An additional step might be added to the methodology to include the Mayo Clinic (n.d.) sundowning definition on the CNA data collection form and required to be checked-off reaffirming the participant’s sundown syndrome symptoms.

This study appears to be consistent with previous research by Rados et al. (2020), which used the same short duration video (i.e., six minutes duration) and tranquility scale with individuals with dementia, who were not identified as sundowners. CNA observers in that study as well as this provided positive comments and indicated improved tranquility with individuals with dementia. While much of the research on the therapeutic effects of viewing nature have used a 10-minute duration intervention, we have found positive effects from this shorter intervention.

While this study does not focus on Attention Restoration Theory (Kaplan, 1989, 1995), it does provide additional evidence-based support for the use of nature-based
interventions. The use of a laptop for convenient portability extends the method to bring the short-duration video to where the individual with dementia is experiencing difficult behaviors. This differs from studies where an activity lounge and large screen monitor have been used. Future research could explore the importance of the size of the image and feelings of immersion in the scene on a laptop.

In addition, our music only results appear to be consistent with the previous findings promoting relaxation with this population (Fang et al., 2017; Lesta & Petocz, 2006). Previous research focused on individuals with dementia, but this study looked at sundowners who were experiencing an episode of difficult behaviors. It appears that the short-duration intervention made a positive difference. For example, staff described participants as being less agitated, more relaxed, not as fearful, showing more patience and with improved behaviors that appeared to promote interactions with others, willingness to receive care, and ability to rest. These findings seem to go beyond participant tranquility by suggesting improved sociability that correspond with benefits of facility-level social factors and social relationships described by Thériault and Grant (2020), as well as the need for meaningful activities that residents can experience on their own presented by Sandovoll (2020).

This simple, short-duration six-minute video with music intervention can be integrated into a care home worker’s daily routine for residents with dementia and who are sundowning. A laptop could be made available for care home workers during the day and at known times of sundowning. In addition, the intervention might be used by home healthcare workers in the community, as well as family caregivers at home.

Future research may include a larger sample size to increase the soundness and generalizability of findings, as well as utilizing a more rigorous study design and standardized instrument tool for individuals with dementia. In addition, our study only implemented the research video for one episode of sundown syndrome. Subsequent studies might include analysis of the intervention for participants over multiple episodes of sundowning.

Conclusion
The findings from this study appear to support the use of a short-duration intervention that could be used with all individuals with dementia experiencing difficult behaviors. This unique intervention could be integrated into routine care home workers’ duties, as well as utilized by home health care workers in the community and family caregivers at home. This intervention is easy to use and can be applied where the individual is experiencing difficult behaviors. Caregivers do not need specialized equipment or extensive training. The quality of life of both the individual with dementia and the caregiver might likely be improved for that important moment. Future studies should build on adding this type of intervention into the overall holistic approach of caregiving.

Additional File
The additional file for this article can be found as follows:

- Appendix A. Six-Item Tranquility Scale. DOI: https://doi.org/10.31389/jtc.69.s1

Competing Interests
The authors have no competing interests to declare.

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Thériault, ÉR and Grant, A. 2020. Depression and aggressive behaviour in continuing care: How cognitive impairment might not explain the whole story. *Journal of Long-Term Care, 1*–*12*. DOI: https://doi.org/10.31389/jltc.15

