





# ‘Now I can bend and meet people virtually in my home’: The experience of a remotely supervised online chair yoga intervention and visual socialisation among older adults with dementia

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## Abstract

**Background:** Little research has been conducted on telehealth-based interventions in older adults. There has been no study of the use of telehealth-based online chair yoga (CY) to improve physical activity and manage dementia symptoms and socialisation for older adults with dementia who are socially isolated.

**Objectives:** The study identified benefits, challenges and facilitators in participating in remotely supervised online CY from the perspective of older adults with dementia and their caregivers, including what would help them to participate in online interventions.

**Methods:** In a qualitative descriptive design, four online focus groups (two pre-intervention and two post-intervention) conducted via videoconference explored the benefits, challenges and facilitators in participating in a remotely supervised twice-weekly, 8-week online CY intervention. A total of 17 participants (eight people with dementia and nine family caregivers) attended the focus groups. The data were subjected to thematic analysis.

**Results:** Thematic analysis of data identified three themes from the perspectives of older adults with dementia and their caregivers: (a) benefits (e.g. sleep and relaxation, emotional regulation, flexibility, muscle strength, convenience, caregiver-participant connection), (b) challenges (e.g. technological setup) and (c) lessons learned (e.g. inclusion of caregiver, yoga instructor, visual cues, socialisation, safety). The online intervention was beneficial to participants, who reported that they wanted to continue home-based online CY practice.

**Conclusion:** Convenience was the major advantage for the participant to continue to practice online CY. The online intervention offered virtual socialisation, which could be significant for motivating older adults to continue the CY program.

**Implications for Practice:** Gerontological nurses could add CY as a nonpharmacological component of a treatment plan and monitor older adults' progress during the online intervention. The home-based online CY intervention should be prioritised to promote health and wellness in socially isolated older adults with dementia.

**KEYWORDS**

dementia, family caregivers, older adults, online chair yoga, technology

## 1 | INTRODUCTION

Dementia is associated with declines in cognitive function (e.g. memory, language, executive skills; Alzheimer's Association, 2021). Dementia also negatively affects physical function (James et al., 2012) and causes impairment in activities of daily living (ADL; Rascovsky et al., 2005). No cure for dementia has been found, although pharmacological treatments have been shown to lessen some cognitive symptoms (Alzheimer's Association, 2021) and noncognitive symptoms of dementia in older adults (Bessey & Walaszek, 2019).

Older adults with dementia living at home and their family caregivers often face challenges in accessing community resources and social support (Dam et al., 2017). The progressive nature of dementia may increase caregiver stress and emotional and physical changes in family caregivers (Schulz & Martire, 2004).

Social support and resources may be especially beneficial for older adults and their caregivers with limited resources during a pandemic such as COVID-19, as required physical distancing has interfered with older adults' social activities (Smith et al., 2020), not only for those with dementia and their caregivers but also for healthcare staff (Dookhy & Daly, 2021). Such limited activity may lead to social isolation, loneliness, depression and increased risk of worsening dementia (Boutoleau-Bretonnière et al., 2020; Manca et al., 2020; Schrepft et al., 2019), associated with reduced quality of life (Said et al., 2020).

Persons with dementia should remain physically active to manage physical and psychological symptoms associated with the condition. Many older adults with dementia cannot participate in standing or strenuous exercise due to balance problems, physical limitations, confusion or fear or risk of falling caused by impaired balance (Park et al., 2019; van Alphen et al., 2016). They become sedentary, which leads to muscle weakness, balance impairment and loss in ADL (van Alphen et al., 2016). Sarcopenia (progressive loss of muscle mass and strength) is a common cause of functional decline in older adults, leading to loss of ADL and/or language (Waite et al., 2021). The prevalence of sarcopenia increases in older adults with dementia (Sugimoto et al., 2017). When older adults with dementia and sarcopenia become sedentary, muscle mass and strength are reduced, leading to further cognitive decline (Sugimoto et al., 2017).

It is essential to provide evidence-based, safe, effective non-pharmacological interventions to manage dementia symptoms (Park & Cohen, 2019). Chair yoga (CY) is a safe, noninvasive, low-impact mind-body intervention for older adults with dementia (Park et al., 2019). CY is composed of physical poses, breathing and relaxation and is practised sitting in a chair or standing and using a chair

### Summary statement of implications for practice

#### 1. What does this research add to existing knowledge in gerontology?

- The home-based online chair yoga intervention had positive effects on sleep, emotional regulation/mood, stress and flexibility/mobility for persons with dementia.
- The online chair yoga intervention offered virtual socialisation, which could be significant for motivating persons with dementia to continue the program.
- Compared with in-person yoga classes, convenience was the major advantage for participants to continue to practice online chair yoga after the study was completed.

#### 2. What are the implications of this new knowledge for nursing care with older people?

- Gerontological nurses should be aware of available technology-based interventions for patients with dementia and their caregivers who have limited social and physical activities and should recommend participation in such interventions.
- Gerontological nurses may encourage use of the online chair yoga program as a nonpharmacological option to promote health and wellness in patients with dementia.
- The direct voice of older people with dementia and their caregivers should be valued and used to inform practice and policy.

#### 3. How could the findings be used to influence policy or practice or research or education?

- It is recommended for both older adults with dementia and their caregivers to attend chair yoga sessions to help each other physically and emotionally; many older adults are more comfortable in having the caregiver present, providing a sense of safety.
- Healthcare policy-makers should ensure that older adults with dementia and their caregivers who are isolated in underserved communities have access to reliable and secure online and technical support.

for support (Park et al., 2017). Group-based in-person studies (Ikai et al., 2017; Yao & Tseng, 2019) have shown positive effects of CY on static and dynamic balance (Yao & Tseng, 2019), reduction of fear of falling and improved mobility, with no adverse events.

Technology plays a growing role in interventions to improve health for older adults in general and especially for older adults with dementia. Increasing numbers of older adults have invested in technology during the COVID-19 pandemic (Morrow-Howell et al., 2020). Technology can increase social connections, help in managing dementia symptoms and facilitate access to services (Goodman-Casanova et al., 2020). Recent technological advances have produced the potential for home-based CY intervention with real-time monitoring through a secure videoconference platform. Home-based interventions encourage physical activity, enhance social connection, promote mental health and support caregivers (Smith et al., 2020). However, some older adults are reluctant to adapt to unfamiliar technology and are less willing to adopt videoconference platforms (Fox & Connolly, 2018). To date, little research has been conducted on online physical activity interventions; in particular, there has been no study of online CY for older adults with dementia. The direct voice of older people with dementia and their caregivers should be valued and used to inform practice and policy (Hung et al., 2017).

## 1.1 | Theoretical model

The current study was guided by the technology adoption model (TAM; Davis, 1989), which posits that the intent to use (acceptance) and usage behaviour (actual use) of technology are predicted by the *perceived usefulness* (benefits from using the technology) and *perceived ease of use* (Portz et al., 2019). Perceived usefulness is the potential user's perception that use of a certain system (e.g. online CY session through videoconferencing) will improve their situation. Perceived ease of use refers to the degree to which the potential user expects the system to be effective (Davis, 1989). TAM serves as a useful framework to influence older adults' intention to use new technology (M. T. Braun, 2013). TAM has been used to predict acceptance of technology by persons who are not currently using the given technology (M. T. Braun, 2013). TAM can be applied in a variety of settings, such as online learning, videoconferencing, social networking media and smartphone use (Yang, 2005).

## 1.2 | Purpose of the study

This study was part of a larger study that used standardised measures and qualitative data from a focus group. Quantitative data were collected to examine the relationship between the online CY intervention and clinical outcomes. While no statistically significant results were identified for pain interference, mobility, cardiac rhythms, sleep disturbance and social isolation from baseline to post-intervention, risk of falling significantly decreased and emotional loneliness increased over the intervention period (Park et al., 2022). However, it is important to collect qualitative data from the direct voice of community-dwelling older adults with dementia and their family caregivers regarding online CY and virtual socialisation.

The purpose of this study was to identify benefits, challenges and facilitators in participating in remotely supervised online CY and

virtual socialisation from the insights and perspectives of a small group of older adults with dementia and their family caregivers. We included reflections on how the online CY intervention should be modified based on experiences reported by the participants and their caregivers. Lessons learned about facilitators and barriers to an online CY program will inform future development of the yoga exercise program.

## 2 | METHODS

### 2.1 | Design

A qualitative descriptive design (Sofaer, 1999) was used to collect data from participants with dementia and their family caregivers. Four focus groups (Krueger & Casey, 2010) were conducted with participants before and after the 8-week intervention: two groups prior to the intervention and two groups after the intervention. Qualitative research allows in-depth and detailed investigation of how an intervention works or does not work in a particular context and why it works or does not work (Thorne, 2015). The focus group method is suitable to solicit a range of viewpoints and opinions and to facilitate reflective discussion (Gray & Brown, 2016).

### 2.2 | Participants

To be eligible for the study, participants (a) were 60 years or older; (b) were living in the community, not in hospitals or long-term care homes; (c) had been diagnosed with dementia (e.g. Alzheimer's disease [AD], dementia with Lewy bodies) by a healthcare provider; (d) produced a cognitive testing score (Montreal Cognitive Assessment [MoCA]) < 26; (e) were able to ambulate at least 30 feet independently and safely with minimal assistance; (f) were cared for by a family caregiver to accompany the participant in each online session; and (g) had access to a computer or tablet and the Internet. Potential participants were excluded if they (a) had a psychiatric disorder, (b) had alcohol or chemical dependency, (c) had a serious comorbidity that precluded participation in yoga, (d) had need of assistance by another person (e.g. holding the arm) to ambulate or (e) used a wheelchair. Eligibility for the family caregiver was a person to accompany the participant in each online class session and provide information on the participant's symptoms. Information about health status and symptoms was sought from the person with dementia in the first instance and requested from the caregiver if necessary before each session.

### 2.3 | Sampling

The research team recruited participants who were receiving services from the Memory Disorder Center (MDC), a diagnostic facility in Florida. A coordinator at the MDC assisted the research team with recruitment. The coordinator approached clients, outlined

the study and provided a flyer that explained the study, inclusion/exclusion criteria and contact information. Interested caregivers of the family member with dementia contacted the research assistants.

Twenty-one participants with dementia were screened for eligibility; 20 met inclusion criteria, one was excluded due to a serious comorbid condition (Parkinson's disease) that would interfere with CY practice. Of the 20 eligible participants, 10 declined to participate due to conflicts with schedule or family caregiver issues. Thus, 10 participants with dementia attended the online CY intervention. 17 participants (eight people with dementia and nine family caregivers) attended the focus groups.

## 2.4 | Online CY

The 8-week online CY intervention was designed for people with dementia to participate with their family caregivers to improve health and well-being and to reduce pain. The intervention was delivered via Zoom, a video conferencing platform. After attending the pre-intervention focus group sessions, participants attended a remotely supervised 60-min CY session twice a week for 8 weeks (16 sessions). The caregiver attended each session with the participant with dementia and assisted the participant in doing CY poses. Each session was conducted by the certified yoga interventionist with online yoga teaching experience. Prior to each session, a 5-min-socialisation activity was led by the instructor. During that time, Zoom gallery view was used so participants and caregivers could see other participants and feel socially connected. Each online session included five components: (a) check-in and socialisation (10 min), (b) breathing techniques and intentional practice (10 min), (c) physical postures (25 min), (d) guided relaxation and visualisation (10 min) and (e) wrap up (5 min). All were completed while sitting in a chair or standing and using a chair for support.

## 2.5 | Study procedure

Prior to the online CY sessions, the research assistant sent a link to each participant's caregiver via email to guide them in using the video application on their computer. Then, the research assistant called each participant and caregiver to ensure that they could gain access to the Zoom link and the online CY session via Zoom. During the CY session, any caregiver who needed technical support (e.g. how to change from gallery view to speaker view in Zoom) called on the research assistant, who walked through the problem with the caregiver to solve the issue. The research assistant joined at least 15 min prior to each session and stayed online to the end of the session for technical support and safety check.

Four focus groups were conducted between June 2021 and August 2021, two prior to the intervention and two after completion of the CY intervention ([Appendix A](#): Focus Group Questions).

Each participant attended one pre-intervention focus group and one post-intervention focus group. Zoom video conferencing was used for all focus group sessions, which lasted an hour each. In the pre-intervention focus group sessions, participants and caregivers discussed how to design online CY to improve health and well-being for older adults with dementia and how to make online CY easy to access for participants with dementia. The post-intervention focus groups discussed challenges faced by participants with dementia in participating in online CY and what would help older adults with dementia to participate in online CY. The sessions were audio-recorded and transcribed verbatim. The focus group sessions were facilitated by a researcher; research assistants took notes.

## 2.6 | Data analysis

The data were subjected to thematic analysis, a well-recognised method for identifying, analysing and reporting themes in qualitative data (V. Braun & Clarke, 2021): (a) data set familiarisation; (b) data coding; (c) initial theme generation; (d) theme development and review; (e) theme refining, defining and naming; and (f) writing up. All authors read the interview transcriptions independently. Two authors searched for codes and patterns across the data to generate initial themes. All authors discussed the themes in research meetings (via Zoom) to refine the final themes. The research team systematically categorised and compared data, ultimately connecting pieces of data into themes that described participants' experiences of practicing the 8-week CY program online via Zoom.

## 2.7 | Rigour

To support the credibility of the findings, initial themes were discussed by all team members, a process that generated iterative cycles of refinements. Reflexivity was an important consideration throughout the analysis. We recognised that, as experienced researchers and educators in social work and healthcare, we came to the analysis with certain expectations and assumptions that could both limit and strengthen our interpretations. We made careful effort to reflect on the role that we played as individual researchers and critically examined how we made sense of the data individually and collectively as a team. This required both challenging our assumptions and taken-for-granted knowledge by looking for different interpretations of the data and encouraging each other to dig a little deeper, building on our disciplinary knowledge and background in order to identify aspects of the themes that might otherwise have gone unnoticed (V. Braun et al., 2022).

## 2.8 | Research ethics

This study was approved by the Florida Atlantic University (FAU) Institutional Review Board (IRB), USA (#1682432), and the University

of British Columbia Research Ethics Board, Canada (#H21-00089). Following requirements by the FAU IRB and state and federal human subjects regulations in research, written informed consent was obtained from caregivers who were legally authorised representatives of the participants with dementia, and assent was obtained the persons with dementia.

When participants with dementia and their caregivers agreed to participate in the study, the research assistant explained how to complete the electronic consent form (caregiver) and assent form (participant). Then, the research assistant sent an email including the electronic consent and assent forms. The participant and caregiver completed the appropriate forms, which included the statement required by the participating university that ensured confidentiality by use of identification codes when collecting, entering and analysing data.

For support of emotional and physical conditions, the certified yoga instructor provided an orientation to explain safety information and to answer questions before the intervention. The research assistant completed a safety check prior to each session, such as asking the participant to confirm that their chair was stable and to remove any object around the sitting area that might interfere with yoga poses or increase risk of falling. The research assistant provided ongoing support for participants and caregivers throughout the study, including referring caregivers to a caregiver support group.

### 3 | RESULTS

#### 3.1 | Demographic characteristics of focus group participants

Table 1 reports characteristics of the eight older adults with dementia and their nine family caregivers who participated in the focus groups (one participant had two caregivers). While a majority of the caregivers were female, there were more male participants with dementia in the focus groups. All of the caregivers were spouses or partners, except one who was the grown child of the participant. All but one of the caregivers and older adults with dementia were non-Hispanic White. In all of the participant dyads, the caregiver and older adult with dementia lived in the same house. Two participants had been diagnosed with AD, the rest with other dementias. The family caregivers ranged in age from 60 to 84 years ( $M = 75.1$ ,  $SD = 9.27$ ). Table 2 shows characteristics of each older adult with dementia, the caregiver, relationship in the dyad and diagnosis.

#### 3.2 | Focus group data

In the focus group sessions, participants provided useful feedback about the impacts and benefits of the CY intervention and individual challenges. Analysis of data generated from the four focus

TABLE 1 Demographic characteristics of participants

Characteristic and category	n	%
Participants with dementia (n = 8)		
Age (M = 81.37 [SD = 8.7], range 68–96 years)		
60–69	1	12.5
70–79	2	25.0
80–89	4	50.0
90–99	1	12.5
Gender		
Male	5	62.5
Female	3	37.5
Race/ethnicity		
Non-Hispanic White	7	87.5
African American	1	12.5
Marital status		
Married	6	75.0
Single/never married	0	0.0
Divorced	1	12.5
Widowed	1	12.5
Characteristic and category	n	%
Dementia type		
Alzheimer's disease	2	25.0
Lewy body dementia	1	12.5
Other	5	62.5
MoCA score (M = 15 [SD = 6.4])		
Caregivers (n = 9)		
Age (M = 75.1 [SD = 9.27], range = 60–84 years)		
60–69	3	33
70–79	1	11
80–89	5	56
90–99	0	0
Gender		
Male	2	22
Female	7	78
Race/ethnicity		
Non-Hispanic White	8	89
African American	1	11
Marital status		
Married	8	89
Single/never married	1	11
Relation to person with dementia		
Spouse/partner	8	89
Daughter	1	11

group sessions resulted in three themes: (a) benefits, (b) challenges and (c) lessons learned. Pseudonyms were assigned for reporting the results. Table 3 categorises themes and subthemes based on the quotes from the older adults with dementia and their caregivers.

TABLE 2 Characteristics of older adults with dementia–caregiver dyad

Dyad	Participant age	Participant gender	Caregiver age	Caregiver relationship	Diagnosis	MoCA score
001	89	Male	84	Spouse	Other dementia	11
002	77	Female	80	Spouse	Other dementia	14
003	83	Male	84	Spouse	Other dementia	21
004	83	Male	80	Spouse	Other dementia	25
005 <sup>a</sup>	76	Male	78	Spouse	Alzheimer's disease	7
006	68	Female	68	Spouse	Alzheimer's disease	8
007	74	Male	61	Spouse	Lewy body dementia	19
008	81	Male	80	Spouse	Alzheimer's disease	10
009	96	Female	60	Daughter	Other dementia	21

<sup>a</sup>Participant with dementia did not attend the focus group sessions; only the caregiver attended.

TABLE 3 Themes and subthemes developed from the quotes

Theme	Subtheme	Quotes
Benefits	Better sleep	"Yoga helped me to relax and it was soothing, so soothing that I fell asleep."
	Emotional regulation and mental health	"The teacher taught us breathe in love, then breathe out love, a useful technique that me and my wife are using to deal with stressful situation."
	Engagement in routine exercise and physical improvement	"I think my husband actually improved physically. From the very beginning he could not raise his arms or his legs, and by the end, he was, getting his arms over his head. I think that muscle strength, improved greatly"
	Caregiver-participant connection	"It is important that we are doing it together, as it's an opportunity to help each other out."
	Online program makes it convenient	"I personally like the online because I do not have to change my shorts or shoes and it is so convenient because I am in my own home. I would put in the same effort either way."
Challenges	Challenges in the technological setup of the camera on Zoom.	I had a difficult time with the technology. As far as the program, it was very good. I enjoyed what I could partake of it."
	Attention span problem while attending online CY sessions	We were waiting for everybody to join and, by the time we started [yoga session], which was probably a 10–15-min period there, he lost interest. Then to get him back in was almost impossible and when he did, maybe after 20 min, he was ready to call it a day.
	Challenges in virtual socialisation	"I am an in-person guy, I like people around me. In-person would allow me to have a break, in which I can speak to others privately; I cannot do [that] online."
Lessons learned	Include the caregiver	"He needed my help to manoeuvre his body into the positions. It is very hard for anybody to do it without somebody there to help, especially if they have not done it before."
	Visual cues	"My husband needs to have a visual of what he's going to be doing in order to feel confident and safe when practicing yoga."
	Socialisation	"I would like to be able to stay connected with the group and know how people are doing."
	Yoga instructor	"Patience, knowledge, voice/tone control, leadership, appraising individuals for their effort. I think she has all the qualities to be an excellent teacher."
	Safety	Online is a safe option and has reduced stress to try to arrange transportation to go out to classes."

### 3.3 | Theme 1: Benefits

#### 3.3.1 | Better sleep

Both the participants with dementia and their caregivers reported that they enjoyed the routine of CY. A major benefit was better sleep, sleeping longer through the night and deeper sleep, resulting in more energy during the day. One participant with dementia, Cate, said, 'It [online CY] was beneficial. It added an extra hour to my

sleep, too'. Another person with dementia, John, said, 'Now my sleep is better; I have begun to dream'.

#### 3.3.2 | Emotional regulation and mental health

The online CY intervention had secondary benefits of emotion regulation and mental health, as participants expressed feeling more positive by being less stressed, less depressed, more tranquil and more relaxed.

Many participants reported that their favourite component was relaxation and its beneficial effects for promoting sleep. Participants reported that applying emotion-based association, such as associating the word *love* to breathing techniques, led to improvement in overall mental health. Other participants echoed that the emotion-based association technique was helpful; they applied it in daily life. One caregiver, Jenny, said that she enjoyed sharing breathing techniques in the sessions with her husband.

We pretty much do meditation and yoga. I particularly liked when the yoga instructor would use the word *love*... . Breathe in love and breathe out love. We've used that in a couple of situations; obviously, you can substitute other words in, like other feelings or emotions into that for different situations.

The meditation component of the intervention helped participants to concentrate on breathing to experience relaxation and ultimately improve their mental health. Participants reported that yoga helped them with stress management. A caregiver, Helen, said, 'I think if he [husband] could relax a little bit and enjoy life a little more, maybe the dementia would ease'.

### 3.3.3 | Improvement in physical health and concentration

In the two pre-intervention focus groups, participants discussed potential cognitive and physical benefits. Some mentioned salience of movement in the legs and the arms. Others stated that they wanted the yoga to ease dementia symptoms, improve cognitive function and provide opportunities to express feelings and socialise with others.

Participants in the post-intervention focus groups reported that online CY had helped them to get into the routine to exercise at home and had improved physical flexibility with bending and cross-leg positions. Both participants and caregivers shared that physical function had changed since participation in online CY. Participant Eileen stated that she had been 'unable to touch my feet' before the program. Her flexibility had improved with routine yoga practice: 'Now I can bend'.

A female participant with dementia, Cate, reported improved flexibility: 'I was stiff as a board to start out with but now I can bend in a lot of ways I couldn't before.... I [didn't] exercise as much as I should have been doing, but I'm doing it now'. One person with dementia, John, said, 'Now I can tie my shoelaces!'

Caregiver Lynn reported,

I think my husband actually improved physically.... From the very beginning, he could not raise his arms or his legs, and by the end, he was getting his arms over his head. I think that muscle strength, improved greatly. Also, we had each other for emotional support, which was helpful.

A female caregiver, Helen, said that the stretching helped because her husband uses his muscles a lot. The participant with dementia, John, said, 'The first time the CY instructor told us to cross our legs, I couldn't get my leg to cross because I was so stiff. Now, I think I am getting it together because I can cross my legs now'.

Caregivers reported that the program improved the participant's body awareness, attention and concentration. One caregiver-participant dyad, Judy and Chris, reported that their participation in the study was aimed to find something new to cope with mental health issues. 'We're doing our best to stay healthy' physically for the body and for the brain. A female caregiver, Doris, shared an observation about her husband: 'He was very engaged. He was also listening to and observing the instructor carefully to make sure that he was following every posture correctly'. Another caregiver, Jane, stated, 'I think the concentration on the breathing was probably one of the biggest things that was helpful for him. He's paying more attention to his breathing. I think that's really good, especially when we do regular yoga classes'. Various persons with dementia reported increased attention span, as 'yoga [helped] with concentration and focus' due to the repetitive nature of the program. After 8 weeks of yoga, caregivers noted that the older adults' concentration had improved, allowing them to perform tasks better.

### 3.3.4 | Caregiver-participant connection

The presence of caregivers in the sessions allowed participants to be safe and provided opportunities for participant and caregiver to interact socially. The presence of caregivers also provided emotional support and guidance in learning techniques outside of the scheduled sessions. Several participants noted that it was important that they practiced CY together, as it was an opportunity to help each other physically and emotionally. Although the main role of the caregivers was to assist the participants, they could practice CY with the participants.

### 3.3.5 | Online program makes chair yoga convenient

Over all, participants found the online program to be convenient because it is was easily accessible from home and did not require transportation or getting dressed. Caregivers had not been able to find appropriate social activities during the COVID-19 pandemic. One caregiver, Ginny, shared,

As we emerged into this whole COVID world, I found it very challenging to locate activities for my mother and even for our own family. However, it was exciting to think about there being something where we can interact and see people and do things all at one time.

Caregiver Phil cited challenges to accessing programs:

Going to places can be challenging through the process of getting ready to get out of the house, to get to the place. The convenience of doing it in your home has been phenomenal for many things, especially doctor's appointments and such. They have become much easier for us because we don't have to get over the hurdle of going all these places.

Many participants with dementia reported that CY was convenient. Karen said, 'I am at home; I don't have to change clothes. I don't have to travel anywhere. I am a home body'. She expressed the desire to continue to participate in online CY after the study. 'There are very positive things that have come out of it. I really believe strongly that this aspect is one of them. I think that it is very difficult for some caregivers to get the people they're caring for out the door.'

Online CY was found to be convenient over all, particularly by those who were socially isolated due to COVID-19. Karen's comment was supported by other participants: 'This program is an excellent thing for senior citizens who can barely get out of the chair. It's a good program and, if we can continue on, I would surely like that.'

### 3.4 | Theme 2: Challenges

A few participants reported challenges in the technological setup of the camera on Zoom. The research assistants offered real-time technology support by calling participants and sending email reminders. Participants praised the research assistants for providing technological support.

Participant John stated, 'It's important to have research support to aid in solving [technical] problems'. Participants emphasised the need to see the yoga teacher's demonstration clearly on the screen to learn the yoga posture properly. Many participants creatively linked the computer screen to a larger television screen. Not all participants were familiar with Zoom; some had to learn its functions in order to participate. However, one participant, Phil, mentioned an advantage of technology: 'I think it was so wonderful that we could Zoom with our family and friends and organizations. This technology is a miracle'. All participants used the Zoom speaker view (instead of the gallery view) in the sessions. The speaker view not only enabled them to focus on the yoga teacher; it engendered a feeling of one-to-one practice, which sustained active engagement.

Caregiver Judy reported her husband's attention span problem while attending online CY sessions. Although he followed the physical poses, he could not focus during the meditation and left before the session had ended.

I think a lot of it was just his attention span. Initially... we were waiting for everybody to join and, by the time we started [yoga session], which was probably a 10–15-min period there, he lost interest. Then to

get him back in was almost impossible and when he did, he liked the first half hour [breathing and physical pose] or so, and then the second part, which was the meditation, he lost all interest and would just get up and leave .... We couldn't keep him focused.

Although online CY was preferred by the participants and their caregivers, participant Dave pointed out challenges in virtual socialisation and preferred in-person CY classes in the community. 'I am an in-person guy, I like people around me. In-person would allow me to have a break, in which I can speak to others privately; I cannot do [that] online.' Caregiver Lois reported, 'Personally, I would prefer it to be at a community center. Timothy loves socialization and it would be very helpful for him to be able to mingle with people in person. I think he would have done better with that kind of setting'.

### 3.5 | Theme 3: Lessons learned about facilitators

#### 3.5.1 | Include the caregiver

Many participants reported being comfortable in having their caregiver present, as it provided a sense of safety in terms of physical support, as well as emotional support through words of encouragement. Participant John said, 'My daughter helped me a lot with moving around and guiding me to try to help me incorporate what I learned in the program. She loves yoga and helps me a lot'.

Caregivers mentioned that the person with dementia needed assistance during the session. Physical guidance was required to manoeuvre body parts into CY positions. 'It is especially important for those if they haven't done yoga before.' Caregiver Helen stated that online CY was safe. 'Our environment felt quite safe, and my husband didn't have to worry about the environment at all. I do agree that it is important to have someone there for support and safety reasons'.

#### 3.5.2 | Visual cues

Caregivers emphasised the need for visual cues to provide step-by-step guidance with the yoga poses. Caregiver Lois stated, 'My husband needs to have a visual of what he's going to be doing' in order to feel confident and safe when practicing yoga. Caregiver Jane commented, 'I think visual cues will be very important. I'm envisioning what would help my mom, be able to follow yoga online. The visual cues will be key and showing how to do it with repetition and very direct directions'.

#### 3.5.3 | Socialisation

Caregivers actively sought support from other caregivers. A sense of a peer support community was helpful for the group. Some reported



that the group exercise met social needs: Seeing the faces of other people provided a sense of connection to them. In the two pre-intervention focus groups, both those with dementia and their caregivers emphasised that they would like to gain a social experience in the intervention sessions, which is particularly important in the COVID pandemic. People with dementia were restricted to home with very limited social activities. In order to promote socialisation, 10 min of socialisation at the beginning of class and 5 min at the end of class were offered. Many participants asked to be given opportunities to stay connected with the group and to know how people are doing. The feeling of belonging to a yoga group community was important to the participants.

### 3.5.4 | Yoga instructor

Participants reported the program to be easy to engage and follow as the yoga instructor provided clear directions and emotional support. Participant Lynn stated, 'It is the same between in-person and online classes because we are still able to work with an instructor that provides us with immediate feedback to correct postures'. Caregiver Jenny reported that the yoga instructor had 'all the qualities: patience, knowledge, tone of voice, leadership and appraising participants for their efforts'.

### 3.5.5 | Safety

In terms of safety, the online program provided participants an opportunity to create their own safe environment at home. Participants reported that the environment felt quite safe, and they agreed that it was important to have someone there for support and safety reasons. Participant Dave shared, 'Online is a really safe option and has reduced a lot of stress to try to arrange transportation to go out to classes'. The importance of caregiver support was emphasised: 'All the individuals here have a caregiver that can assist them with challenges immediately'.

## 4 | DISCUSSION

This study showed that home-based online group CY was feasible and acceptable from the perspectives of older adults with dementia and their family caregivers. The focus group data showed that participants expressed a clear preference for the group CY format over the individual format, in particular for those who were socially isolated.

The focus group data confirmed the TAM (Davis, 1989), which posited that the intention and actual use of online CY would be predicted by the benefits from attending and the convenience of using online CY, compared with in-person CY. From the perspectives of older adults with dementia and their caregivers, the results confirmed that the online CY intervention was beneficial for these

populations who were socially isolated, and the participants and their caregivers reported that they wanted to continue home-based online CY practice after the study was completed. Convenience was the major advantage for the participant to continue to practice online CY, since no travel to the centre was required. Older adults feel more comfortable and relaxed in home environment. This program reduced stress for caregivers related to transportation of participants. However, perceived stress in caregivers was not formally measured (e.g. using a scale/questionnaire) in this study.

Visual cues are important for older adults with dementia so that they can observe the poses from the yoga interventionist and follow the poses correctly. A brochure, poster or other graphic helped those who were new to yoga to feel comfortable in practicing yoga outside of class to master the techniques. In addition to visual graphics, the yoga instructor provided access to a video of a previous session for participants' future reference.

The online intervention offered virtual socialisation, which could be significant for motivating them to continue the CY program. Participants recommended that the program include opportunities for social interaction. The care recipient-caregiver dyad showed the connection as they attended every CY session and helped each other physically and emotionally. This finding is consistent with the idea that members of spousal and similar dyads can mutually influence physical and mental health (Meyler et al., 2007) and that the dyadic intervention can supplement caregivers' limited social activities (Riffin et al., 2017). A recent systematic review (Doyle et al., 2021) concluded that caregivers received benefits from dyadic exercise interventions: psychosocial health, a feeling of empowerment and improved quality of the relationship with the care recipient, as well as physical and functional outcomes for the caregivers.

Perceptions of improvement in attention span and concentration were noted as the sessions progressed. One caregiver shared her husband's challenge in practicing meditation (the husband had a MoCA score of 7, indicating severe dementia [MoCA, 2021]). It is possible that meditation is challenging for those with advanced dementia but a benefit for those with mild dementia or mild cognitive impairment. A recent study (Yu et al., 2021) showed that a mindfulness awareness intervention led to significant cognitive gains and neuroplastic changes for mild cognitive impairment. Over all, interactions between participants and caregivers cultivated an environment of safety, security and support. Most important, the participant-caregiver dyads practised CY together, presenting an opportunity to help each other physically and emotionally.

Even though several benefits were identified, challenges with online CY in this population were unavoidable. Online intervention includes technological difficulties. Although the caregivers were able to set up computers with access to the Zoom, they reported challenges in interacting with the platform for the yoga sessions. Many caregivers were also older adults (mean age 76.9) and unfamiliar with video conferencing. To overcome these obstacles, the research assistants were on call during the CY sessions to assist with technology issues.

The second challenge was the limited social interaction in the yoga sessions, as they were able to interact with other participants

only through the screen. Participants and caregivers made it clear that social interaction is important to reduce feelings of isolation due to COVID-19 (e.g. Bar-Tur et al., 2021; Curelaru et al., 2021; Hwang et al., 2020; Jutai & Tuazon, 2022). Participation in social time was limited, and some stated that they would appreciate more opportunities for social interaction. It is plausible that older adults with dementia and their caregivers may have had resilience that enabled them to resist the stresses of COVID-19 after they participated in online CY. The social connections and interactions gained in attending online CY were a key source of resilience during the pandemic.

The family caregivers played a significant role in this study. They provided physical and emotional assistance to participants by demonstrating postures and troubleshooting technological challenges. They contributed to data collection by assisting the participants to complete physical and psychosocial assessments. They informed the research team about progression outside of the sessions, such as increased cognitive functioning, concentration and focus and mobility and flexibility.

#### 4.1 | Limitations, strengths and implications

This was a small-scale study in an urban community; results do not reflect experiences of those in other settings, such as rural communities or of those who do not have access to a computer. It is possible that social desirability bias occurred during the focus group sessions; participants may have hesitated to share their opinions with the researchers regarding particular challenges. Despite identified limitations, this study has strengths. Caregiver-recipient dyads reported their perspectives on benefits and challenges associated with CY practice. While caregivers assisted participants during the CY sessions, only one participant needed significant assistance; the caregivers could practise breathing and guided relaxation to reduce stress and tension from caregiving and improve their own mental well-being.

Older people are vulnerable to climate-change-related health impacts, as they are more likely to have chronic conditions of dementia and physical disabilities. A current report on health and climate change (Watts et al., 2021) identified that older adults experience morbidity and mortality associated with extreme weather, such as heat waves, widespread wildfires and violent hurricanes. In particular, those with cognitive and functional limitations are at high risk for adverse health outcomes from climate change (Gamble et al., 2013). A recent study (Wei et al., 2019) found that cooler-than-average temperatures and increased temperature variability may increase risk of dementia-associated admissions to the hospital. Thus, climate change may affect progression of dementia and related hospitalisation costs (Wei et al., 2019). To address special challenges that older adults could face during emergencies associated with climate change, specific resources for planning, early intervention and follow-up should be considered (Bryant et al., 2022). In particular, healthcare providers need education about how climate change could negatively affect older people and how the providers can help them through preparedness and treatment (Bryant et al., 2022).

As suggested by George and Whitehouse (2021), a healthy society should invest energy to improve social and environmental conditions for people living with cognitive symptoms. Online yoga can be one of the 'socialceuticals', a term George and Whitehouse (2021) used to describe healing activities that bring people together to build resilience for brain health.

The need for future research into technology-based support interventions for older adults with dementia and their family caregivers was identified as a research priority during the pandemic, as both were socially isolated and both needed to remain physically active. Future studies can measure objectively the stress and burden levels of caregivers who attend home-based online CY interventions with their family member with dementia, as caregivers play an important role in online interventions for older adults with dementia. Future CY intervention research should compare the efficacy of home-based online CY interventions on the health and well-being of older adults with dementia and their family caregivers with in-person group-based CY interventions in terms of clinical outcomes. Although convenience is attractive to those who are socially isolated, more research should be conducted to identify whether online CY is as effective as in-person CY in managing health outcomes, including noncognitive symptoms such as insomnia and stress. A randomised control trial design would be necessary to provide evidence of the efficacy of online CY and in-person CY on health outcomes. It is important to practice CY routinely to make it become a habit, which could help to build perseverance and maximise the benefits of the intervention. In this study, 60-min CY sessions were conducted twice weekly for 8 weeks.

Online-based interventions should be provided for older adults who are socially isolated; the interventions should include technological services, particularly for those who live in underserved communities. In order to optimise online therapeutic interventions, these services should be fully covered by healthcare insurance. Healthcare policy-makers should ensure that older adults in underserved communities have access to reliable and secure online support.

## 5 | CONCLUSION

In the critical time of the COVID-19 pandemic, the risk of social isolation and deconditioning in older adults with dementia has been a significant concern, requiring continuous support from family caregivers and practitioners. Results from this study showed that the online CY program was feasible and acceptable for social isolated older adults with dementia. Convenience was a major advantage for both participant and caregiver to continue to practice online CY while feeling comfortable and relaxed in the home environment. Virtual socialisation via the online CY intervention is important for motivating participants to continue CY practice. More research on CY is required for older adults with dementia.

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## CONFLICT OF INTEREST

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

## ETHICS STATEMENT

This study was approved by the Florida Atlantic University Institutional Review Board, USA (#1682432), and the University of British Columbia Research Ethics Board, Canada (#H21-00089).

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## APPENDIX A

### FOCUS GROUP QUESTIONS

Thank you for taking the time to join our discussion. I am Lillian Hung from the University of British Columbia. The purpose of this focus group is to learn your perspectives on using ONLINE CHAIR YOGA to support YOUR HEALTH AND WELL-BEING. The session will be video-recorded (Zoom application) because we do not want to miss any of your comments. Your name will be kept confidential in the study. This means that the opinions that you express here will not be identified with your name. We encourage you to refrain from disclosing the contents of this discussion outside of the focus group; however, we cannot control what other participants do with the information discussed. Throughout the discussion, we ask that everyone take turns and respect each other's expression of experiences. We have 60 min. Let us begin.

#### Pre-CY Intervention: Focus Group Session

1. What is your opinion about using online chair yoga to support your health and well-being? Probes: needs, worries, social isolation, access to group exercise
2. What may challenge you from using online chair yoga program? Probes: knowledge and skills, devices, motivation, confidence, support

3. What would you like to have support you in online chair yoga? What helps? Probes: Tools and resource support, creative strategies?

**Conclusion:** Any other comments that you would like to add?

#### Post-Intervention Focus Group Session

1. What was your experience in using online chair yoga to support your health and well-being? Probes: stories/anecdotes, positive and challenging experiences, social isolation, access to group exercise
2. What supported you in deciding to use online chair yoga program? What concerned you? Please share your experience of what worked well and what did not work? Probes: Environmental, technological, knowledge factors
3. What would help you to integrate online chair yoga into your routine of self-care activities? Probes: Tools and resources, support, creative strategies; what can be done to improve?

**Conclusion:** Any other comments that you would like to add?