Select Psychological and Physical Impacts of Therapeutic Yoga for Informal Caregivers: A Feasibility Study

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ABSTRACT

An informal caregiver (ICG) is a person who provides unpaid care to an individual with a disease or disability. The psychological and physical well-being for care recipients are positively impacted by the ICG, but an ICG’s psychological and physical well-being are regularly negatively impacted as a result of providing informal care. Yoga may be a therapeutic intervention for ICGs to improve psychological and physical well-being. Studies including ICGs who participate in yoga may experience health improvements, but due to the small number of studies involving ICGs, feasibility aspects need to be further addressed to adapt programs which are accommodating to ICGs. A multi-method research design was utilized to examine select psychological and physical impacts, and feasibility components for ICGs after participating in a therapeutic yoga intervention. After the 8-week intervention, participants ($n = 8$) experienced a statistically significant reduction in depression, burden, and negative affect. In addition, ICGs experienced a significant reduction in pain interference and significant improvements in upper-body strength, aerobic endurance, and upper-body flexibility. Five qualitative categories (i.e. psychological improvements, functional improvements, yoga engagement, social support, and self-care) emerged from the focus group/individual phone interviews. Mixing the quantitative and qualitative data strengthened a number of results. For example, upper-body flexibility significantly improved for ICGs after the 8-week yoga intervention and during the focus group/individual phone interviews, ICGs discussed noticeable improvement in terms of flexibility. Interestingly, the leisure constraint questionnaire revealed more constraints after the 8-weeks of yoga, but all of the ICGs in the focus
group/individual phone interviews had future plans to engage in yoga. While the overall study design appeared to be feasible, three qualitative categories (i.e. programmatic aspects, safety concerns, and care recipient separation) emerged from the focus group/individual phone interviews as areas to focus on in the future. Implications for future research and recreational therapy practice are included. Future studies should consider replicating this yoga program for ICGs to add to the small number of findings from yoga and caregiving studies and specifically examine pain interference.
DEDICATION

This dissertation is dedicated to my dream team of remarkable family members. I will never be able to put into words how much you sincerely mean to me and how much your unwavering support means to me but, I’m going to try and scratch the surface.

Dad and mom, you both are the reason I made it this far for reasons that I could never begin to explain. You are the two people that have provided me boundless opportunities throughout my entire life. Dad, you have been available to me no matter what time of day/night it has been and provided me with guidance in all areas of life. I truly appreciate the work you have done in your life to provide me with the opportunities you didn’t have. I can undeniably say that I would not be the person I am today without you. Mom, you are unquestionably the strongest person I have even known. My career and passion for research blossomed because of you and I’m a better person for being your daughter.

Mauntie, you are the team captain of my dream team. I am forever thankful that you’re in my life, and you countlessly inspire me. I aspire to be the strong compassionate woman that you are. You are the voice I hear when I don’t think I can go on and you are the words of wisdom when obstacles arise.

Grammie and Gramps Jones, thank you will never justify enough appreciation that I have for the both of you. Gram, you provided the foundation to my dream team and crafted me into the person I am today. What would Gram do or say dashes through my mind daily. You were the stern, but loving force in my life for so many years that has pushed me to accomplish this goal. Gramps, thank you for being the most loving and
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Thank you, dream team. I can only wish that others who tread in a similar path as mine have such an incredible support system. I hope you all know that completing this final degree is as much your accomplishment as it is mine.

P.S., Phillip Lee, thank you for coming into my life and ending this journey with me....

“You are my love story, and I write you into everything I do, everything I see, everything I touch and everything I dream, you are the words that fill my pages.”

-Alysha
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE PAGE</td>
<td>i</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>ii</td>
</tr>
<tr>
<td>DEDICATION</td>
<td>iv</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>vi</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>vii</td>
</tr>
<tr>
<td>CHAPTER I</td>
<td>1</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>4</td>
</tr>
<tr>
<td>Research Questions</td>
<td>4</td>
</tr>
<tr>
<td>CHAPTER II</td>
<td>5</td>
</tr>
<tr>
<td>LITERATURE REVIEW</td>
<td>5</td>
</tr>
<tr>
<td>Informal Caregivers</td>
<td>5</td>
</tr>
<tr>
<td>Yoga</td>
<td>17</td>
</tr>
<tr>
<td>Feasibility</td>
<td>20</td>
</tr>
<tr>
<td>Theoretical Framework</td>
<td>22</td>
</tr>
<tr>
<td>Summary</td>
<td>23</td>
</tr>
<tr>
<td>CHAPTER III</td>
<td>25</td>
</tr>
<tr>
<td>METHODS</td>
<td>25</td>
</tr>
<tr>
<td>Research Design</td>
<td>25</td>
</tr>
<tr>
<td>Quantitative Measure</td>
<td>31</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS (Continued)

| Analyses | 40 |
| CHAPTER IV | 44 |
| Introduction | 44 |
| Methods | 46 |
| Results | 55 |
| CHAPTER V | 70 |
| Introduction | 70 |
| Methods | 73 |
| Results | 77 |
| CHAPTER VI | 90 |
| CONCLUSION | 90 |
| Summary of Major Findings | 90 |
| Contributions and Practical Implications | 91 |
| Study Limitations | 92 |
| Summary | 93 |
| APPENDICES | 94 |
| Appendix A: Recruitment Flyer | 95 |
| Appendix B: Informed Consent | 96 |
| Appendix C: PAR-Q | 98 |
| Appendix D: Media Release | 99 |
TABLE OF CONTENTS (continued)

Appendix E: BDI ......................................................................................................... 101
Appendix F: ZBI .......................................................................................................... 105
Appendix G: SSQ6 ...................................................................................................... 108
Appendix H: MCSI ...................................................................................................... 114
Appendix I: PANAS .................................................................................................... 117
Appendix J: PAC ......................................................................................................... 118
Appendix K: Leisure Constraints Questionnaire ......................................................... 119
Appendix L: WHOQOL-BREF ................................................................................... 121
Appendix M: Chair Stand Test .................................................................................... 125
Appendix N: Arm Curl Test ........................................................................................ 126
Appendix O: 2-Minute Step Test ................................................................................ 127
Appendix P: Chair Sit and Reach ................................................................................ 129
Appendix Q: Back Scratch Test ................................................................................... 130
Appendix R: PEG ........................................................................................................ 131
Appendix S: Therapeutic Yoga Intervention Sequence ............................................... 132
Appendix T: Demographics ......................................................................................... 135
Appendix U: Evaluation of Acceptability ................................................................... 139
Appendix V: Focus Group Questions for ICGs ........................................................... 140
REFERENCES ............................................................................................................ 142
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Demographic characteristics</td>
<td>56</td>
</tr>
<tr>
<td>4.2</td>
<td>Change in psychological measures at T1 and T2</td>
<td>58</td>
</tr>
<tr>
<td>4.3</td>
<td>Change in physical measures at T1 and T2</td>
<td>59</td>
</tr>
<tr>
<td>4.4</td>
<td>Focus group and phone interview data</td>
<td>62</td>
</tr>
<tr>
<td>4.5</td>
<td>Mixed methods comparative matrix</td>
<td>63</td>
</tr>
<tr>
<td>5.1</td>
<td>Demographic characteristics</td>
<td>78</td>
</tr>
<tr>
<td>5.2</td>
<td>Evaluation of acceptability questionnaire</td>
<td>81</td>
</tr>
<tr>
<td>5.3</td>
<td>Focus group and phone interview data</td>
<td>85</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

Page

3.1 Mixed methods concurrent triangulation strategy ................................................... 26
CHAPTER I

INTRODUCTION

The U.S. Department of Health and Human Services Administration for Community Living reported that the older population (age 65+) represented 14.5% of Americans and is expected to grow to 21.7% by 2040 (U.S. Department of Health and Human Services, 2014). Various health conditions occur more frequently in the older population, and as the aging population grows, so does the number of individuals with age-related diseases that may need assistance with activities of daily living (ADLs).

An informal caregiver (ICG) provides care or assistance to an individual with a disease or disability without receiving financial compensation for the help they provide (Biegel, Sales, & Schulz, 1991). Providing informal care may positively effect a care recipient’s psychological and physical health, but the daily tasks of caregiving often result in negative impacts to the psychological and physical well-being of the ICG (Navaie-Waliser et al., 2002). Psychological and physical impacts differ depending on the ICG and the type of disability their care recipient has (Aranda & Knight, 1997; Carson et al., 2007; Connell & Gibson, 1997; Schulz & Beach, 1999; Shaw et al., 1997). Notably, ICGs who share a home with their care recipient may experience higher levels of stress when compared to ICGs who do not share a home, because their role as a caregiver is temporarily on hold when not with the care recipient (Pinquart & Sörensen, 2007).

ICGs assist in nearly every aspect of life and are rarely trained to help with all the associated caregiving tasks (Family Caregiver Alliance, 2017). A number of common
Caregiving tasks include: helping their care recipient take a shower and/or getting dressed, buying groceries, cooking meals, cleaning, providing transportation, arranging medical appointments, and managing care recipient medications (Family Caregiver Alliance, 2017). Undeniably, the countless tasks an ICG performs may negatively impact their life.

Although there are many negative symptoms associated with being an ICG, there are positive aspects associated with the caregiving experience. Researchers of one study reported that 73% of their ICG participants identified one positive aspect of caregiving (e.g. companionship and fulfilling/reward) and 6.9% identified two or more positive aspects (C. A. Cohen, Colantonio, & Vernich, 2002). ICGs who described having lower levels of burden and a higher health status associated more positive feelings towards their caregiving responsibilities (C. A. Cohen et al., 2002). One way to enhance positive feelings and address other mental health concerns may be through yoga.

Yoga is a mind and body complementary health approach that includes specific cognitive and physical techniques that are led by a trained practitioner or teacher (National Center for Complementary and Integrative Health, 2013). This mind and body complementary health approach may positively impact both psychological and physical well-being for ICGs (Martin & Keats, 2014; Van Puymbroeck, Payne, & Hsieh, 2007; Varambally et al., 2013). For example, one study revealed ICGs improved in overall psychological distress, as well as improvements in upper-body strength and flexibility (Martin & Keats, 2014). Further, another yoga intervention found that yoga may enhance
well-being for ICGs by building on positive feelings during the program and reducing perceived leisure constraints (Van Puymbroeck et al., 2007).

Building on positive emotions may be the key to the benefits of interventions for ICGs. Emotions are short-lived occurrences that generate synchronized changes in people’s thoughts, actions, and physiological reactions (Fredrickson & Branigan, 2005). Furthermore, affect refers to consciously accessible feelings and exists within emotions (i.e. as the component of subjective experience) (Fredrickson, 2001). Positive affect is the broader mindset, while positive emotions are the short-lived occurrences that influence affect. Further, people who experience more positive emotions have a greater ability to solve problems regarding personal growth and development (Fredrickson, 2003). Additionally, experiencing a positive emotion leads to a cognitive and behavioral state of mind that indirectly prepares an individual for later difficult situations (Fredrickson, 2003). Moreover, “positive affect reflects the extent to which a person feels enthusiastic, active, and alert. High positive affect is a state of high energy, full concentration, and pleasurable engagement, whereas low positive affect is characterized by sadness and lethargy” (Watson, Clark, & Tellegen, 1988, p. 1063). The overarching positive affect encourages an individual to continue participating in the activity, so those positive emotions still occur (Fredrickson, 2001). When an individual experiences positive emotions, their attention is broadened and they may build intellectual, social, and physical resources (Fredrickson, 2001). This theory, known as the broaden-and-build theory of positive emotions, was proposed by Barbara Fredrickson (1998), and serves as the foundation of this study since yoga is a physical activity that has been shown to
promote positive emotions (Campbell & Moore, 2004; Danhauer et al., 2008; Van Puymbroeck, Smith, & Schmid, 2011). As a result, this theory helped to guide the assessment selection process for ICGs who participated in this study.

**Purpose of the Study**

This study aims to build on the body of research that examines therapeutic yoga interventions for ICGs. The purpose of this study is to determine the psychological and physical effects of participating in an 8-week therapeutic yoga intervention for ICGs. The concept of this study partially stems from the small but promising research on yoga interventions for ICGs, as well as the research that has revealed the need to enhance focus on promoting health and well-being for ICGs (Reinhard, Given, Petlick, & Bemis, 2008).

**Research Questions**

This study will aim to answer the mixed methods research questions:

1. What are the perceived psychological and physical benefits of the therapeutic yoga intervention for ICGs?

2. Is a therapeutic yoga intervention for ICGs feasible?
CHAPTER II
LITERATURE REVIEW

The United States is presently experiencing a rapid growth in its older population, and this growth is expected to continue until 2050 (Vincent & Velkoff, 2010). Furthermore, life expectancies worldwide are predicted to increase to 83 years in developed countries and 75 years in less-developed countries by 2045-2050 (Chatterji, Byles, Cutler, Seeman, & Verdes, 2015; Gerland et al., 2014). If/when they come to fruition, these estimations of worldwide aging will likely increase the prevalence of chronic diseases that are more common in individuals 65 years and older (Anderson & Horvath, 2004).

Informal Caregivers

An estimated 34% of ICGs, people who provide unpaid care for an individual with a disease or disability, are aged 65 or older (Alzheimer’s Association, 2015). Older adults who perform caregiving tasks may be particularly vulnerable to experience negative psychological and physical outcomes as a result of caregiving (Navaie-Waliser et al., 2002). Research has consistently revealed that women are more likely than men to adopt the primary caregiving role (Allen, 1994; Almberg, Jansson, Grafström, & Winblad, 1998; Horowitz, 1985; Ingersoll-Dayton, Starrels, & Dowler, 1996; Neal, Ingersoll-Dayton, & Starrels, 1997), and care for a partner or parent (Almberg et al., 1998; Dwyer & Coward, 1991; Ingersoll-Dayton et al., 1996). Additionally, research has shown that caregiving is more likely to affect mental health negatively in female ICGs, as compared to male ICGs. Support for this finding comes from studies where female ICGs
reported higher levels of depression, stress, burden, and anxiety than their male counterparts (Almberg et al., 1998; Blood, Simpson, Dineen, Kauffman, & Raimondi, 1994; Chris Collins & Jones, 1997; Faison, Faria, & Frank, 1999; Gold et al., 1995; Kramer & Kipnis, 1995; B. Miller & Cafasso, 1992; Morris, Woods, Davies, & Morris, 1991; Schulz, Visintainer, & Williamson, 1990; Yee & Schulz, 2000). Moreover, compared to male ICGs, female ICGs are less likely to participate in behaviors that promote health (Burton, Newsom, Schulz, Hirsch, & German, 1997).

Regardless of gender, the caregiver role is highly associated with feelings of burden (Brodaty, Woodward, Boundy, Ames, & Balshaw, 2014; Deimling, Bass, Townsend, & Noelker, 1989; George & Gwyther, 1986; Kim, Chang, Rose, & Kim, 2012; Pratt, Wright, & Schmall, 1987; Zarit, Todd, & Zarit, 1986). Caregivers who reported experiencing increased levels of burden displayed lower levels of health-related QoL, specifically worsening mental health (Morimoto, Schreiner, & Asano, 2003). An ICG’s ability to perform caregiving tasks may be affected when their needs are unmet (Kristjanson, Atwood, & Degner, 1995; Tringali, 1986).

**Psychological Symptoms Experienced by Informal Caregivers.** Previous studies have revealed that the tasks associated with caregiving may adversely impact an ICG’s psychological well-being (i.e. depression, burden, social support, strain, affect, leisure constraints, and QoL) (Clay, Roth, Wadley, & Haley, 2008; Henderson, Stalnaker, & Taylor, 1988; Papastavrou, Kalokerinou, Papacostas, Tsangari, & Sourti, 2007; Robertson, Zarit, Duncan, Rovine, & Femia, 2007; Semiatin & O’Connor, 2012; Signe &
Elmståhl, 2008; Takai et al., 2009). What’s more, the negative outcomes ICGs may experience due to caregiving responsibilities impact their overall well-being.

*Depression.* The American Psychiatric Association (2017) states that depression is a familiar and severe medical illness that negatively affects how a person feels, the way they act, and think. “Depression causes feelings of sadness and/or a loss of interest in activities once enjoyed” (p.1). It may negatively impact a person’s psychological and physical well-being and may hinder their ability to function at home/work (American Psychiatric Association, 2017). Research has revealed that ICGs are two times more likely to experience symptoms of depression when compared to non-caregivers (Baumgarten et al., 1992). Furthermore, depressive symptoms have been observed at higher rates among family caregivers when juxtaposed to their peers (i.e. same age) who are not caring for a family member (Aneshensel, Pearl, Mullan, Zarit, & Whitlatch, 1995; Tennstedt, Cafferata, & Sullivan, 1992). It is important to note that the intensity of care recipient suffering has shown to contribute to caregiver’s depression levels (Schulz et al., 2008). Equally important, caregiving tasks (i.e. mental health impact of caregiving) have been reported to link directly to depression and to appear more among caregivers who are White (Haley et al., 1995). Researchers report that ICGs who live with their care recipient experience higher levels of depression and/or burden when compared to ICGs who live separately from their care recipient (Grafström, Fratiglioni, Sandman, & Winblad, 1992; Zanetti et al., 1998; Zarit & Whitlatch, 1992).

*Burden.* Caregiver burden was defined by George and Gwyther (1986) as “the physical, psychological or emotional, social, and financial problems that may be
experienced by family members caring for impaired older adults” (p.253). Caregiver burden jeopardizes a ICG’s psychological, physical, and emotional well-being (Burden & Quite, 2000; Etters, Goodall, & Harrison, 2008; Zarit, Reever, & Bach-Peterson, 1980). One study revealed that ICGs who are Black experienced lower levels of burden when compared to ICGs who are White (Haley et al., 1995) and several studies have supported this finding (Hinrichsen & Ramirez, 1992; Lawton, Rajagopal, Brody, & Kleban, 1992). Findings from one longitudinal study revealed that ICGs who are highly stressed have an increased risk of mortality when compared to non-caregivers and ICGs who do not report personal burden (Schulz & Beach, 1999). Furthermore, a study examining social support and caregiver burden reported engagement in social activities for fun and recreation as the most important action to reduce caregiver burden (Thompson Jr, Futterman, Gallagher-Thompson, Rose, & Lovett, 1993) and earlier research by Zarit et al. (1980) found that ICGs who received increased visits from family and friends experienced decreased levels of burden.

Social Support. Social support refers to interpersonally supportive behaviors and includes the reciprocity of social support during the lifespan (K. Robinson, 1990). Network size and regularity of contact, support received, regularity of assistance from others, and general contentment with one’s own social network are all areas included in social support (Wills & Shinar, 2000). Social support groups provide mutual assistance for individuals encountering chronic diseases or life-threatening illnesses (Cline, 1999). Researchers have revealed that social support preferences may differ by race. Wood and Parham (1990) reported that caregivers who are White attend support groups more
frequently than did caregivers who are Black. Additionally, caregivers who are Black described receiving more instrumental support from family, friends, and ministers when compared to caregivers who are White (Wood & Parham, 1990). Conversely, Haley et al., (1995) reported outcomes of caregiving by race (i.e. Black compared to White) had similar effects in the domain of social support. Additionally, when compared to non-caregivers, ICGs who are Black and White reported less satisfaction with the quality of their social support system (Haley, Roth, Howard, & Safford, 2010). Lastly, research has revealed that female ICGs manage most caregiving responsibilities and receive less informal support from others (Yee & Schulz, 2000).

An individual who is satisfied with their own social support network does not only mean the availability of social support, but also that the social support is at their preferred level (Stokes, 1983). When an individual feels the desired amount of social support, it may lead to a well-balanced life (S. E. Cohen & Syme, 1985). Perceived levels of social support have been linked to how an individual may cope with stress (B. R. Sarason et al., 1991). Social support may positively affect an ICG’s health status by reducing caregiver stressors (Chappell & Reid, 2002).

**Stress and Strain.** Stress is a response to a real or perceived threat; this threat may be physiological or biological. Exposure to chronic stress increases an individual’s vulnerability to adverse health outcomes (G. E. Miller, Chen, & Zhou, 2007). ICGs reported their caregiving experiences as “being immersed in caregiving; enduring stress and frustrations; and suffering through the losses” (Butcher, Holkup, & Buckwalter, 2001, p.33). Findings also suggest that ICGs experience particularly high stress levels
when compared to non-caregivers (Pinquart & Sörensen, 2003). Furthermore, Haley et al.’s (1995) findings suggest that caregivers who are Black may be more resilient to stressors that stem from caregiving tasks when compared to caregivers who are White.

Strain for ICGs is the perceived impact caregiving has on multiple aspects of their life (B. C. Robinson, 1983). Specifically, subjective strain is an ICG’s perception of the weight of caregiving responsibilities on their psychological and physical well-being (Gonyea, O’connor, Carruth, & Boyle, 2005). For instance, research has revealed that among older spousal caregivers, levels of mental or emotional strain is an independent mortality risk factor (Schulz & Beach, 1999). Findings from one study suggest that experiencing high caregiver strain was connected with a 23% elevated adjusted stroke risk (Haley et al., 2010). This finding was linked stronger to men, and predominantly in men who are African American that had high caregiving strain (Haley et al., 2010).

Positive and Negative Affect. Positive affect is displayed when an individual is feeling alert, active, and/or enthusiastic and negative affect is displayed when an individual is feeling distress and/or unpleasant engagement that includes feelings of fear, anger, guilt, nervousness, disgust, and/or contempt (Watson et al., 1988). An ICG may experience, due to caregiving responsibilities, diminished positive affect and elevated negative affect (Robertson et al., 2007). Fredman, Gordon, Heeran, and Stuve (2013) suggested that interventions aimed at improving positive affect may decrease an ICG’s sleep issues. This was concluded because results revealed ICGs who experienced high positive affect had a significantly lower amount of issues with sleep when compared to their counterparts with low positive affect, and ICGs who experienced depressive
symptoms reported slightly more issues with sleep (Fredman, Gordon, Heeren, & Stuver, 2013).

It is critical to examine the positive elements of informal caregiving to understand patterns of positive and negative affect in ICGs (Robertson et al., 2007). Furthermore, positive aspects of the caregiving experience have been linked to increased positive affect (Braithwaite, 1996) and improved ICG well-being (Levesque, Cossetle, & Laurin, 1995).

*Positive Aspects of Caregiving.* Although there are many negative aspects discussed related to caregiving responsibilities, there are positive aspects of caregiving as well. Positive aspects of caregiving (e.g. uplifting experiences associated with caregiving responsibilities) may reduce stressors related to caregiving responsibilities and improve outcomes for ICGs (Kinney & Stephens, 1989). The American Psychological Association (2018) revealed that “many family caregivers report positive experiences from caregiving, including a sense of giving back to someone who has cared for them, the satisfaction of knowing that their loved one is getting excellent care, personal growth and increased meaning and purpose in one’s life” (p.1). Furthermore, some ICGs feel that they are passing on a tradition of care, and by modeling caregiving skills, their children may be more likely to care for them in the future if necessary (American Psychological Association, 2018). One study reported that 73% \((n=211)\) of participants (i.e. ICGs) identified at least one specific positive aspect of caregiving and an additional 6.9% \((n=20)\) identified more than one positive aspect of caregiving (C. A. Cohen et al., 2002). Schulz et. al. (2007) implied beneficial outcomes of informal caregiving may be because of the caregiver’s compassion for their care recipient. This provides important
programmatic implications. As Lévesque et al., (2002), Louderback (2002), and Nolan, Grant, and Keady (1996) suggested, when programming for ICGs, researchers should not only focus on reducing the negative aspects, but also enhancing positive aspects of caregiving. Even if an ICG experiences positive aspects of caregiving, limited time alone from their care recipient may reduce their ability to participate in physical activity.

Leisure Constraints. Participating in leisure is directly connected with leisure constraints and may determine an individual’s level of leisure time (D. W. Crawford & Godbey, 1987; D. W. Crawford, Jackson, & Godbey, 1991). A leisure constraint has been defined as an impediment to participate in leisure activities (D. W. Crawford & Godbey, 1987). The three categories of constraints are as follows: interpersonal, intrapersonal, and structural.

Interpersonal constraints are a result of relationships with others (Hawkins, Peng, Hsieh, & Eklund, 1999). Hawkins et al.’s (1999) example of interpersonal constraints include “the ability to find a partner or friends with whom to pursue the desired leisure activity, money and time availability, and too many family obligations” (p.180). For example, ICGs from one study reported a lack of time due to caregiving responsibilities as the most frequent answer in why leisure participation levels changed (Dunn & Strain, 2001). Furthermore, findings from another study reported ICGs felt a lack of freedom to do what they wanted to do and when they wanted to do it because of the need to stay home to care for their care recipient (Bedini & Guinan, 1996). “Intrapersonal constraints include perceptions of oneself that primarily shape the expression of preferences” (Hawkins et al., 1999, p.180). Examples for this category include: perceived suitability of
activities, familial and non-familial attitudes, and perceived self-skill (D. W. Crawford et al., 1991). For example, established societal and role beliefs created limitations to access leisure for the ICGs (Bedini & Guinan, 1996). Structural constraints include reasons and resources that interfere between leisure preferences and activity involvement (Hawkins et al., 1999). Examples of structural constraints include the availability of opportunity, transportation, and facility (Raymore, Godbey, Crawford, & Von Eye, 1993). For instance, some ICGs report feeling fearful of what may happen to their care recipient while they are gone from home (i.e. availability of opportunity) participating in leisure (Bedini & Guinan, 1996). Over all, ICGs have identified less available time for leisure (Chenoweth & Spencer, 1986; Rosenthal, Sulman, & Marshall, 1993), increased work load at home (Dunn & Strain; Stoller, 1983), and financial limitations (Chenoweth & Spencer, 1986; White-Means & Chang, 1994) as reasons for not pursuing leisure.

Female ICGs reported a sense of family obligations and expectations as barriers to pursuing leisure activity (Henderson et al., 1988). Dunn, Strain, and Strain (2001) reported that ICGs may discount the important health benefits that leisure may provide, especially when family responsibilities are high and/or rising. Consequently, excluding leisure time may increase social isolation, stress, and hinder psychological and physical well-being (White-Means & Chang, 1994). Results from numerous researchers have revealed that leisure activity may improve an individual’s health status (Reiner, Niermann, Jekauc, & Woll, 2013; United States Department of Health, 1996; Warburton, Nicol, & Bredin, 2006). Studies involving ICGs who participated in leisure activity
revealed lower perceived stress, burden and depression levels (Castro, Wilcox, O’sullivan, Baumann, & King, 2002) and improved QoL (Hirano et al., 2011).

**Quality of Life (QoL).** QoL is a broad, multifaceted concept that typically includes personal evaluations of both negative and positive aspects of life (The WHOQOL Group). Poor psychological and physical well-being is associated with caregiving responsibilities, which in turn negatively impacting an ICG’s QoL. Although high levels of burden do not equate to a lower QoL (Sulch & Kalra, 2003), two studies for ICGs reported objective burden was linked to QoL (Ho, Chan, Woo, Chong, & Sham, 2009; Hughes, Giobbie-Hurder, Weaver, Kubal, & Henderson, 1999).

**Physical Symptoms Experienced by Informal Caregivers.** Caregiving responsibilities may have a negative physical health effect for ICGs. Researchers have found that caregiver stress was independently associated with physical disability (Bruce et al., 2005), and that overall level of pain is a substantial predictor of the physical dimensions of caregiver burden (i.e. caregiving tasks impacting an ICG’s feelings on their physical health) (S. L. Jones, Hadjistavropoulos, Janzen, & Hadjistavropoulos, 2011).

**Pain.** ICGs have been referred to as the ‘hidden patient’ because health concerns are predominately focused on the care recipient (Fengler & Goodrich, 1979), as such, research is very limited regarding pain that the ICG may experience. ICGs assist with many aspects of daily living for their care recipient that may negatively impact their physical well-being. Results from a study on ICGs revealed pain is a significant and substantial contributor to physical domain of caregiving burden and a significant
contributor to emotional and total caregiving burden (S. L. Jones et al., 2011). One study researching prevalence of lower back pain in ICGs revealed 82.8% of their participants reported high frequencies of lower back pain (Yılmaz Yalcinkaya, Önes, Bora Ayna, Kucukali Turkyilmaz, & Erden, 2010). Similarly, a separate study revealed higher levels of low back pain in ICGs when compared to their control group (Bardak, Erhan, & Gündüz, 2012). Increasing or beginning to participate in physical activities may be one option to improve pain.

**Exercise for Informal Caregivers.** Three studies have examined the role of exercise in improving psychological or physical health in ICGs. Farran et al.’s (2008) study examined a 6-month, home-based health promotion program for ICGs for individuals with Alzheimer’s disease. Participants self-reported on their physical activity levels and reported a 42% increase in moderate minutes (i.e. physical activity 30-minutes per day most days of the week and goal of 150-minutes per week) from pre- to post-intervention. This study concluded that an exercise program for ICGs on physical activity is feasible, but identified barriers (e.g. anxiety and depressive symptoms and heavy caregiving responsibilities) to physical activity and should be addressed in the future (Farran et al., 2008).

Castro et al. (2002) offered a 12-month exercise program to female ICGs of people with dementia. One hundred ICGs participated in the either the exercise program or a nutrition education group. Participants in the exercise group received enough home-based exercise instructions to cover four 30-minute (at least) sessions per week. Adherence was reported at 74% after the 12-month program (three sessions per week at
Participants in the exercise group reported increased benefits associated with exercise and elevated levels of motivation when compared to the control group. Additionally, all participants reported improvements in stress, burden, and depression levels from pre- to post-testing (Castro et al., 2002).

Connell and Janevic (2009) explored a six-month telephone-based exercise program for ICGs of people with dementia. One hundred and thirty-seven ICGs were randomized into either the intervention group \( (n=86) \) or the control group \( (n=71) \). Participants in the intervention group received a video that discussed strategies for implementing physical activity into their daily routine, a selection of exercise videos (i.e. low impact exercises suitable for ICGs with limited mobility or low impact movement and aerobic dance), and a booklet about balance, flexibility, and strength for older adults (Connell & Janevic, 2009). A workbook containing information about the program, with a section for participants to keep track of their weekly progress and record their progress towards their goals was also included. Lastly, two newsletters that focused on motivation were emailed to this group. ICGs with or below-median exercise scores at baseline significantly increased their scores at the six-month follow-up compared to the control group. Researchers determined that ICGs are able to increase their amount of physical activity (Farran et al., 2008).

Research has consistently revealed that individuals participate in their leisure interests (e.g. hobbies) less frequently once they became an ICG (Bedini & Guinan, 1996; Pilisuk & Parks, 1988; Rogers, 1997; Stone, Cafferata, & Sangl, 1987; Wilson, 1990). For example, many ICGs identified their declining health status was related to:
caregiving responsibilities, reduced participation levels in regular exercise, less time for oneself, reduced interest in all activities, less opportunities to socialize with friends, less vacations, and less time for leisure pursuits due to caregiving responsibilities (Bedini & Guinan, 1996; Cantor, 1983; Snyder & Keefe, 1985; Thompson Jr et al., 1993). Additionally, ICGs from Farran et al.’s (2008) lifestyle physical activity intervention identified heavy non-caregiving and caregiving responsibilities as two barriers to participating in physical activity.

ICGs who participated in exercise programs have received diverse health benefits, such as improvements in stress, burden, and depression. Yoga, too, has been shown to deliver these types of health benefits, as it incorporates exercising an individual’s mind and body. Yoga may be practiced alone or in groups and may be adapted to all ability levels. For these reasons, yoga for ICGs deserves further exploration.

**Yoga**

If a non-conventional technique is used together with conventional medicine, it is deemed “complementary” and if a non-conventional technique is used in lieu of conventional medicine, it is believed to be “alternative” (National Center for Complementary and Integrative Health, 2013). Complementary health approaches include two subgroups (i.e. natural products or mind and body practices). Mind and body practices encompass a wide range of techniques that are performed by a teacher or trained practitioner (National Center for Complementary and Integrative Health, 2013). Yoga, a mind and body complementary health approach, incorporates pranayama (breath work), asana (physical postures), and dhyana (meditation) (Jeter, Slutsky, Singh, & Khalsa,
Yoga has been shown to impact a person’s psychophysiological functioning (Jeter et al., 2015) and has become a popular therapeutic intervention for individuals with physical and psychological conditions. For example, decreased levels of depression (Groessl, Weingart, Aschbacher, Pada, & Baxi, 2008; Jorge et al., 2016; Shapiro et al., 2007; Sharma, Das, Mondal, Goswami, & Gandhi, 2005) and stress (Bilderbeck, Brazil, & Farias, 2015; Jorge et al., 2016; Mackenzie, Carlson, Ekkekakis, Paskevich, & Culos-Reed, 2013; Yoshihara, Hiramoto, Oka, Kubo, & Sudo, 2014) have been reported after participating in yoga. Furthermore, enhanced physical functioning (Altenburger, Schmid, Puymbroeck, & Miller, 2016; Chen et al., 2008; DiBenedetto et al., 2005; A. A. Schmid et al., 2012; A. A. Schmid, Miller, Van Puymbroeck, & DeBaun-Sprague, 2014; A. A. Schmid, Miller, Van Puymbroeck, & Schalk, 2016; Van Puymbroeck, Allsop, Miller, & Schmid, 2015), and improved QoL (Crowe, Van Puymbroeck, Linder, Mcguire, & Watt, 2015; Immink, Hillier, & Petkov, 2014; Jorge et al., 2016; Martin & Keats, 2014; Minor, Carlson, Mackenzie, Zernicke, & Jones, 2006; Varambally et al., 2013) have also been reported in various populations after yoga participation.

**Yoga for Informal Caregivers.** Yoga interventions for ICGs have shown many different psychological and physical benefits (Danucalov et al., 2013; Martin & Keats, 2014; Van Puymbroeck et al., 2007; Varambally et al., 2013; Waelde, Thompson, & Gallagher-Thompson, 2004). Five published yoga interventions have targeted ICGs. Waelde et al., (2004) explored a six-session, manualized yoga-meditation program for 12 ICGs of individuals with dementia. The study aimed to help ICGs cope with stress, and
post-intervention scores revealed significant improvements in depression, state anxiety, and in self-efficacy (Waelde et al., 2004).

Van Puymbroeck et al., (2007) explored an 8-week yoga intervention where ICGs were randomized into the yoga group \( (n = 8) \) or control group \( (n = 9) \). The aim of this study was to determine the physiological well-being and coping of ICGs. ICGs in the yoga group were asked to attend the yoga study twice a week for 1.25 hours each session. Scores showed significant improvements in lower body strength and improvements in coping, upper-body strength, and aerobic endurance (Van Puymbroeck et al., 2007).

Danucalov et al., (2013) investigated the potential effects of an 8-week yoga and compassion meditation program for ICGs of people with Alzheimer’s disease. Twenty-five ICGs were randomly assigned to the yoga and compassion meditation program and 21 were randomly assigned into the control group. Participants in the yoga and compassion meditation group had to attend a total of eight sessions in person (one per week) and 16 at home (two per week) with guidance from a DVD. The program revealed that participants who were in the yoga and compassion meditation group significantly improved in psychological and physical QoL domains after the program (Danucalov et al., 2013).

Varambally et al., (2013) investigated a yoga-based intervention for ICGs of people with psychosis. ICGs were randomized into a yoga group \( (n=15) \) or a wait-list group \( (n=14) \) and participants were assessed pre- and post-intervention. Participants attended yoga classes three times a week for four weeks and were then instructed to practice yoga at home for the next two months. Results revealed the yoga group
significantly reduced burden scores and improved QoL scores compared to the wait-list group at the end of three months (Varambally et al., 2013).

Martin and Keats (2014) explored the impact yoga had on QoL and psychological distress in ICGs of people with cancer. Twelve ICGs participated in a 6-week yoga intervention and completed pre- and post-assessments. Results indicated significant improvements for the mental component of the QoL assessment and in overall psychological distress. Subdomains in the QoL and psychological distress assessment also revealed an improvement in levels. Open-ended survey questions over program satisfaction were given to participants to fill out. Participants reported improved perceived physical and mental well-being after participating in the study and highlighted improvements in energy, breathing, balance, flexibility, and core and upper-body strength (Martin & Keats, 2014).

Future yoga studies for ICGs should also investigate feasibility components due to the small number of available research/participants. As improvements in well-being may be experienced after participating in a yoga study, the documented findings may encourage healthcare professionals to recommend yoga as a complementary/alternative technique. Identifying areas of weakness in past yoga research may also aid in developing or standardizing yoga techniques that have also reported improvements in psychological or physical well-being.

**Feasibility**

Feasibility studies are an essential phase of the research process and are utilized by researchers to determine if an intervention is suitable for additional testing (Bowen et
In other words, they determine if an intervention may be performed at a larger scale (as intended) (Leon, Davis, & Kraemer, 2011). Bowen et al. (2009) suggested that feasibility studies “enable researchers to assess whether or not the ideas and findings may be shaped to be relevant and sustainable” (p.2) for program facilitators and participants. Feasibility studies enable investigators to identify if research methods or protocols need modification and suggest how adaptations may improve future testing (Bowen et al., 2009). There are several general areas to focus on in feasibility studies: acceptability refers to how the participants and facilitators of the intervention respond (e.g. did participants report enjoyment from participating in the program) (Bowen et al., 2009); demand for the intervention is assessed by documenting the actual attendance rate of participants (i.e. facilitators document attendance of each participant); and practicality focuses on how the intervention is delivered when resources, time, and/or commitment are limited in a way (e.g. did participants report complaints on length of the program) (Bowen et al., 2009). Additional general areas of feasibility to focus on for studies include adaptation refers to any changes made to the protocol or intervention (e.g. documenting any modifications made to the intended population) and fidelity identifies the extent to which facilitators implement an intervention as designed by the researcher (e.g. how much was the intended program altered after completion) (Dusenbury, Brannigan, Falco, & Hansen, 2003).

Recreational therapists provide holistic treatment for individuals with a disease or disability. Recreational therapists follow a systematic process that assesses an individual’s psychological and/or physical needs to develop an intervention that may
improve those needs after participation (Austin, 2001). The goal of the intervention is to restore or improve an individual’s level of functioning. Individuals who participate in recreational therapy may improve their overall well-being and experience positive emotions during a selected intervention. Furthermore, it is the recreational therapist’s responsibility to educate participants on the link between a specific intervention and outcome.

**Theoretical Framework**

This study is grounded in positive psychology and more specifically, the broaden and build theory of positive emotions. This theory provided support in the development of the proposed study.

**Positive Psychology.** Positive psychology focuses on the individual’s positive experiences: past satisfaction and well-being; present happiness, joy, sensual pleasures, and flow; and past hope, optimism, and faith (Seligman, 2002). Individuals who experience positive emotions during an activity frequently continue involvement and individuals who experience a negative emotion often pause to decide if they should stop or continue participation (Fredrickson, 1998). Recreational therapists focus on health promotion and occasionally utilize activities that promote positive emotions. For example, several recreational therapists have utilized the broaden and build theory of positive emotions to provide support in their selected interventions with specific populations (Van Puymbroeck et al., 2011; Walter & McCormick, 2014).

**The Broaden and Build Theory of Positive Emotions.** The broaden and build theory of positive emotions is grounded in positive psychology, which focuses on
understanding specific factors that allow individuals to flourish (Fredrickson, 2001). Thoughts, actions, and physiological reactions are generated from short lived occurrences (i.e. emotions) (Fredrickson & Branigan, 2005). Positive emotions have the ability to broaden an individual’s ‘thought-action repertoire’ and build on experiences (Fredrickson, 2001); “negative emotions narrow the momentary thought-action repertoire” (Fredrickson, 1998, p. 6). The undoing hypothesis (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000) reveals that “if negative emotions narrow the momentary thought-action repertoire and positive emotions broaden this same repertoire, then positive emotions ought to function as efficient antidotes for the lingering effects of negative emotions” (Fredrickson, 2011). Evidence supports that positive emotions have occurred during a yoga intervention, so participants may be more likely to continue in yoga and receive possible health benefits (Van Puymbroeck et al., 2011). This framework was applied when selecting the intervention for ICGs, because yoga studies with various populations has revealed increased positive emotions (Hartfiel, Havenhand, Khalsa, Clarke, & Krayer, 2011; Litchke & Hodges, 2014; Narasimhan, Nagarathna, & Nagendra, 2011; Shapiro & Cline, 2004; Van Puymbroeck et al., 2011).

**Summary**

This yoga study was designed to address psychological and physical outcomes specific to ICGs. Feasibility components need to be addressed in future studies to determine if yoga studies are appropriate for ICGs. The following section of this dissertation will provide the rationale for the mixed methodological approach and explain
the mixed methods used. Yoga may be a potential nonpharmacological treatment for symptoms experienced due to caregiving responsibilities.
CHAPTER III

METHODS

Mixed methodology combines quantitative and qualitative data that enable researchers to be holistic and flexible with their investigative techniques when addressing a multifaceted research question (Onwuegbuzie & Leech, 2006).

This study employed a mixed methods concurrent design to examine the possible psychological and physical effects a therapeutic yoga intervention had for ICGs. Psychological characteristics (i.e. depressive symptoms, burden, social support, strain, positive and negative affect, positive aspects of caregiving, leisure constraints, and QoL) and physical characteristics (i.e. pain, lower-body strength, upper-body strength, aerobic endurance, lower-body flexibility, and upper-body flexibility) were assessed for ICGs. This study intended to answer the following specific aims:

1. What are the perceived psychological and physical benefits of the therapeutic yoga intervention for ICGs?
2. Is a therapeutic yoga intervention for ICGs feasible?

Research Design

The methodological framework that guided this study was mixed methods research. Quantitative and qualitative data should be regarded as complementary rather than opposing (Borland, 2001). Mixed methods research unites quantitative and qualitative data collection and analysis to best answer research questions (Johnson, Onwuegbuzie, & Turner, 2007). Mixed methods research minimizes weaknesses that quantitative and qualitative approaches have individually by combining them to explore a
topic robustly (i.e. weakness minimization) (Creswell & Plano Clark, 2011b). A mixed methods concurrent design was chosen because the quantitative and qualitative phases of this study held equal weight (i.e. neither phase was emphasized over the other) (Creswell & Plano Clark, 2011a; Onwuegbuzie & Leech, 2006). The quantitative approach provided a general understanding of within group differences in the psychological and physical outcomes for ICGs after they participated in the study. The qualitative approach provided subjective details from the participant’s point of view (Creswell & Plano Clark, 2011a). More specifically, the phenomenological approach allows participants to have the opportunity to discuss their personal experience as an ICG in association with their yoga participation during the focus group period (Manen, 1990; Seidman, 2013). Verification was addressed in the focus group data through clarifying questions from the facilitator related to unclear statements made by any participant. The mixing of quantitative and qualitative methods enhances understanding (Guest, 2013) of the psychological and physical effects experienced by the participants in the therapeutic yoga intervention (see Figure 3.1).

Figure 3.1
Mixed methods concurrent triangulation strategy

(Creswell, Plano Clark, Gutmann, & Hanson, 2003)

**Participants.** Snowball and purposive sampling techniques were used to recruit subjects for this study. The principal investigator (PI) was referred to support group leaders that had contact information of ICGs to recruit participants for this study. Support group leaders for ICGs were contacted by the PI with study information and asked to circulate the flyer to known ICGs. The PI also attended two memory care support groups to present the yoga study for ICGs and hand out contact information to individuals who were interested in learning more about the study.

To determine eligibility for the study, potential participants had to identify the disease/disability their care recipient had to be included in the study. Additional inclusion criteria for ICGs to participate in this study included: 1) age 18 years or older; 2) provide informal care to someone with a disease or disability; 3) answer ‘no’ to all eight questions from the PAR-Q (a screener for potential contraindications and/or adverse physical effects in reaction to physical activity). An answer of ‘yes’ to any of the eight questions would have been acceptable if accompanied with documentation of approval from a healthcare provider. 4) Willing to participate in the eight-week intervention. Individuals were excluded from participating in the yoga study if they reported not being able to attend the classes twice a week (60-minutes per session) for 8-weeks at the selected yoga location.

**Procedure.** The PI was referred to support group facilitators and asked if the study flyer regarding the therapeutic yoga program (see Appendix A) may be circulated
at group or via email to ICGs (age ≥18). Additionally, the PI attended two memory care support groups to discuss the therapeutic yoga study and obtain contact information from ICGs who were interested in possibly participating in the study. Once the PI successfully contacted the potential participant, the PI asked the ICG to explain the details of providing care to their care recipient (i.e. list several tasks they perform for their care recipient and why). If the ICG assisted their care recipient in one or more caregiving tasks s/he was then asked to answer the PAR-Q (screener for potential adverse physical effects or contraindications to physical activity). All eight PAR-Q questions should be answered with a ‘no’ (‘yes’ to any of the questions was acceptable with documentation of approval from a healthcare practitioner). Lastly, the PI asked the ICG if s/he would be willing to participate in an eight-week study that met twice a week for 60-minutes per session. If the ICG agreed, a meeting was scheduled to complete the informed consent (see Appendix B), the PAR-Q (see Appendix C), the media release form (see Appendix D), and pre-intervention physical assessments (see below). A packet with the psychological assessments were given to the ICG and asked to bring back the packet completed on the first day of yoga.

The ICG was asked to read and complete the scales for depressive symptoms (see Appendix E), perception of caregiver burden (see Appendix F), social support (see Appendix G), strain (see Appendix H), positive and negative affect (see Appendix I), positive aspects of caregiving (see Appendix J), leisure constraints (see Appendix K), and QoL (see Appendix L) by the first yoga session. Lower-body strength (see Appendix M), upper-body strength (see Appendix N), aerobic endurance (see Appendix O), lower-body
flexibility (see Appendix P), upper-body flexibility (see Appendix Q), and pain (see Appendix R) measurements were administered by the PI and a trained research assistant the week before yoga classes began.

The PI provided ICGs with information that included date, time, and location of the eight-week study via email several weeks before the study began. A paper copy with the date, time, and location of the eight-week study was also available for participants to take home at their pre-intervention scheduled meeting. An email and/or phone call (from the PI) was made to each participant for the first two weeks to remind participants of the date and time of yoga. Participants met at the Salem, South Carolina Keowee Key Event Center. The intervention was held with all participants in one room. The yoga study began January 9, 2018 and concluded March 1, 2018.

Two student assistants were recruited from the Recreational Therapy graduate program at Clemson University. The PI trained both student assistants on how to administer each specific outcome measure instrument. The PI and research assistants practiced the outcome measurements before facilitating them with participants one week before the intervention. The measures were repeated with the ICGs at the study location within one week after completing the therapeutic yoga intervention.

A semi-structured focus group was held after the last yoga session. The purpose of the focus group was to obtain subjective information that provided detailed insight into their experience that may have been missed or further elaborated upon the quantitative measurements. The focus group had one experienced facilitator present and was recorded via two recording devices. The facilitator followed an interview guide and asked probing
questions when a comment needed addition detail (Krueger & Casey, 2014). One research assistant documented behaviors and took field notes during the focus group. Two phone interviews were conducted after the last yoga session due to unavailability to attend the focus group. The experienced facilitator who performed the focus group also conducted the two phone interviews and followed the exact interview guide with two recording devices. Probing questions were asked during the individual interviews if the facilitator needed additional details.

**Therapeutic Yoga Intervention.** The therapeutic yoga intervention was scheduled for eight consecutive weeks, two sessions per week at 60 minutes per session, which is consistent with the existing yoga literature that suggests that most interventions have two sessions per week at 60-90 minutes per session for eight weeks (Carei, Fyfe-Johnson, Breuner, & Brown, 2010; Javnbakht, Kenari, & Ghasemi, 2009; Pullen et al., 2008; A. a. Schmid et al., 2012; Van Puymbroeck et al., 2007, 2011). However, one yoga session was cancelled due to weather conditions.

Asanas (physical postures), pranayama (breath control), and dhyana (meditation) were the three components incorporated into each yoga session. The integration of the three components is what makes yoga holistic and effective (Clare Collins, 1998).

Asanas are the foundation used to explore the mind, breath, and body (Saraswati & Hiti, 1996). These physical postures are techniques that foster attentiveness, relaxation, and meditation (Saraswati & Hiti, 1996). The therapeutic yoga intervention for ICGs (see Appendix S) was developed and administered by a yoga therapist (C-IAYT) who is trained to develop appropriate goals, adapt yoga practices, and implement those practices
in specific clinical contexts (Kepner et al., 2014). Participants were encouraged to continue their breath work (pranayama) and meditation (dhyana) techniques throughout the flow of their physical postures. Asanas were introduced and implemented to target lower-body strength, upper-body strength, aerobic endurance, lower-body flexibility, and upper-body flexibility. The therapeutic yoga intervention progressed from seated, to standing, to floor postures; and asanas advanced incrementally for the participants, depending on the individual abilities of each participant. Pranayama and dhyana techniques were introduced at the beginning of each class and each asana was demonstrated with adaptations before participants attempted the pose.

**Quantitative Measures**

**Demographic Questions.** Demographic questions, such as age, gender, relationship to care recipient, care recipients’ health condition, years as an ICG for their current care recipient, length (i.e. hours/days) of time spent providing informal care to their care recipient, marital status, race, highest level of education completed, overall health status, smoking habits, occupation, and living arrangements (i.e. living alone or with others), were collected for ICGs. See Appendix T for the demographic assessment.

**Psychological Measures.** The ICGs completed a battery of psychological and physical measures pre- and post-intervention. The measures are described below.

**Beck Depression Inventory (BDI).** Introduced in 1961 and revised in 1996, the Beck Depression Inventory (BDI) is a 21-item instrument, self-report questionnaire used to assess severity of depressive symptoms (A. T. Beck, Steer, & Brown, 1996; A. Beck, Ward, & Mendelson, 1961). Responses on the four-point Likert scale range from zero
(e.g. I do not feel sad) to three (e.g. I am so sad and unhappy that I can’t stand it). The items are summed for a total score ranging from zero to 63, and depressive symptoms may be categorized as minimal (0-9), mild to moderate (10-18), moderate to severe (19-29), and severe (30-63) (Beck et al., 1996). Both test-retest reliability (α =0.93) (Poole, Bramwell, & Murphy, 2006) and internal consistency (average α =0.82) (Richter, Werner, Heerlein, Kraus, & Sauer, 1998) are excellent. Studies for ICGs have utilized the BDI to rate severity of depression symptoms (Berg, Palomäki, Lönnqvist, Lehtihalmes, & Kaste, 2005; Trail, Nelson, Van, Appel, & Lai, 2003). See Appendix E for the BDI.

**Zarit Burden Interview (ZBI).** Introduced in 1980, the Zarit Burden Interview (ZBI) is a 29-item instrument, self-report questionnaire that assesses caregivers’ perceptions of burden that may affect their health, personal, social, or financial wellbeing (Zarit et al., 1980). A shorter 22-item version with acceptable validity and reliability was introduced in 1985 (Cooper, Katona, Orrell, & Livingston, 2008; Grunfeld et al., 2004; Schreiner, Morimoto, Arai, & Zarit, 2006; Takahashi, Tanaka, & Miyaoka, 2005) and selected for use in the study. Responses on the five-point Likert scale range from zero (never) to four (nearly always) about the extent of burden experiences while being a caregiver. All items are summed for a total score ranging from zero to 88, and the sum is categorized as little or no burden (0-21), mild to moderate burden (21-40), moderate to severe burden (41-60), or severe burden (61-88) (Zarit et al., 1980). In the present study, the analysis for the ZBI was conducted using 21 items rather than 22. One of the questions included in the assessment did not pertain to any participants (i.e. Do you feel that you have lost control of your life since your relative’s death?), therefore the question
was excluded. Cronbach’s alpha was calculated at .93 for 21 items in the ZBI. See Appendix F for the ZBI.

The Social Support Questionnaire Shortened Version (SSQ6). The Social Support Questionnaire shortened version (SSQ6) is a six-item measure to assess a participant’s perception of their social support (I. G. Sarason, Sarason, Shearin, & Pierce, 1987). Each question has two parts, the first part asks the participant to list each person they may count on for help or support that is related to the question. The number of individuals the participant lists for each item is the number score. The second part of the SSQ6 has the participant rate how satisfied they are with their overall support and this produces a satisfaction score for each question that ranges between one (very dissatisfied) to six (very satisfied) (I. G. Sarason, Levine, Basham, & Sarason, 1983; I. G. Sarason et al., 1987). The overall number scores and satisfaction scores are produced by dividing the total of the number scores or the total of the satisfaction scores by six, the number of questions in the SSQ6. Higher scores indicate greater levels of social support and lower scores indicate diminished social support levels. The SSQ6 has a reported internal reliability that ranges from 0.90 to 0.93 when compared to the SSQ (I. G. Sarason et al., 1987). The SSQ6 has been utilized to assess social support in ICGs (Haley, Levine, Brown, & Bartolucci, 1987). See Appendix G for the SSQ6.

Modified Caregiver Strain Index (MCSI). Introduced in 1983, the Caregiver Strain Index (CSI) is a 13-item self-report questionnaire to assess caregiver strain (B. C. Robinson, 1983). The more recent version, that was utilized in this study was the
Modified Caregiver Strain Index (MCSI), is also a 13-item self-report assessment that measures caregiver strain. Answers range from yes, on a regular basis (two) to no (zero); total scores range from zero to 26 and higher scores indicate higher levels of caregiver strain (Thornton & Travis, 2003; Travis, Bernard, McAuley, Thornton, & Kole, 2003). The MCSI is marginally higher in internal reliability coefficient (.90) than the original (.86). Test-retest reliability resulted at .88 from one-third of the original caregiver sample (Thornton & Travis, 2003). Studies for ICGs have utilized the MCSI to assess caregiver strain (Panganiban-Corales & Medina, 2011; van den Heuvel, Witte, Schure, Sanderman, & Jong, 2001). See Appendix H for the MCSI.

Positive and Negative Affect Schedule (PANAS). The Positive and Negative Affect Schedule (PANAS) was developed by Watson, Clark, and Tellegen (1988) to measure positive and negative affect. The PANAS is a 20-item self-report assessment that includes 10 positive and 10 negative feelings in a mixed order that the participant may score from one (very slightly or not at all) to five (extremely) (Watson et al., 1988). The positive questions are summed (ranging from 10-50) and higher scores indicate higher levels of positive affect. The negative questions are summed (ranging from 10-50) and lower scores represent lower negative affect (Watson et al., 1988). Reliability was adequate in a non-clinical sample, the positive affect portion was α=.89 and the negative affect portion was α=.85 (J. R. Crawford & Henry, 2004). Studies for ICGs have utilized the PANAS to assess positive and negative affect (Clair & Ebberts, 1997; Rapp & Chao, 2000). See Appendix I for the PANAS.
Positive Aspects of Caregiving Scale (PAC). Developed with participants from the Resources for Enhancing Alzheimer’s Caregiver Health (REACH) project and published in 2004, the Positive Aspects of Caregiving Scale (PAC) is an 11-item, self-report questionnaire that assesses caregiver’s mental/affective state associated with their experience of caregiving (Tarlow et al., 2004). Responses for the five-point Likert scale range from one (disagree a lot) to five (agree a lot) on the extent of positive aspects of caregiving. All items are summed (ranging from 11-55) and higher scores indicate greater positive aspects of caregiving. Cronbach’s alpha for reliability was reported at 0.89 for the entire measure (Tarlow et al., 2004). See Appendix J for the PAC.

Leisure Constraint Questionnaire. The Leisure Constraint Questionnaire is a 20-item measure with a five-item response scale that ranges from one (strongly agree) to five (strongly disagree) (Jackson, 1988; Jackson, Crawford, & Godbey, 1993; Shinew, Floyd, & Parry, 2004). All items are summed (ranging from 20-100) and lower scores indicate higher leisure constraints. Van Puymbroeck et. al., (2011) reported Cronbach’s alpha as 0.81 for their study. See Appendix K for the Leisure Constraint Questionnaire.

World Health Organization Quality of Life-BREF (WHOQOL-BREF). The World Health Organization Quality of Life-BREF (WHOQOL-BREF) is a shortened 26-item assessment developed from the original WHOQOL-100 that assesses QoL in four domains: physical health (e.g. sleep and rest); psychological health (e.g. bodily image and appearance); social relationships (e.g. personal relationships); and environment (e.g. freedom, physical safety and security) (World Health Organization, 1996). Responses on
the five-point Likert scale (higher scores indicate improved QoL) vary depending on the
domain addressed and all domains are summed and totaled to result in one score (World
Health Organization, 1996). A cross-cultural study was administered for the WHOQOL-
BREF to determine appropriate Cronbach’s alpha for each domain (physical .82;
psychological .81; social .68; environmental .80) (Skevington, Lotfy, & O’Connell,
2004). Studies for ICGs have utilized the WHOQOL-BREF to assess the four domains of
QoL (Coco et al., 2005; McKee et al., 2003). See Appendix L for the WHOQOL-BREF.

**Physical Measures.** The physical measures chosen were based on past research
on ICGs. ICGs completed the physical measures pre- and post-intervention and are
described below.

*Chair Stand Test.* The chair stand test assesses lower-body strength in older adults
(Rikli & Jones, 2013). Participants came to a complete stand (arms folded across chest)
from a seated position as many times as possible within 30 seconds while the research
assistant or the PI recorded the number of successful stands. This assessment was
administered to measure change in lower-body strength. Validity was reported at 0.77 as
a method to measure lower-body strength in older adults (C. J. Jones, Rikli, & Beam,
1999). See Appendix M for the Chair Stand Test.

*Arm Curl Test.* The arm curl test measures upper-body strength in older adults
(Rikli & Jones, 2013). All participants completed as many full bicep curls (five-pound
weight) as possible within 30 seconds while the PI recorded the number of successful
curls. This assessment was administered to measure upper-body strength. The protocol
for the arm curl test states men should use an 8lb. weight and women use a 5lb. weight
ICGs generally neglect their health concerns to predominately focus on their care recipient (Fengler & Goodrich, 1979). For this reason, the PI chose to have all ICGs (i.e. one man and seven women) perform the arm curl test with a 5lb. weight for consistency across participants. See Appendix N for the Arm Curl Test.

2-Minute Step Test. The 2-minute step test measures aerobic endurance by counting full number of steps in place an individual may complete in two minutes (Rikli & Jones, 2013). This assessment was administered to measure aerobic endurance. See Appendix O for the 2-Minute Step Test.

Chair Sit-And-Reach Test. The chair sit-and-reach test measures lower-body flexibility (Rikli & Jones, 2013). The individual was in a seated position on a chair with one leg out straight in front and arms reaching towards the toes of the outstretched leg. Measurements (in inches) were taken to measure the distance between fingertips and toes. This assessment was administered to measure lower-body flexibility. Intraclass test-retest reliability was reported as good for men (0.92) and women (0.96) in older adults (C. J. Jones, Rikli, Max, & Noffal, 1998). See Appendix P for the Chair Sit-And-Reach Test.

Back Scratch Test. The back scratch test measures upper-body flexibility by reaching one hand over the shoulder to the middle of the back and one hand reaching behind the back to the middle (Rikli & Jones, 2013). Measurements (in inches) were taken to measure the distance between both fingertips. This assessment was administered to measure upper-body flexibility. See Appendix Q for the Back Scratch Test.

PEG. The PEG is a three-item measure that assesses pain severity and pain
interference (Krebs et al., 2009). The three items assess pain intensity, interference with enjoyment in life, and interference in general activity (Krebs et al., 2009). Responses on the ten-point scale range from zero (no pain) to ten (pain as bad as you can imagine). The score from each of the three questions are summed (ranging from zero-30) and divided by three for a final score out of 10. Higher scores indicate more pain severity and pain interference. Cronbach’s alpha for reliability in the three-item scale was reported at 0.89 (Krebs et al., 2009). See Appendix R for the PEG.

**Feasibility.** When researching feasibility, there are important areas to examine, including acceptability, demand, practicality, adaptation, and fidelity of the intervention. Acceptability was documented by the participant’s responses in the evaluation of acceptability questionnaire and discussed during the focus group/individual interviews. Demand was recorded by the PI during each yoga class. Practicality was reported by the PI through documentation of limited resources, time, and/or commitment by any persons involved in the study. Also, ICGs reported on practicality via specific questions in the evaluation of acceptability questionnaire. Adaptations during any portion of the yoga classes were documented by the yoga instructor and by the PI if made to the protocol. Fidelity of the intervention was recorded with notes by the PI to document if the yoga intervention was presented as intended. The yoga instructor made notes of any portion of the intervention that had negative reactions for participants. For example, the PI followed-up with participants who dropped out of the study for any reason. The PI documented recruitment efforts and participant attendance throughout the study.
**Evaluation of Acceptability.** The PI developed the 14-item evaluation of acceptability questionnaire (See Appendix U) to obtain participants’ view of acceptability and practicality of the therapeutic yoga intervention. The 5-point Likert scale answers range from one (*strongly disagree*) to five (*strongly agree*). All items were summed (ranging from 14-70) and higher scores indicated higher levels of acceptability for the therapeutic yoga intervention. Questions focused on program location, program appropriateness, and program enjoyment.

**Other Quantitative Feasibility Indicators.** The PI of the study documented and screened for eligibility, number of participants excluded, and final number of participants that qualified for enrollment. Recruitment status was documented (i.e. start date of recruitment and ending date) to reveal if efforts were successful in recruiting ICGs by the PI. Retention was evaluated by monitoring attendance in each yoga session by the PI. The yoga instructor documented fidelity of the intervention during each session and the PI documented attrition (i.e. if and why a participant drops out of the study). The PI reported the final number of ICGs who were included in analysis.

**Focus Group/Individual Interviews.** All the ICGs were invited to attend a semi-structured focus group directly following the last yoga session. A set of questions (see Appendix V for focus group questions) was developed to further understand their lived experience while participating in the therapeutic yoga intervention. Questions were directed towards preconceived expectations, experiences during the intervention, and feasibility of the eight-week yoga intervention. A student research assistant facilitated the semi-structured focus group, one student research assistant documented behavior, and
two audio devices recorded questions/responses. Two ICGs were unable to attend the focus group due to prior commitments with their care recipients. The PI offered the two ICGs the option to participate in separate phone interviews and both agreed. The student research assistant who facilitated the focus group conducted both phone interviews two days following the last yoga session and asked the exact questions from the focus group with two audio devices recording questions/responses.

**Analyses**

**General Considerations:** Quantitative and qualitative data were analyzed independently (Creswell & Plano Clark, 2011a). Quantitative data was entered and stored in an SPSS (v. 24) database. Qualitative data was transcribed verbatim electronically and securely stored, along with the audio recordings. Data from the quantitative and qualitative phases were mixed after completion of the study to examine possible supportive findings between select components.

**Specific Aim 1:** To determine the perceived psychological and physical benefits of the therapeutic yoga intervention.

**Hypothesis 1:** ICGs will experience improvements in the select psychological and physical components after participating in the 8-week therapeutic yoga intervention.

**Analysis Plan for Aim 1.** The BDI, ZBI, SSQ6, MCSI, PANAS, PAC, leisure constraint questionnaire, WHOQOL-BREF, PEG, chair stand test, arm curl test, 2-minute step test, chair sit-and-reach test, and back scratch measures were utilized to determine the change in the psychological and physical components in ICGs following the therapeutic yoga intervention. A Wilcoxon signed-rank test was performed to compare
within group differences between pre- and post-assessment scores due to the small sample size.

Percent change was calculated using Kolasinski and colleagues model (Kolasinski et al., 2005):

\[
\text{Percent change from baseline} = \left( \frac{\text{Final value} - \text{baseline value}}{\text{baseline value}} \right) \times 100\%.
\]

The focus group was conducted directly following the last yoga session and the two phone interviews two days succeeding the last yoga session. Questions were developed to further understand the ICGs lived experience while participating in the therapeutic yoga intervention. Conventional content analysis (CCA) (i.e. analytic technique) were performed on all interview transcripts to describe the psychological and physical effects of ICGs (Hsieh & Shannon, 2005). Codes and categories were formed from the data (Hsieh & Shannon, 2005) rather than utilizing preconceived categories (Kondracki, Wellman, & Amundson, 2002). To begin the coding process, comments were placed into similar groups and given a code (Krueger & Casey, 2014). When all statements were coded, analytic categories were then prepared (Krueger & Casey, 2014). Categories were determined through the participant’s responses. The PI and a student research assistant both independently analyzed the qualitative data to create legitimation (i.e. assessing the quality of inferences made by both researchers).

The PI examined similar findings from the independent quantitative and qualitative data. Mixing (comparing quantitative results with qualitative results) was the final stage of analysis. Similar and conflicting findings from quantitative and qualitative data were examined and shown in a quantitative and qualitative matrix. Greene,
Caracelli, and Graham (1989) described the use of triangulation to corroborate findings. The concurrent triangulation design supported authenticating internal consistency and assessing reliability of the outcomes from this study (Greene, Caracelli, & Graham, 1989).

**Specific Aim 2:** To determine if the therapeutic yoga intervention for ICGs is feasible.

**Hypothesis 2:** The therapeutic yoga intervention will be feasible for ICGs.

**Analysis Plan for Aim 2.** Documentation from the PI and yoga therapist (as indicated above) were analyzed to report *acceptability, demand, practicality, adaptation, fidelity, recruitment effort,* and *participant attendance* through notes and an attendance sheet. An evaluation of acceptability questionnaire was administered post-intervention to participants and summed to determine participants’ attitudes towards acceptability and practicality (e.g. was the length of the program appropriate) of the therapeutic yoga intervention.

The focus group ensued immediately following the last yoga session and the two phone interviews two days after the last yoga session. Questions were created to gain further understanding of the ICGs lived experience while participating in the therapeutic yoga intervention. Conventional content analysis (CCA) (i.e. analytic technique) were performed on all interview transcripts to illustrate feasibility aspects of the yoga study (Hsieh & Shannon, 2005). Codes and categories formed the data (Hsieh & Shannon, 2005) instead of utilizing preconceived categories (Kondracki et al., 2002). Comments were placed into similar groups and given a code to begin the coding process (Krueger &
Casey, 2014). When all statements were coded, analytic categories were then arranged (Krueger & Casey, 2014). Categories were established through the participant’s responses. The PI and a student research assistant both independently analyzed the qualitative data to create legitimation (i.e. assessing the quality of inferences made by both researchers).
CHAPTER IV

Introduction

An informal caregiver (ICG) is an individual who provides unpaid care for a person with a disease or disability. ICGs assist in nearly every aspect of life and are rarely trained to help with all the associated caregiving tasks (Family Caregiver Alliance, 2017). A number of common caregiving tasks include: helping their care recipient take a shower and/or getting dressed, buying groceries, cooking meals, cleaning, providing transportation, arranging medical appointments, and managing their care recipient’s medications (Family Caregiver Alliance, 2017). Providing informal care may positively effect a care recipient’s psychological and physical health, but the daily tasks of caregiving often result in negative impacts to the psychological and physical well-being of the ICG (Navaie-Waliser et al., 2002). Psychological and physical impacts differ depending on the ICG and the type of disability their care recipient has (Aranda & Knight, 1997; Connell & Gibson, 1997; Schulz & Beach, 1999; Shaw et al., 1997). Notably, ICGs who share a home with their care recipient may experience higher levels of stress when compared to ICGs who do not share a home, because their role as a caregiver is temporarily on hold when not with the care recipient (Pinquart & Sörensen, 2007).

Previously, researchers have identified that the tasks associated with caregiving may adversely impact an ICG’s psychological well-being (i.e. depression, burden, strain, affect, leisure constraints, and quality of life (QoL) (Clay et al., 2008; Henderson et al., 1988; Papastavrou et al., 2007; Robertson et al., 2007; Semiatin & O’Connor, 2012;
Signe & Elmståhl, 2008; Takai et al., 2009). An ICG’s ability to perform caregiving tasks may be affected when their personal needs are unmet (Kristjanson et al., 1995; Tringali, 1986). Researchers have found that caregiver stress was independently associated with physical disability for ICGs (Bruce et al., 2005), and that overall level of pain is a substantial predictor of the physical dimensions of caregiver burden (i.e. caregiving tasks impacting an ICG’s feelings on their physical health) (S. L. Jones et al., 2011).

Although there are many negative symptoms associated with caregiving, there are also positive aspects associated with the caregiving experience. One study reported that 73% of their ICG participants identified one particular positive aspect of caregiving (e.g. companionship and fulfilling/reward) and 6.9% identified two or more (C. A. Cohen et al., 2002). ICGs who described having lower levels of burden and higher health status were associated with positive feelings towards caregiving (C. A. Cohen et al., 2002). One way to enhance positive feelings and address other mental health concerns may be through yoga.

Yoga, a mind and body complementary health approach, incorporates pranayama (breath work), asana (physical posture), and dhyana (meditation) (Clare Collins, 1998). Yoga has been shown to impact a person’s psychophysiological functioning (Jeter et al., 2015) and has become a popular therapeutic intervention. Yoga may positively impact psychological well-being for ICGs (Martin & Keats, 2014; Van Puymbroeck et al., 2007; Varambally et al., 2013). For example, one study revealed ICGs improved in overall psychological distress (Martin & Keats, 2014). Further, another study found that yoga may enhance well-being for ICGs by building on positive feelings during the program.
and reducing perceived leisure constraints (Van Puymbroeck et al., 2007). Finally, yoga interventions for ICGs have improved physical functioning for ICGs (Martin & Keats, 2014; Van Puymbroeck et al., 2007). Due to the small number of findings from yoga studies for ICGs, psychological and physical impacts must be measured in greater detail. Therefore, this study sought to build on previous improvements found in psychological and physical well-being ICGs may experience after participating in a yoga intervention. Additionally, due to the small number of yoga interventions for ICGs and understanding that ICGs may experience pain from performing informal caregiving tasks, this study also investigated pain levels in ICGs after participating in an 8-week yoga intervention.

**Methods**

**Design**

This pilot study employed a mixed methods concurrent design to investigate the research question:

What are the perceived psychological and physical benefits of a therapeutic yoga intervention for ICGs?

The quantitative and qualitative phases of this study held equal weight (i.e. neither phase was emphasized over the other) (Creswell & Plano Clark, 2011a; Onwuegbuzie & Leech, 2006). The quantitative approach provided a general understanding of within group differences in the psychological and physical outcomes for ICGs after they participated in the study. The qualitative approach provided subjective details from the participant’s point of view (Creswell & Plano Clark, 2011a). More specifically, the phenomenological approach was chosen to allow participants the opportunity to discuss their personal
experience as an ICG in association with their yoga participation during the focus group period (Manen, 1990; Seidman, 2013).

Participants

Eleven ICGs responded to flyers and emails that advertised the therapeutic yoga intervention. In order to qualify for inclusion in this study, individuals had to meet the following criterion: 1) age 18 years or older, 2) provide informal care to someone with a disease or disability, 3) answer ‘no’ to all eight questions from the PAR-Q (a screener for potential contraindications and/or adverse physical effects in reaction to physical activity), although an answer of ‘yes’ to any of the eight questions was acceptable if accompanied with documentation of approval from a healthcare professional; and 4) be willing to participate in the 8-week intervention. Individuals were excluded from participating in the yoga study if they reported not being able to attend the classes twice a week (60-minutes per session) for 8-weeks at the selected yoga location. The study was approved by the local Institutional Review Board, and all ICGs signed consent forms prior to involvement with the study.

Intervention

Participants were asked to attend bi-weekly hour-long sessions for 8-weeks. The sessions consisted of a variety of pranayama (breathing), asanas (physical postures), and dhyana (meditation) techniques. Each yoga session was instructed by a single certified yoga therapist (C-IAYT). The yoga therapist created the sequencing for the progressively difficult 8-week study with the intent to enhance psychological and physical well-being for the ICGs (please see Appendix S for the yoga sequence utilized). Yoga postures were
demonstrated by the instructor to the participants to allow each person to choose how they completed a pose (e.g. sitting or standing). A yoga mat, two blocks, one yoga strap, and one bolster were given to each participant at the beginning of class and the instructor provided additional yoga materials for modification when needed.

**Quantitative Data Collection**

*Demographic Information*

Demographic information was collected at time one (T1, pre 8-week yoga intervention) and time two (T2, post 8-week yoga intervention). Characteristics such as, age, gender, relationship to care recipient, care recipients’ health condition, years as an ICG for their current care recipient, and length (i.e. hours/days) of time spent providing informal care to their care recipient were collected. Additionally, marital status, race, highest level of education completed, overall health status, smoking habits, occupation, and living arrangements were self-reported by participants.

*Psychological Measures*

Beck Depression Inventory (BDI) is a 21-item self-report measure and was used to assess severity of depressive symptoms (A. T. Beck et al., 1996; A. Beck et al., 1961). Responses on the four-point Likert scale range from zero (e.g. *I do not feel sad*) to three (e.g. *I am so sad and unhappy that I can’t stand it*). The items are summed for a total score ranging from zero to 63, and depressive symptoms may be categorized as minimal (0-9), mild to moderate (10-18), moderate to severe (19-29), and severe (30-63). Both test-retest reliability (Poole et al., 2006) and internal consistency (A. T. Beck, Epstein, Brown, & Steer, 1988) were reported as acceptable.
Zarit Burden Interview (ZBI). The Zarit Burden Interview (ZBI) assesses caregivers’ perceptions of burden that may affect their health, personal, social, or financial wellbeing (Zarit et al., 1980). A shorter 22-item version with acceptable validity and reliability was introduced in 1985 (Cooper et al., 2008; Grunfeld et al., 2004; Schreiner et al., 2006; Takahashi et al., 2005) and utilized in this study. Responses on the five-point Likert scale range from zero (never) to four (nearly always) about the extent of burden experiences while being a caregiver. All items are summed for a total score ranging from zero to 88, and the sum is categorized as little or no burden (0-21), mild to moderate burden (21-40), moderate to severe burden (41-60), or severe burden (61-88) (Zarit et al., 1980). In the present study, the analysis for the ZBI was conducted using 21 items rather than 22. One of the questions included in the assessment did not pertain to any participants (i.e. Do you feel that you have lost control of your life since your relative’s death?), therefore the question was excluded. Cronbach’s alpha for the 21 items in the ZBI utilized in this study were calculated at $\alpha=.93$.

Modified Caregiver Strain Index (MCSI). The Caregiver Strain Index (CSI) assesses caregiver strain (B. C. Robinson, 1983). A more recent version, the Modified Caregiver Strain Index (MCSI), was utilized and is also a 13-item self-report assessment that measures caregiver strain. Answers range from yes, on a regular basis (two) to no (zero) and scores may range from zero to 26 with higher scores indicating a higher level of caregiver strain (Thornton & Travis, 2003; Travis et al., 2003). The MCSI internal reliability coefficient and test-retest reliability were reported as acceptable resulting from one-third of the original caregiver sample (Thornton & Travis, 2003).
Positive and Negative Affect Schedule (PANAS). The Positive and Negative Affect Schedule (PANAS) (Watson et al., 1988) measures positive and negative affect. The PANAS is a 20-item self-report assessment that includes 10 positive and 10 negative feelings in a mixed order that the participant may score from one (very slightly or not at all) to five (extremely) (Watson et al., 1988). The positive questions are summed (ranging from 10-50) and higher scores indicate higher levels of positive affect (Watson et al., 1988). The negative questions are summed (ranging from 10-50) and lower scores represent lower negative affect (Watson et al., 1988). Reliability for the PANAS was reported as adequate (J. R. Crawford & Henry, 2004).

Positive Aspects of Caregiving Scale (PAC). Developed with participants from the Resources for Enhancing Alzheimer’s Caregiver Health (REACH) project and published in 2004, the 11-item Positive Aspects of Caregiving Scale (PAC) assesses caregiver’s mental/affective state associated with their experience of caregiving (Tarlow et al., 2004). Responses for the five-point Likert scale range from one (disagree a lot) to five (agree a lot) on the extent of positive aspects of caregiving. All items are summed (ranging from 11-55) and higher scores indicate greater positive aspects of caregiving. Cronbach’s alpha for reliability was reported as acceptable for the entire measure (Tarlow et al., 2004).

Leisure Constraint Questionnaire. The 20-item Leisure Constraint Questionnaire has a five-item response scale that ranges from one (strongly agree) to five (strongly disagree) and assesses perceived constraints on leisure (Jackson, 1988; Jackson et al., 1993; Shinew et al., 2004). All items are summed (ranging from 20-100) and lower
scores indicate a higher amount of leisure constraints. Van Puymbroeck et. al., (2011) reported Cronbach’s alpha as acceptable in a previous yoga study with older adults.

World Health Organization Quality of Life-BREF (WHOQOL-BREF). The World Health Organization Quality of Life-BREF (WHOQOL-BREF) is a shortened 26-item assessment developed from the original WHOQOL-100 that assesses QoL in four domains: physical health (e.g. sleep and rest); psychological health (e.g. bodily image and appearance); social relationships (e.g. personal relationships); and environment (e.g. freedom, physical safety and security) (World Health Organization, 1996). Possible answers on the five-point Likert scale vary depending on the addressed domain. All domains are summed and totaled to result in one score (higher scores indicate improved QoL) (World Health Organization, 1996). A cross-cultural study was administered for the WHOQOL-BREF to determine appropriate Cronbach’s alpha for each domain and were acceptable (Skevington et al., 2004).

Physical Measures

PEG. The PEG is a three-item measure that assesses pain severity and pain interference (Krebs et al., 2009). The three items assess pain intensity, interference with enjoyment in life, and interference in general activity (Krebs et al., 2009). Responses on the ten-point scale range from zero (no pain) to ten (pain as bad as you can imagine). The score from each of the three questions are summed (ranging from zero-30) and divided by three for a final score out of 10. Higher scores indicate more pain severity and pain interference (Krebs et al., 2009). Cronbach’s alpha for reliability in the three-item scale and construct validity were acceptable (Krebs et al., 2009).
Chair Stand Test. The chair stand test assesses lower-body strength in older adults (Rikli & Jones, 2013). Participants came to a complete stand (arms folded across chest) from a seated position as many times as possible within 30 seconds while the research assistant or the PI recorded the number of successful stands. This assessment was administered to measure change in lower-body strength. Validity was reported as acceptable (C. J. Jones et al., 1999).

Arm Curl Test. The arm curl test measures upper-body strength in older adults (Rikli & Jones, 2013). All participants completed as many full bicep curls (five-pound weight) as possible within 30 seconds while the PI recorded the number of successful curls. This assessment was administered to measure upper-body strength. The protocol for the arm curl test states men should use an 8lb. weight and women use a 5lb. weight (Rikli & Jones, 2013). ICGs generally neglect their health concerns to predominately focus on their care recipient (Fengler & Goodrich, 1979). For this reason, the PI chose to have all ICGs (i.e. one man and seven women) perform the arm curl test with a 5lb. weight for consistency across participants.

2-Minute Step Test. The 2-minute step test measures aerobic endurance by counting full number of steps in place an individual completed in two minutes (Rikli & Jones, 2013). Both knees must reach the predetermined height (i.e. level measured midway between the kneecap and hip bone). This assessment was administered to measure aerobic endurance.

Chair Sit-And-Reach Test. The chair sit-and-reach test measures lower-body flexibility (Rikli & Jones, 2013). The individual was in a seated position on a chair with
one leg out straight and arms reaching towards the toes of the outstretched leg. Measurements (in inches) were taken to measure the distance between fingertips and toes. The center of the toe in the shoe is considered a measurement of zero. If the individual did not meet the toe, then a negative score to the nearest half-inch was recorded. If the individual reached past the zero point a positive measurement to the nearest half-inch was recorded. A positive score indicates greater lower-body flexibility. Intraclass test-retest reliability was reported as good for men and women in older adults (C. J. Jones et al., 1998). This assessment was administered to measure lower-body flexibility.

Back Scratch Test. The back scratch test measures upper-body flexibility by reaching one hand over the shoulder to the middle of the back and one hand reaching behind the back to the middle (Rikli & Jones, 2013). Measurements (in inches) were taken to measure the distance between both fingertips. The position of the individual’s fingertips point towards each other and the distance between the fingertips is measured to the nearest half-inch. If the fingertips touch a score of zero is recorded. If the fingertips do not touch a negative measurement is recorded and if the fingertips overlap a positive score is recorded. Positive scores indicate greater upper-body flexibility. This assessment was administered to measure upper-body flexibility.

**Qualitative Data Collection**

Each of the ICGs were invited to participate in a semi-structured focus group following the last yoga session to discuss their personal experience during the yoga study. A student research assistant facilitated the semi-structured focus group, one student
research assistant documented behavior, and two audio devices recorded questions/responses. Two ICGs were unable to attend the focus group due to prior commitments with their care recipients. The PI offered them the option to participate in separate phone interviews and both agreed. The student research assistant who facilitated the focus group conducted both phone interviews two days following the last yoga session and asked the exact questions from the focus group. The two phone interviews were recorded with two audio devices. Several questions incorporated during the focus group included ‘Tell me about how this program has impacted you? Now that the program is completed, what are your perceived benefits? Describe any elements of the yoga program you really liked or disliked?’

**Quantitative Data Analysis**

Demographic information were examined utilizing frequencies and descriptive statistics. Multiple imputation for missing data was utilized for the bivariate analyses. To test the normality of data, the Shapiro-Wilks test was conducted. The data were not normally distributed thus a Wilcoxon signed-rank test was performed to compare within group differences between T1 and T2 assessment scores. To determine trends in the data, percent change was calculated using the formula: Percent change from baseline = [(Mean T2 – Mean T1) ÷ Mean T1] x 100%. All assessments were collected within one week of beginning the study (i.e. T1) and within one week of completing the study (i.e. T2).

**Qualitative Data Analysis**

Conventional content analysis (CCA) (i.e. analytic technique) were performed on all interview transcripts to describe the psychological and physical effects of ICGs (Hsieh
& Shannon, 2005). Codes and categories were formed from the data (Hsieh & Shannon, 2005) rather than utilizing preconceived categories (Kondracki et al., 2002). To begin the coding process, comments were placed into similar groups and given a code (Krueger & Casey, 2014). When all statements were coded, analytic categories were then prepared (Krueger & Casey, 2014). Categories were determined through the participant’s responses. The PI and a student research assistant both independently analyzed the qualitative data to create legitimation (i.e. assessing the quality of inferences made by both researchers).

Mixed Methods Data Analysis

The PI examined similar findings from the independent quantitative and qualitative data. Mixing (comparing quantitative results with qualitative results) was the final stage of analysis. Supporting and diverging findings from quantitative and qualitative data were examined and are presented in a mixed methods comparative matrix (see table 5 for the mixed methods comparative matrix). Greene, Caracelli, and Graham (1989) described the use of triangulation to corroborate findings. The concurrent triangulation design supported authenticating internal consistency and assessing reliability of the outcomes from this study (Greene et al., 1989).

Results

Participants

Two of the eleven ICGs who expressed interest in participating in the yoga study were not willing to drive the distance to the study location. Thus, nine ICGs met inclusion criteria and enrolled in the yoga study. One of the nine ICGs ended
communication/attendance and was recorded as lost to attrition following the first week. Additionally, one ICG was lost to attrition after week seven of the yoga study due to a misunderstanding of what yoga is.

The mean age (in years) of the ICGs was 68 ± 7.40. Two of the care recipient’s illness or disability was identified as Vascular Dementia, two as a mild cognitive impairment, one as ethanol induced Dementia, one as Dementia with Parkinson’s Disease, one as Alzheimer’s disease, and one had balance and mobility barriers. The mean amount of time providing care/day to that care recipient was 19.25 ± 6.59 hours and the mean amount of time providing care/year to that care recipient was 6.83 ± 6.16. Table 1 explains the results in greater detail.

<table>
<thead>
<tr>
<th>Table 4.1 Demographic characteristics (N=8)</th>
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<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Gender</td>
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<td>Female</td>
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<tr>
<td>Male</td>
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<tr>
<td>Age</td>
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<td>53-63</td>
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<tr>
<td>Race</td>
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<td>Marital status</td>
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<tr>
<td>Single/never married</td>
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<tr>
<td>Living arrangements</td>
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<td>With others</td>
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<tr>
<td>Alone</td>
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<tr>
<td>Care recipient’s disease or disability</td>
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<td>Cognitive impairment</td>
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<tr>
<td>General health decline</td>
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<td>Cognition and general health decline</td>
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<tr>
<td>Relation to care recipient</td>
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<tr>
<td>Spouse</td>
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<td>Oldest daughter</td>
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<tr>
<td>Daughter-in-law</td>
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<tr>
<td>Number of years as the care recipient’s ICG</td>
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<td>≤5</td>
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<tr>
<td>≤10</td>
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<tr>
<td>≤20</td>
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<tr>
<td>Hours per day spent as the care recipient’s ICG</td>
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<tr>
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<tr>
<td>12</td>
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<tr>
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</table>

**Quantitative Results**

*Psychological Measures*

The Wilcoxon signed-rank test was used to compare within group differences between T1 and T2 for all psychological assessments. A significant difference was found in the results of depression from T1 to T2 for ICGs (Z=-2.201, p=.028). That is, the ICGs reduced the severity of depression after participating in the 8-week therapeutic yoga study. Additionally, a significant reduction was revealed in the results of burden (Z=-2.214, p=.027) and negative affect (Z=-1.963, p=.050) from T1 to T2 for participants. No significant differences were found in the remainder of psychological measures (i.e. strain, positive affect, positive aspects of caregiving, leisure constraints, and QoL).
Although most of the results from the psychological measures were not statistically significant, percent change calculations from T1 to T2 indicated improvements in four of the remaining five psychological measures. Results for caregiver strain were reduced by 8.30% following the yoga study. ICGs experienced a 14.29% increase in positive affect after participating in the 8-week therapeutic yoga study. Additionally, the positive aspects of caregiving score increased by 14.36% after the yoga study. Lastly, QoL slightly increased by 0.27% for ICGs following the 8-week yoga study. Table 2 explains the results in greater detail.

Table 4.2 Change in psychological measures at T1 and T2

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean T1 (SD)</th>
<th>Mean T2 (SD)</th>
<th>% change</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>12.07 (11.17)</td>
<td>9.26 (10.24)</td>
<td>-23.28</td>
<td>-2.201</td>
<td>.028*</td>
</tr>
<tr>
<td>Burden</td>
<td>45.25 (12.26)</td>
<td>40.38 (13.96)</td>
<td>-10.76</td>
<td>-2.214</td>
<td>.027*</td>
</tr>
<tr>
<td>Strain</td>
<td>13.50 (8.67)</td>
<td>12.38 (9.23)</td>
<td>-8.30</td>
<td>-1.192</td>
<td>.233</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>26.25 (7.05)</td>
<td>30.00 (9.78)</td>
<td>14.29</td>
<td>-1.439</td>
<td>.150</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>19.88 (6.56)</td>
<td>15.50 (4.31)</td>
<td>-22.03</td>
<td>-1.963</td>
<td>.050*</td>
</tr>
<tr>
<td>Positive Aspects of Caregiving</td>
<td>26.89 (12.52)</td>
<td>30.75 (14.77)</td>
<td>14.36</td>
<td>-1.014</td>
<td>.310</td>
</tr>
<tr>
<td>Leisure Constraints</td>
<td>82.29 (6.53)</td>
<td>84.39 (7.83)</td>
<td>2.55</td>
<td>-1.183</td>
<td>.237</td>
</tr>
<tr>
<td>QoL</td>
<td>59.34 (9.68)</td>
<td>59.50 (10.01)</td>
<td>0.27</td>
<td>-.170</td>
<td>.865</td>
</tr>
</tbody>
</table>

SD = standard deviation.
Physical Measures

To compare within group differences between T1 and T2 scores, a Wilcoxon signed-rank test was performed for all physical measures. A significant difference was revealed in the results of pain interference from T1 to T2 for ICGs ($Z=-2.201$, $p=.028$). This finding indicates ICGs reduced their pain interference following the 8-week therapeutic yoga study. ICGs also experienced a significant improvement in the results of upper-body strength ($Z=-2.207$, $p=.027$) aerobic endurance ($Z=-2.197$, $p=.028$), and upper-body flexibility ($Z=-2.047$, $p=.041$) from T1 to T2. No significant differences were found for lower-body strength and lower-body flexibility.

Percent change calculations from T1 to T2 indicated ICGs experienced improvements in lower-body strength and flexibility. Results for lower-body strength increased by 13.80%, while scores for lower-body flexibility improved by 140.19% following the 8-week therapeutic yoga study. This dramatic improvement is due to the increases for one participant of 5.50-inches and a second participant of 4-inches. Table 3 explains the results in greater detail.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean T1 (SD)</th>
<th>Mean T2 (SD)</th>
<th>% change</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain Interference</td>
<td>6.46 (6.45)</td>
<td>2.56 (2.68)</td>
<td>-60.37</td>
<td>-2.201</td>
<td>.028*</td>
</tr>
<tr>
<td>Lower-Body Strength</td>
<td>10.29 (3.09)</td>
<td>11.71 (4.15)</td>
<td>13.80</td>
<td>-1.604</td>
<td>.109</td>
</tr>
<tr>
<td>Upper-Body Strength</td>
<td>13.57 (4.54)</td>
<td>17.86 (4.41)</td>
<td>31.61</td>
<td>-2.207</td>
<td>.027*</td>
</tr>
<tr>
<td>Aerobic Endurance</td>
<td>56.29 (19.58)</td>
<td>79.71 (14.67)</td>
<td>41.61</td>
<td>-2.197</td>
<td>.028*</td>
</tr>
<tr>
<td>Lower-Body Flexibility</td>
<td>1.07 (5.14)</td>
<td>2.57 (5.33)</td>
<td>140.19</td>
<td>-1.476</td>
<td>.140</td>
</tr>
</tbody>
</table>
Qualitative Results

Focus Group/Individual Phone Interviews

The focus group lasted approximately 34 minutes and the two phone interviews were collectively approximately 11 minutes. Several questions during the focus group/individual interviews included ‘What were your expectations of this program? Tell me about any feelings at the beginning of the yoga program about leaving your care recipient to attend yoga? How did or did those feelings change as the yoga intervention progressed?’ The semi-structured questions guided the development of the codes/categories (i.e. inductive approach) (Thomas, 2006). The conventional content analysis (CCA) resulted in 47 codes that formed five categories: psychological improvements, functional improvements, yoga engagement, social support, and self-care. Table 4 contains direct quotes from participants and explains each category and the number of codes per category.

The conversation during the focus group/individual interviews among ICGs focused on using calming techniques from the yoga classes. Participants expressed the ability to calm themselves when feeling stressed as an ICG and several ICGs also mentioned that they have more energy during the day. For example, one ICG said, “—So, this is good for me because now I have another way of making myself calm besides going out and doing all my volunteer work, and doing my swimming, and doing my pickleball to keep me active and everything. Maybe this is what I need to add to it to calm me down. Because I spend all my time trying to keep up with everything and then take care
of him. So, this has been a good eye opener in that respect.” These comments and others resulted in the emergence of the category with the most codes (i.e. physiological improvements).

Many of the participants noticed an improvement in flexibility after participating in yoga. For example, one participant said, “Well, I certainly am more limber. I can bend. It’s not so hard to move around.” A different ICG revealed he was able to progress from the chair postures to the floor by the end of the 8-week study. These comments created the category with the second most codes (i.e. functional improvements).

All of the participants in the focus group/individual interviews had a plan to continue yoga (i.e. yoga engagement). Some of the participants revealed they spoke with the yoga instructor (for this study) to plan a yoga class for once a month as a group. One of the ICGs did plan to continue yoga, but due to financial restrictions and availability she was only interested in continuing the practice at home. One of the other ICGs said, “Well, we do have a Fitness Center, and that’s where we have chair yoga. So one of the participants and I are going to try them.”

Two of the ICGs discussed connecting socially through the yoga class and began to carpool to drive their care recipients to a day program. Additionally, the focus group revealed it was nice to be with people who understood what one another was going through as an ICG. For example, one ICG said, “But I will add to that because I think the social interaction of doing it together, I think I found that a lot better than maybe trying to do it with YouTube or something.” The social support category was evident through the discussion and comments over the connection found as ICGs during the yoga study.
Several of the ICGs discussed how important it was to take care of themselves and participate in activities they enjoy without their care recipient (i.e. self-care). For example, one of the participants said, “My own well-being is very important because I can’t take care of him (i.e. care recipient) if I’m not well.” Additionally, several of the ICGs mentioned they are not able to be away from their care recipient for long, while others were able to.

Table 4.4 Focus group and phone interview data

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Codes</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiological improvements- calmer and increased energy as an ICG</td>
<td>16</td>
<td>“It does take practice to learn to calm yourself and really focus on your breathing because I’ve been told that you cannot, at the same time be anxious and breathe deeply. So, bring your mind back to breathing so your body doesn’t do it’s flip-flops. That’s really how—in fact, I did it last night when I was anxious in bed and I thought, “Okay. Breathe.” And it really does work.” “This gave me another mechanism to deal with stress.” “I certainly am more limber. I can bend. It’s not so hard to move around.” “I think I’ve gotten more flexible, I guess I’ve gotten stale.” “I’ll continue at home.”</td>
</tr>
</tbody>
</table>
| Functional improvements- increased physical function | 11              | “We have a class here at the Fitness Center and that’s where we have chair yoga, so one of the participants and I are going to try it.” “We could, kind of, share our stories and know we’re not alone.” “Basically, just to be in a group where the people have the same problems I have. That does help.” “My mom seems to accept yoga as a valid reason for me being out of the
Self-care—taking time for themselves as an ICG house. Doing errands is not so great. Yoga? Yeah. She knows it’s for me and she’s okay with it.” “You have to be able to get away for an hour. It’s okay.”

Mixed Methods Results

Mixing the quantitative and qualitative data from this study revealed supporting and opposing findings from the therapeutic yoga study. Both datasets supported improvements in flexibility and aerobic endurance. Interestingly, the quantitative data revealed a higher leisure constraint score at T2, while the qualitative data revealed diverging results from all the participants, who planned to engage in yoga after the yoga intervention ended. Table 5 presents a comparative matrix that presents the merged results. The third column indicates if the quantitative and qualitative results are supporting or diverging.

Table 4.5 Mixed methods comparative matrix

<table>
<thead>
<tr>
<th>Quantitative Results</th>
<th>Qualitative Results</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistically significant improvement in upper-body flexibility (Back Scratch Test) p=.041 T1 -2.43±5.26 T2 -1.21±4.61</td>
<td>“I certainly am more limber. I can bend. It’s not so hard to move around.”</td>
<td>Supporting results: Statistically significant improvement in upper-body flexibility scores, and participants reported improved flexibility.</td>
</tr>
<tr>
<td>Statistically significant improvement in aerobic endurance (2-Minute Step Test) p=.028 T1 56.29±19.58 T2 79.71±14.67</td>
<td>“Well, I’m more energetic in my home.”</td>
<td>Supporting results: Statistically significant improvement in aerobic endurance scores, and participants reported an increase in energy.</td>
</tr>
</tbody>
</table>
Increase in leisure constraint (The Leisure Constraint Questionnaire)  
p = .237  
T1 82.29±6.53  
T2 84.39±7.83

“We have a class here at the Fitness Center and that’s where we have chair yoga, so one of the participants and I are going to try it.”

Divergent results: An increase in leisure constraints was reported at T2, but all participants reported a plan to continue practicing yoga.

Discussion

In this sample of ICGs, we found significant improvements in multiple aspects of psychological and physical well-being after participating in the 8-week therapeutic yoga intervention. The improvements are important as previous studies have revealed that the tasks associated with caregiving may adversely impact an ICG’s psychological well-being (i.e. depression, burden, strain, affect, leisure constraints, and QoL) (Clay et al., 2008; Henderson et al., 1988; Papastavrou et al., 2007; Robertson et al., 2007; Semiatin & O’Connor, 2012; Signe & Elmståhl, 2008; Takai et al., 2009). What’s more, the negative outcomes ICGs may experience due to caregiving responsibilities impact their overall well-being. Five published yoga interventions have targeted ICGs and revealed different psychological and physical benefits after participation (Danucalov et al., 2013; Martin & Keats, 2014; Van Puymbroeck et al., 2007; Varambally et al., 2013; Waelde et al., 2004).

In our study, we found ICGs improved their severity of depression levels significantly after participating in the 8-week yoga intervention. Our findings are consistent with Waelde et al.’s (2004) yoga study who also found a significant improvement in depression levels following their yoga study for ICGs. Contradictory findings were revealed in comparison to Varambally et al.’s (2013) yoga study for ICGs. There were no significant changes in depression scores for ICGs after participating in
their yoga study (Varambally et al., 2013). The participants in our study may have experienced a decrease in depression based on the duration of our 8-week yoga intervention, as Varambally et al.’s intervention was 4-weeks in duration. Additionally, caregiving tasks (i.e. mental health impact of caregiving) have been reported to link directly to depression and to appear more among caregivers who are White (Haley et al., 1995). Our findings support that as all participants identified as White/Caucasian, while Waelde et al.’s participants included eight Latinas and four Caucasians, which may indicate that there was less depressive symptoms to improve in Waelde et al.’s study population. Lastly, researchers report that ICGs who live with their care recipient experience higher levels of depression and/or burden when compared to ICGs who live separately from their care recipient (Grafström et al., 1992; Zanetti et al., 1998; Zarit & Whitlatch, 1992). Results from our frequency analysis revealed all participants were living with their care recipient at the time of the 8-week yoga intervention and experienced higher severity of depression and/or burden levels before participating in our yoga study. Therefore, our findings support the current literature that links ICGs who live with their care recipients experience high levels of depression and/or burden.

Burden levels significantly decreased in our participants following the 8-week therapeutic yoga study. Our findings are similar to Varambally et al.’s (2013) yoga study for ICGs who also reported a significant improvement in burden following participation. Conflicting findings were reported in Waelde et al.’s (2004) yoga study for ICGs. That is, there were no differences observed in subjective or objective caregiver burden for participants in Waelde et al.’s study. The significant decrease in burden scores from our
study may have occurred for participants due to the decrease in time they spent performing their caregiving responsibilities while attending the yoga classes. The significant decrease in burden levels also may have occurred from the social interaction they experienced during each yoga session. For example, previous researchers examining social support and caregiver burden reported engagement in social activities for fun and recreation as the most important action to reduce caregiver burden (Thompson Jr et al., 1993).

Negative affect significantly decreased for our ICGs following the 8-week therapeutic yoga study. Participants in our study may have experienced the decrease in negative affect due to ceasing caregiving responsibilities for the amount of time they participated in each yoga session. Notably, negative affect was not examined in the five existing yoga studies for ICGs (Danucalov et al., 2013; Martin & Keats, 2014; Van Puymbroeck et al., 2007; Varambally et al., 2013; Waelde et al., 2004).

Additionally, several physical assessment scores significantly improved for our ICGs following the 8-week therapeutic yoga study. Our yoga study for ICGs is the first to examine changes in pain interference. After participating in our therapeutic yoga study, participants significantly reduced their level of pain interference. This is an important finding since results from one study which examined prevalence of lower back pain in ICGs revealed 82.8% of their participants reported high frequencies of lower back pain (Yilmaz Yalcinkaya et al., 2010). Furthermore, a separate study revealed a higher level of low back pain in ICGs when compared to their control group (Bardak et al., 2012). The
significant decrease in pain interference for our study may have resulted from our yoga therapist’s ability to modify every physical posture to meet each ICG’s ability level.

Van Puymbroeck et al.’s (2007) yoga study for ICGs examined all of the physical fitness measures that were utilized in our study. Interestingly, none of the significant differences were found in both studies. Van Puymbroeck et al.’s findings revealed a significant increase in lower-body strength for ICGs. Although not statistically significant, ICGs from our yoga study improved lower-body strength by 13.80% from T1 to T2. In addition, our ICGs significantly improved in upper-body strength after the yoga study and Van Puymbroeck et al.’s ICGs experienced an 8% increase in upper-body strength. A similar trend was reported by ICGs participating in Martin and Keats’s (2014) yoga study. Specifically, open-ended survey question responses revealed ICGs perceived an improvement in upper-body strength following completion of the yoga study (Martin & Keats, 2014).

Aerobic endurance and upper-body flexibility significantly improved for our participants following the 8-week therapeutic yoga study. While Van Puymbroeck et al.’s (2007) results for aerobic endurance and upper-body flexibility were not statistically significant, ICGs did improve their aerobic endurance by 10% and upper-body flexibility by 56% from T1 to T2, thus the literature supports the findings of increased endurance and upper-body flexibility.

Limitations

Although there were improvements in psychological and physical well-being, there were limitations. The sample size was small, which limits generalizability. Future
researchers should complete a randomized control trial with blind researchers to eliminate bias. A control group may participate in a similar home-based mind and body exercise to compare findings. Additionally, the researchers did not monitor between-yoga-session practice for participants. Consequently, researchers involved in this study are unable to recommend an exact dosage of yoga participation that may replicate results. Moreover, the physical measures were not recorded in identical order for each participant. The PI and student research assistant selected specific physical measures to facilitate. ICGs began the physical assessments based on the facilitator’s availability. On this account, physical assessment scores may be altered depending on the order ICGs executed the measures. Furthermore, survey burden may have occurred with the participants in this study. Seven psychological measures and sixteen demographic questions were given to the participants to complete within one week of beginning the yoga study and again within one week of finishing the yoga study. The length of time ICGs spent completing the assessment package may have created survey burden and may not have resulted in the most accurate responses.

**Future Research**

There are a small number of yoga interventions that have examined the possible psychological and physical impacts for ICGs. Future studies should research if a similar intervention has beneficial outcomes with the selected psychological and physical assessments to strengthen findings. Future researchers may also consider examining pain interference because the findings from this yoga study for ICGs appear to be the first to document a significant reduction in pain interference after participating in the 8-week
yoga intervention. Next, researchers may consider monitoring between-yoga-session practice for participants to determine if any other variables may have affected results, and should consider measuring dose of the intervention to determine at which point changes in psychosocial well-being occurs. Lastly, researchers should consider the number of assessments chosen in relation to potential survey burden participants may experience.

**Implications for Practice**

Researchers may share findings with healthcare professionals to potentially improve the overall well-being of ICGs by informing ICGs of the possible benefits of yoga participation. There is a small, but promising quantity of yoga studies that have reported improvements in psychological and physical functioning, therefore healthcare practitioners should pay particular attention to the yoga components that may impact select psychological and physical well-being.

**Conclusion**

This study found that an 8-week therapeutic yoga study for ICGs has the potential to significantly decrease depression, burden, and negative affect. Trends in our data reveal a reduction in strain, and improvements in positive affect, positive aspects of caregiving, and quality of life. Additionally, ICGs significantly reduced their pain interference and increased their upper-body strength, aerobic endurance, and upper-body flexibility. Physical trends in the data reveal improved lower-body strength and lower-body flexibility. Thus, these pilot data indicate support for yoga as a tool to enhance psychological and physical well-being for ICGs.
CHAPTER V

Introduction

The U.S. Department of Health and Human Services Administration for Community Living reported that the older population (age 65+) represented 14.5% of Americans, and is expected to grow to 21.7% by 2040 (U.S. Department of Health and Human Services, 2014). Various health conditions occur more frequently in the older population, and as the aging population grows, so does the number of individuals with age-related diseases that may need assistance with activities of daily living.

An informal caregiver (ICG) is a person who provides unpaid care to someone living with a disease or disability (Biegel et al., 1991). The caregiver role is highly associated with feelings of burden (Brodaty et al., 2014; Deimling et al., 1989; George & Gwyther, 1986; Kim et al., 2012; Pratt et al., 1987; Zarit et al., 1986). Caregiver burden was defined by George and Gwyther (1986) as “the physical, psychological or emotional, social, and financial problems that may be experienced by family members caring for impaired older adults” (p.253). Caregiver burden jeopardizes an ICG’s psychological, physical, and emotional well-being (Etters et al., 2008; Zarit et al., 1980). Caregiver burden also increases with the number of hours spent providing caregiving tasks (Family Caregiver Alliance, 2017). Providing informal care requires a significant expenditure of energy and time (Yee & Schulz, 2000). ICGs have revealed that positive activities in their daily life decreased by 27.2% in as a result of caregiving tasks (Alzheimer’s Association, 2015).
ICGs report that the substantial time commitment spent performing caregiving tasks forces them to decrease or completely discontinue participating in leisure activities despite the well-established benefits of leisure participation on an ICG’s well-being (Richeson, Janssen, McMahan, Van Puymbroeck, & Buettner, 2008). Further, ICGs have identified less available time for leisure, as well as an increased work load at home, and financial limitations as reasons for not pursuing leisure (Chenoweth & Spencer, 1986; Rosenthal et al., 1993). Dunn, Strain, and Strain (2001) reported that ICGs may discount the important health benefits that leisure may provide, especially when family responsibilities are high and/or rising. Consequently, excluding leisure time may increase social isolation, stress, and hinder psychological and physical well-being.

Results from numerous studies have revealed that leisure activity may improve an individual’s health status (Reiner et al., 2013; United States Department of Health, 1996; Warburton et al., 2006). Studies involving ICGs who participated in leisure activity revealed lower perceived stress, burden and depression levels (Castro et al., 2002) and improved quality of life (Hirano et al., 2011). Furthermore, one study examining social support and caregiver burden reported participating in social activities for fun and recreation as the most important action to decrease caregiver burden (Thompson Jr et al., 1993).

Yoga may be a leisure-based intervention that could enhance an ICGs’ well-being. However, the many responsibilities ICGs experience make regular attendance to group interventions difficult (Farran et al., 2008; Harding et al., 2004; Hartke & King, 2003; Mant, Carter, Wade, & Winner, 2000). While yoga interventions for ICGs have
shown different psychological and physical benefits (Danucalov et al., 2013; Martin & Keats, 2014; Van Puymbroeck et al., 2007; Varambally et al., 2013; Waelde et al., 2004), ICGs from Farran et al.’s (2008) lifestyle physical activity intervention identified heavy non-caregiving and caregiving responsibilities as two barriers to participating in physical activity. Due to the small number of yoga studies that have been able to implement research specifically for ICGs, feasibility of this type of intervention needs to be addressed.

Feasibility studies are an essential phase of the research process and are utilized by researchers to determine if an intervention is suitable for additional testing (Bowen et al., 2009). In other words, they determine if an intervention may be performed at a larger scale (as intended) (Leon et al., 2011). Bowen et al. suggested that feasibility studies “enable researchers to assess whether or not the ideas and findings may be shaped to be relevant and sustainable” (p.2) for program facilitators and participants. Feasibility studies enable investigators to identify if research methods or protocols need modification and suggest how adaptations may improve future testing (Bowen et al., 2009). Researchers need to focus on the components of a study that are feasible for ICGs, including acceptability, demand, practicality, adaptation, and fidelity, as outlined by Bowen. Acceptability refers to how the participants and facilitators of the intervention respond (e.g. did participants report enjoyment from participating in the program) (Bowen et al., 2009); demand for the intervention is assessed by documenting the actual attendance rate of participants (i.e. facilitators document attendance of each participant); and practicality focuses on how the intervention is delivered when resources, time, and/or
commitment are limited in a way (e.g. did participants report complaints on length of the program) (Bowen et al., 2009). Additional general areas of feasibility to focus on for studies include adaptation, which refers to any changes made to the protocol or intervention (e.g. documenting any modifications made to the intended population) and fidelity, which identifies the extent to which facilitators implement an intervention as designed by the researcher (e.g. how much was the intended program altered after completion) (Dusenbury et al., 2003). Furthermore, recruitment effort and participant attendance should be recorded by researchers.

Therefore, this therapeutic yoga study examined what aspects of the study were feasible for ICGs. Understanding key feasibility components may make the implementation of yoga interventions for ICGs stronger in the future.

Methods

Design

A multi-method design was utilized to investigate the research question:

Is a therapeutic yoga intervention for ICGs feasible?

Neither the quantitative phase or the qualitative phase was emphasized over the other in this pilot study (Creswell & Plano Clark, 2011a; Onwuegbuzie & Leech, 2006). The quantitative approach provided a general understanding of within group differences for the evaluation of acceptability questionnaire results from the ICGs after they participated in the study. The qualitative approach offered subjective details from the ICGs’ point of view (Creswell & Plano Clark, 2011a). To be more specific, the phenomenological
approach was selected to allow participants the chance to discuss their individual experience as an ICG in association with their yoga participation throughout the focus group period (Manen, 1990; Seidman, 2013).

**Participants**

Eleven ICGs who were interested in the yoga study replied to flyers and emails that advertised the yoga study. To qualify for this intervention individuals had to meet the following criterion: 1) age ≥18; 2) care for someone with a disease or disability; 3) answer ‘no’ to questions from the PAR-Q (screener for possible contraindications and/or adverse physical effects in response to a physical activity), although if ‘yes’ was recorded in response to any of the PAR-Q questions acceptance into the study was permitted if a doctor approved participation; and 4) able to attend the eight-week yoga study.

**Intervention**

ICGs were asked to attend a 60-minute therapeutic yoga intervention twice a week for eight-weeks. One yoga session was cancelled due to weather conditions. Each yoga session consisted of meditation (dhyana), physical postures (asana), and breathing techniques (pranayama). A yoga therapist (C-IAYT) facilitated each session and was chosen because of her knowledge and training for adapting physical postures to meet the ability of each participant and ensure safety. There were no adverse events during the yoga study.

**Quantitative Data Collection**

*Demographics*
Demographic information was self-reported by participants at time one (T1, pre-eight-week yoga intervention) and time two (post eight-week yoga intervention). Gender, age, race, marital status, relationship to care recipient, and care recipients’ health condition were collected. Additionally, years as an ICG for their current care recipient, length (i.e. hours/days) of time spent providing informal care to their care recipient, smoking habits, highest level of education completed, overall health status, occupation, and living arrangements (i.e. living alone or with others) were collected.

Evaluation of acceptability

The main author developed a 14-item evaluation of acceptability questionnaire to obtain participants’ view of acceptability and practicality of the therapeutic yoga intervention. The 5-point Likert scale answers range from one (strongly disagree) to five (strongly agree). Scores were summed, with a possible total score ranging from 14 to 70, where higher scores indicated higher levels of acceptability for the therapeutic yoga intervention. Questions focused on program location, program appropriateness, and program enjoyment. Participants were asked to complete this scale within one week of the final yoga session and return the questionnaire to the PI.

Qualitative Data Collection

Focus Group/Individual Interviews

ICGs were asked to attend a semi-structured focus group directly following the last yoga class to further understand their lived experience participating in the therapeutic yoga intervention. Semi-structured questions were directed towards participant’s preconceived expectations, experiences during the intervention, and feasibility of the
eight-week yoga intervention. Additionally, acceptability of the yoga intervention (e.g. did participants report enjoyment from participating in the program) and practicality (e.g. did participants report complaints on length of the program) (Bowen et al., 2009) was incorporated into the focus group questions. The focus group lasted 34 minutes with five ICGs in attendance. One student research assistant supervised the focus group (i.e. asked the predetermined set of questions), one student research assistant kept record of the participant’s behaviors, and two audio devices recorded questions/responses. Two ICGs had prior commitments with their care recipients and were therefore unable to attend the focus group. The PI offered both ICGs the option to partake in separate phone interviews and both assented. To keep the focus group and phone interviews consistent, the same student researcher conducted the phone interviews with the exact set of questions two days succeeding the last yoga session. Two audio devices recorded the phone interviews.

Other Feasibility Measurements

The PI documented and screened potential participants for eligibility during the recruitment effort, number of participants who did not meet inclusion criteria, and the final number of participants who qualified for enrollment. Recruitment status was documented (i.e. start date of recruitment and ending date) to reveal if efforts were successful in recruiting ICGs. Demand was evaluated by the PI who monitored/documentated participant’s attendance to each yoga session and attrition by contacting participants if a class was missed. The yoga therapist documented adaptations made to the initial yoga sequence protocol during each session that she developed prior to the eight-week intervention. Notes were made if she deviated from any portion of the
class and reported to the PI. Fidelity of the intervention was monitored by the PI. The PI took notes throughout the development of the yoga intervention and throughout the study to report how much of the yoga program was altered after completion.

**Quantitative Data Analysis**

Demographic information were examined utilizing descriptive statistics and frequencies. The evaluation of acceptability questionnaire was examined using frequencies and percentages per individual item. Additionally, the mean total score was calculated for each individual participant’s questionnaire.

**Qualitative Data Analysis**

Conventional content analysis (CCA) (i.e. analytic technique) were performed on all interview transcripts to illustrate feasibility aspects of the study (Hsieh & Shannon, 2005). Codes and categories formed the data (Hsieh & Shannon, 2005) instead of utilizing preconceived categories (Kondracki et al., 2002). Comments were placed into similar groups and given a code to begin the coding process (Krueger & Casey, 2014). When all statements were coded, analytic categories were then arranged (Krueger & Casey, 2014). Categories were established through the participant’s responses. The PI and a student research assistant both independently analyzed the qualitative data to create legitimation (i.e. assessing the quality of inferences made by both researchers).

**Results**

**Participants**

Two of the eleven ICGs who contacted the PI with interest in participating in the yoga program were not willing to drive the distance to the selected location. Therefore,
nine ICGs were enrolled, consented, and began participating in the study. After attending classes the first week of the study, one of the nine ICGs ended communication/attendance and was recorded as lost to attrition. Additionally, one ICG was lost to attrition following week seven due to a misunderstanding of what yoga is. Notably, one ICG who participated in the study did lose his care recipient shortly before the study began but was included in analysis.

The mean age for participants was 68 with a standard deviation (SD) of 7.40. Two of the care recipient’s disease or disability was reported as Vascular dementia, two as a mild cognitive impairment, one as Dementia with Parkinson’s Disease, one as Alzheimer’s disease, one as ethanol induced Dementia, and one with balance and mobility complications. The mean amount of time providing care/year to that care recipient was 6.83 months per year (SD = 6.13) and the mean amount of time providing care/day to that care recipient was 19.25 hours per day (SD = 6.59). Table 1 explains the findings of demographic characteristics in greater detail.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
<td>87.5</td>
</tr>
<tr>
<td>Male</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64-75</td>
<td>7</td>
<td>87.5</td>
</tr>
<tr>
<td>53-63</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>7</td>
<td>87.5</td>
</tr>
<tr>
<td>Single/never married</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>8</td>
<td>100.0</td>
</tr>
<tr>
<td>Relation to care recipient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spouse</td>
<td>6</td>
<td>75.0</td>
</tr>
<tr>
<td>Oldest daughter</td>
<td>1</td>
<td>12.5</td>
</tr>
</tbody>
</table>
Daughter-in-law 1 12.5

Care recipient’s disease or disability
  Cognitive impairment 6 75.0
  General health decline 1 12.5
  Cognition and general health decline 1 12.5

Number of years as the care recipient’s ICG
  ≤5 4 50.0
  ≤10 3 37.5
  ≤20 1 12.5

Hours per day spent as the care recipient’s ICG
  24 5 62.5
  12 2 25.0
  10 1 12.5

Highest level of education
  High school graduate/some college 3 37.5
  College graduate/some post-graduate 3 37.5
  Post-graduate 2 25.0

Perceived health
  Very good 4 50.0
  Good 4 50.0

Work
  Retired 4 50.0
  Yes 2 25.0
  No 2 25.0

Living arrangements
  With others 7 87.5
  Alone 1 12.5

Attendance: Fifteen classes were offered during the eight-week period (one was cancelled due to snow). The minimum number of classes attended were eight, the maximum 15, with a mean class attendance of 13.13 and standard deviation of 2.42.

Retention: Over the course of the eight-week study we were able to retain 77.78% of participants. The PI explained during the recruitment process that this yoga study had no religious intent and the yoga therapist explained this to the participants as well several times during the yoga classes. Attrition occurred from one participant due to a
misunderstanding of what yoga is. The participant emailed the PI to explain in detail why she would not be attending the last week of the study. She stated,

“I have enjoyed the stretching and strengthening exercises, breathing, and relaxing aspects of your yoga class. As a strong Christian believer, I had a few doubts about the mantras (LAM, VAM, RAM, etc.) and poses (legs crossed, hands in prayer, fingers held in circles). So, I finally decided to look up what specifically all of these things mean. My conclusion is that I don't want to position my body or my words to emulate how worshipers of Buddhism or Hinduism act when in prayer poses. PLEASE NOTE: I acted completely out of my own volition and never felt pressured by (yoga therapist’s name) to hum or say anything. I am not strong enough to speak and act independently of what everyone else is doing, however, and end up saying sounds I’d prefer not to out of a sense of peer pressure. My withdraw [sic] is out of personal conviction, not because I am upset with anybody or feeling anybody did anything wrong. This is not blame, just preference.”

Adaptations: The yoga therapist documented fidelity of the intervention. One breathing technique was added on the first day of class that was not included in the initial sequence and continued throughout all yoga classes. Two types of breath work were condensed because of the one class cancelation. Several physical postures were modified/added when the yoga therapist determined the different physical abilities of each participant.

Quantitative Results

Evaluation of Acceptability
The mean score for the evaluation of acceptability questionnaire was 60.2 (out of 70) with a standard deviation of ±5.82. The minimum score for participants was 51.0 and the maximum was 66.0. The two items that experienced the greatest levels of acceptability included ‘I enjoyed attending yoga class’ and ‘Overall, I tolerated the breathing techniques in each class.’ Six of the eight ICGs strongly agreed with both of these items and two ICGs agreed. The two items with the lowest levels of acceptability included ‘The location for the yoga intervention was close to my home’ and ‘I would drive this distance for another eight-week yoga program.’ ‘The location for the yoga intervention was close to my home’ responses from the ICGs were three strongly agreed, three agreed, one disagreed, and one strongly disagreed. ‘I would drive this distance for another eight-week yoga program’ responses from participants were four strongly agreed, one agreed, one neutral, and two disagreed. Table 2 reveals the details of the evaluation of acceptability questionnaire, and frequency per response for each question are provided.

<table>
<thead>
<tr>
<th>Table 5.2 Evaluation of acceptability questionnaire (N=8)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The 8-week yoga intervention began shortly after I signed up to participate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>3</td>
<td>37.5</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>50.0</td>
</tr>
<tr>
<td>Neutral</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>2. The location for the yoga intervention was close to my home.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>3</td>
<td>37.5</td>
</tr>
<tr>
<td>Agree</td>
<td>3</td>
<td>37.5</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>3. I would drive this distance for another eight-week yoga program.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statement</td>
<td>Strongly Agree</td>
<td>Agree</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------</td>
</tr>
<tr>
<td>The class time was easy to work into my schedule.</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>I never had to be persuaded to attend one of the yoga classes.</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>The building the yoga class was held in was acceptable.</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>The room the yoga class was held in was acceptable.</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>I enjoyed attending yoga class.</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>The yoga instructor consistently demonstrated techniques that I was able to perform.</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

82
10. Overall, I tolerated the physical postures in each class.
   - Strongly Agree: 4 (50.0)
   - Agree: 3 (37.5)
   - Neutral: 0 (0.0)
   - Disagree: 1 (12.5)
   - Strongly Disagree: 0 (0.0)

11. Overall, I tolerated the breathing techniques in each class.
   - Strongly Agree: 6 (75.0)
   - Agree: 2 (25.0)
   - Neutral: 0 (0.0)
   - Disagree: 0 (0.0)
   - Strongly Disagree: 0 (0.0)

12. Overall, I tolerated the meditation techniques in each class.
   - Strongly Agree: 5 (62.5)
   - Agree: 3 (37.5)
   - Neutral: 0 (0.0)
   - Disagree: 0 (0.0)
   - Strongly Disagree: 0 (0.0)

13. It was easy for me to attend each yoga class.
   - Strongly Agree: 3 (37.5)
   - Agree: 0 (0.0)
   - Neutral: 0 (0.0)
   - Disagree: 0 (0.0)
   - Strongly Disagree: 0 (0.0)

14. I plan to attend this program again if it is offered.
   - Strongly Agree: 2 (25.0)
   - Agree: 1 (12.5)
   - Neutral: 1 (12.5)
   - Disagree: 0 (0.0)
   - Strongly Disagree: 0 (0.0)

**Qualitative Results**

*Focus Group/Individual Phone Interviews*
Several example topics over acceptability and practicality of the yoga study during the focus group/individual interviews included ‘Do you think the intervention was tolerable for you throughout? Tell me about the drive and parking accessibility. Tell me about [location] as the site for the intervention.’ Two phone interviews were performed due to two ICG’s schedule. The focus group lasted approximately 34 minutes and the two phone interviews combined were approximately 11 minutes. The CCA resulted in 41 codes that formed three emerging categories: programmatic aspects, safety concerns, and care recipient separation. The questions during the semi-structured focus group guided the development of the codes/categories (i.e. inductive approach) (Thomas, 2006). Table 3 explains each category, number of codes per category, and direct quotes from participants.

The majority of ICGs reported that the study location was perfect, which formed the programmatic aspects category. The conversations centered around how close the participants lived to the location. For example, one participant said, “I’m just grateful it was here” in response to the selected study location. Six of the seven ICGs would attend the yoga program again at the location and one would not be willing to drive the 25-30-minute commute in both directions to attend yoga. The participants also discussed the yoga instructor as patient and enthusiastic.

The safety concern that one ICG identified was related to a specific option to use a headstand inversion table (a prop to assist with headstand), but all the other participants explained they had no concern over it. The ICGs also discussed how the yoga instructor gave options for postures so they would not hurt themselves. Specifically, one ICG said,
“She gave us so many alternatives to each pose.” Additionally, a different ICG said, “She showed us how to protect ourselves.” Furthermore, both of the ICGs who participated in the separate individual phone interviews reported they had no safety concerns throughout the eight-week therapeutic yoga study.

The majority of the participants explained they were not thinking about their care recipient while attending the yoga classes. One ICG did mention she would not be able to leave her care recipient alone for much longer than the class lasted or she would worry. The concentrated discussion regarding care recipients led to the care recipient separation category.

**Table 5.3** Focus group and phone interview data (N=7)

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of codes</th>
<th>Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmatic aspects- Location and instructor</td>
<td>25</td>
<td>“That was ideal for us. We didn’t have to drive anywhere except the compound.”</td>
</tr>
<tr>
<td>Safety concerns- Feeling comfortable with postures</td>
<td>8</td>
<td>“(Instructor) was so good in that there was no wrong thing to do. We could do it our own way. We didn’t have to do it at all. We could just kind of lie there.”</td>
</tr>
<tr>
<td>Safety concerns- Feeling comfortable with postures</td>
<td>8</td>
<td>“She showed us how to protect ourselves.”</td>
</tr>
<tr>
<td>Safety concerns- Feeling comfortable with postures</td>
<td>8</td>
<td>“She gave so many alternatives for each pose.”</td>
</tr>
<tr>
<td>Safety concerns- Feeling comfortable with postures</td>
<td>8</td>
<td>“Our sitter was established. If it had been a newbie kind of thing, that would’ve been rough, but my mom knew her.”</td>
</tr>
<tr>
<td>Safety concerns- Feeling comfortable with postures</td>
<td>8</td>
<td>“And that was why it worked out because I couldn’t go much farther and feel comfortable.”</td>
</tr>
</tbody>
</table>
Discussion

This eight-week therapeutic yoga study for ICGs was designed to examine feasibility. Findings have continued to report the difficulty in recruitment efforts for ICGs to agree and regularly attend a community-based intervention due to their countless responsibilities (Farran et al., 2008; Harding et al., 2004; Hartke & King, 2003; Mant et al., 2000). Van Puymbroeck et al.’s (2007) study for ICGs is currently the sole yoga intervention for ICGs that investigated feasibility. Van Puymbroeck et al.’s study reported a 75% retention rate of participants (i.e. six of eight participants completed the study). Similarly, our study was able to retain 77.78% of participants (i.e. seven of nine participants completed the study). It is important to note that both of the studies had a high retention rate and both were eight-weeks in length. Therefore, a duration of an eight-week yoga study appears to be a feasible option for ICGs.

While Van Puymbroeck et al.’s (2007) yoga study for ICGs assessed feasibility, they did not utilize an assessment to measure feasibility aspects of their program. Our study utilized the evaluation of acceptability questionnaire that specifically focused on acceptability and practicality of the yoga study. The results from the evaluation of acceptability indicated that the yoga study was feasible for all participants. All of the 14 questions from the evaluation of acceptability questionnaire were answered positively with ‘strongly agree’ or ‘agree’. These data indicated that acceptability and practicality were met for the ICGs. The four questions that contained a ‘disagree’ or ‘neutral’
response also pertained to *acceptability* (i.e. interest in participating in the program if offered again) and *practicality* (i.e. location, distance to location, class time, toleration of physical postures).

The ICGs in our study were specifically asked a set of questions over feasibility aspects of the yoga study. Three categories emerged from the focus group/individual phone interviews (i.e. programmatic aspects, safety concerns, and care recipient separation). The programmatic aspects category was formed from the ICGs positive discussion over the program location and the comments regarding likability of the yoga instructor. The safety concerns category included various comments over how comfortable the participants felt performing the various physical postures during the eight-weeks. Lastly, the care recipient separation category resulted from the ICGs discussion on leaving to attend the therapeutic yoga intervention alone.

**Implications for Practice**

Based on the findings from our study, there are several essential program components a researcher or recreational therapist needs to successfully implement a yoga therapy program. First, program location is an essential characteristic in feasibility terms for ICGs who want to participate in yoga. For example, as a result of the low numbers in recruitment efforts for the first selected study location, the PI elected to change the location. A group of ICGs expressed interest in participating in the study, but not at the first location because of the distance from their home. A second location was chosen because the number of interested potential participants went from three to eleven. Ultimately with the change in location, two of the eleven ICGs decided it was too far of a
drive from their home. Recreational therapists should also ask ICGs to provide several times during the day that would best fit their schedule for maximum attendance rate. Additionally, ensure that there are no religious overtones incorporated into the program, and consider using a different term for Anjali mudra (e.g. prayer pose). Additionally, recreational therapists should explain each term used during the program and each mudra. Furthermore, choose a yoga therapist that has the background and knowledge to adapt all poses to meet the ability levels of each participant. Lastly, program cost is an important aspect to consider when developing feasible leisure options for ICGs. For example, ICGs have reported financial limitation as a leisure barrier (Chenoweth & Spencer, 1986; White-Means & Chang, 1994). Discussion from this study about future yoga engagement options revealed many of the participants already had access to participating in yoga classes (i.e. paying monthly dues) and had never attended. Several of the ICGs stated they were now going to attempt the yoga classes because they enjoyed the yoga study experience. Recreational therapists may research local yoga opportunities and provide their clients with the information. One ICG did state financial burden as a reason to not attend local yoga classes but did express interest in practicing yoga for free from home in the future. Recreational therapists may also consider providing ICGs with free resources post-treatment.

**Future Research**

Recommendations for future research may consider offering the intervention at multiple locations and times to serve as many ICGs as possible. This may be accomplished by providing potential participants with a survey to determine optimal
location sites and times of the day that work best for the ICGs. Additionally, future research should incorporate suggestions from the feasibility findings in future studies. A larger randomized controlled trial should be implemented with blinded researchers to control for bias. A matched at-home control group may be implemented to assess feasibility findings. Additionally, researchers should consider a plan to reiterate the non-religious components of yoga at the beginning of each class to prevent a decrease in attrition rate.

**Limitations**

As with all studies, there were several limitations in this study. Recruitment efforts shifted due to the lack of participant interest at the first selected location. The small sample size limited generalizability and this study did not have a control group to compare feasibility findings. Additionally, there were no criteria on how long an ICG identified as one or the hours spent caregiving a day/week. Furthermore, there were no specific inclusion criteria set to specify a disease/disability that a care recipient lived with. This is important to note because ICGs experience psychological and physical effects from performing caregiving tasks at different intensity levels depending on their care recipient’s disease/disability.

**Conclusion**

The results from this study revealed that the eight-week therapeutic yoga study for ICGs was feasible. Thus, the protocol from this study, with additional revisions as indicated by the feasibility data, needs to be further investigated in order to better understand if yoga is feasible and beneficial for ICGs.
CHAPTER VI

CONCLUSION

Summary of Major Findings

Aim 1: The psychological and physical impacts ICGs experience after participating in a therapeutic yoga program was explained in detail. ICGs experienced a significant decrease in depression, burden, negative affect, and pain interference after participating in the 8-week therapeutic yoga intervention. Additionally, upper-body strength, aerobic endurance, and upper-body flexibility were significantly improved for participants.

Five qualitative categories (i.e. psychological improvements, functional improvements, yoga engagement, social support, and self-care) emerged from the focus group/individual interviews. Mixing the quantitative and qualitative data revealed supporting and diverging findings from the therapeutic yoga study. For example, quantitative results revealed a significant improvement in upper-body flexibility and supported/strengthened the qualitative responses over ICGs perceived improved flexibility. Additionally, quantitative results revealed aerobic endurance significantly improved for ICGs following the yoga study. This finding supports/strengthens qualitative responses from participants on feeling an increase in energy levels after the 8-week therapeutic yoga study. Interestingly while mixing the data, quantitative findings revealed a higher leisure constraint score after participating in the study and qualitative results indicated all participants had future plans for continuing yoga.

Aim 2: The feasibility of an eight-week therapeutic yoga program for ICGs was explained in detail. The evaluation of acceptability results revealed that acceptability and
practicality components of the yoga study were feasible. Demand (i.e. attendance rate) was high throughout the yoga study. Small adaptations were made to the yoga sequence by the instructor to accommodate different ability levels during classes. The initial study location was changed before the intervention began to accommodate a group of interested ICGs. Three categories emerged from the focus group/individual phone interviews (i.e. programmatic aspects, safety concerns, and care recipient separation).

**Contributions and Practical Implications**

Findings from this study as a whole indicate that a similar yoga intervention for ICGs may be feasible and participants may experience improvements in psychological and social well-being. ICGs evaluated and discussed feasibility aspects of the study. Participant scores indicated the therapeutic yoga intervention was feasible (i.e. acceptability and practicality). It is important to note that one other study has evaluated feasibility components of a yoga study for ICGs (Van Puymbroeck et al., 2007). However, unlike our study Van Puymbroeck et al. did not implement a quantitative measure to assess feasibility. The PI from our study developed and implemented an evaluation of acceptability measure. The evaluation of acceptability questionnaire will need to be implemented in further studies to gauge reliability. Our study location was ideal for the majority of the ICGs. Five of the eight ICGs lived within minutes of the selected study location. ICGs experienced significant improvements in select psychological and physical impacts after participating in the eight-week therapeutic yoga study. The findings from this study build on the small body of research (i.e. five current
studies) available on yoga interventions for ICGs (Danucalov et al., 2013; Martin & Keats, 2014; Van Puymbroeck et al., 2007; Varambally et al., 2013; Waelde et al., 2004).

As a result of this study, healthcare professionals could implement a therapeutic yoga protocol that seems to be feasible for ICGs and may improve ICGs psychological and physical well-being. This is important for recreational therapists, as our study will strengthen several findings from the available literature on yoga programs for ICGs. Our yoga study must be examined, refined, and further researched as the study protocol was developed/implemented for the first time with significant beneficial outcomes.

**Study Limitations**

Although there were improvements in psychological and physical well-being, there were limitations. The sample size was small, which limits generalizability and recruitment efforts shifted due to the lack of participant interest in the first selected location. Future researchers should complete a randomized control trial with blind researchers to eliminate bias. A control group may participate in a similar home-based mind and body exercise to compare findings. Additionally, the researchers did not monitor between-yoga-session practice for participants. Consequently, researchers involved in this study are unable to recommend an exact dosage of yoga participation that may replicate results. Moreover, the physical measures were not recorded in identical order for each participant. The PI and student research assistant selected specific physical measures to facilitate. ICGs began the physical assessments based on the facilitator’s availability. On this account, physical assessment scores may be altered depending on the order ICGs executed the measures. Furthermore, survey burden may have occurred with
the participants in this study. Seven psychological measures and sixteen demographic questions were given to the participants to complete within one week of beginning the yoga study and again within one week of finishing the yoga study. The length of time ICGs spent completing the assessment package may have created survey burden and may not have resulted in the most accurate responses.

**Summary**

The results of this study offer useful information for recreational therapists and other health professionals that plan to implement therapeutic yoga as a facilitation technique. This study have indicated significant psychological improvements in depression, burden and negative affect. Additionally, trends in the data reveal improvements in strain, positive aspect, positive aspects of caregiving, and QoL. Significant physical improvements were revealed in pain, upper-body strength, aerobic endurance, and upper-body flexibility. Trends in our data show ICGs’ also improved in lower-body strength and lower-body flexibility. This research has indicated that yoga is feasible for ICGs and particular attention should be paid to program location, cost, and religious/spiritual intent. Results from this study indicate the need for replication on the therapeutic yoga program to strengthen findings on the select psychological and physical impacts ICGs may experience from participating in a feasible yoga study.
APPENDICES
Appendix A

Recruitment Flyer

Therapeutic Yoga for Informal Caregivers
REQUEST FOR RESEARCH PARTICIPANTS
Principal Investigator: Dr. Marieke Van Puymbroeck

Participation in exercise programs have been shown to improve various aspects of health for informal caregivers. Clemson University researchers invite you to participate in therapeutic yoga. Our goal is to help you experience the benefits of yoga and improve your quality of life.

Clemson Researchers are looking for people who:

** Are informal caregivers
** Are in adequate health to participate in yoga
** Would like to take part in a yoga program
** Able to sit unassisted in a chair
** 18 years of age or older
** Speak English
**Willing to commit to yoga practice two times a week for 8 weeks

We will enroll 20 people
For more information, contact: Alysha Walter at 1-815-677-1127
or alyshaw@clemson.edu
Appendix B

Informed Consent

Information about Being in a Research Study
Clemson University

Therapeutic Yoga Program for Informal Caregivers

Description of the Study and Your Part in It

Alysha Walter and Dr. Marieke Van Puymbroeck are inviting you to take part in a research study. Alysha Walter is a student at Clemson University, running this study with the help of Dr. Marieke Van Puymbroeck. Dr. Van Puymbroeck is a professor at Clemson University. The purpose of this research is to examine therapeutic yoga impacts on informal caregivers. This study will recruit 20 total participants maximum.

After you agree to participate in the program, you will answer questions on your health and physical condition and attend the therapeutic yoga program two times a week, one hour each day, for 8-weeks. After the completion of the program you will complete the same assessments as in the beginning of the program and be asked to participate in a group discussion, which will be audio recorded. We will take photographs throughout the eight-week study to document progress of participants. Photographs will be used only for research purposes.

Risks and Discomforts

We are going to ask you to do some walking and lifting during the assessments. There is a risk that you could fall or injure yourself while performing assessment tasks. A research assistant will be with you while performing assessment tasks to reduce the risks. No additional risk or discomfort is anticipated during the 8-week study, but notify your yoga instructor right away if you experience any discomforts.

Possible Benefits

You may benefit mentally and physically by participating in the study. The information gained from this study may be disseminated through papers, presentations, and educational material. This scientific community or society may benefit from understanding the impacts of therapeutic yoga on informal caregivers.

Protection of Privacy and Confidentiality

The research team will be the only people who will have access to your personal information that is provided. All information will be kept in a secure location. The audio recording and photographs will be kept for seven years. The audio recordings will not be shared with anyone outside the research team. The photographs will be used in research/educational presentations.
The results of this study may be published in scientific journals, professional publications, or educational presentations.

We might be required to share the information we collect from you with the Clemson University Office of Research Compliance and the federal Office for Human Research Protections. If this happens, the information would only be used to find out if we ran this study properly and protected your rights in the study.

Choosing to Be in the Study

You do not have to be in this study. You may choose not to take part and you may choose to stop taking part at any time. You will not be punished in any way if you decide not to be in the study or to stop taking part in the study. If you choose to stop taking part in this study, the information you have already provided will be used in a confidential manner.

Compensation for Injury as a Result of Study Participation

Clemson University is not responsible for any injury that may occur during the study. Injuries sometimes happen in research even when no one is at fault. Clemson University and the investigators as part of this study have no plans to pay you or give you other compensation for an injury, should occur. However, you are not giving up any of your legal rights by signing this form.

Contact Information

If you have any questions or concerns about this study or if any problems arise, please contact Alysha A. Walter from Clemson University at 815-677-1127 or Dr. Marieke Van Puymbroeck via her Clemson University phone number 864-656-1189.

If you have any questions or concerns about your rights in this research study, please contact the Clemson University Office of Research Compliance (ORC) at 864-656-0636 or irb@clemson.edu. If you are outside of the Upstate South Carolina area, please use the ORC’s toll-free number, 866-297-3071.

Consent

I have read this form and have been allowed to ask any questions I might have. I agree to take part in this study.

Participant’s signature: __________________________ Date: ______________

Print name: ____________________________________

A copy of this form will be given to you.
Appendix C

PAR-Q

Screening Tool: PAR-Q

The purpose of this questionnaire is to screen individuals for potential contraindications and/or adverse physical effects in response to physical exertion. The questions pertain to current physician recommendations and health status.

Please read each question carefully and answer every question honestly:

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>1) Does your physician recommend that you not exercise due to chronic hypertension?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>2) Does your physician recommend that you not exercise due to coronary artery disease or previous heart attack?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>3) Do you currently lose consciousness or lose your balance because of dizziness?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>4) When you do physical activity, do you feel abnormal pain in your chest?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>5) Does your physician recommend that you not exercise due to a joint or bone problem that may be made worse by a change in your physical activity?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>6) Does your physician recommend that you not exercise due to carotid artery disease or previous stroke(s)?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>7) Does your physician recommend that you not exercise due to insulin dependent diabetes?</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>8) Does your physician recommend that you not exercise due to other health problems?</td>
</tr>
</tbody>
</table>

A yes to any of the above questions will prohibit participation in the study entitled “Select Psychological and Physical Impacts of Therapeutic Yoga for Informal Caregivers: A Feasibility Study.”

If you honestly answered no to all questions, you can be reasonably positive that you can safely participate in this project.

If your health changes so you then answer yes to any of the above questions, please notify the research team immediately to cease participation and see guidance from a physician.

Participant Signature ___________________________ Date ________________

Witness ______________________________________ Date ________________
Appendix D

Media Release

Clemson University Authorization for Use of Photographic/Image/Video/Voice Recording

Program Name: Clemson University Yoga for Informal Caregivers
Date of Program: Spring 2018
Clemson University Contact: Alysha A. Walter

Participant’s Name: ____________________________________________________________

PLEASE READ THIS DOCUMENT CAREFULLY. It affects the rights you may have concerning the use by Clemson University of any photographs, video, images or voice recording taken of you during the program identified above.

I, ____________________________________________ hereby grant permission to Clemson University and its representatives and employees to take photographs or videos of me, to make recordings of my voice, and to obtain a transcript of my spoken or written words during my participation in the Clemson University Yoga for Informal Caregivers. I give Clemson University permission to use these images, recordings, and spoken or written comments, as well as my name, likeness, voice and biographical information as follows:

1. To copy, reproduce, distribute, modify, display and perform.
2. To use in composite or modified forms in any media, now known or later developed, including but not limited to publications, newspapers, television, radio, sound track recording, motion picture, filmstrip, still photograph, the Internet, the world wide web, or any transcript.
3. For purposes including but not limited to education, research, trade, advertising, and promotion of the project throughout the world and in perpetuity.

I agree that I will receive no further consideration, other than that already received, for these uses and that Clemson University owns all rights to the images and recordings. I waive the right to inspect or approve uses of the images, recordings or written copies.

I hereby release Clemson University, its representatives, agents, employees and assigns from any claims that may arise from these uses, including claims of defamation, invasion of privacy, or rights of publicity or copyright. This release is binding on me, my heirs, assigns and estate and represents the entire agreement between me and Clemson University regarding the matters herein.
I agree that Clemson University is not obligated to use any of the rights granted under this Agreement.

______________________________  __________
Participant’s Signature          Date
Appendix E

Beck’s Depression Inventory

Instructions:
This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the one statement in each group that best described the way you have been feeling during the past two weeks, including today. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness

0  I do not feel sad.
1  I feel sad much of the time.
2  I am sad all the time.
3  I am so sad and unhappy that I can’t stand it.

2. Pessimism

0  I am not discouraged about my future.
1  I feel more discouraged about my future than I used to be.
2  I do not expect things to work out for me.
3  I feel my future is hopeless and will only get worse.

3. Past Failure

0  I do not feel like a failure.
1  I have failed more than I should have.
2  As I look back, I see a lot of failures.
3  I feel I am a total failure of a person.

4. Loss of Pleasure

0  I get as much pleasure as I ever did from the things I enjoy.
1  I don’t enjoy things as much as I used to.
2  I get very little pleasure from the things I used to enjoy.
3  I can’t get any pleasure from the things I used to enjoy.

5. Guilty Feelings
0  I don’t feel particularly guilty.
1  I feel guilty over many things I have done or should have done.
2  I feel quite guilty most of the time.
3  I feel guilty all of the time.

6.  Punishment Feelings

0  I don’t feel I am being punished.
1  I feel I may be punished.
2  I expect to be punished.
3  I feel I am being punished.

7.  Self-Dislike

0  I feel the same about myself as ever.
1  I have lost confidence in myself.
2  I am disappointed in myself.
3  I dislike myself.

8.  Self-Criticalness

0  I don’t criticize or blame myself more than usual.
1  I am more critical of myself than I used to be.
2  I criticize myself for all of my faults.
3  I blame myself for everything bad that happens.

9.  Suicidal Thoughts or Wishes

0  I don’t have any thoughts of killing myself.
1  I have thoughts of killing myself, but I would not carry them out.
2  I would like to kill myself.
3  I would kill myself if I had the chance.

10.  Crying

0  I don’t cry any more than I used to.
1  I cry more than I used to.
2  I cry over every little thing.
3  I feel like crying, but I can’t.

11.  Agitation

0  I am no more restless or wound up than usual.
1  I feel more restless or wound up than usual.
2 I am so restless or agitated that it’s hard to stay still.
3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

0 I have not lost interest in other people or activities.
1 I am less interested in other people or things than before.
2 I have lost most of my interest in other people or things.
3 It’s hard to get interested in anything.

13. Indecisiveness

0 I make decisions about as well as ever.
1 I find it more difficult to make decisions than usual.
2 I have much greater difficulty in making decisions than I used to.
3 I have trouble making any decisions.

14. Worthlessness

0 I do not feel I am worthless.
1 I don’t consider myself as worthwhile and useful as I used to.
2 I feel more worthless as compared to other people.
3 I feel utterly worthless.

15. Loss of Energy

0 I have as much energy as ever.
1 I have less energy than I used to have.
2 I don’t have enough energy to do very much.
3 I don’t have enough energy to do anything.

16. Changes in Sleeping Pattern

0 I have not experienced any change in my sleeping pattern.
1a I sleep somewhat more than usual.
1b I sleep somewhat less than usual.
2a I sleep a lot more than usual.
2b I sleep a lot less than usual.
3a I sleep most of the day.
3b I wake up 1-2 hours early and can’t get back to sleep.
17. **Irritability**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I am no more irritable than usual.</td>
</tr>
<tr>
<td>1</td>
<td>I am more irritable than usual.</td>
</tr>
<tr>
<td>2</td>
<td>I am much more irritable than usual.</td>
</tr>
<tr>
<td>3</td>
<td>I am irritable all the time.</td>
</tr>
</tbody>
</table>

18. **Changes in Appetite**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I have not experienced any change in my appetite.</td>
</tr>
<tr>
<td>1a</td>
<td>My appetite is somewhat less than usual.</td>
</tr>
<tr>
<td>1b</td>
<td>My appetite is somewhat greater than usual.</td>
</tr>
<tr>
<td>2a</td>
<td>My appetite is much less than before.</td>
</tr>
<tr>
<td>2b</td>
<td>My appetite is much greater than usual.</td>
</tr>
<tr>
<td>3a</td>
<td>I have no appetite at all.</td>
</tr>
<tr>
<td>3b</td>
<td>I crave food all the time.</td>
</tr>
</tbody>
</table>

19. **Concentration Difficulty**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I can concentrate as well as ever.</td>
</tr>
<tr>
<td>1</td>
<td>I can’t concentrate as well as usual.</td>
</tr>
<tr>
<td>2</td>
<td>It’s hard to keep my mind on anything for very long.</td>
</tr>
<tr>
<td>3</td>
<td>I find I can’t concentrate on anything.</td>
</tr>
</tbody>
</table>

20. **Tiredness or Fatigue**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I am no more tired or fatigued than usual.</td>
</tr>
<tr>
<td>1</td>
<td>I get more tired or fatigued more easily than usual.</td>
</tr>
<tr>
<td>2</td>
<td>I am too tired or fatigued to do a lot of things I used to do.</td>
</tr>
<tr>
<td>3</td>
<td>I am too tired or fatigued to do most of the things I used to do.</td>
</tr>
</tbody>
</table>

21. **Loss of Interest in Sex**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I have not noticed any recent change in my interest in sex.</td>
</tr>
<tr>
<td>1</td>
<td>I am less interested in sex than I used to be.</td>
</tr>
<tr>
<td>2</td>
<td>I am much less interested in sex now.</td>
</tr>
<tr>
<td>3</td>
<td>I have lost interest in sex completely.</td>
</tr>
</tbody>
</table>
Appendix F

Zarit Burden Interview

Instructions:
The following is a list of statements which reflect how people sometimes feel when taking care of another person. After each statement, indicate how often you feel that way: never, rarely, sometimes, quite frequently, or nearly always. There are no right or wrong answers.

1. Do you feel that your relative asks for more help than he or she needs?
   0 Never   1 Rarely   2 Sometimes   3 Quite Frequently   4 Nearly Always

2. Do you feel that, because of the time you spend with your relative, you don’t have enough time for yourself?
   0 Never   1 Rarely   2 Sometimes   3 Quite Frequently   4 Nearly Always

3. Do you feel stressed between caring for your relative and trying to meet other responsibilities for your family or work?
   0 Never   1 Rarely   2 Sometimes   3 Quite Frequently   4 Nearly Always

4. Do you feel embarrassed about your relative’s behavior?
   0 Never   1 Rarely   2 Sometimes   3 Quite Frequently   4 Nearly Always

5. Do you feel angry when you are around your relative?
   0 Never   1 Rarely   2 Sometimes   3 Quite Frequently   4 Nearly Always

6. Do you feel that your relative currently affects your relationship with other family members?
   0 Never   1 Rarely   2 Sometimes   3 Quite Frequently   4 Nearly Always

105
7. Are you afraid about what the future holds for your relative?
   0 Never 1 Rarely 2 Sometimes 3 Quite Frequently 4 Nearly Always

8. Do you feel that your relative is dependent upon you?
   0 Never 1 Rarely 2 Sometimes 3 Quite Frequently 4 Nearly Always

9. Do you feel strained when you are around your relative?
   0 Never 1 Rarely 2 Sometimes 3 Quite Frequently 4 Nearly Always

10. Do you feel that your health has suffered because of your involvement with your relative?
    0 Never 1 Rarely 2 Sometimes 3 Quite Frequently 4 Nearly Always

11. Do you feel that you don’t have as much privacy as you would like, because of your relative?
    0 Never 1 Rarely 2 Sometimes 3 Quite Frequently 4 Nearly Always

12. Do you feel that your social life has suffered because you are caring for your relative?
    0 Never 1 Rarely 2 Sometimes 3 Quite Frequently 4 Nearly Always

13. Do you feel uncomfortable having your friends over because of your relative?
    0 Never 1 Rarely 2 Sometimes 3 Quite Frequently 4 Nearly Always

14. Do you feel that your relative seems to expect you to take care of him or her, as if you were the only one he or she could depend on?
    0 Never 1 Rarely 2 Sometimes 3 Quite Frequently 4 Nearly Always
15. Do you feel that you don’t have enough money to care for your relative, in addition to the rest of your expenses?

0 Never
1 Rarely
2 Sometimes
3 Quite Frequently
4 Nearly Always

16. Do you feel that you will be unable to take care of your relative much longer?

0 Never
1 Rarely
2 Sometimes
3 Quite Frequently
4 Nearly Always

17. Do you feel that you have lost control of your life since your relative’s death?

0 Never
1 Rarely
2 Sometimes
3 Quite Frequently
4 Nearly Always

18. Do you wish that you could just leave the care of your relative to someone else?

0 Never
1 Rarely
2 Sometimes
3 Quite Frequently
4 Nearly Always

19. Do you feel uncertain about what to do about your relative?

0 Never
1 Rarely
2 Sometimes
3 Quite Frequently
4 Nearly Always

20. Do you feel that you should be doing more for your relative?

0 Never
1 Rarely
2 Sometimes
3 Quite Frequently
4 Nearly Always

21. Do you feel that you could do a better job in caring for your relative?

0 Never
1 Rarely
2 Sometimes
3 Quite Frequently
4 Nearly Always

22. Overall, how burdened do you feel in caring for your relative?

0 Not at all
1 A Little
2 Moderately
3 Quite a bit
4 Extremely
Appendix G

Social Support Questionnaire Shortened Version

Instructions:
Each item is a question that solicits a two-part answer: Part 1 asks you to list all the people that fit the description of the question, and Part 2 asks you to indicate how satisfied you are, in general, with these people.

1. Whom can you really count on to be dependable when you need help?

☐ No one

1. ______________________________

2. ______________________________

3. ______________________________

4. ______________________________

5. ______________________________

6. ______________________________

7. ______________________________

8. ______________________________

9. ______________________________

How Satisfied?

☐ Very Satisfied

☐ Fairly Satisfied

☐ A Little Satisfied

☐ A Little Dissatisfied

☐ Fairly Dissatisfied

☐ Very Dissatisfied
2. Whom can you really count on to help you feel more relaxed when you are under pressure or tense?

☐ No one

1. ______________________________

2. ______________________________

3. ______________________________

4. ______________________________

5. ______________________________

6. ______________________________

7. ______________________________

8. ______________________________

9. ______________________________

How Satisfied?

☐ Very Satisfied

☐ Fairly Satisfied

☐ A Little Satisfied

☐ A Little Dissatisfied

☐ Fairly Dissatisfied

☐ Very Dissatisfied
3. Who accepts you totally, including both your worst and your best points?

☐ No one

1. ___________________________________

2. ___________________________________

3. ___________________________________

4. ___________________________________

5. ___________________________________

6. ___________________________________

7. ___________________________________

8. ___________________________________

9. ___________________________________

How Satisfied?

☐ Very Satisfied

☐ Fairly Satisfied

☐ A Little Satisfied

☐ A Little Dissatisfied

☐ Fairly Dissatisfied

☐ Very Dissatisfied
4. Whom can you really count on to care about you, regardless of what is happening to you?

☐ No one

1. ______________________

2. ______________________

3. ______________________

4. ______________________

5. ______________________

6. ______________________

7. ______________________

8. ______________________

9. ______________________

How Satisfied?

☐ Very Satisfied

☐ Fairly Satisfied

☐ A Little Satisfied

☐ A Little Dissatisfied

☐ Fairly Dissatisfied

☐ Very Dissatisfied
5. Whom can you really count on to help you feel better when you are feeling generally down-in-the-dumps?

☐ No one

1. __________________________
2. __________________________
3. __________________________
4. __________________________
5. __________________________
6. __________________________
7. __________________________
8. __________________________
9. __________________________

How Satisfied?

☐ Very Satisfied
☐ Fairly Satisfied
☐ A Little Satisfied
☐ A Little Dissatisfied
☐ Fairly Dissatisfied
☐ Very Dissatisfied
6. Whom can you count on to console you when you are very upset?

☐ No one

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________

How Satisfied?

☐ Very Satisfied
☐ Fairly Satisfied
☐ A Little Satisfied
☐ A Little Dissatisfied
☐ Fairly Dissatisfied
☐ Very Dissatisfied
Appendix H

Modified Caregiver Strain Index

Instructions:
Here is a list of things that other caregivers have found to be difficult. Please put a checkmark in the columns that apply to you. We have included some examples that are common caregiver experiences to help you think about each item. Your situation may be slightly different, but the item could still apply.

<table>
<thead>
<tr>
<th>Item</th>
<th>No=0</th>
<th>No=0</th>
<th>Yes, On A Regular Basis=2</th>
<th>Yes, Sometimes =1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My sleep is disturbed</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>(For example: the person I care for is in and out of bed or wanders around at night.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Caregiving is inconvenient</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>(For example: helping take So much time or it’s a long drive over to help)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Caregiving is a physical strain</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>(For example: lifting in or out of a chair; effort or concentration is required)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Caregiving is confining</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>(For example: helping restricts free time or I cannot go visiting)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. There have been family adjustments</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>(For example: helping has disrupted my routine; there is no privacy)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No=0</td>
<td>Yes, On A Regular Basis=2</td>
<td>Yes, Sometimes =1</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------</td>
<td>---------------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>There have been changes in personal plans (For example: I had to turn down a job; I could not go on vacation)</td>
<td>___</td>
<td>______________</td>
<td>__________</td>
</tr>
<tr>
<td>7.</td>
<td>There have been other demands on my time (For example: other family members need me)</td>
<td>___</td>
<td>______________</td>
<td>__________</td>
</tr>
<tr>
<td>8.</td>
<td>There have been emotional adjustments (For example: severe arguments about caregiving)</td>
<td>___</td>
<td>______________</td>
<td>__________</td>
</tr>
<tr>
<td>9.</td>
<td>Some behavior is upsetting (For example: incontinence; the person cared for has trouble remembering things; or the person I care for accuses people of taking things)</td>
<td>___</td>
<td>______________</td>
<td>__________</td>
</tr>
<tr>
<td>10.</td>
<td>It is upsetting to find the person I care for has changed so much from his/her former self (For example: he/she is a different person than he/she used to be)</td>
<td>___</td>
<td>______________</td>
<td>__________</td>
</tr>
<tr>
<td>11.</td>
<td>There have been work adjustments (For example: I have to take time Off for caregiving duties)</td>
<td>___</td>
<td>______________</td>
<td>__________</td>
</tr>
<tr>
<td></td>
<td>No=0</td>
<td>Yes, On A Regular Basis=2</td>
<td>Yes, Sometimes =1</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------</td>
<td>--------------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>12. <strong>Caregiving is a financial strain</strong></td>
<td>___</td>
<td>_______________</td>
<td>_________</td>
<td></td>
</tr>
</tbody>
</table>
| 13. **I feel completely overwhelmed**  
(For example: I worry about the person I care for; I have concerns about how I will manage) | ___ | _______________ | _________ |
Appendix I

Positive and Negative Affect Schedule

Instructions:
This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate to what extent you feel this way right now, that is, at the present moment OR indicate the extent you have felt this way over the past week (circle the instructions when taking this measure).

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very Slightly or Not at All</td>
<td>A Little</td>
<td>Moderately</td>
<td>Quite a Bit</td>
<td>Extremely</td>
</tr>
<tr>
<td>1.</td>
<td>_______</td>
<td>Interested</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>_______</td>
<td>Distressed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>_______</td>
<td>Excited</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>_______</td>
<td>Upset</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>_______</td>
<td>Strong</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>_______</td>
<td>Guilty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>_______</td>
<td>Scared</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>_______</td>
<td>Hostile</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>_______</td>
<td>Enthusiastic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>_______</td>
<td>Proud</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>_______</td>
<td>Irritable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>_______</td>
<td>Alert</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>_______</td>
<td>Ashamed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>_______</td>
<td>Inspired</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>_______</td>
<td>Nervous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>_______</td>
<td>Determined</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>_______</td>
<td>Attentive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>_______</td>
<td>Jittery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>_______</td>
<td>Active</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>_______</td>
<td>Afraid</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix J

Positive Aspects of Caregiving Scale

<table>
<thead>
<tr>
<th>Prior to the study, providing help to your family member....</th>
<th>Disagree a lot</th>
<th>Disagree a little</th>
<th>Neither agree nor disagree</th>
<th>Agree a little</th>
<th>Agree a lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Makes you feel more useful</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Makes you feel good about yourself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Makes you feel needed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Makes you feel appreciated</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Makes you feel important</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Makes you feel strong and confident</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Gives more meaning to your life</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. Enables you to learn new skills</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. Makes you appreciate life more</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. Makes you more positive toward life</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. Strengthened your relationship with other people</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
**Appendix K**

**Leisure Constraints Questionnaire**

**Instructions:**
*Please check the response that fits your response to the following question: How much does each of the following factors limit your participation in activity?*

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I’m too tired</td>
<td></td>
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<td></td>
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<tr>
<td>2. I can’t afford to go to fitness or recreation facilities</td>
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<tr>
<td>3. I don’t have time</td>
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<td></td>
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<tr>
<td>4. I’m afraid of getting hurt</td>
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<tr>
<td>5. It’s not important for me to be physically active</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6. My friends and family members would look down on me if I started to be physically active</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7. I’m already physically active at work, I don’t need to exercise</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8. Weather is often bad around here</td>
<td></td>
<td></td>
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<tr>
<td>9. It’s not safe to exercise where I live</td>
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</tr>
<tr>
<td>10.</td>
<td>I’m afraid of unattended dogs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>I’m too self-conscious about the way I look</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>My health is not good enough</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>I don’t know where I could participate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>I’m not skilled enough</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>I have problems with transportation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>I have nobody to participate with</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>There are no facilities in my neighborhood</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>I participated in the past and I didn’t like it</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>I don’t like to participate in physical activity in public places</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>I am limited in my activities because I don’t have someone I can rely on</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix L

WHOQOL-BREF

Instructions:
The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. Please choose the answer that appears most appropriate. If you are unsure about which response to give to a question, the first response you think of is often the best one.

1. How would you rate your quality of life? 1 2 3 4 5

Very poor Poor Neither poor nor good Good Very good

2. How satisfied are you with your health? 1 2 3 4 5

Very dissatisfied Dissatisfied Neither satisfied nor dissatisfied Satisfied Very satisfied

The following questions ask about how much you have experienced certain things in the last four weeks.

3. To what extent do you feel that physical pain prevents you from doing what you need to do? 1 2 3 4 5

Not at all A little A moderate amount Very much An extreme amount

4. How much do you need any medical treatment to function in your daily life? 1 2 3 4 5

5. How much do you enjoy life? 1 2 3 4 5
6. To what extent do you feel your life to be meaningful?  

<table>
<thead>
<tr>
<th>Not at all</th>
<th>A little</th>
<th>A moderate amount</th>
<th>Very much</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

7. To what extent do you feel that physical pain prevents you from doing what you need to do?  

<table>
<thead>
<tr>
<th>Not at all</th>
<th>A little</th>
<th>A moderate amount</th>
<th>Very much</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

8. How much do you need any medical treatment to function in your daily life?  

<table>
<thead>
<tr>
<th>Not at all</th>
<th>A little</th>
<th>A moderate amount</th>
<th>Very much</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

9. How much do you enjoy life?  

<table>
<thead>
<tr>
<th>Not at all</th>
<th>A little</th>
<th>A moderate amount</th>
<th>Very much</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

The following questions are about how completely you experience or were able to do certain things in the last four weeks.  

<table>
<thead>
<tr>
<th>Not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Mostly</th>
<th>Completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

10. Do you have enough energy for everyday life?  

11. Are you able to accept your bodily appearance?  

12. Have you enough money to meet your needs?  

13. How available to you is the information that you need in your day-to-day life?
14. To what extent do you have the opportunity for leisure activities?

<table>
<thead>
<tr>
<th>Very poor</th>
<th>Poor</th>
<th>Neither poor nor good</th>
<th>Good</th>
<th>Very good</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

15. How well are you able to get around?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

16. How satisfied are you with your sleep?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

17. How satisfied are you with your ability to perform your daily living activities?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

18. How satisfied are you with your capacity for work?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

19. How satisfied are you with yourself?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

20. How satisfied are you with your personal relationships?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

21. How satisfied are you with your sex life?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

22. How satisfied are you with the support you
get from your friends?

23. How satisfied are you with the conditions of your living place?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

24. How satisfied are you with your access to health services?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

25. How satisfied are you with your transport?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

The following question refers to how often you have felt or experienced certain things in the last four weeks.

26. How often do you have negative feelings such as blue mood, despair, anxiety, depression?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Seldom</th>
<th>Quite often</th>
<th>Very often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Do you have any comments about the assessment?

_______________________________________________________________________
Appendix M

Chair Stand Test

Purpose and Daily Benefit: The purpose of the Chair Stand is to measure the strength of your lower body. Lower body strength is important for activities such as getting out of a chair, on the bus, out of the car, and rising up from a kneeling position in the house or garden. The strength of your lower body can directly affect the ease with which you perform the activities you do every day.

Equipment: Chair without arms, Stopwatch

Test Steps:

1. Place the chair against a wall where it will be stable.
2. Sit in the middle of the chair with your feel flat on the floor, shoulder width apart, back straight.
3. Cross your arms at the wrist and place them against your chest.
4. The test partner will tell you when to begin and will time you 30 seconds, using the stopwatch. You will rise up to a full stand and sit again as many times as you can during the 30-second interval.
   a. Each time you stand during the test be sure you come to a full stand.
   b. When you sit, make sure you sit all the way down. Do not just touch your backside to the chair. You must full sit between each stand.
   c. Do not push off your thighs, or off the seat of the chair with your hands to help you stand unless you have to.
   d. Keep your arms against your chest crossed and do not allow the arms to swing up as you rise.
   e. If you are on your way up to stand when time is called you will be given credit for that stand.

Per Protocol Instructions: If the participant used their hands at all to push off in order to stand do not count the rep as a “Per Protocol” stand. Only stands that are done without any assistance by pushing off the seat, off the thighs or with any other assistive devices such as a walker or cane are counted as “Per Protocol” stands. If the participant is unable to do any stands per the protocol, then you may let the individual do the test by pushing off their legs or the chair, or using their walker, but the test will then be scored as “Did Not Follow Protocol.” Only “Per Protocol” scores are recorded in the overall group outcomes reports. Both “Per Protocol” scores and “Did Not Follow Protocol” scores are saved in the individual’s IHP personal account and center account.
Appendix N

Arm Curl Test

**Purpose and Daily Benefit:** The purpose of the Arm Curl is to measure the strength of your upper body. Upper body strength is important for activities such as carrying laundry, groceries, and luggage. It is also important for picking up grandchildren and giving them a big hug! A lack of upper body strength could keep you from pouring milk from a jog, being able to go grocery shopping for yourself and maintaining your independence.

**Equipment:** 5 lb. Weight and an 8 lb. weight, stopwatch and a straight-back chair with no arms. Women will curl a 5 lb. weight in this test and Men will curl an 8 lb. weight for their test. It is extremely important to the accuracy of the test that you use the appropriate weight for men and women in this test.

**Test Steps:**

1. Your test partner will tell you when to begin and will time you for 30 seconds, using the stopwatch or a watch with a second hand.
2. Do as many curls as you can in the allotted 30-second time period, moving in a controlled manner.
3. Remember to do a Full Curl, squeezing your lower arm against your upper arm at the top of each curl and returning to a straight arm each time. Keep your upper arm still. Do Not swing the weight.
4. If you have started raising the weight again and are over halfway up when time is called, you may count that curl!
5. Record the score on the scorecard.

**Per Protocol Instructions:** Demonstrate the test slowly and insure proper grip. Allow participant to practice 1-2 repetitions. If the participant cannot lift the appropriate weight for their gender then the participant may do the test without a weight, raising just the weight of their arm. The participant’s test will need to be scored as “Did Not Follow Protocol” if they do not use a weight or if they use a lighter weight such as a 3 lb. or 1 lb. weight if they are a woman, or if they are a man and use a 5 lb., 3lb. or 1 lb. weight. Only ‘Per Protocol” scores are recorded in the overall group outcomes report. Both “Per Protocol” scores and “Did Not Follow Protocol” scores are saved in the individual’s IHP personal account and center account.
Appendix O

2-Minute Step Test

**Purpose and Daily Benefit:** The purpose of the Two-Minute Step Test is to measure your endurance or physical stamina. Endurance is important for activities such as shopping, walking for a distance, and traveling. The more physical stamina you have, the more energy you will have to do the things you enjoy. You will also be able to do more with less fatigue. Your endurance affects your ability to perform many of your daily activities and to maintain your independence.

**Equipment:** Stop Watch, Measuring Tape, Visible Tape (i.e. masking tape or painter’s tape)

**Set Up:** Begin by setting the minimum knee or stepping height for each participant. This is at the level even with the midway point between the kneecap and the front hipbone. (Iliac crest). It can be determined using a tape measure or by stretching a cord from the middle of the kneecap (patella) to the hipbone. Then you can fold it over and mark this point on the thigh with a piece of tape.

**Test Steps:**

1. Your test partner will tell you when to begin and will time you for two full minutes using the stopwatch.
2. Begin stepping, being careful to lift your knees to the appropriate height each time so that your knee is level with the tape mark on the wall. Your entire foot must touch the ground on each step to ensure that you are not jogging, you need to “step”.
3. Your test partner will count each time you raise your right knee, counting each full stepping cycle. A full step cycle is when both the right and the left foot have lifted off the floor and come back down.
4. Your test partner should alert you at each 30 second interval to allow you to gauge how you feel. If you cannot complete the full 2 minutes that is fine, just complete as much time as you can comfortably complete.
5. If you wish to rest during the test you may stop stepping, rest and then resume the test. The stopwatch will continue to run and you may start stepping again as long as you are still within the two-minute test period.

**Per Protocol Instructions:** If the participant cannot do any steps without holding onto a walker or a chair placed to their side then the participant is not following the test protocol. The participant may still complete the test but if they complete the test holding
onto a chair or assistive device their score will be saved as “Did Not Follow Protocol.” Only ‘Per Protocol’ scores that are completed by the participant without holding onto any assistive devices are recorded in the overall group outcomes reports. Both “Per Protocol” scores and “Did Not Follow Protocol” scores are saved in the individual’s IHP personal account and center account.
Appendix P

Chair Sit and Reach

**Purpose and Daily Benefit:** The purpose of the Chair Sit and reach test is to measure your lower body flexibility, specifically your hamstring flexibility. Lower body flexibility is important for preventing lower back pain. It also plays a role in your balance, posture, in fall prevention, and in your gait, or walking. Lower body flexibility is important for maintaining an active, independent lifestyle.

**Equipment:** Chair, Ruler

**Test Steps:**

1. Place the chair against a wall so it will be stable.
2. Slide forward in your chair until you are able to straighten one of your legs. The ankle of your straight leg should be flexed at about a 90-degree angle. Your other foot should be flat on the floor.
3. Place one of your hands directly on top of the other so that they are stacked with your fingers extended.
4. Exhale as you bend forward at the hip and try to reach your toes. If the extended leg begins to bend, move back in your chair until the leg is straight.
5. Hold the stretch for a least 2 seconds and Do Not Bounce or jerk as you reach.
6. Take two practice reaches on each leg. Determine which side is more flexible.
7. You will measure and record only your most flexible side on your scorecard.
8. Be sure you have a stable chair so that the chair will not tip forward as you reach for your toes.
9. After you have completed the practice reaches, your test partner will hold a ruler across the toe of your shoe. The center of the toe of your shoe is considered to be a measurement of “0”.
10. Reach forward toward your toes. Mark your score to the nearest half-inch.
11. If you reach past this “0” point at the middle of your toe, you receive a positive score of as many inches as you reach past it, measured to the nearest half-inch.
12. If you cannot reach your toes, you receive a negative score of as many inches as you are short of the “0” point at the middle of the toe of your shoe, measures to the nearest half-inch.

**Per Protocol Instructions:** This test should be scored as “Followed Protocol” for all trials taken as there really are no modifications for this test.
Appendix Q

Back Scratch Test

**Purpose and Daily Benefit:** The Back Scratch Test is a measure of flexibility of your upper body. Upper body flexibility affects your ability to reach for items that may be high on a shelf, change a light bulb, or do any activity that requires arm and/or shoulder movement. Maintaining flexibility in your upper body will assist you in continuing to live independently.

**Equipment:** Ruler

**Test Steps:**

1. Place your left arm straight up in the air above your left shoulder.
2. Bend your left arm at the elbow to reach toward your back, with your fingers extended. Your elbow pointed toward the ceiling.
3. Place your right hand behind your back with your palm out and your fingers extended up.
4. Reach up as far as possible and attempt to touch the fingers of your two hands together. Some people are not able to touch at all, while others’ fingers may overlap.
5. Take two practice stretches with each arm, determining which side is more flexible. You will be measuring and recording only your most flexible side.
6. You are now ready to be measured. Perform the stretch as outlined above. Without shifting your hands, your test partner will position your fingers so that they are pointing toward each other.
7. The distance between the fingertips of one hand and the other is measured to the nearest half-inch. If your fingers overlap, the amount of the overlap will be measured.
8. Fingertips just touching receive a score of “0”.
9. If your fingers do not touch, you receive a negative score of the distance between your fingers, measured to the nearest .5 or half inch.
10. You receive a positive score if your fingers overlap, measuring the overlap to the nearest .5 or half inch.
11. If you are able to touch your fingers together, do not grab your fingers together and pull, as this will affect the accuracy of your score.
12. Do the stretch twice, recording the best score and remember to indicate if the score was positive or negative.

**Per Protocol Instructions:** This test should be scored as “Followed Protocol” for all trials taken as there really are no modifications for this test. If modifications are made in any way, record the score as “Did Not Follow Protocol” and note the modifications in the test comments section.
Appendix R

PEG

PEG: A Three-Item Scale Assessing Pain Intensity and Interference

1. What number best describes your pain on average in the past week?

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<th>4</th>
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<td>No pain</td>
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2. What number best describes how, during the past week, pain has interfered with your enjoyment of life?

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3. What number best describes how, during the past week, pain has interfered with your general health?

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## Appendix S

### Therapeutic Yoga Intervention Sequence

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<th>Yoga Activity</th>
<th>Week 1 S 1&amp;2</th>
<th>Week 2 S 3&amp;4</th>
<th>Week 3 S 5&amp;6</th>
<th>Week 4 S 7&amp;8</th>
<th>Week 5 S 9&amp;10</th>
<th>Week 6 S 11&amp;12</th>
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<td>Seed Sounds</td>
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<td>Konasana/Queens Bound Angle</td>
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Appendix T

Demographics

Please read and answer the following questions.

1. What is your first and last name?
________________________________________

2. What is your date of birth?
________________________________________

3. What is your current age?
________________________________________

4. Are you male or female?

☐ Male

☐ Female

5. What is your relationship with your care recipient?
________________________________________

6. What health condition does your care recipient have that requires your help?
________________________________________

7. How many years have you been this person’s caregiver?
________________________________________

8. What is the length of time you spend as their caregiver? (In hrs/day & number of months)
________________________________________
9. What is your marital status?

☐ Married
☐ Widowed
☐ A member of an unmarried couple
☐ Divorced
☐ Single and never been married
☐ Separated

10. What is your race?

☐ Black/African American
☐ White/Caucasian
☐ Asian American
☐ Hispanic/Latino
☐ Native American Indian/Alaskan
☐ Native Hawaiian/Pacific Islander
☐ Other

11. What is the highest level of education you have completed?

☐ Less than high school
☐ High school graduate
☐ Some college
☐ College graduate
☐ Some post-graduate
☐ Post-graduate degree
12. How would you rate your overall health?
   □ Excellent
   □ Very good
   □ Good
   □ Fair
   □ Poor

13. Do you smoke?
   □ Yes
   □ No

14. Do you work?
   □ Yes
   □ No
   □ Retired

15. If you work, how many hours per week?
   □ >5
   □ >10
   □ >20
   □ >30
   □ >40
16. Do you live....

☐ Alone

☐ With others

If you live with others, please list relationship status of each person you live with.

________________________________________________________________________
________________________________________________________________________
### Appendix U

#### Evaluation of Acceptability

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<th>Agree (4)</th>
<th>Neutral (3)</th>
<th>Disagree (2)</th>
<th>Strongly Disagree (1)</th>
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<td>1.</td>
<td>The 8-week yoga intervention began shortly after I signed up to participate.</td>
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<tr>
<td>2.</td>
<td>The location for the yoga intervention was close to my home.</td>
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<tr>
<td>3.</td>
<td>I would not drive this distance for another 8-week yoga program.</td>
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<tr>
<td>4.</td>
<td>The class time was easy to work into my schedule.</td>
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<td>5.</td>
<td>I never had to be persuaded to attend one of the yoga classes.</td>
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<td>6.</td>
<td>The building the yoga class was held in was acceptable.</td>
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<td>7.</td>
<td>The room the yoga class was held in was acceptable.</td>
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<tr>
<td>8.</td>
<td>I enjoyed attending yoga class.</td>
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<td>9.</td>
<td>The yoga instructor consistently demonstrated techniques that I was able to perform.</td>
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<td>10.</td>
<td>Overall, I tolerated the physical postures in each class.</td>
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<td>11.</td>
<td>Overall, I tolerated the breathing techniques in each class.</td>
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<tr>
<td>12.</td>
<td>Overall, I tolerated the meditation techniques in each class.</td>
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<td>13.</td>
<td>It was easy for me to attend each yoga class.</td>
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<td>14.</td>
<td>I plan to attend this program again if it is offered.</td>
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Appendix V

Focus Group Questions for ICGs

Questions for the ICGs group:

- Tell me about how this program has impacted you?
- How has this program impacted your care recipient?
- How has this program impacted your involvement in your home and in the community?
- Tell me about any changes you noticed with your care recipient relationship in the past eight weeks.
- Tell me about any changes you noticed in caring for your recipient in the last eight weeks.
- What were your expectations of this program?
- Now that the program is completed, what are your perceived benefits?
- Tell me any changes that have occurred in the last eight weeks.

  * Probes include:

  - Describe any changes you experienced in your physical fitness.
  - Describe any changes you experienced in your general health.
  - Describe any changes you experienced in your stress levels.
  - Describe any changes you experienced in feelings of burden.
  - Describe any changes you experienced in feelings of depression.
  - Describe any changes you experienced in positive or negative emotions.
  - Describe any changes you experienced in social situations.

- Describe any plans you have for continuing yoga.
- Describe any elements of the yoga program you really liked or disliked?
- Describe any safety concerns you had during the intervention.
- Did you think the intervention was tolerable for you throughout?
- Tell me how participating in a group of other caregivers was.
- Tell me about any feelings at the beginning of the yoga program about leaving your care recipient to attend yoga?
- How did or did those feelings change as the yoga intervention progressed?
- Describe your feelings on the program location?
- Tell me about the drive and parking accessibility.
- Tell me about Keowee Key as the site for the intervention.
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