

YOGA'S EFFECT ON QUALITY OF LIFE AND PSYCHOLOGICAL DISTRESS IN
KEY CAREGIVERS OF CANCER SURVIVORS

by

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for the degree of Master of Science

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DALHOUSIE UNIVERSITY
SCHOOL OF HEALTH AND HUMAN PERFORMANCE

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Dedication

À **Bazzy** – DIDO (heehee).

À **Mini** - mini aime. mini menquez. mini aime.

À **Pigeon/#1/#12/Papa le grand** - Tu es facilement le meilleur papa une fille pourrait rêver d'avoir. Je t'aime gros.

Guuuuuuunnnnnnnnnnddddyyyyyyyyyy - As I've always said, you're the best Gundy there ever was. Ever will be. Me loves you tons.

Jean-Paul - Oink. Thanks for all of the things you do as a big brother, but don't have too... Whistler comes to mind ☺

To Ace – For now, you are the champ. But I will be victorious one day ☺

To Calculus - I promise to see the world for you. Thank you for exploring the world of Harry Potter for me!

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Abstract

Fourteen cancer caregivers participated in a six-week Vinyasa Yoga (VY) intervention and completed demographic items, psychological distress, measures of QOL, and open-ended questions. There was a significant difference and large effect ($n^2=.47$) in the total mood disturbance scores; $t(13)= 3.43$, $p=0.005$, 95% CI [8.6, 38.1]. There was no significant difference in the Physical Component Score; $t(13)= 1.70$, $p=0.113$, 95% CI [-.8, 6.8], $n^2=0.18$. There was a significant difference and large effect ($n^2=.30$) in the Mental Component Score; $t(13)= -2.37$, $p=0.034$, 95% CI [-12.9, -.6]. Additional analyses indicated that several subdomains of psychological distress and QOL were significant. Responses to the survey questions revealed participants perceived benefiting physically and mentally from the VY intervention, noting improvements in flexibility, core and upper-body strength, mindfulness, breathing, and energy. Although further and more rigorous exploration is required, this study provides support for the feasibility of VY with cancer caregivers.

List of Abbreviations Used

AARP – American Association of Retired Persons

CAM – Complementary and Alternative Medicine

CCS – Canadian Cancer Society

NAC – National Alliance for Caregiving

NCCAM - National Center for Complementary and Alternative Medicine

NCCS – National Coalition for Cancer Survivorship

PA – Physical Activity

PAR-Med-X – Physical Activity Readiness-Medical Examination Form

PAR-Q – Physical Activity Readiness Questionnaire

POMS – Profile of Mood States

QOL – Quality of Life

RCT – Randomized Controlled Trial

SF36v2 - Medical Outcomes Study 36-Item Short-Form Health Survey

VY – Vinyasa Yoga

WHO - World Health Organization

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Chapter One: Introduction

In 2007, cancer surpassed cardiovascular disease as the leading cause of death in Canada (Canadian Cancer Society [CCS], 2012). In Atlantic Canada, generally both incidence and mortality rates of cancer are higher (CCS, 2012). The ongoing image of cancer is that of an acute and deadly disease that acts quickly and ends life. Although cancer mortality rates remain high in developed countries, cancer is now seen as a chronic illness with overall survival rates across all cancers at approximately 62% (CCS, 2012). Due to medical advances in cancer treatment, a growing number of cancer survivors are living for longer periods of time. Furthermore, due to toxic treatments in outpatient settings in combination with the shortage of health care providers and limited health care resources, family and friends are often replacing skilled healthcare workers in the delivery of complex care to their loved ones at home. Thus, the cancer caregiver role has changed considerably over time, from convalescence to providing highly technical care and psychological support. Although caregiving has been shown to have some positive benefits, such as finding meaning, inner enrichment, and growth (Pearlin, Mullan, Semple, & Skaff, 1990), the burden/stress of caregiving for cancer survivors has many adverse effects, including reduced quality of life (QOL) and psychological distress (Boyle et al., 2000; Vedhara, Shanks, Anderson, & Lightman, 2000). Interestingly, studies have demonstrated that as a consequence of providing care, caregivers of cancer survivors will sometimes experience psychological distress that is on par with, or in excess of, the distress experienced by the survivors themselves (Couper et al., 2006; Manne et al., 2007; Rabin et al., 2009; Han & Haley, 1999; Low, Payne, & Roderick, 1999). Furthermore, the demands of caregiving for a loved one with cancer can

frequently lead to the abandonment of leisure and social activities, such as physical activity (PA) (Dumont, Dumont, & Mongeau, 2008). Importantly, the degree to which caregivers have negative or positive experiences in caregiving may affect not only their mental and physical states, but also their ability to care for the cancer survivor.

Researchers have highlighted the value and importance of PA and findings suggest that it has positive consequences on both mental (e.g., depression, anxiety) and physical (e.g. immune system) health (e.g., Paluska & Schwenk, 2000; Cress et al., 1999; Elward & Larson, 1992; Glass, de Leon, Marottoli, & Berkman, 1999). Today, more and more Canadians are seeking out alternative modes of PA such as yoga. Like more traditional forms of PA, a significant body of clinical research has confirmed the diverse health benefits associated with the practice of yoga (e.g., Khalsa, 2004; Innes & Vincent, 2006; Innes, Bourignon, & Taylor, 2005; Raub, 2002). To date however, little research regarding cancer caregiver's PA interests and preferences have been undertaken. In one of the few studies assessing the PA interests of caregivers, Swartz and Keir (2007) found that this population had interest in stress-reduction techniques and PA interventions. However, evidence of the potential efficacy of mind-body fitness programs such as yoga for caregivers continues to be lacking. Accordingly, the purpose of the present study was to examine the impact of a six-week VY intervention on the overall QOL and overall psychological distress in key caregivers of cancer survivors. Based on a review of the available literature, we hypothesized that the six-week VY intervention will reduce overall psychological distress and improve overall QOL in key caregivers of cancer survivors.

Definition of Terms

For the purpose of this study, the following terms are defined as:

Key caregiver. Refers to anyone who provides uncompensated care to the cancer survivor. A key caregiver is someone who provides physical, emotional, financial, social, and/or personal care/support to the cancer survivor (Yabroff & Kim, 2009; Blum & Sherman, 2010). Key caregivers can include any of the cancer survivor's social network members (e.g., spouses/partners, immediate family members, friends) who self-identify or are identified by the cancer survivor as a key caregiver providing any form of uncompensated care.

Cancer survivor. Refers to any individual diagnosed with cancer from the time of discovery and for the balance of life (National Coalition for Cancer Survivorship, 2012).

QOL. Predominantly defined in literature as the interactions of physical, social/familial, emotional, psychological, spiritual, and functional well-being (Chase, Watanabe, & Monk, 2010; Kim, Spillers, & Hall, 2010; Ferrell, Dow, & Grant, 1995; Dow, Ferrell, Leigh, Ly, & Gulasekaram, 1996; Haley, LaMonde, Han, Burton, & Schonwetter, 2003).

Psychological distress. Often discussed in psychological, nursing, social science, and medical literature (Bruch, Rivet, & Laurenti, 2000; Masee, 2000; Lazarus 1998). A definition of the concept of psychological distress, as provided by oncology nursing literature, defined psychological distress as a general concept of "maladaptive psychological functioning in the face of stressful life events" (Abeloff, Armitage, Lichter, & Niederhuber, 2000, p. 556). Additionally, Ridner (2004) defines psychological distress as the uneasy or uncomfortable emotional state experienced in response to a precise stressor or demand that results in temporary or permanent harm to the person. Likewise, Costa-Requena, Cristofol, and Canete (2012) define psychological distress as an

unpleasant emotional experience, be it psychological, social, and/or spiritual, which extends from normal feelings of vulnerability, fear, and sadness, to disabling problems such as depression and anxiety.

Chapter Two: Literature Review

Cancer: A Global, National, and Local Concern

Worldwide. Globally, approximately 12.7 million cancer cases are estimated to have occurred in 2008, resulting in 7.6 million cancer deaths (13% of all deaths) (Jemal, Bray, Center, Ferlay, & Ward, 2011). Approximately 56% of cancer cases and 64% of cancer deaths occurred in the economically developing world (Jemal et al., 2011). Currently, the leading cause of death in economically developed countries, and second leading cause of death in developing countries is cancer (World Health Organization [WHO], 2008). The likelihood of being diagnosed with cancer is more than twice as high in developed countries than developing countries (WHO, 2012). Furthermore, according to the WHO's World Cancer Report, cancer rates are expected to increase to 15 million new cases in the year 2020 (WHO, 2003). What's more, cancer deaths worldwide are projected to be an estimated 13.1 million in 2030 (Globocan, 2008).

The occurrence of cancer rises considerably with age, usually due to an accumulation of risks for specific cancers that increase with age. This overall risk increase is combined with the propensity for cellular repair systems to be less effective as a person grows older (WHO, 2011). Lifestyle choices, particularly those that are a part of a Western lifestyle, are also key risk factors for the development of cancer. The Western lifestyle typically encompasses low PA and a high calorie diet rich in fat, refined carbohydrates, and animal protein. Modifying or avoiding these risk factors could prevent more than 30% of all cancers (WHO, 2011).

Canada. In 2006, an estimated 1,048,900 years of life were lost as a result of cancer (CCS, 2012). In 2007, cancer surpassed cardiovascular disease as the leading

cause of death in Canada (CCS, 2012). Presently, it is estimated that 186,400 new cases of cancer (excluding non-melanoma skin cancers) and 75,700 cancer deaths will occur in 2012 (CCS, 2012). This year, approximately 88,800 Canadian women and 97,600 Canadian men will be diagnosed with cancer, while an estimated 36,200 Canadian women and 39,500 Canadian men will die from it (CCS, 2012). On average, that number transforms into 500 cancer diagnoses and 200 cancer deaths every day, or 21 diagnoses and nine deaths per hour. Based on 2012 incidence rates, 40% of Canadian women and 45% of Canadian men will develop cancer during their lifetimes (CCS, 2012). Moreover, the CCS (2012) estimates that approximately one out of every four Canadians are expected to die from cancer (24% of women and 29% of men).

Maritimes and Nova Scotia. Generally, both incidence and mortality rates of cancer are higher in Atlantic Canada. For males, the estimated incidence rate for all cancers is highest in the Atlantic Provinces, Québec, and Ontario. For females, the highest rates of all cancers are found in Nova Scotia, Québec, Ontario, and New Brunswick (CCS, 2012).

More Nova Scotians will die from cancer than any other cause (Statistics Canada, 2008). In 2012, an estimated 6,100 new cases and 2,700 deaths are expected to occur in Nova Scotia (CCS, 2012). In Nova Scotia men and women, lung cancer is the most frequently diagnosed cancer and cause of death. An estimated 930 men and women will be diagnosed and 870 will die of lung cancer in 2012. For Nova Scotia men, prostate cancer is the most frequently diagnosed type of cancer while breast cancer is the most frequently diagnosed type of cancer in Nova Scotia women (CCS, 2012).

Beating the Odds

Survival. Despite the prevalence of cancer, the prospects for surviving this disease have never been better. Survival rates have steadily improved over the years and recent estimates suggest that the five year survival rate across all cancers is approximately 62% - a 10% increase from the previous decade (CCS, 2012). Importantly, survival rates do vary based on cancer type and can range from poor (e.g., lung, pancreatic cancer), average (e.g., colorectal cancer), to good (e.g., prostate, thyroid cancer) (CCS, 2012). The estimated survival rate even rockets to over 90% for such cancers as thyroid (98%), prostate (96%), and testicular (95%) (CCS, 2012).

Treatment and effects. The substantial strides made in improving survival can be largely attributed to more effective, targeted combination therapies. The most common treatment methods for cancer include surgery, chemotherapy, and radiation therapy. These therapies are either used on their own or in conjunction with each other or in combination with other therapies (i.e., hormonal therapy, stem cell/bone marrow transplantation, targeted therapy, and immunotherapy; American Society of Clinical Oncology, 2012). More and more, various combinations of these treatments are being used to treat cancer. From these therapies, as well as from the disease itself, cancer pain can result (Hollis, 2010). While a whole literature is dedicated to understanding the psychosocial impact of a cancer diagnosis, it is clear that a diagnosis can and does also take a toll on the physical, functional, emotional, and spiritual well-being of cancer survivors (Courneya, 2003).

Beyond the patient. Cancer statistics and projections indicate that at some point in life, the majority of the population will know a close social network member with

cancer (Segrin & Badger, 2010). The acute and long-term effects of cancer are far reaching and extend beyond the cancer survivor to their social network members, which include spouses/partners, immediate family members, and friends (Kim & Given, 2008; Northouse et al., 2007). In close relationships, there is often a high level of dependence between the social network members. That is, other network members often heavily influence one's own outcomes. Principally, what affects one person within the network will generally have an effect on the other members of that network (Segrin & Badger, 2010). Therefore, as one person becomes negatively affected by illness (i.e., cancer), the other people's outcomes may also be affected (Segrin & Badger, 2010). Though there are numerous reasons for this phenomenon, it is expected that overall, as something triggers distress in one member of a social network, it will create distress in the other, (e.g., family, friend) (Segrin & Badger, 2010). Often times, when a loved one is afflicted with an illness or disabling condition, it is these social network members who take on additional responsibilities. This effect is increasingly evident in the cancer caregiving literature since the role of cancer caregiver has changed from that of a reasonably passive role to that of an active participant in decision-making (Ifanti, Argyriou, & Kalofonos, 2012). This act of "stepping up" and providing support greater than normally expected rises out of a close relationship with the recipient (Goodhead & McDonald, 2007).

Although cancer mortality rates remain high, many cancers are now seen as a chronic disease with uncertainty in remission, new recurrence, palliation, and death (Kim & Given, 2008). As such, many social network members who "step up" and fill the gap in cancer care, do so for months, or even years (Kim & Schulz, 2008; Beesley, Price, & Webb, 2010; Rabow, Hauser, & Adams, 2004; Adams, Boulton, & Watson, 2009).

Caregivers

The distinction between providing support and care for someone and becoming a “true” caregiver is often unclear. Many individuals who “fit” the definition of a caregiver may not think of themselves as such. Defining who “fits” such a definition can therefore be complex. “Caring”, as defined by Baines, Evan, and Neysmith (1999), can be referred to as the efforts, whether mental, emotional, and/or physical involved in looking after and supporting others. “Caregiving” however, goes beyond caring and refers more to the doing of the caring work (e.g., the type of support provided), including specific tasks. Caregiving has been assessed in various ways, including the types of tasks performed, the frequency with which tasks are performed, the intensity and duration of the tasks, and the relationship between the caregiver and care recipient (Keefe, 2011). Those who take on a “caregiver” role are most often members of the immediate or extended family or friends. They provide support, care, and assistance, without pay, to any individual who is in need of support due to impairment in functioning (e.g., mental, chronic, or life-threatening illness or disability) (Keefe, 2011).

In the current study, the term caregiver refers to anyone who provides unpaid care, assistance, and/or support (regardless of one’s motivation) to an individual in need. This may include emotional, financial, spiritual, social, and physical care and/or support (Family Caregiver Alliance, 2011; Blum & Sherman, 2010; Yabroff & Kim, 2009). In comparison to paid employment, informal caregiving tends to be invisible. Likewise, caregivers themselves often do not recognize their vital role or view themselves as such. This may be due to the fact that caregiving can blend into normal relationship reciprocity and does not involve any formal agreements (Goodhead & McDonald, 2007). Cranswick

and Dosman (2008) note that spousal caregivers in particular may not identify themselves as caregivers. Only by self-identifying, however, are caregivers able to find services and obtain information or help by professionals. Self-identifying and recognizing oneself as a caregiver has been shown to make a positive difference not only in caregivers themselves, but also in the lives of their care recipient(s), family members, and other loved ones (National Family Caregivers Association, 2001).

Caregiving in North America

Canada. In Canada and other countries alike, caregiving plays a unique and valuable role in society. Caregivers provide assistance to someone who is, in some level, debilitated and requires assistance (Family Caregiver Alliance, 2011). These informal caregivers provide care and assistance for spouses, children, parents, and other extended family members and friends who are in need of support (Family Caregiving Advocacy and Action, 2011). In Canada, caring for an older close relative was the most common caregiving relationship, with six out of every 10 caregivers caring for a parent or parent-in-law (Cranswick & Dosman, 2008). Interestingly, Cranswick and Dosman (2008) found that 14% of caregivers were friends, and 5% were neighbours of the person they were caring for. When available, spousal caregivers tend to provide more care than other caregivers (Keefe, Légaré, Charbonneau, & Décarie, forthcoming).

A 2007 Canadian survey indicated that nearly one in four (23%) Canadians had cared for a close family member or friend with a serious health problem in the past 12 months (CCS, 2012). The care given in Canadian households to older adults is consistently estimated to be provided by informal caregivers (family and friends) 70 to 80% of the time (Hébert et al., 2001; Canadian Caregiver Coalition, 2008). It is estimated that four to five million Canadians were providing care for a family member with long-

term health problems in 2008 (Canadian Caregiver Coalition, 2008).

United States. Such as in Canada, a considerable portion of care services are provided by family members in US homes (Family Caregiver Alliance, 2006). In 2004, there were approximately 44 million family caregivers (21% of the US population) who were at least 18 years old and providing care for an adult (National Alliance for Caregiving [NAC] and American Association of Retired Persons [AARP], 2004). By 2009, an estimated 48.9 million informal caregivers in the US were helping adult family members or friends (NAC & AARP, 2009). This number is only expected to continue to grow. From 2000 to 2050, it is estimated that the amount of family caregivers in the US will increase by 85% (Department of Health and Human Services and Assistant Secretary for Planning and Evaluation, 2003). The growth of caregivers across North America can be attributed to shorter hospital stays, changes in the healthcare system, medical innovations, and the development of home care technology (Northouse, Katapodi, Song, Zhang, & Mood, 2010).

Demographics

Canada. In Canada, family caregivers are predominantly female (77%) and typically the daughter or spouse of the care recipient. The predominance of female caregivers is greatest among caregivers under 45 years of age, where 82% are women, as compared to caregivers 65 and older, where only 71% are women (Health Canada, 2002). Canadian caregivers tend to be at least 45 years of age (70%), with only one in four (25%) 65 or older (Health Canada, 2002). In 2007, it was estimated that only six in 10 Canadian caregivers (57%) were female (Cranswick & Dosman, 2008). Although caregivers are still predominantly female, the drop in percentage of female caregivers from 2002 to 2007 may be due to the fact that men are caregivers too, and demographic

trends suggest that men will increasingly become informal caregivers for older adults (Sanders, 2007). Furthermore, the majority of Canadian caregivers define themselves as Canadian (41%), English (14%), or Quebecois (10%) (Health Canada, 2002). Finally, in 2002, only four in 10 Canadian caregivers were employed, either full time (22%), part time (10%), or self-employed (9%) (Health Canada, 2002).

United States. As in Canada, more women than men are caregivers, with 66% of the caregiver population being female. Stobert and Cranswick (2004) argue that the disparity between the amount of care provided by men and by women is related to the kind of care performed. Women are significantly more likely to take responsibility for housework and personal care, as well as assisting with the management of care arrangements. Men may also help with these tasks, but they are significantly more likely to take responsibility for home maintenance and transportation (Armstrong & Kits, 2001). Also like its neighbour to the north, male caregivers are likely to increase due to a variety of social demographic factors (Kramer & Thompson, 2002). Furthermore, more so than in Canada, the majority of American caregivers tended to be in the work force, with approximately six out of every 10 (64%) caregivers employed at some point in the last 12 months (NAC & AARP, 2009). Finally, the average age of American caregivers is 48, though approximately 51% of caregivers are between the ages of 18 and 49 (NAC & AARP, 2009).

Tasks

Caregivers provide a broad range of services and supports, including: helping with chores such as cooking, shopping, housework, and home maintenance; helping with personal care activities such as bathing, dressing, and grooming; administering medications and injections; helping manage finances; attending appointments and

providing emotional support; and arranging and participating in social events (Armstrong & Kits, 2001; Swartz & Keir, 2007).

Length of Caregiving

The intensity and length of caregiving can be significant. Over 700,000 Canadian caregivers provide more than 10 hours of care per week while 60% provide care for more than three years (Health Canada, 2002). Furthermore, data reported by Statistics Canada (2002) indicated that among caregivers aged 45 to 64, women spent approximately 30 hours per month and men spent approximately 16 hours per month caregiving. Moreover, among those aged 65 and older, women spent approximately 33 hours per month, and men approximately 21. In a more recent study, the average caregiver reported spending 20 hours per week and four and a half years caregiving (Deloitte Canadian Health Consumer Survey, 2009). What's more, one quarter of the caregiver population spent approximately 40 hours per week caregiving. This study also noted that 38% of caregivers had been providing continuous care for more than two years (Deloitte Canadian Health Consumer Survey, 2009). In a recent American study, one third of family caregivers had provided care for more than five years, with the majority providing 20 to 39 hours of unpaid care each week (NAC & AARP, 2009) and four and a half years of caregiving. Only three in 10 (31%) caregivers provided care for less than one year. Finally, 15% reported caring for 10 years or more (NAC & AARP, 2009).

Financial Toll

Canadian and American caregivers alike can be found across all income levels. In Canada, only 35% of households with caregivers report income over \$45,000 yet it is estimated that two-thirds of these caregivers are spending more than \$100 per month on caregiving (Health Canada, 2002). Moreover, caregivers with higher levels of income are

more likely to report higher monthly out-of-pocket expenses (Health Canada, 2002). More recent reports indicate that over one quarter (27%) of caregivers of someone with a mental illness report an annual income of less than \$25,000, one in six (17%) report a household income between \$25,000 and \$35,000, 26% report household incomes between \$35,000 and \$54,000, and 30% report household incomes greater than \$55,000 (Health Canada, 2004). Furthermore, over one-quarter (28%) of caregivers report spending at least \$300 per month in out-of-pocket expenses related to their caregiving. Finally, caregivers with an annual household income of at least \$45,000 (18%) are more likely to report spending at least \$500 per month in out-of-pocket expenses (Health Canada, 2004).

In the US, more than 40% of caregivers were shown to have annual household incomes less than \$50,000, yet, in 2007, the average out-of-pocket expense for American caregivers was \$5,531. This represents approximately 10% of the caregiver's annual income (Assuring Healthy Caregivers, 2008). Surprisingly, at lower income levels, the annual average costs remains at about \$5500, thus making the financial burden even greater (Assuring Healthy Caregivers, 2008). Furthermore, female caregivers who provided care for their parents were 2.5 times more likely than non-caregivers to live below the poverty level (Family Caregiver Alliance, 2007). Finally, according to the Metlife Mature Market Institute (1999), a high-intensity caregiver can expect a lifetime income loss (including pension, social security, and earning losses) of \$659,139.

The increased financial burden on caregivers often stems from expenses such as transportation, medical equipment and supplies, technical support, and medications (CCS, 2012; Dumon et al., 2006). In addition to out of pocket expenses, financial burden may stem from a loss of salary and benefits, loss of promotional and training

opportunities, and/or a reduction in Social Security Benefits and retirement savings (Dumont et al., 2006; Fast, Eales, & Keating, 2001). Moreover, caregivers often change their work patterns to make themselves available to provide care; thus reducing their hours, taking days off, arriving late or leaving early, taking a leave of absence without pay, or even quitting (Dumont et al., 2006). Moreover, caregivers may be turned down for raises and promotions, or may have to refuse career-related opportunities, such as additional training, since they cannot take on the additional time and responsibility due to their caregiving. Finally, by reducing work hours, caregivers may lose employment-related benefits, such as life and long-term disability insurance, private and public pension benefits, and extended health care benefits (Fast et al., 2001).

Economic Contribution

In North America, informal caregivers have great economic value as an “unpaid labor force”. The work of informal caregivers is essentially irreplaceable, mainly because providing an alternate source of care would be difficult and costly (Maslo, Levine, & Reinhard, 2006). This being said, it is not easy to assess the economic value of the contribution of informal caregivers or the cost of the formal care that would be required should informal care become unavailable. Hollander, Liu, and Chappell (2009), for instance, report that the market value of the contribution of Canada’s informal caregivers was between \$24 and \$31 billion in 2007, accounting for 1.6 to 2.0 percent of Canadian GDP.

In the US, in 2009, caregivers were estimated to have an economic value to be around \$450 billion (Family Caregiver Alliance, 2011). To put this amount in perspective, \$450 billion is more than total spending for Medicaid, including state and federal contributions that totaled 200 billion in the US in 2005 (Gibson & Houser, 2007).

It is therefore no surprise to hear that in the US, informal caregivers are often referred to as a national resource.

Benefits

Chappell and Dujela (2008) found that caregivers could be both burdened and experience good or high levels of well-being at the same time - finding inner enrichment and growth even as they contend with mounting burdens (Pearlin et al., 1990). The literature shows that many informal caregivers providing care do so gladly and feel positively about their role. Caregivers may find personal fulfillment and satisfaction from helping to relieve another's suffering (Family Caregiver Alliance, 2006). It is those, however, who have heavier commitments that are more likely to feel negatively (Goodhead & McDonald, 2007). Likewise, the quality of the relationship between the caregiver and care recipient influences how positively caregivers perceive their role (Goodhead & McDonald, 2007). For example, in a study by Rajnovich, Keefe, and Fast (2005), more than 70% of both men and women caregivers stated that caregiving had strengthened their relationship with the care recipient.

Though being a caregiver can benefit the caregiver in various fashions, there are also several deleterious effects associated with informal caregiving. Informal caregiving has been shown to place heavy demands on caregivers. The importance of caregiver health while meeting these demands is crucial and should not be underestimated, particularly since many of the negative effects associated with caregiving are irregular, persistent, and uncontrollable (AARP, 2008).

Conditioning Variables

Several personal variables of informal caregivers, such as their coping strategies, personality factors, or social support, are often presumed to be conditioning variables in

the caregiving stress process (Kim & Given, 2008). Studies have documented that age, educational level, and ability to participate in valued activities plays a role in caregivers' levels of emotional stress (Goldstein et al, 2004; Sansoni, Vellone, & Piras, 2004; Swartz & Kein, 2007). Furthermore, Collins and Swartz (2011) noted that caregivers reporting the highest burden are more likely to be less educated, to live with the care recipient, and to perceive they had no choice in assuming the caregiver role. Reports from other studies (Given et al., 2004; Hagedoorn, Sanderman, & Buunk, 2002; Nijboer et al., 2000; Kurtz, Given, Kurtz, & Given, 1994) also reported a higher level of psychological distress among female caregivers. Moreover, Hagedoorn et al. (2002) reported that women who perceived themselves as lacking confidence and/or competence in respect to caring for a loved one experience higher levels of distress than men.

Another previously studied caregiver conditioning variable is age. The literature, however, has been inconsistent with regard to age differences in caregiver health. Some studies have found poorer physical health among older caregivers (e.g., Navaie-Waliser et al., 2002), whereas Harwood, Barker, Ownby, and Duara (2000) found no significant age differences. In terms of relationship to the care recipient, spouses may report worse physical health than adult children do, often however because they are older and more likely to show age-related physical decline. Such as with age, the literature is inconsistent with regard to relationship. Many adult children have additional family and work responsibilities which have been shown to conflict with caregiving (Pinquart & Soerenen, 2007). Dumont et al., (2006) also supported the notion that young caregivers may experience higher psychological distress, particularly closer to the impending death of their care recipient. Young caregivers may experience impending death (and death) as a very traumatizing event – which only adds to their familial and professional stresses

and responsibilities (Given et al., 2004; Goldstein et al., 2004). Conversely, Pinquart and Sørensen (2003) noted, in their meta-analysis, that spousal caregivers had higher levels of objective burden than adult child caregivers and fewer psychological and physical resources to cope with stressors. In fact, after statistically controlling for the care receiver's illness and caregiver age, the negative effect of caregiving was larger in samples with more spouses for stress, physical health, and self-efficacy (Pinquart & Sørensen, 2003).

Caregiver Health

Previous studies have indicated that being a caregiver is linked to negative psychological and physiologic health consequences. As a result, the ability to provide effective care may become limited (CCS, 2012). Shaw et al. (1997) noted that the poor health of caregivers may be due to factors such as (a) the effects of physical exertion (e.g., yielding skeletal injuries and aggravating chronic illnesses such as arthritis); (b) negative changes in health-related activities (e.g., diet and PA); (c) the physiological effects of psychological distress (e.g., depression and anxiety, which increase vulnerability to infections); and (d) changes in sympathetic arousal and cardiovascular reactivity (e.g., increasing the risk for hypertension and cardiovascular disease). For these reasons, caregivers and family members of cancer survivors are often described as 'second order patients' (Lederberg, 1998) or 'secondary survivors' (Aziz, 2002; Aziz & Rowland, 2003). Furthermore, in Twonbly's (2004) article, Dr. Rowland, director of the Office of Cancer Survivorship, notes that the definition of cancer survivorship was broadened "to highlight the fact that family members are often 'secondary survivors' that are often profoundly affected by the cancer diagnosis of a loved one" (p. 1414). What's more, the definition of survivorship, in the dictionary of cancer terms on the National

Cancer Institute's website, states that, "family members, friends, and caregivers are also part of the survivorship experience" (National Cancer Institute, 2012).

Psychological. One of the greatest risks for caregivers is becoming ill themselves (Kelly, Reinhard, & Brooks-Danso, 2008). Psychological disorders previously reported in caregivers include panic disorder, major depressive disorder, post-traumatic stress disorder, and generalized anxiety disorder (Sansoni et al., 2004; Vanderwerker, Laff, Kadan-Lottick, McColl, & Prigerson, 2005; Winslow, 2003). Research studies undertaken at the Tug McGraw Research Center (TMRC) in the Preston Robert Tisch Brain Tumor Center at Duke University have also shown that a high percentage (72%) of the caregiver population report elevated levels of stress (Swartz & Keir, 2007). In another study, Butler, Turner, Kaye, Ruffin, and Downey (2005) found mood disturbance or psychological distress to occur in 32 – 50% of caregivers.

According to the Canadian Mental Health Association (2004), caregivers of persons with mental illness were most likely to feel stressed in terms of their emotional health, with close to eight in 10 reporting that caregiving has resulted in significant (29%) or some (48%) emotional difficulties for themselves. Several studies have also shown that caregivers who feel overloaded by the amount of care they provide are at higher risk for depression (Yates, Tennstedt, & Chang, 1999; Haley, Levine, Brown, Berry, & Hughes, 1987; Dura, Stukenberg, & Kiecolt-Glaser, 1990; Gallagher, Wrabetz, Lovett, Del Maestro, & Rose, 1989) and anxiety (Kiecolt-Glaser & Glaser, 2001; Schulz, O'Brien, Bookwala, & Fleissner, 1995; Schulz & Beach, 1999). This risk, however, has been shown to be mediated by the quality of their relationship with the care recipient (Yates et al., 1999). Furthermore, when compared to non-caregivers, Pinquart and Sörensen (2003) suggest that caregivers fare worse than non-caregivers with respect to

five indicators of psychological and physical health. The authors discovered, in their meta-analysis, that caregivers are more stressed and depressed, and have lower levels of subjective well-being, physical health, and self-efficacy than non-caregivers (Pinquart & Sørensen, 2003). Finally, Vitaliano et al. (2003) reported an 11% prevalence rate for major and minor depression among non-caregivers as compared to 22% among caregivers.

Social and physical. While fulfilling the role of caregiver, caregivers often give up social activities and leisure time in order to provide care (Keating, Fast, Frederick, Cranswick, & Perrier, 1999) and often lose friends and feel isolated (Haley et al., 1987; Keefe, 2011). Caregivers often have difficulty maintaining social networks either because they do not have the time or energy to maintain them or because friends stop visiting (Cranswick & Dosman 2008). Moreover, providing care can interfere with the caregiver's ability to participate in valued activities (such as social outings & PA) and caregivers are less likely to engage in preventive health measures (Collins & Swartz, 2011). This disruption in lifestyle, as shown in patient studies of caregivers of stroke survivors, can result in emotional distress (Evans, Bishop, & Haselkorn, 1991). Specifically, the authors noted that more lifestyle interference was associated with more emotional distress, regardless of the level of care provided.

Physically, Patterson and Grant (2003) and Vitaliano, Zhang, and Scalan (2003) note that psychological distress, such as caregiver burden and depression, may cause negative hormonal changes and interrupt health habits such as healthy eating patterns and getting enough sleep. Consistent with these findings, caregiving has been associated with a variety of damaging physical conditions, including an increased vulnerability to physical illness (Chenoweth & Spencer, 1986; Kiecolt-Glaser & Glaser, 1989),

respiratory infections, hypertension, eating disorders, poor health habits (Carter & Chang, 2000; Chentsova-Dutton et al., 2000; Mitteman, Roth, Haley, & Zarit, 2004; Baron, Cutrona, Hicklin, Russell, & Lubaroff, 1990), compromised immune function (Kiecolt-Glaser & Glaser, 1989), increased mortality, and higher use of psychoactive medications (Kiecolt-Glaser & Glaser, 2001; Schulz et al., 1995; Schulz & Beach, 1999).

Two meta-analyses assessing the physical health of caregivers have found that informal caregivers have poorer physical health than non-caregivers, measured both by perceived health (Pinquart & Sørensen, 2003) and by objective health measures such as stress hormones, antibodies, and medication use (Vitaliano et al., 2003). One study comparing healing time among caregivers and non-caregivers undergoing punch biopsy found that complete healing took significantly longer in caregivers (9 days longer) as compared to non-caregivers (Kiecolt-Glaser, Maruchar, Malarkey, Mercado, & Glaser, 1995). Additionally, Schulz and Beach (1999) found that spousal caregivers reporting caregiving strain had a 63% greater risk of death (four years later) than non-caregivers.

Other studies assessing subjective health have also shown family or informal caregivers to self-report poorer physical health associated with their caregiving (Kiecolt-Glaser & Glaser, 2001; Schulz et al., 1995; Schulz & Beach, 1999). In a recent study, one in five caregivers described his or her health as fair or poor, and 17% believed that their health had deteriorated as a result of providing care (NAC, 2006). Moreover, one half of American caregivers (53%) reported that the decline in their own health compromises their ability to provide care for the care recipient (NAC, 2006). Therefore, as caregivers struggle to perform their caregiving duties while also fulfilling their various other responsibilities, adverse effects can result not only for the caregiver, but also for the care recipient who may experience added health problems such as reduced QOL and increased

anxiety (Halm & Bakas, 2007). Finally, the physical consequences of caregiving have also been shown to differ according to gender and ethnicity. When asked about their overall health, more than twice as many women (18%) as men (8%) reported that caregiving had affected their health (Keefe, 2011). Additionally, Pinquart and Sörensen (2005) found ethnic minority caregivers to have poorer physical health than Caucasian caregivers.

Informal caregivers represent a vulnerable population due to being exposed to the stresses and pressures of their caregiving role (Mazanec, Daly, Douglas, & Lipson, 2011). These caregivers provide a vital service not only to their care recipients, but also to health professionals and society at large. Without informal caregivers, the present level of long-term care could not be sustained. Thus, supporting family caregivers and their ability to provide care at home or in the community is essential to the health care system (Family Caregiver Alliance, 2006). Under some circumstances, however, caregiving is transformed from a regular exchange of assistance to an extraordinary and disproportionate service.

Identifying a Vulnerable Caregiving Population: Caring for Cancer Survivors

The development of a serious and prolonged illness, such as cancer, is a circumstance in which caregiving may pose extra challenges (Pearlin et al., 1990). Specific and appropriate services may be even less available or obtainable than for caregivers in general. The course of the cancer experience, from diagnosis and treatment to survivorship or end of life, offers numerous significant and unique challenges that may negatively affect informal caregivers (Kim & Given, 2008; Kitrungle & Cohen, 2006). Unlike caregiving associated with dementia or other chronic illnesses, cancer caregiving

has been depicted as having an abrupt onset and unpredictable course with the highest intensity during the treatment and end-of-life phases (Kim & Schulz, 2008). The number of cancer caregivers is yet to be widely researched, however, it is expected that the prevalence of cancer will continue to increase, leading to more and more reliance on informal caregivers to support individuals from initial diagnosis to throughout the course of treatment (Edwards et al., 2002). Moreover, medical advances have led to a growing number of cancer survivors requiring some degree of caregiving to assist in coping with side effects, psychosocial needs, and cancer recurrence (Haylock, 2010). As such, more cancer survivors with increasingly complex needs are being cared for at home at various points during their cancer journey (Bliss, Watson, Given, Baird, & Klatt-Ellis, 1994). In Canada, the healthcare system restructuring that has occurred over the past decade in all provinces and territories has resulted in more cancer-related services being delivered in the home – and it is not slowing down. With rising healthcare costs, cancer patients will continue to receive treatments in outpatient settings; the task of which frequently falls on a family member or loved one who takes on the role of caregiver. Therefore, despite the many other obligations and responsibilities that characterize their lives, family members and loved ones are increasingly replacing skilled healthcare workers in the delivery of unfamiliar complex care to cancer survivors (Baider, 2011). Today, informal caregivers of cancer survivors are required to act as an extension of the healthcare system. Blum and Sherman (2010) note that informal (family) caregivers provide more than half the care required by cancer survivors; typically it is the spouses/partners or adult children that provide this care (Caregiving in the United States, 2009). For the purpose of this study, the term “cancer caregiver” refers to anyone who provides uncompensated physical, emotional, social, financial, or personal care and/or support to a cancer survivor (Given,

Given, & Kozachik, 2001; Yabroff & Kim, 2009; Blum & Sherman, 2010).

Cancer caregiving. Caregiving in the context of cancer often involves long-term commitment, and as is the case with other caregivers, the care provided is often continuous and typically performed for several months or years. The literature on cancer caregivers underlines five main points, namely: (1) the increasing number of patients with ongoing chronically complex care needs, (2) the increasing number of complicated tasks assumed by informal caregivers, (3) the high number of unmet caregiver needs, (4) the subjective nature of the caregiving experience, including positive and negative components, and (5) the conceptualization of caregiver burden as linked to negative effects of caregiving (Groo, Dahl, Moum, & Fossa, 2005; Thomas & Morris, 2002).

Regrettably, such as with caregivers of persons with other illnesses or disabilities, most social network members who take on the cancer caregiving role are ill prepared (Kim & Given, 2008) and receive little support or information to help them carry out their vital role (Bishop, et al., 2007; Given et al., 2001). Cancer caregivers are often expected to find their own way in an increasingly difficult and fragmented health care system (Arno, Levine, & Memmott, 1999). Consequently, many report feeling inadequately trained for the clinical care tasks that they provide (van Ryn et al., 2011).

Responsibilities. Recently, the caregiving responsibilities of those caring for a cancer survivor have increased significantly, mainly due to the use of toxic treatments in outpatient settings, the shortage of health care providers, and limited health care resources (Northouse, Katapodi, Song, Zhang, & Mood, 2010). The cancer caregiver role has changed dramatically from promoting convalescence to providing high technology care and psychological support in the home (Baider, 2011). Providing care for cancer survivors is complex and technical, and requires intellectual refinement and physical

endurance (Hudson, 2004; Proot et al., 2004). Informal cancer caregivers are required to meet multidimensional needs, including treatment monitoring; treatment related symptom management; emotional, financial, and spiritual support; assistance with personal and instrumental care; transportation and coordination between various appointments; administering treatments; helping with activities of daily living; and attending medical appointments with the cancer survivor (Given et al., 2001; Kim & Schulz, 2008; Cameron, Shin, Williams, & Stewart, 2004). Additionally, cancer caregivers have an essential role in both cancer treatment and longer-term adaptation to the disease, and hold the dual responsibility of caring for and caring about the patient (Kim & Given, 2008).

Several benefits, as previously noted, have been associated with caregiving in general. This may especially be the case with cancer caregiving, which may provide opportunities to find meaning and gain some control over what is typically an extremely difficult and disconcerting experience. The role of cancer caregiver, however, may adversely affect caregivers who lack adequate resources or who are insufficiently prepared for this complex role (Baider, 2011). The experiences of cancer for families have been described as burdensome and stressful. Such burden can arise from numerous sources, including direct care and physical strain; managing uncertainty, worry, and tension; role conflict; economic burden; work adjustments; and sleep disturbance (Yates & Stetz, in press; Archbold, Stewart, Greenlick, & Harvath, 1990; Schumacher, 1995). As such, fulfilling the cancer caregiver role has the potential to be physically, emotionally, mentally, financially, and socially taxing (Schubart, Kinzie, & Farace, 2007; Beesley, Price, & Webb, 2010; Rabow, Hauser, & Adams, 2004).

Conditioning variables. A number of factors may influence the impact of caregiving for a cancer survivor on their caregiver, such as the cancer survivor's condition and the caregiver's coping style and personality characteristics (Weitzner, & McMillan, 1999). Furthermore, as the literature continues to mature on caregivers of cancer survivors, predictor variables for outcomes such as mental health problems have been identified. Several variables have been shown to affect depressive symptoms such as caregiver age, sex, relationship to the patient, length of time as a caregiver, and patient's cancer type (Sörensen & Pinquart, 2002; Kozachik et al., 2001). In addition, cancer caregiver depression appears to be sensitive to sleep deprivation (Carter, 2003; Carter, 2002; Carter, 2006), declines in their own health, perceived burden of caregiving, (Northouse et al., 2002; Kim, Duberstein, Sorensen, & Larson, 2005; Rossi Ferrario, Zotti, Massara, & Nuvolone, 2003), changes in the caregivers' roles, responsibilities, and leisure activities, (Williamson, Shaffer, & Schulz, 1998), and lifestyle interferences and social isolation (Cameron, Franche, Cheung, & Stewart, 2002; Goldstein et al., 2004).

Various factors may also affect a cancer caregiver's QOL, including the type and setting of therapy (curative or palliative), the time since the patient's diagnosis, and comorbidities of both the cancer survivor and caregiver (Weitzner, McMillan, & Jacobsen, 1999; Kim & Given, 2008; Gourin, Boyce, Vaught, Burkhead, & Podolsky, 2009). One of the most consistent predictors of negative health outcomes for cancer caregivers, including QOL, is gender. Studies consistently demonstrate women reporting higher rates of depression and anxiety, and lower life satisfaction and QOL ratings when compared with men. Furthermore, Nijboer et al. (2001) found that women caregivers may also experience greater personal loss and limitations in activity and report greater burden and more unmet needs than male caregivers. One explanation for this gender difference is

that women receive less support or acknowledgment for their caregiving role than male caregivers. Women have also been reported to be more likely to be the sole caregiver, providing, on average, double the amount of hours of care than men. Additionally, the care provided by women tends to be more intensive and complex than that provided by males (Sjovall et al., 2009). Interestingly however, research has found no significant gender differences in total involvement in care. Although women caregivers do report doing more personal care tasks and household chores than men, the effect sizes have been found to be “quite small” (Yabroff & Kim, 2009; Navaie-Waliser, Spriggs, & Feldman, 2002; Hodges, Humphris, & Macfarlane, 2005).

For many cancer caregivers, physical and psychological outcomes appear to be mediated by their perception of burden in contrast with perceived positive aspects of the role (Kurtz, Kurtz, Given, & Given, 2004; Goldstein et al., 2004; Glajchen, 2004; Kim, Schulz, & Carver, 2007). However, Kurt et al. (2004) found that the perceived burden was not necessarily associated with the number of caregiving hours or the severity of the patient’s symptoms. Instead, the caregivers’ perception of burden was influenced more by a lack of confidence (less self-efficacy), insufficient preparation to complete certain skills (Nijboer, Triemstra, Tempelaar, Sanderman, & van den Bos, 1999), lifestyle disruptions (Cameron et al., 2002), and constraints in activities (due to caregiving), leading to social isolation (Williamson, Shaffer, & Schulz, 1998). Authors also report that many of the cancer survivor’s variables may influence the caregiver’s burden, such as physical impairment, obscurity of symptoms, or loss of physical functioning (Dumont et al., 2006; Given et al., 1993; Harding, Higginson, & Donaldson, 2003; Grov, Fossa, Sorebo, & Dahl, 2006). Additionally, greater distress in cancer caregivers tended to be associated with their perceptions of a patient’s advancing disease (Burrige, Barnett, &

Clavarino, 2009). Likewise, in the situation of advanced cancer, subjective caregiving burden was a higher factor in predicting caregivers' depression or distress (Dumont et al., 2006; Braun, Mikulincer, Rydall, Walsh, & Rodin, 2007). Therefore, as cancer progresses, both patient and caregiver needs increase exponentially (Giarelli, Pisano, & McCorkle, 2000).

Finally, in addition to the various predicting variables mentioned above, employed cancer caregivers are particularly vulnerable to the negative effects of stress as they attempt to juggle the demands of work and caregiving (Gaugler et al., 2008; Kim, Baker, Spiller, & Wellisch, 2006). As such, higher levels of depressive symptoms have been found in employed cancer caregivers (Given et al., 2004). However, authors have noted that working may also provide positive benefits to caregivers such as reprieve from the strain of caregiving, economic security, and social support (Gysels & Higginson, 2009; Kim et al., 2006; Swanberg, 2006).

Financial toll. Such as with other caregivers, the demands of cancer caregiving can also lead to lost wages or even having to leave the workforce entirely; potentially resulting in further personal and social effects. For cancer caregivers, the sudden onset and uncertainty of the cancer caregiving trajectory can lead to missed time from work, work interruptions, decreased productivity, and even job resignation (Swanberg, 2006).

Findings from a 2004 study showed that the majority of cancer caregivers experienced an adverse impact on their employment, particularly during the palliative phase of caregiving (Grunfeld, et al., 2004). This finding is consistent with results from other studies of family caregivers of cancer patients (Hayman, Langa, & Kabeto, 2001; Philp, McKee, Meldrum, 1995; Covinsky, Goldman, & Cook, 1994). In Grunfeld et al.'s (2004) study, 5% of cancer caregivers had to quit their job or declined advancement, and

a large proportion lost work hours or used special leave or holidays to fulfill their caregiving responsibilities. The authors further documented substantial psychological, occupational, and economic burdens associated with cancer caregiving as patients' functional status declined and death approached (Grunfeld et al., 2004).

National data pertaining to American family caregivers of cancer survivors estimates that cancer caregivers average providing care for 8.3 hours per day for 13.7 months (Yabroff & Kim, 2009). Van Houtven, Ramsey, Hornbrook, Atienza, and van Ryn (2010) reported that over the course of the cancer journey, the value of lost employment and out-of-pocket expenses was \$7,028 in the first year following diagnosis (derived from the value of the caregiver's time providing care). Furthermore, this value was \$19,701 from one year to six months before death, and \$14,234 in the six months before death (Van Houtven et al., 2010). Although time and out of pocket costs demonstrate the sizeable financial burden imposed on those who take on the role of caring for a cancer survivor, a large part of the cancer caregiving literature focuses on the negative psychological and physical consequences of cancer caregiving, which financial hardship may exacerbate.

Many studies have examined the psychological and physical toll that caring for a cancer survivor can have (Bishop et al., 2007; Kim & Given, 2008; Northouse et al., 2002; Wagner, Bigatti, & Storniolo, 2006; Northouse et al., 2005), often noting decreased functioning across multiple physical and mental domains, such as physical functioning, social involvement, energy, and sleep (Aranda & Hayman-White, 2001; Given et al., 1993; Kurtz et al., 2004; Popadopoulos et al., 2011). Moreover, several studies have specifically reported reduced QOL (Kim & Given, 2008; Kitrungrote & Cohen, 2006; Kim, Spillers, & Hall, 2010), psychological distress - including depression, anxiety, and

anger (Kim & Given, 2008; Janda et al., 2008; Gough & Hudson, 2009; Molassiotis, Wilson, Blair, Howe, & Cavet, 2010; Couper et al., 2006; Hinnen et al., 2008; Pitceathly & Maguire, 2003; Janda et al., 2008), and negative physical changes in cancer caregivers (Carter, 2002; Stenberg, Ruland, & Miaskowski, 2010; Barg, 1998; Ramirez, Addington-Hall, & Richards, 1998).

Cancer Caregiver Health

Psychological distress. Psychological distress is often discussed in psychological, nursing, social science, and medical literature (Lazarus 1998, Bruch et al., 2000, Masee, 2000). Psychological distress is one of the most studied aspects of QOL in cancer caregivers (Kim & Given, 2008), particularly in the advanced stages of cancer (Pitceathly & Maguire, 2003; Kim & Given, 2008; Janda et al., 2008; Gough & Hudson, 2009; Molassiotis et al., 2010; Grov et al., 2005). Psychological distress is present in the cancer caregiver population, with caregivers of advanced cancer patients often showing impaired cognitive functioning and meeting the criteria (MacKenzie, Smith, Hasher, Leach, & Behl, 2007), or being treated for, psychiatric problems (Vanderweker, Laff, Kadan-Lottick, McColl, & Prigerson, 2005). Anxiety and depression are two of the most commonly reported problems for cancer caregivers, with estimates for depression at 39% (Braun et al., 2007) and for anxiety at 40% (Janda et al., 2007). Hagedoorn et al. (2000) also report that cancer caregivers experience high rates of anxiety and depression, with 20% to 30% of all cancer caregivers believed to be at high risk for psychiatric morbidity. As advanced cancer progresses and patients continue to receive treatment, their needs increase exponentially (Giarelli, Pisano, & McCorkle, 2000). What is often not recognized during this time, however, is that the needs of the cancer caregivers also increase drastically. A study by the Quebec Government cited in Dumont et al. (2006)

found that overall, family caregivers of terminally ill cancer patients experience psychological distress that tends to increase as the cancer survivor's mobility declines. The results of the study show that 40% to 60% of family cancer caregivers who care for a loved one during the end of life experience a high level of psychological distress, especially as the patient's independence declines. Regrettably, despite high levels of stress, cancer caregivers rarely use any form of mental health services to help cope with their own emotional distress (Bishop et al., 2007; Vanderwerker et al., 2005); putting them at risk for long-term health problems.

Two meta-analyses (Hodges et al., 2005; Hagedoorn et al., 2000) examined the relationship between the psychological distress of patients with cancer and their primarily spouse caregivers and found that their responses to cancer were interdependent. That is, each person affected the other's level of emotional well-being. Finally, Bambauer et al. (2006) found that when cancer survivors meet the criteria for a psychiatric disorder, their caregivers are 7.9 times more likely to also meet the criteria. Bambauer et al.'s (2006) findings are consistent with other research noting informal cancer caregivers are prone to psychological distress and emotional burden (Gaugler et al., 2005; Kim & Given, 2008).

Caregivers and the general population. Research has shown that cancer caregiving can often result in greater psychological distress or depression and reduced QOL as compared to the general population or non-caregiving controls (e.g., Pot, Deeg, & Van Dyck, 2000; Stenberg, Ruland, & Miaskowski, 2010; Nijboer et al., 1999). In a study by Segrin and Badger (2010), the authors noted that spouses/partners of cancer survivors exhibited significantly elevated depression and negative affect when compared to the general American population. Furthermore, the authors noted that the adult

children of cancer survivors also had elevated depression (Segrin & Badger, 2010). Segrin and Badger's (2010) findings displayed that spouses, siblings, parents, adult children, cousins, and friends of cancer survivors all experienced states of distress to a comparable degree. Moreover, the cancer survivor's adult children had even higher depression scores than did the spouses/partners or the general population. As a unit, the cancer survivor's adult children had depression levels beyond the threshold for significant depression (Segrin & Badger, 2010). Therefore, while spouses/partners of cancer survivors are at greater risk of depression (Braun et al., 2007), recent findings demonstrate that those fulfilling the caregiver role, regardless of relationship to cancer survivor, are also at risk (Segrin & Badger, 2010).

Caregivers and their care recipients. It has been documented that as a consequence of providing care, caregivers of cancer survivors will sometimes experience psychological distress that is on par with, or in excess of, the distress experienced by the survivors themselves (Couper et al., 2006; Manne et al., 2007; Rabin et al., 2009; Han & Haley, 1999; Low et al., 1999). In several studies (Braun, Mikulincer, Rydall, Walsh, & Rodin, 2007; Matthews, 2003; Mellon, Northouse, & Weiss, 2006; McCorkle, Siefert, Dowd, Robinson, & Pickett, 2007; Hodges, Humphris, & Macfarlane, 2005; Grunfeld et al., 2004; Weitzner, McMillan, & Jacobsen, 1999), the family caregiver's mental health burden and psychological morbidity was equal to or exceeded that of the patient with cancer. Furthermore, a greater percentage of spouses in Braun et al.'s (2007) study had clinically significant levels of depression compared to the survivors themselves (39% vs. 23%). The authors also noted that approximately 40% of cancer survivors' spouses score above the cutoff for clinically significant depression on the Beck Depression Inventory-II. Hinnen et al. (2008) also found that levels of distress reported by husbands of breast

cancer survivors did not differ significantly from the level reported by the patients. Finally, findings from Sjøvall et al. (2009), involving over 11,000 spouses and partners of cancer survivors, showed that the risk of psychiatric diagnosis doubled following the diagnosis of their partner's cancer (Sjøvall et al., 2009).

Therefore, not only does the literature suggest higher levels of depression and anxiety in cancer caregivers than in the general population, but it also suggests that cancer caregivers' levels of depression and anxiety may be higher than in the cancer survivor themselves (Pitceathly & Maguire, 2003; Janda et al., 2008; Gough & Hudson, 2009; Grov et al., 2005). As such, cancer caregivers should not be considered only as "carers", but also as potential patients (Dumont et al., 2006).

QOL. The extent to which cancer caregivers are negatively affected by their new role relates to their own QOL and psychological well-being (Ferrell et al., 1995; Ferrell, Grant, Padilla, & Vemuri, 1991; Haley et al., 2003). QOL is a multidimensional construct that can be considered a health status and/or an outcome of health care and rehabilitation (Kim & Given, 2008). Predominant views of what constitutes the major dimensions of QOL in literature encompass the interactions of physical, social/familial, emotional, spiritual, and functional well-being (Chase et al., 2010; Dow et al., 1996; Ferrell et al., 1995; Haley et al., 2003; Kim, & Given, 2008); the most studied aspect of QOL being psychological distress.

Reduced QOL can be an indication of disease, functional disability, or an expression of negative social circumstance. The course of the cancer experience, from diagnosis and treatment to survivorship or end of life, offers numerous significant and unique challenges that may negatively affect the QOL of informal caregivers (Kim & Given, 2008; Kitrungrrote & Cohen, 2006). One recent study detailed the relationship of

unmet cancer caregiver needs and QOL outcomes at two months and two and five years post diagnosis (Kim, Kashy, Spillers, & Evans, 2010). Caregivers whose psychosocial needs were not met showed poorer mental health at all three time points. The authors determined that unmet psychosocial needs were a predictor of poor mental health, even while accounting for the effects of a multitude of demographic variables. Recently, Vedhara et al. (2000) reported decreased QOL associated with stressors such as duration and intensity of care, recurrence of illness, caregiver demands, and patient impairment. Additionally, Boyle et al. (2000) reported a significant relationship between stressors such as role change, responsibility, caregiving experience, and lifestyle interference and QOL in caregivers. Moreover, there is also evidence that changes in family roles and the burden placed on family cancer caregivers have negative effects on the QOL of both cancer patients and their caregivers, particularly during advanced stages of cancer (Grover et al., 2006). Likewise, certain high-stress periods of cancer caregiving, such as diagnosis and treatment, may be particularly demanding and have a negative impact on the caregiver's QOL (Persson, Ostlund, Wennman-Larsen, Wengstrom, & Gustavsson, 2008).

Recently, a study by Kim, Spillers, et al. (2010) investigated the long-term impact of cancer on family caregivers' QOL. Three groups of caregivers were identified, namely: caregivers of cancer survivors in remission, caregivers whose care recipients were deceased, and current caregivers. Current caregivers reported the worst levels of QOL. Bereaved caregivers reported lower levels of psychological and spiritual adjustment than former caregivers whose care recipients were in remission. Although reduced QOL may be worse in current caregivers, these findings bring awareness to the long-term impact of cancer on the caregivers' QOL. The authors showed that family

members who remain in an active caregiver role continue to suffer from poor QOL five years after the initial cancer diagnosis of a family member. These findings help increase evidence-based awareness of the deep and lasting impact cancer can have on caregivers' QOL.

Physiology. As previously mentioned, QOL includes not only psychological and social aspects, but aspects of physical functioning as well. Studies have highlighted that informally caring for a relative or friend with cancer or advanced incurable disease can also be associated with many physical problems, such as sleeplessness, general deterioration in health, and exhaustion (Barg, 1998; Ramirez et al., 1998). Cancer caregivers have also been found to exhibit pain, fatigue, appetite disturbance, and moderate-to-severe sleep problems (Carter, 2002; Carter, 2006; Matthews, Baker, & Spikers, 2003). What's more, the physical stress associated with cancer caregiving can lead not only to considerable physiologic changes and medical illness, but also to a greater risk of mortality (Dumont et al., 2008). In one of the few studies specific to cancer, Beesley et al., (2010) found that 56% of 101 long-term caregivers of ovarian cancer survivors reported having at least one negative change in their health behaviours since becoming a caregiver. Specifically, physical inactivity and weight gain were the most common. Although cancer caregiver physical health problems such as fatigue and pain have often been studied (Carter, 2002; Stenberg et al., 2010), the health promotion behaviours of cancer caregivers, such as PA, have been explored to a much smaller degree.

The Gap in Cancer Caregiver Health

Previously, improving cancer caregiver's QOL and psychological distress with the use of PA interventions has not been a focal point of research. As illnesses such as

cancer become more prevalent and the healthcare system becomes increasingly overwhelmed, many cancer survivors will require greater informal voluntary caregivers (Rivera, 2009). However, should the caregiver experience any negative health outcomes, their ability to persist to care for the cancer survivor may be impaired. As such, caregivers who experience distress may negatively impact the cancer survivor (Van Puymbroeck, Payne, & Hsieh, 2007; Baider, 2011). Moreover, a correlation exists between the unmet needs of caregivers and the unmet needs of the cancer patient (Molassiotis et al., 2010). Understanding and alleviating distress in cancer caregivers is essential and has implications for the abilities of the caregivers to provide effective assistance and support to the cancer survivor throughout their cancer journey (Segrin & Badger, 2010). The continued reliance on cancer caregivers, without clear recognition of or response to their own support needs could lead to negative effects, which in turn, can affect their QOL and psychological distress. Further, these negative QOL and psychological distress effects can result in negative consequences for the cancer survivor, as well as other loved ones and society at large.

Many studies have evaluated QOL and psychological distress in cancer caregivers (e.g., Haley et al., 2003; Boyle et al., 2000; Couper et al., 2006; Vedhara et al., 2000; Manne et al., 2007; Gaugler et al., 2005; Rabin et al., 2009). Few studies, however, have sought to improve QOL and reduce psychological distress with the use of PA. Additionally, intervention studies for cancer caregivers have largely focused on the patient or how the caregivers can specifically assist the cancer survivor, such as improving patient outcomes and caregiving skills and awareness (Waldron et al., 2012). For example, cancer caregiver interventions have focused on educating caregivers about how to find psychosocial resources (Bultz, Speca, Brasher, Geggie, & Page, 2000;

Pasacreta, Barg, Nuamah, & McCorkle, 2000; Kozachik et al., 2001), managing the care recipient's symptoms (Smeenk, van Haastregt, de Witte, Crebolder, 1998; Grimm, Zawacki, Mock, Krumm, & Frink, 2000), seeking out medical information (Kim & Given, 2008), and developing the caregivers' confidence and comprehension (National Cancer Institute at the National Institutes of Health, 2011). Furthermore, most intervention studies for cancer caregivers have been conducted jointly with the cancer survivor; less attention has specifically been paid toward the cancer caregivers themselves (Cochrane & Lewis, 2005; Beesley et al., 2010).

Cancer Caregiver Interventions

From a recent meta-analysis of randomized controlled trials conducted with cancer caregivers alone or jointly with the patient, Northouse et al. (2010) identified three types of interventions: (1) psycho-educational (57%), which primarily provided information about managing the cancer patients' symptoms as well as physical and emotional aspects; (2) skills training (26%), which primarily focused on the development of the cancer caregivers' communication, problem-solving, and coping skills; and (3) therapeutic counseling (17%), which focused primarily on strengthening patient-caregiver relationships and dealing with loss. Of these interventions, the majority (63%) were delivered together to patients and caregivers. The remaining (37%) were delivered to caregivers only, usually to deal with their fears and increase their skills. Most of the interventions were delivered face-to-face (69%), while the rest were delivered by telephone (20%) or in a group format (11%). The intervention sessions varied in number and length, from 1.7 hours to 18 hours ($M=7.5$ hours), and from two to 16 sessions ($M=6.7$ sessions). Most of the caregivers in the studies were spouses (84%), female (61%), and white (84%) (Northouse et al., 2010).

Further, in a recent review of interventions for caregivers of cancer patients and persons with chronic illness (Northouse et al., 2012), five meta-analyses addressed the question: *What effect do interventions have on caregiver and patient outcomes?* Although results may depend on the content, number, and length of the interventions, as well as which outcomes were assessed, the meta-analyses of studies in both the cancer and chronic illness populations showed that interventions can have positive effects on caregiver outcomes, such as QOL (Northouse et al., 2012). Positively, these interventions often have positive effects on patient outcomes as well; however, they are seldom implemented.

Finally, in one of the most comprehensive reviews examining psychosocial interventions to improve the QOL of adult cancer caregivers, Waldron, Janke, Bechtel, Ramirez, and Cohen (2012) examined six randomized controlled trials. Waldron et al.'s (2012) systematic review is the only one exclusively examining studies measuring QOL outcomes in cancer caregivers using methodical and replicable approaches. In their review, primary caregivers were spouses/partners, siblings, children, other relatives, or close friends. In line with the literature, of the four studies that described caregiver gender, 81.9% of overall caregivers were female (Waldron et al., 2012).

In their review, Waldron et al. (2012) identified a variety of psychosocial intervention techniques such as coping skills training (n=2), problem solving (n=1), enhanced sleep habits (n=1), and improving communication between caregiver and cancer survivor (n=4). In the majority of the studies reviewed (n=5; 83.3%), educational elements delivered to the cancer caregivers included information on treatment side effects, expected patient outcomes, and possible long-term effects of cancer for both the patient and caregiver. Four of the studies (66.7%) utilized supportive techniques while

the remaining two studies (33.3%) utilized problem skills training (Waldron et al., 2012). Half of the interventions were offered jointly to cancer patients and their caregiver. The remaining 50% were offered solely to the caregiver. Three interventions were delivered face-to-face (50%), one intervention (16.7%) tested the efficacy of a telephone-based intervention, and two interventions (33.3%) used combinations of face-to-face and telephone sessions. The overall attrition rate was 32.8%, varying from 10.6% to 54.7% from baseline to the first follow-up. Of the studies reviewed, problems with retention included changes in caregiver's health, scheduling issues, caregiver strain, and patient death (Waldron et al., 2012). Five of the six studies (83.3%) examined promoted changes in QOL as a primary outcome. In two of the six studies (33.3%), a statistically significant improvement in general QOL was reported. In the remaining four studies (66.7%), no significant change in QOL was noted.

Generally, current systematic reviews and meta-analyses focus on caring-related changes (Stenberg et al., 2010), improving the cancer knowledge of caregivers (Bevan & Pecchioni, 2008), the negative impact of caregiving on carers' mental and physical health (Nijboer et al., 1998), and caregiving at the end of life (Bee, Barnes, & Luker, 2009). While these reviews provide an important framework to recognizing the needs of cancer caregivers, they lack assessing interventions that are not psychosocial-based that could decrease the negative impact of caring for a loved one with cancer. Furthermore, although caregivers need and want information to help them fulfill their new role, many studies identified in these reviews have high attrition rates. As such, these interventions may not be the most appropriate methods to increase QOL and reduce psychological distress (Waldron et al., 2012). While cancer caregivers are increasingly being recognized for the essential support they provide, much remains uncertain about how to best support

them.

Caregivers of chronically ill individuals, such as those with cancer, characterize a new group worthy of attention, research, and interventions specifically focusing on their own health needs. In light of the mounting evidence regarding the negative effects of cancer caregiving, interventions aimed at improving overall QOL and reducing overall psychological distress in cancer caregivers is long overdue. Maintaining or improving the QOL and reducing the psychological distress of cancer caregivers is important not only for the caregiver's own health, but also for the caregiver's ability to provide optimal care - simultaneously reducing the weight on the health care system and improving the outcomes of cancer survivors (Mittleman, 2005). Ulger & Yagli (2010) note that employing a PA intervention may be the foremost method to improve QOL. Furthermore, PA has also consistently been shown to have positive effects on psychological distress (Paluska & Schwenk, 2000; Morgan, 1994; Landers & Petruzello, 1994; Bowen et al., 2006; Gautam, Saito, & Kai, 2007).

PA

PA constitutes a crucial element of healthy living; however, at least 60% of the world's population fails to attain the minimum PA recommendations (WHO, 2012). Physical inactivity has been identified as the fourth leading risk factor for global mortality (6% of deaths globally) (WHO, 2012). The general aerobic prescription, as outlined by the Canadian Sedentary Behaviour Guidelines (2012) to achieve health benefits, in adults aged 18 to 64, is to accumulate at least 150 minutes of moderate-to-vigorous-intensity aerobic PA per week, in bouts of 10 minutes or more. It is also beneficial to add muscle and bone strengthening activities, which use the major muscle groups at least twice a week (Canadian Sedentary Behaviour Guidelines, 2011).

Unfortunately, statistics indicate that nearly half of all Canadian adults are not adequately physically active to achieve optimal health benefits (Gilmour, 2007). Likewise, only 31% of American adults engage in regular leisure time PA (U.S. Department of Health and Human Services, 2007). Although the psychological and physical benefits of PA have been well documented over the years, these statistics suggest that an inactive lifestyle is more common than a physically active one – that the majority of individuals, whether healthy or living with a chronic illness, do not regularly engage in PA (Pollock et al., 1998; Blanchard, Courneya, & Stein, 2008; Vanasse, Demers, Hemiari, & Courteau, 2006).

Researchers have highlighted the value and importance of PA as findings suggest that it has positive consequences on mental (e.g., depression, anxiety) and physical (e.g. immune system) health (Paluska & Schwenk, 2000; Cress et al., 1999; Elward & Larson, 1992; Glass et al., 1999). PA has been shown to be associated with numerous physiologic and psychologic health benefits in non-diseased populations such as cardiovascular fitness (Mitchell & Raven, 1994), pulmonary function (Babcock & Dempsey, 1994), anxiety (Landers & Petruzzello, 1994), depression (Morgan, 1994), and self-esteem (McAuley, 1994). More recently, Jennen and Uhlenbruck (2004) also found that PA can prevent negative health effects and may even promote healthy aging. However, despite PA's documented physical and psychological benefits, few PA interventions have targeted cancer caregivers.

Caregivers and PA participation. It has been hypothesized, that part of the negative impact on caregiver health may be due to the reduced probability that caregivers engage in behaviours such as regular PA (Castro, Wilcox, O'Sullivan, Baumann, & King, 2002; Lim & Taylor, 2005; Vitaliano et al., 2002). There is opposing evidence about the

amount and quality of physical health behaviours caregivers engage in such as PA. Conn, Tripp-Reimer, and Maas (2003) suggested that caregiving may particularly affect the time caregiver's spend for leisure activities, such as PA. Some caregivers have been shown to be more likely to meet physical recommendations for exercise than non-caregivers (McGuire, Bouldin, Andresen & Anderson, 2010). McKibbin, Walsh, Rinki, Koin, and Gallagher-Thompson (1999) even report that approximately half of all caregivers exercise regularly. Other studies, however, are less optimistic. Self-report evidence indicates that physical inactivity is prevalent among caregivers (Vitaliano et al., 2002). In line with Vitaliano et al., (2002), Etkin, Prohaska, Connell, Edelman, and Hughes (2008) note that the majority (60%) of caregivers do not engage in consistent, regular PA, and less than a quarter meet or exceed PA recommendations.

Importantly, Hirano et al., (2011) note that leisure score is most strongly associated with care burden. Furthermore, caregivers with high care burden may have less temporal or psychological capacity to spare time for PA. Also, caregivers may be prone to feeling physically fatigued by this sense of burden (Hirano et al., 2011). What's more, care burden has also been associated with depressive mood (Adams, 2008), and Wise, Adams-Campbell, Palmer, and Rosenberg (2006) report that depressive mood generally lowers PA levels. In line with these findings, other studies have reported that psychological distress is a factor associated with lower PA (Kaplan et al., 2001; Lim & Taylor, 2005). As such, reduced PA due to care burden may have some deteriorating effects on caregivers' health. Therefore, interventions attempting to increase leisure activities such as PA may therefore reduce care burden and psychological distress (Hirano et al., 2011). Furthermore, beyond the standard health benefits that cancer caregivers stand to gain from regular PA participation, (Chodzko-Zajko et al., 2009), they

may also be in a better position to meet the physical and mental challenges of caregiving - perhaps also delaying hospitalization/institutionalization of the care recipient. However, because of the time and energy expended in caring for others, cancer caregivers and other caregivers alike often neglect engaging in high levels of PA (Vitaliano et al., 2002; Grundy et al., 2005; Lu & Wykle, 2007).

PA participation in caregivers and non-caregivers. Few studies undertaken with caregivers have scientifically evaluated their PA participation levels relative to similarly aged non-caregivers. Marquez, Bustamente, Kozey-Keadle, and Kraemer (2012) reported that caregivers were significantly more likely to prefer exercise in 10-minute bouts than non-caregivers. Results showed that most of the PA engaged in occurred during the afternoon hours, and patterns of activity over the course of a day did not significantly differ between caregivers and non-caregivers. Both caregivers and non-caregivers accumulated high levels of light intensity activity, with caregivers doing 259 minutes and non-caregivers doing 284 minutes per day (Marquez et al., 2012). Importantly, Marquez et al. (2012) noted that non-caregivers reported greater social support to exercise from family members, and caregivers reported significantly greater anxiety, depression, stress, and negative health symptoms. Moreover, in studies matching caregivers of elders with non-caregivers (Scharlach, Midanik, Runkle, & Soghikian, 1997) or spousal caregivers (Burton, Newsom, Schulz, Hirsch, & German, 1997), no significant differences were found in health promotion behaviours. However, the category of caregivers who provided more assistance with activities of daily living were significantly less likely to exercise and get enough rest (Burton et al., 1997; Scharlach et al., 1997). Interestingly, Fredman, Bertrand, Martire, Hochberg, and Harris (2006) found that older women caregivers reported less exercise than non-caregivers but not less

overall PA. It may be possible that the lack of difference in PA levels between caregivers and non-caregivers can be explained by the activity involved in the tasks completed by the caregivers.

Contrary to the findings above, von Känel et al. (2011) showed that Alzheimer's caregivers were less physically active as compared to non-caregivers; a finding also documented in previous studies (Burton et al., 1997; Schultz et al., 1997). von Känel et al.'s (2011) main finding was that caregivers reporting low levels of PA had significantly greater standardized cardiometabolic risk scores than non-caregivers with the same low PA level. In contrast, when caregivers reported high levels of PA, they had similar cardiometabolic risk scores as non-caregivers with the same high level of PA. Their results suggest that high levels of PA might serve as a defense in cardiometabolic risk in caregivers (von Känel, et al., 2011). Finally, King and Brassington (1997) conducted a population-based survey of family caregivers. Their study indicated that: (a) similar to their non-caregiving peers, physical inactivity is a predominant risk factor among caregivers that requires attention; and (b) a significant amount of both male and female caregivers are interested in improving their PA levels. The fact that PA was rated as more desirable than stress management or other types of health promotion programs (e.g., nutrition, weight control) in King and Brassington's (1997) study, highlights the advantage of developing interventions aimed specifically at promoting regular PA among caregivers.

Caregiver PA preferences. Caregiver preferences and interest in PA, along with other health promoting activities, has rarely been explored in cancer caregivers. To date, few attempts to scientifically evaluate this issue among a more representative population

of cancer caregivers have been undertaken. PA has often not been studied in cancer caregivers and only recently has it gained popular interest in other caregivers.

In one of the few studies involving caregivers and PA preferences, Swartz and Keir (2007) examined stress-reduction preferences in informal caregivers of brain tumour patients (N=60). Eighty-six percent (n=52) of the participants responded that they believed using stress reduction programs could “definitely” or “probably” reduce stress. Only 3% (n=2) of caregivers indicated that they believed stress could “probably not” or “definitely not” be reduced through stress reduction programs (Swartz & Keir, 2007). What’s more, 77% (n=46) of participants also reported having previously participated in exercise and 23% (n=14) in meditation. Importantly, no negative experiences were recorded for either of these programs (Swartz & Keir, 2007). Positively, 81% percent of informal caregivers indicated that they were at least “somewhat” interested in learning about programs to reduce stress.

Encouragingly, in Swartz and Keir’s (2007) study, caregivers were most interested in participating in programs that were exercise based (73%). Male caregivers ranked exercise (70%), massage (70%), soft-belly breathing (55%), and meditation (55%) as their most preferred stress reduction programs. Female caregivers ranked exercise (75%), massage (65%), coping skills (58%), and progressive muscle relaxation (50%) as their most preferred stress reduction programs (Swartz & Keir, 2007). Caregivers preferred to participate or receive follow-up information about stress reduction programs via mail (75%), e-mail (72%), computer program/CD-ROM (58%), in-person (57%), telephone (45%), in small groups (43%), and in large groups (20%). When asked how far they would be willing to travel to participate in a stress reduction intervention, 30% (n=18) of the caregivers responded “not at all”, 48% (n=29) responded “15 minutes”, and

22% (n=13) responded “60 minutes”. Twenty-five percent (n=15) of caregivers were interested in participating in stress-reduction techniques daily, 18% (n=11) twice weekly, and 30% (n=18) weekly. When asked about the length of time one could participate in various programs, caregivers indicated they could participate for at least 15 (22%), 30 (42%), 45 (8%), and 60 (20%) minutes (Swartz & Keir, 2007).

The majority of the caregivers sampled believed that stress reduction programs could indeed help them reduce their stress and were interested in learning more about these programs. In terms of gender, more male than female caregivers believed programs could help them reduce stress (95% vs 83%) (Swartz & Keir, 2007). Of the 11 programs presented to the participants in the study, the most frequently chosen (73%) was exercise. Positively, 47% of caregivers also chose meditation, 47% chose deep soft-belly breathing, and 42% chose yoga (Swartz & Keir, 2007). The data clearly indicate that cancer caregivers are interested in and believe that they are able to participate in some form of stress-reduction program. The results of the study are encouraging. Caregivers of patients with brain tumours are indeed stressed, and they want information to reduce stress and believe that stress-reduction programs and interventions can help. Furthermore, the authors believe that the programs caregivers preferred could be modified safely to the health status of most caregivers. The information obtained by Swartz and Keir (2007) indicates that both men and women prefer interventions that make use of exercise and may be interested in stress-reduction programs such as meditation and yoga. This is promising information since exercise, meditation, and yoga can be safely modified to fit the needs and PA levels of all caregivers (Swartz & Keir, 2007). Contrary to King et al. (2002) who reported that 30 to 40 minute exercise bouts might not be feasible for caregivers given their extensive obligations, Swartz and Keir (2007) noted that the

majority of the sample were willing to travel 15 minutes to participate in a program once a week that lasted 30 minutes – demonstrating that exercise-based stress-reduction programs for informal caregivers are feasible.

Caregivers and PA interventions. In one intervention involving caregivers of persons with dementia, results showed promise in increasing PA levels and adherence to PA (King, Baumann, O’Sullivan, Wilcox, & Castro, 2002). Moreover, a recent six-month telephone-based exercise intervention for female spouse dementia caregivers encouraged participants to exercise in shorter and more frequent sessions if they could not spare larger periods of time (Connell & Janevic, 2009). This study resulted in a significantly greater increase in exercise and exercise self-efficacy and greater reductions in perceived stress relative to controls. A study by Farran et al. (2008) also examined the effects of a telephone-based lifestyle PA intervention in conjunction with standard education/support in a sample of Alzheimer’s caregivers. There were no significant improvements in self-reported PA for the total group; however, 50% of caregivers increased total self-reported minutes and 42% increased total moderate minutes of PA from pre-intervention to post-intervention. Finally, in one of the only studies involving a randomized controlled trial (RCT) and yoga intervention solely for caregivers (N=13), the authors noted a significant increase in lower body flexibility after eight weeks of Hatha yoga (Van Puymbroeck, Payne, & Hsieh, 2007). Importantly, the authors noted that the caregivers who participated in yoga chose to pursue additional yoga instruction; likely indicative of their satisfaction with yoga as an intervention and PA option.

Regular PA represents an important means by which mental and physical functioning can be maintained at the level required to successfully perform caregiving

functions and other tasks of daily living (Bouchard, Shephard, & Stephens, 1994). As such, PA strategies for preventing negative outcomes associated with cancer caregiving and for maintaining caregiver health, functioning, and well-being are vital (Vitaliano, 1990). There is a need for PA interventions for cancer caregivers, as exhibited by caregiver's low levels of PA and reduced QOL and psychological distress. The imperative to deliver safe, effective, evidence-based PA interventions for cancer caregivers using reliable, valid, and quantitative measures to assess changes in overall QOL and psychological distress is great.

Novel Forms of PA

Presently, research involving novel forms of PA is becoming increasingly popular among healthy and chronically ill populations (Speed-Andrews, Stevinson, Belanger, Mirus, & Courneya, 2010; Gimbel, 1998; Mustian, Katula, & Zhao, 2006; Tacon & McComb, 2009; Crew et al., 2007). Many of these novel modes of PA are often categorized as Complementary and Alternative Medicines (National Center for Complementary and Alternative Medicine [NCCAM], 2009). Complementary and Alternative Medicine (CAM) is a term applied to therapies not generally used in mainstream medicine. This term has changed over time, evolving from 'quackery' to 'unorthodox' and 'unconventional', and finally resting on 'alternative' (Cassileth & Deng, 2004). CAM refers to an array of therapies, from alternatives, to complementary modalities. Today, more Canadians are seeking out complementary and alternative medicines for a myriad of reasons. Metcalfe, Williams, McChesney, Patten, and Jette (2010) indicate that approximately 12% of Canadians used some sort of CAM service in the past 12 months.

Mind-body therapies. Mind-body therapies comprise a distinct category of CAM as delineated by the U.S. NCCAM (NCCAM, 2009). Mind-body therapies focus on the interactions of the brain, mind, body, and behaviour, with the intent to ease the mind to affect physical functioning and advance overall health (Elkins, Fisher & Johnson, 2010). Mind-body interventions include such therapies as behavioural therapy, biofeedback, cognitive therapy, guided imagery, hypnosis, meditation, tai chi, yoga, and relaxation. Interestingly, while still considered “alternative”, many of these techniques have become part of mainstream care over the years (Deng, Cassileth, & Yeung, 2004). Currently, treatment for psychological distress, including anxiety and depression, often involve psychological and pharmacological interventions; however, mind-body interventions are becoming increasingly popular as a means to reduce stress in individuals. Mind-body interventions appear to be rising in popularity because of their contribution to improving mood, reducing stress and anxiety, providing a more optimistic attitude in coping, promoting relaxation, and improving overall health outcomes with few or no negative side-effects (Cassileth & Deng, 2004; Elkins et al., 2010). Additionally, the prospect that participants can take control over their own health course and influence their disease or illness by way of mental or emotional work is becoming increasingly important and sought after (Cassileth, 1999).

Evidence from systematic reviews and meta-analyses of randomized trials have provided strong evidence demonstrating that CAM is beneficial in improving QOL and psychological distress (Danahauer et al., 2009; Deng et al., 2004; Astin, Shapiro, & Eisenberg, 2003). One of the most widely used mind-body therapies today is the ancient Eastern discipline of yoga (Wolsko, Eisenberg, & Davis, 2004; Rosenbaum et al., 2004).

Yoga. Yoga has vast appeal throughout the world since it is not linked with any religion and is regarded as a technique of personal growth (Nayak & Shankar, 2004; Feuerstein, 2001; McCall, 2007). The word yoga, which in Sanskrit literally means *yoke*, implies harnessing oneself to a discipline or a way of life (Feuerstein, 2001; Nayak & Shankar, 2004; Lasater, 1997). Yoga philosophy and practice were first described by Patanjali in the classic text, *Yoga Sutras*, which is widely acknowledged as the authoritative text on yoga (Lasater, 1997; Desikachar, Bragdon, & Bossart, 2005). Today, many people identify yoga only with *asanas*, the physical postures of yoga. However, *asanas* are just one of the many tools used for healing. In *Yoga Sutras*, Patanjali outlines an eightfold path to awareness and enlightenment called “ashtanga”, which literally means "eight limbs" (Satchidananda, 2009). The eight limbs are comprised of ethical principles for living a meaningful and purposeful life. Any of the eight limbs may be used separately, but within yoga philosophy, the *asanas* (physical postures) and breathing exercises prepare the mind and body for meditation and spiritual development (Collins, 1998; Maehle, 2006). Based on Patanjali's eight limbs, many different yogic disciplines have developed. Each has its own technique for preventing and treating disease (Williams, Steinberg, & Petronis, 2003). The most commonly pursued yoga styles include Hatha/Raja Yoga (physical development); Gnyana Yoga (developing the intellect); Bhakti Yoga (spiritual devotion); and Karma Yoga (practical action). Yoga as discussed here refers to a practice that combines the physical and spiritual, as developed in ancient India.

Yoga in the West. Yoga is now regarded in the Western world as a holistic approach to health and is classified by the National Institutes of Health as a form of CAM

(NCCAM at the National Institutes of Health, 2012). Yoga is presently experiencing a noticeable increase in popularity in the West, primarily in wellness centers and health clubs. The practice of yoga in the West entails a sequence of *asanas* (physical postures) that incorporate synchronized breathing and a focused mind. A study in 2005 illustrated that 5.5% of Canadian adults (approximately 1.4 million people) practiced yoga (Namasta, 2005). Furthermore, Namasta (2005) reported that 2.1 million Canadians (one in 12 people) said they anticipate trying yoga within the next 12 months. Likewise, yoga is one of the ten most commonly practiced forms of complementary healthcare in the US (Barnes, Powell-Griner, McFann, & Nahin, 2004). Furthermore, according to the 2007 National Health Interview Survey, more than 13 million American adults practiced yoga in the previous year, and from 2002 and 2007, use of yoga among adults increased by one percent (approximately three million people). Finally, the 2007 survey also noted that more than 1.5 million children practiced yoga in the previous year (NCCAM at the NIH, 2012).

In the West, the most common aspects of yoga practiced are the *asanas* and breathing exercises of Hatha yoga and meditation (Nayak & Shankar, 2004; Collins, 1998). Hatha yoga is the non-secular component of the yoga discipline that has become popular in the West. Hatha literally means *Ha* - sun, and *Tha* – moon (Feuerstein, 2001). These opposites symbolize the spectrum of actuality that life presents to all human beings. This sun and moon metaphor means that the purpose of Hatha yoga is to balance and amalgamate opposites. Hatha yoga enhances the capacity of the physical body through the use of a series of body postures (*asanas*), breathing techniques (*pranayama*), and meditation – all of which are usually incorporated with one another (Riley, 2004). The physical postures of Hatha yoga include standing, sitting, forward bending, twisting,

inverting, balancing, reclining, and back bending. All postures are designed to increase flexibility and strengthen the body (McCall, 2007; Coulter, 2001; Desikachar, 1999). The breathing techniques of Hatha yoga focus on the conscious prolongation of inhalation, breath retention, and exhalation. It is by unifying the physical body, breath, and concentration while also performing the postures and movements that blockages in the energy channels of the body can be cleared and become more balanced (Woodyard, 2011).

Within Hatha yoga, there are many styles. The three styles most commonly practiced in the West include Vinyasa, Ashtanga, and Iyengar yoga (Riley, Ehling, & Sanchier, 2004; Saper, Eisenberg, Davis, Culpepper, & Phillips, 2004). All three systems highlight the breath, *asanas* (postures), and meditation, as well as the therapeutic aspect of the three elements combined (Riley et al., 2004). The core teaching of Vinyasa Yoga (VY) is to continually alter the practice to the individuals' changing needs in order to achieve maximum benefits (Ramaswami, 2005). VY utilizes a system of "connecting postures", however, it is not limited to the series of postures specific to Ashtanga yoga as outlined by Sri K. Pattabhi Jois. VY is one of the most commonly practiced styles in the West, and is sometimes also referred to as "flow" yoga. In comparison, Ashtanga yoga is renowned for its strenuous and demanding standardized series of postures (Fraser, 2007). Finally, the Iyengar system of Hatha yoga stresses technical alignment and repeated use of assistive devices, such as straps, blocks, and blankets to prop up parts of the body while performing postures (Iyengar, 1976).

VY. VY is about balancing lightness with heaviness, movement with stillness, and strength with flexibility. VY is any form of yoga that links one *asana* (physical posture) to another in a continuous flow (Ramaswami, 2005). The Sanskrit word *Vinyasa*

stems from a prefix, *vi*, meaning ‘variation’, and a suffix *nyasa*, meaning ‘within prescribed parameters’ (Ramaswami, 2005). Each *yogasana* (yoga posture) is linked to the next one via a series of particular transitional movements, synchronized with the breath. In VY, the mind closely follows the measured, velvety, and deliberately loud *Ujjayi* (victorious) breath. Thus, the *yoking* (yoga) of mind and body takes place with the breath acting as the bind (Ramaswami, 2005). *Ujjayi* breath is sometimes also called “Ocean Breath” because the sound created mimics the sound of the sea. The subjective experience of *Ujjayi* breath is physical and mental calmness along with alertness (Brown & Gerbarg, 2005). *Pranayama* (breath work/control) is a fundamental part to all yoga postures. *Panayama* is the science of breath. *Prana* means “breath, life, vitality, and energy”. *Ayama* means “length, expansion, stretching, and restraint” (Muller, 2009). *Ujjayi* breath is the most common method of *pranayama* during yoga practice; it helps establish a natural rhythm of the breath while increasing lung capacity (Nayak & Shankar, 2004).

VY follows the most absolute definition of classical yoga, typically defined in two ways. In one definition, yoga is defined as *yukti* (union) while in the other it is defined as *samadhi* (peace of the mind). By using the breath as a bind, VY incorporates body and mind; therefore, it is the yoga of union. Since the mind follows the breath, the mind is made an integral part of the entire process and can therefore achieve an elevated level of *samadhi* (peace of mind) (Ramaswami, 2005).

The goal of yoga. The goal of yoga is the ability to still the mind, control the senses, and be absorbed by the universe, thus achieving fulfillment or enlightenment (Cope, 2006; Fraser, 2007; Gimbel, 1998). Yoga honours, supports, and utilizes the mind-body connection like no other form of PA via *pranayama* (breath control) (Philip,

2009; Grilley, 2002). Yogic philosophy teaches that each person is born with a certain amount of life force or energy (Chi). Once that energy is consumed, the person leaves this life. Stress, improper breathing, poor diet, unhealthy lifestyles, illness, and disease all cause this Chi to burn up at a greater rate. Through the conscious control of the breath, yogis believe and teach that one can conserve their life force (Chi) (Butera, 2009). Practicing yoga on a regular basis can lead to better overall health and well being by establishing natural harmony and balance between the various organ systems (Nayak & Shankar, 2004).

Yoga's effectiveness. Improved flexibility is one of the first and most obvious benefits of yoga (McCall, 2007). While practicing yoga, the joints are taken through their full range of motion, bringing nutrients, oxygen, and blood to the area, which helps to prevent conditions like arthritis and chronic pain (McCall, 2007). Furthermore, yoga helps to build muscle mass and/or maintain muscle strength, which also helps protect from conditions such as arthritis, osteoporosis, and back pain (Desikachar, Bragdon, & Bossart, 2005). Flexibility, however, is simply one of the benefits associated with yoga.

Yoga's comprehensive system can also reduce stress, anxiety, and depression, improve balance, promote strength, heighten cardiovascular conditioning, lower blood pressure, strengthen bones, improve immune function, increase the oxygen supply to the tissues, foster psychological equanimity, and promote spiritual well-being - and that's only a fraction of the list (Lox, Ginis, & Petruzello, 2006; Tran, Holly, Lashbrook, & Amsterdam, 2001; Van Puymbroeck et al., 2007; Woolery, Myers, Stemlieb, & Zeltzer, 2004; Pilkington, Kirkwood, Rampes, & Richardson, 2005; Vedamurthachar et al., 2006). Importantly, many of yoga's benefits can be explained in ways that conform to Western ways of knowing and thinking (Lox et al., 2006).

In recent years, the scientific study of yoga has increased substantially and many clinical trials have been designed to assess its therapeutic effects and benefits (Woodyard, 2011). A significant body of clinical research has confirmed numerous health benefits of yoga (Khalsa, 2004; Innes & Vincent, 2006; Innes et al., 2005; Raub, 2002). Recent discoveries from well designed randomized trials utilizing yoga as a clinical intervention report exciting results. For example, yoga has been shown to improve management of Type II diabetes mellitus (Innes & Vincent, 2006), ease chronic low back pain (Sherman, Cherkin, Erro, Miglioretti, & Deyo, 2005), increase QOL in patients with chronic pancreatitis (Sareen, Kumari, Gajebasia, & Gajebasia, 2007), decrease gastrointestinal symptoms in irritable bowel syndrome (Kuttner et al., 2006), and advance the physical capabilities of healthy senior adults (Oken et al., 2006). Yoga has also been shown to be effective and safe for a variety of medical interventions including asthma (Manocha, Marks, Kenchington, Peter, & Salome, 2002), cardiovascular disease, diabetes, headaches, hypertension, coronary heart disease (Baer, 2003; Raub, 2002; Bijlani et al., 2005; Nagarathna & Nagendra, 1985; Manocha 2003, Manocha et al., 2002; Dash & Telles 2001; Kolasinski et al., 2005; Yogendra et al., 2004; Yang 2007; Schmidt, Wijga, Von Zur Muhlen, Branbant, & Wagner, 1997; Manchanda et al., 2000), mental disorders (Sangula & Rice, 2004; Shannahoff & Beckett, 1996; Woolery et al., 2004; Culos-Reed, Carlson, Daroux, & Hately-Aldous, 2006; Javnbakht, Hejazi Kenari, & Ghasemi, 2009), osteoarthritis (Garfinkel, Schumacher, Husain, Levy, & Resheta, 1994; Kolasinski et al., 2005), and cancer (Ulger & Yagli, 2010; Speed-Andrews et al., 2010; Culos-Reed et al., 2006; Wolsko et al., 2004; Danhauer et al., 2009; McCall, 2007; Gimble, 1998; Moadel et al., 2007; Banerjee et al., 2007). Furthermore, yoga has been shown to elicit favourable changes in risk factors for chronic disease such as body weight, cholesterol, blood

glucose levels, and blood pressure (Yang, 2007; Bijlani et al. 2005, Manchanda et al., 2000; Schmidt et al., 1997; Yogendra et al., 2004). Studies have also shown yoga interventions to be of benefit to emotional wellness, managing stress (Granath, Ingvarsson, von Thiele, & Lundberg, 2006; Smith, Hancock, Blake-Mortimer, & Eckert, 2007; Culos-Reed et al., 2006), and depressive symptoms (Pilkington et al., 2005; Woolery et al., 2004; Culos-Reed et al., 2006; Javnbakht et al., 2009). Finally, studies conducted in other patient populations and healthy individuals have shown beneficial effects on psychological and somatic symptoms, as well as other aspects of physical function (Bower, Woolery, Sternlieb, & Garet, 2005). What's important is that the use of yoga has been recognized not only for disease prevention, but also health promotion (Nayak & Shankar, 2004).

Raub (2002) illustrated the health benefits of participating in *yogasanas* (physical postures of yoga) and *pranayama* (breath work) and alleged that these produce valuable influence on the four major systems of the human body, namely: the nervous and endocrine systems, the musculoskeletal system (locomotion), and the cardiopulmonary system (oxygen delivery). These effects may be beneficial for individuals who experience distress, and as a consequence, a lowered QOL (Vitaliano et al., 2005). In a study by Michalsen et al. (2005), the effectiveness of participating in a three-month yoga program (two sessions/week) on females who self-referred as emotionally distressed was assessed. Compared to the wait-list control group, women who participated in the yoga program showed significant improvements in well-being, state and trait anxiety, perceived stress, vigor, depression, and fatigue. Physical well-being also improved. This study showed that yoga could significantly improve psychological outcomes in females experiencing mental distress. In another study, yoga was employed in a 12-week RCT involving a sample of

breast cancer patients (Moadel et al., 2007). This study was accepted by the ethically diverse participants who reported improved QOL and emotional well-being, in addition to reduced distress.

In addition to the effects of yoga on mood disorders and stress reduction, yogic practices are shown to improve cardiorespiratory performance, psychological profile, and plasma melatonin levels, as well as significantly reduce systolic blood pressure, diastolic blood pressure, mean arterial pressure, and orthostatic tolerance (Cohen, Warneke, Fouladi, Rodriguez, & Chaoul-Reich, 2004; Harinath et al., 2004). Furthermore, yoga has been shown to improve the cardiovascular efficiency and homeostatic control of the body and result in improvements in autonomic balance, respiratory performance, and overall well-being (Woodyard, 2011). Yoga also teaches relaxation which can relieve muscular and nervous tension, leading to increased energy (Nayak & Shankar, 2004). Moreover, evidence suggests that yoga results in one's ability to make healthy lifestyle changes and leads to improvements in sleep duration and quality (Cohen et al., 2004). Even small amounts of yoga have shown to make significant changes. For example, in a study by Woolery et al. (2004), young male and female students practicing in yoga for one hour a week for five weeks showed significant reduction in depression and trait anxiety.

Woodyard (2011) assessed the findings of selected articles regarding the therapeutic effects of yoga to provide a comprehensive review of the benefits of regular yoga practice. The manuscript provided information regarding the therapeutic effects of yoga as studied in various populations concerning a multitude of different ailments and conditions. The findings corroborate those of previous studies mentioned, and noted yoga can enhance overall well-being and QOL. Finally, as previously noted, in one of the only studies solely for caregivers involving yoga, Van Puymbroeck et al. (2007) noticed a

significant increase in lower body strength and flexibility. Importantly, these findings are consistent with the results of Tran, Holly, Lashbrook, and Amsterdam's (2001) study, which found increases in upper and lower body strength in healthy adults (ages 18–27). Van Puymbroeck et al.'s (2007) findings also support Kolasinski et al.'s (2005) study which reported increased strength and flexibility after an eight-week Iyengar yoga program for individuals over 50 with osteoarthritis.

Markedly, yoga is a therapeutic approach that is customizable to individuals throughout their lifespan. Where available, groups of people are able to participate in specific yoga programs that meet their unique movement needs (e.g., athletes, elderly, children, pre and post-natal women, mental or physical health challenges). However, the lack of movement and mind-body therapies such as yoga in Western medicine displays the mind/body dichotomy that has habitually characterized Western medical and health care. Yoga may have added benefit than just using relaxation techniques or traditional aerobic exercises because it couples physical exercise with breathing and brings a meditative quality to a physical practice (Raub, 2002). Smith et al. (2007) claim that yoga may be more effective than relaxation therapy for improving mental health. Moreover, Salmon, Lush, Jablonski, and Sephton (2009) report that as a means of uniting the body and mind, yoga has few equals. Finally, it has been suggested that the therapeutic benefits of yoga may also potentially exceed those of pharmaceutical drugs alone (Chapman & Bredin, 2010).

Summary

Existing evidence has supported the notion that cancer affects not only the patients themselves, but also their entire social network. Most social network members who take on the caregiver role are ill prepared (Kim & Given, 2008), and these caregivers

may sometimes experience psychological distress that is on par with, or in excess of, the distress experienced by the survivors themselves (Couper & al., 2006; Manne et al., 2007; Rabin et al., 2009). The physical and psychological well-being of cancer caregivers is at greater risk than that of normal populations because they have little time to rest, partake in fewer self-care behaviours (e.g., PA), or fail to request medical care for themselves (Burton et al., 1997; Carter, 2002). Researchers have highlighted the value and importance of PA, with findings suggesting that it has positive consequences on mental (e.g., depression, anxiety) and physical (e.g. immune system) health. Today, more and more Canadians are seeking out alternative modes of PA such as yoga. Yoga is one form of PA that, based upon previous research, may show promise for improving the QOL and psychological distress of cancer caregivers (Woodyard, 2011; Raub, 2002; Culos-Reed et al., 2006; Kirkwood, Rampes, Tuffrey, Richardson, & Pilkington, 2005; Kolasinski et al., 2005).

When practicing yoga, a fundamental emphasis is placed on accepting one's present moment experiences. Having this healthy sense of acceptance may be especially important for individuals dealing with cancer since yoga may help decrease the stress experienced from cancer's sudden onset and continued uncertainty (Woodyard, 2011). With the anticipated continued rise in cancer diagnoses, it is essential for people to have informed evidence-based choices about effective health care, especially in Nova Scotia, where cancer rates are among the highest in Canada (CCS, 2012).

As participation rates in mind-body fitness programs such as yoga continue to increase, it is important for health care professionals to be informed about the nature of yoga and the evidence of its many therapeutic effects (Woodyard, 2011). Professionals and health educators need to be aware of the potential of yoga as an important component

of overall well-being – particularly with regard to QOL and psychological distress as it pertains to cancer caregivers (Woodyard, 2011). Although informal cancer caregivers are generally part of an invisible healthcare system, they are essential to Canadian society. Addressing the needs of cancer caregivers and providing them with optimal support/intervention options can result not only in maintaining or improving their mental and physical health, but also improving the outcomes of cancer survivors and decreasing costs to the healthcare system (Mittleman, 2005; Kitrungroter & Cohen, 2006). As such, the next step is to experimentally determine whether a six-week VY intervention can improve overall QOL and reduce overall psychological distress in key cancer caregivers.

Research Question and Hypotheses

Based on the gaps in the literature, the current study sought to address the following question: Does a six-week VY intervention help reduce overall psychological distress and increase overall QOL in key caregivers of cancer survivors?

The hypotheses were:

- 1) A six-week VY intervention will reduce overall psychological distress in key caregivers of cancer survivors.
- 2) A six-week VY intervention will increase overall QOL in key caregivers of cancer survivors.

Chapter Three: Methods

Study Design and Recruitment

A single-group, six-week pre- post-test pilot study was conducted with measures taken prior to program initiation and again following program completion. Pre and post program data included measures of PA, psychological distress, QOL, and subjective program experience.

Prior to commencing the research study, ethics approval was obtained from Capital Health's Research Ethics Board (Appendix A, p.155). Upon receiving ethical approval, participants were recruited from the Queen Elizabeth II Health Sciences Center Victoria General Site with the help of a local radiation oncologist (Dr. Robert Rutledge) who was made aware of the upcoming study and permitted for recruitment posters (Appendix B, p.164) to be placed in the cancer center's waiting room. Additional recruitment posters were placed throughout the IWK women's center and cancer support group locations such as Cancer Care Nova Scotia, Canadian Cancer Society – Nova Scotia Division, the Canadian Breast Cancer Foundation – Atlantic Chapter, and Prostate Cancer Canada in Halifax. Additional recruitment efforts included providing study details to attendees of the Healing and Cancer Foundation's weekend workshops for cancer survivors/family members and via mass emails sent to appropriate mailing lists by Dalhousie University's Department of Health and Human Performance, Capital Health (including Capital News), the YWCA, local yoga studios, Caregivers Nova Scotia, the Canadian Cancer Society, Cancer Care Nova Scotia, and the Self-Help Connection. Details about the study and the recruitment poster were also posted on relevant webpages, such as the Canadian Psychosocial Oncology Partners and Young Adult Cancer Canada (Appendix C, p.165),

as well as the Facebook pages of Caregivers Nova Scotia, the Canadian Cancer Society, the Terry Fox Foundation, and the CIBC run for the cure. Finally, an advertisement was placed in the Coast *online* and the Coast newspaper for the first week of December 2011.

Potential participants interested in learning more about the study were directed to contact the principal investigator (PI) for additional information. During this initial contact, eligibility criteria was reviewed and potential participants were provided with an overview of the research study, participant responsibilities (e.g., time investment, travel to the intervention location, duration of the program), potential risks and benefits of participating in the study, and assurance of confidentiality. If the inquirer was still interested, the pre-screening tool (Appendix D, p.167), which included the distress thermometer, Physical Activity Readiness-Questionnaire (PAR-Q)/Physical Activity Readiness-Medical-Examination form (PAR-Med-X), and questions regarding their willingness and availability to participate in a VY intervention was asked over the phone to ensure eligibility.

At the time of pre-screening, all interested participants met the required minimum score of five (or greater) out of 10 on the distress thermometer (where a higher score indicates greater psychological distress). The PAR-Q was used to assess whether participants had any barriers to participating in any physical activities such as bone and joint problems, heart conditions, chest pain during activity, high blood pressure or heart drugs, chest pain at rest, loss of balance, and dizziness (Thomas, Reading, & Shephard, 1992) (Appendix D, p.168). The PAR-Q is in a yes/no format and includes questions such as: *In the past month, have you had chest pain when you were not doing physical activity?* and *Do you lose your balance because of dizziness or do you ever lose consciousness?* Those participants (n=2; 14.3%) who responded with a “yes” to one or

more of the questions on the PAR-Q were asked to have the PAR-Med-X completed by their physician. The PAR-Med-X (Appendix D, p.169) is a PA specific checklist used by physicians for anyone who answers “yes” to any of the questions on the PAR-Q. The Conveyance/Referral Form in the PAR-Med-X can be used to convey clearance for PA participation (Thomas et al., 1992). The two participants (14.3%) who responded with a “yes” to one or more of the questions on the PAR-Q were mailed and asked to have the PAR-Med-X form completed by their physician prior to participation in any study related activities. Attached to the PAR-Med-X was a description of the VY intervention (Appendix E, p.170) for their physician to give their recommendations on the participants’ involvement in this study. Participants passing either the PAR-Q or PAR-Med-X were given further information regarding the VY sessions (e.g., start date, times, location/directions, where to park for free, what to wear) and were either mailed a copy of the informed consent (Appendix F, p.171), research team contact page (Appendix G, p.181), and baseline questionnaire (Appendix H, p.182) or came one hour prior to the commencement of the first VY session. Participants were asked to review the information, make note of any questions or concerns, and complete the questionnaire prior to the first session. Participants were asked to sign two consent forms and were given one to take home with them. All participants were also asked to review the PAR-Q forms which had previously been completed over the phone before their first yoga session, and, if nothing had changed, sign and date the form.

Participants

Eligibility to participate in the present study was based on the following criteria: English speaking, currently between the ages of 18 and 65, no health concerns that would preclude safe participation, willing to not initiate or alter PA behaviours during the six

weeks of the study intervention, provided informal (unpaid) care to a person diagnosed with cancer at the time of the start of the study, and self-identified or was identified by a cancer survivor as a key caregiver. Participants could be either male or female. The study was inclusive of all individuals regardless of their relationship status and relationship to the care recipient (cancer survivor). Exclusionary criteria included being pregnant or having just given birth (< 2 months) since pre- and post-natal yoga differs from the style taught in this study and was not appropriate for pre- or post-natal women. Additional exclusionary criteria included children/youth (< 18 years) and seniors (> 65 years) as VY is not always appropriate for younger children or older adults unless modifications and individual assessments are made.

Intervention

VY was the style of yoga taught during the intervention. This style was chosen as the PI was trained in this style and had taught it for several years. Additionally, this style was chosen due to its current popularity in the West. The same certified yoga instructor led all 12 of the yoga sessions. To practice yoga safely and effectively, learning yoga with a trained instructor is necessary, and is essential for all beginners.

The yoga intervention ran twice a week for six weeks (12 sessions). Caregivers were encouraged to participate in VY for 150 minutes/week (two sessions at 75 minutes each) for six weeks. This intervention supported the Canadian Society for Exercise Physiology's Canadian Sedentary Behaviour Guideline's (2012) aerobic, muscle, and bone strengthening prescription of an accumulated 150 minutes of moderate-to-vigorous PA per week. All yoga sessions were conducted Monday and Wednesday evenings from 6:30pm to 7:45pm at Dalhousie University's Dalplex (room 206). A meditation DVD with wordless music and underwater ocean views was projected onto a screen at the front

of the classroom and 24 flameless candles illuminated the room each class (Appendix I, p.194).

All yoga sessions included between 25-40 yoga poses derived from the VY method and was taught according to the principles of VY, which include balancing lightness with heaviness, stillness with movement, and strength with flexibility while linking one physical posture to the next in a continuous flow (see Appendix J, p.196, for the list of *asanas* (physical postures) utilized in the program and the properties thought to be associated with each). At the start of each yoga session, participants did some *pranayama* (breath) and meditative work both while sitting in a comfortable position and while in one to two Yin yoga poses (see Appendix J, p.196-204, for a list of the Yin yoga *asanas* utilized during *pranayama* (breath work) and the properties thought be associated with each).

Participants were encouraged to notice, and be respectful of, physical limitations that may appear throughout the course of performing the *asanas* (physical poses). Additionally, participants were educated with regard to what normal physiological responses to PA were to ensure participants did not interpret common symptoms associated with VY (e.g., heavy breathing, sweating, muscle soreness) as a problem. This study aimed to ensure participants understood that these symptoms are the body's natural responses to stress on the system and may be alleviated with subsequent PA. Finally, although VY instructors are expected to provide general guiding as to correct and incorrect ways to do each *asana* (physical pose), participants were actively encouraged to work on paying attention to their own bodies and pushing themselves only within their own personal limits; not to try and do the 'more advanced' *asanas* should they not be there that day. The yoga instructor followed a principle expressed by Desikachar (1999),

which is to ‘start where you are’, conveying the importance of functioning within one’s present physical limitations. Participants were also encouraged to take breaks whenever needed as well as to consume water whenever it was required during their practice (participants were encouraged to bring a water bottle). The facility that housed the intervention had a water fountain within a very short distance of the room in which the VY sessions were being held.

Each VY session included five to 15 minutes of *pranayama* (breathing) exercises and meditation (Appendix K, p.236), 50-60 minutes of VY poses, and four to 10 minutes of ‘*savasana*’ – a pose that helps to calm down the mind, promote relaxation, and relieve stress and pressure off of the body (Coulter, 2001; Kaminoff, 2007; Fraser, 2007). The instructor recorded attendance after each session. Missed sessions were followed up for reasons of feasibility and interest. Props and their correct use was taught in order to provide each individual with the means to access each pose safely while properly aligning the body to achieve the most benefits while being comfortable and inducing relaxation.

An information sheet which included information regarding emergency services and yoga studios in Halifax/Dartmouth was made available to the participants at each yoga session for any individual who may desire/require additional support or information (Appendix L, p.240). Upon completion of the VY intervention, participants who desired further information about yoga studios in Halifax and Dartmouth and VY were given information and recommendations about affordable and convenient yoga classes/studios and VY DVDs.

Measures

Demographics. Demographic information was collected by self-report and

included age, gender, education level, marital status, annual income, employment status, religion, race/ethnicity, and care recipient's cancer diagnosis (type of cancer), month/year of cancer diagnosis, type(s) of treatment, whether treatment was completed (yes (date/month) / no), whether the cancer had recurred or metastasized, type of recurrence/metastases, month/year of recurrence/metastases, other treatment(s) for recurrence(s)/metastases, months fulfilling the caregiver role, relationship to cancer survivor, yoga participated in throughout one's lifetime, within the past 12 months, and within the past six months, perceived level of yoga practitioner, and yoga style(s) previously practiced (Appendix H, p.182-184).

PA. PA behaviour was assessed by self-report using a modified version of the Leisure Score Index from the Godin Leisure-Time Exercise Questionnaire (GLTEQ) (Godin, Jobin, & Bouillon, 1986; Godin & Shepard, 1985; Courneya, Jones, Rhodes, & Blanchard, 2004). The GLTEQ (Appendix H, p.185) includes three questions that assess the frequency and duration of mild (minimal effort, no perspiration), moderate (not exhausting, light perspiration), and strenuous (heart beats rapidly, sweating) PA performed during free time in a typical week within the past month.

Total PA minutes were calculated by multiplying the reported duration and frequency of weekly moderate and vigorous PA. Frequency and duration of mild PA were not assessed although the mild category was included in the survey to ensure participants did not report mild activities in the moderate category (Courneya et al., 2004). The focus on only moderate and vigorous PA was based on the aerobic prescription outlined by the Canadian Society for Exercise Physiology's (2012) Canadian Sedentary Behaviour Guidelines for achieving health benefits. The Canadian Sedentary Behaviour Guidelines (2012) suggests that 150 minutes of moderate-to-vigorous intensity

aerobic PA per week, in bouts of 10 minutes or more, is required in order to achieve health benefits.

The number and percentage of participants meeting the PA guidelines was calculated based on the 2008 PA Guidelines for Americans (US Department of Health and Human Services, 2008) which suggests that individuals should obtain either 75 minutes of vigorous PA per week, 150 minutes of moderate PA per week, or an equivalent combination that double weights the vigorous minutes. For descriptive purposes, participants were divided into the following two categories: (1) insufficiently active (some PA but less than the equivalent of 150 minutes of moderate-to-vigorous PA/week) and (2) meets guidelines (≥ 150 minutes of moderate-to-vigorous PA/week). The GLTEQ is deemed to be one of the most reliable measures of self-reported exercise. An evaluation of this measure found it to be brief, reliable, easily administered, and to possess concurrent validity (Jacobs, Ainsworth, Hartman, & Leon, 1993).

Psychological distress. The Profile of Mood States (POMS; McNair, Lorr, & Droppelman, 1971) was used to measure overall psychological distress in cancer caregivers (Appendix H, p.192-193). The scale, developed by McNair et al. (1971), has 65 items describing feelings people have. The POMS is scored on a 5-point likert scale, from 0 (not at all) to 4 (extremely), with respondents indicating mood reactions ‘during the past week including today’ or for shorter periods such as ‘right now’. The POMS measures mood disturbance across six domains and yields an overall psychological distress measure (Total Mood Disturbance [TMD]). The six domains include: *tension–anxiety* (higher scores indicate greater tension/anxiety, whereas lower scores indicate a lack of or lower tension/anxiety), *depression–dejection* (higher scores indicate greater depression/dejection, whereas lower scores indicate a lack of or lower

depression/dejection), *anger–hostility* (higher scores indicate greater anger/hostility, whereas lower scores indicate a lack of or lower anger/hostility), *vigor–activity* (higher scores indicate greater or more vigor/activity, whereas lower scores indicate a lack of/lower vigor/activity), *fatigue–inertia* (higher scores indicate greater fatigue/inertia, whereas lower scores indicate a lack of or lower fatigue/inertia), and *confusion–bewilderment* (higher scores indicate greater confusion/bewilderment, whereas lower scores indicate a lack of or lower confusion/bewilderment). A higher TMD score indicates greater overall psychological distress, whereas a lower score indicates a lack of or lower amount of psychological distress (McNair, Lorr, & Droppelman, 1971). The possible range of scores for overall psychological distress (TMD) and each of the subscales are as follows: TMD (35 to 115-120), tension-anxiety (0 to 26-36), depression-dejection (0 to 36-60), anger-hostility (0 to 30-48), vigor-activity (0-6 to 32), fatigue-inertia (0 to 26-28), and confusion-bewilderment (0 to 19-28). When plotted, the respondent's raw factor scores are easily converted to *T*-scores, which are based on a standard score distribution transformed to have a mean of 50 and a standard deviation of 10 (Guildford & Fruchter, 1978). *T*-scores of 65 and 35, marking ± 1.5 standard deviations from the mean, are common cut-points for cases needing special attention (McNair & Heuchert, 2005).

The POMS measures state (vs trait) elements and therefore previous administrations do not influence subsequent administrations, making it an excellent tool for repeated-measures. Factor analytic replications present evidence of the factorial validity of the six mood factors, while an examination of the individual items describing each mood state support the content validity of the factor scores (Lorr et al., 2004). Furthermore, McNair et al., (1971) assert that the six POMS mood factors have been

shown to be stable under a range of situations. The POMS manual provides documentation of criterion-related validity built upon psychotherapy studies, studies of responses to emotion-inducing manipulations, and controlled outpatient drug trials. Finally, since 1971, various research studies have provided evidence for the predictive and construct validity of the POMS (Edelman, Bell, & Kidman, 1999; LeUnes, 2000; Nowell, Reynolds, Buysse, Dew, & Kupfer, 1999; Nyenhuis, Yamamoto, Luchetta, Terrien, & Parmentier, 1999), and several studies (Boyle, 1987; Boyle, 1988; Norcross, Guadagnoli, & Prochaska, 1984; Reddon, Marceau, & Holden, 1985) have provided at least partial support for the factorial validity of the POMS through the use of factor analytic procedures. The ease of administering the POMS, as documented by LeUnes and Burger (1998) and LeUnes (2000, 2002), is one of its major advantages, and that, coupled with its wide use, demonstrates user acceptance and its intrinsic psychometric merit.

Individual subscale scores were obtained using the QuikScore™ forms included within each POMS answer sheet. A TMD score was obtained by summing the scores of the six subscales while weighting vigor-activity negatively. The TMD score is presumed to be highly reliable because of the inter-correlations among the six POMS subscales (McNair & Heuchert, 2011). Reliability coefficients for the summary measure and six subscales in the current study were: TMD ($\alpha=0.75$ at baseline and $\alpha=0.92$ post-intervention), *tension-anxiety* ($\alpha=0.81$ at baseline and $\alpha=0.90$ post-intervention), *depression-dejection* ($\alpha=0.89$ at baseline and $\alpha=0.92$ post-intervention), *anger-hostility* ($\alpha=0.93$ at baseline and $\alpha=0.89$ post-intervention), *vigor-activity* ($\alpha=0.88$ at baseline and $\alpha=0.88$ post-intervention), *fatigue-inertia* ($\alpha=0.88$ at baseline and $\alpha=0.92$ post-

intervention), *confusion-bewilderment* ($\alpha=0.81$ at baseline and $\alpha=0.90$ post-intervention) (Table 2).

QOL. The Medical Outcomes Study 36-Item Short-Form Health Survey version 2 (SF36v2) instrument was used to measure overall QOL in cancer caregivers (Appendix H, p.186-191) (Ware, Kosinski, & Dewey, 2000). The SF36v2 is a multi-purpose, 36-item health survey yielding a profile of two health component summary measures (Physical Component Score [PCS] and Mental Component Score [MCS]), each of which is comprised of four subscales. The four physical (PCS) subdomain scales include: (1) *physical functioning* (lower scores indicate greater limitations in performing everyday physical activities, whereas higher scores indicate better physical functioning without limitations due to health), (2) *role-physical* (lower scores reflect problems with work or daily roles due to physical health problems, whereas higher scores indicate better role-physical functioning), (3) *bodily pain* (lower scores reflect very severe and extremely limiting pain whereas higher scores indicate a lack of bodily pain and no limitations due to pain), and (4) *general health* (lower scores indicate that personal health is judged to be poor and deteriorating, whereas higher scores indicate that general health perceptions are excellent). The four mental (MCS) subdomain scales include: (1) *vitality* (lower vitality scores indicate that participants feel tired and worn out, whereas higher scores indicate more vitality; that participants feel energetic), (2) *social functioning* (lower scores reflect frequent interference with social activities due to emotional or physical health problems, whereas higher scores indicate better to excellent social functioning; no problems with social activities due to physical or emotional problems), (3) *role-emotional* (lower scores reflect issues or problems with day to day activities as a result of emotional problems, whereas higher scores indicate better to excellent role-emotional functioning - no issues

or problems with day to day activities due to emotional problems), and (4) *mental health* (lower scores reflect feelings of depression or unease most/all of the time, whereas higher scores indicate excellent mental health; feelings of happiness and calm most/all of the time) (Ware, 1994). The two summary scales have been shown to be factorially valid across clinical and general populations from various countries (Ware et al., 2000). Moreover, previous research has confirmed the reliability of the eight scales using estimates of both internal consistency and test-retest methods and provided evidence for the construct, criterion, content, concurrent, and predictive validity of the SF-36 v2 (Ware et al., 2000).

Standardized z -scores ($M=50$, $SD=10$) for the eight subscales and two health component summary scores, PCS and MCS, were yielded using the QualityMetric Health Outcomes™ Scoring Software 4.0 provided by QualityMetric with the SF36v2 forms. Further post-hoc analyses included calculating and examining the SF36v2's eight subscales and two summary measures' change scores using descriptive statistics to assess for potentially significant minimally important difference values. The following mean group minimally important difference values for the summary measures (PCS, MCS) and eight subscales are proposed to be: PCS, 2-3 points; MCS, 3 points; *physical functioning*, 2 points if the score is below 40 and 3 points if the score is at or above 40 points; *role physical*, 2 points; *bodily pain*, 2 points if the score is below 40 and 3 points in the score is at or above 40 points; *general health*, 2 points if the score is below 40 and 3 points if the score is at or above 40 points; *vitality*, 2 points if the score is below 40 and 3 points if the score is at or above 40 points; *social functioning*, 3 points; *role emotional*, 4 points; and *mental health*, 3 points (Ware et al., 2007). These suggested values signify the best estimates based on current evidence.

The SF36v2 is a generic measure, as opposed to one that targets a specific disease, treatment group, or age (Ware et al., 2007). The SF36v2 is used internationally and evaluated for reliability, validity, and sensitivity in healthy persons. The SF-36v2 has proven useful in surveys of general and specific populations, has been translated for use in more than 40 countries, takes approximately five to 10 minutes to complete, and is a highly recommended measure with advanced psychometric properties (Ware et al., 2007). Studies to date have yielded content, concurrent, criterion, construct, and predictive evidence of validity. Specifically, the SF36v2 has been found to possess adequate discriminatory power, good correlation with other measures, good construct validity, and adequate criterion validity (Ware, 1994). Finally, the SF36v2 is psychometrically robust and clinically credible (Ware & Sherbourne, 1992). Recently, the SF36v2 was judged to be the most widely evaluated generic patient assessed health outcome measure in a bibliographic study on the development of QOL measures (Garratt, Schmidt, Mackintosh, & Fitzpatrick, 2002).

The reliability of the eight scales and two health component summary measures has been estimated using both internal consistency and test-retest methods (Ware, 1994). Standard errors of measurement, 95% confidence intervals for individual scores, reliability (specifically good internal consistency and adequate test-retest reliability), and responsiveness (specifically adequate sensitivity to change) have been reported (Ware et al., 2007).

Reliability coefficients for the two summary measures and eight subscales in the current study were: PCS ($\alpha=0.90$ at baseline and $\alpha=0.89$ post-intervention); MCS ($\alpha=0.89$ at baseline and 0.93 post-intervention); *physical functioning* ($\alpha=0.75$ at baseline and $\alpha=0.78$ post-intervention); *role physical* ($\alpha=0.89$ at baseline and $\alpha=0.88$ post-

intervention); *bodily pain* ($\alpha=0.92$ at baseline and $\alpha=0.52$ post-intervention); *general health* ($\alpha=0.91$ at baseline and $\alpha=0.84$ post-intervention); *vitality* ($\alpha=0.90$ at baseline and $\alpha=0.83$ post-intervention); *social functioning* ($\alpha=0.68$ at baseline and $\alpha=0.86$ post-intervention); *role emotional* ($\alpha=0.86$ at baseline and $\alpha=0.91$ post-intervention); *mental health* ($\alpha=0.70$ at baseline and $\alpha=0.83$ post-intervention) (Table 2).

Perceptions of the program. Open-ended survey questions were administered via a short questionnaire at the completion of the six-week intervention. The open-ended survey questions were administered to shed light on caregiver's PA practices and preferences as well as evaluate their views on the importance of being physically and mentally fit, for which limited literature exists. The questionnaire also collected specific information with regard to the current study, such as participation motives, group composition, as well as participant's overall satisfaction with the VY program. The open-ended survey included questions such as: *What was your main reason/motivation for attending yoga sessions?* and *What would you like to see different to make this program a better experience?* (Appendix M, p.244).

Statistical Analyses

This pilot study explored two questions: 1) does a six-week VY intervention reduce overall psychological distress in key caregivers of cancer survivors? and 2) does a six-week VY intervention improve overall QOL in key caregivers of cancer survivors? All analyses were conducted using SPSS v. 19.0. Baseline demographic information, care recipient health profiles, attendance, and PA levels were analyzed and reported using descriptive statistics and frequencies.

After the psychological distress and QOL data was reverse-scored using the Quick-Score Forms (POMS) and QualityMetric Health Outcomestm Scoring Software 4.0

(SF36v2), individual items, subscale totals, and summary measures were inputted into SPSS v. 19.0. The data was examined for missing values, meeting the assumptions of the tests to be performed (paired-samples *t*-tests) and analyzed for outliers ($>3SDs$; Osborne & Overbay, 2004) using descriptives and frequencies. No missing values or outliers were found within the dataset. The data was then checked for normality with histograms, Q-Q plots, skewness and kurtosis calculations (Price, 2000), and 5% trimmed means. Prior to analysis, the POMS summary measure (TMD) and six subscales and SF36v2's two summary measures (PCS, MCS) and eight subscales were checked for reliability. Inter-item reliability analysis was performed on the three summary measures (TMD, PCS, MCS) and fourteen subscales (six POMS subscales and eight QOL subscales). Summary measures with an internal reliability of .70 or greater were considered acceptable for analyses. Since analyzing the subscales was not the study's hypothesized planned outcome but instead part of the post-hoc exploratory analysis, the two SF36v2 subscales with an internal reliability $< .70$ (social functioning and bodily pain) were included in the post-hoc analysis.

The POMS' raw subscale and summary measure scores were used for analysis (where lower scores indicate better psychological health except for the vigor-activity subscale where higher scores indicate better physical functioning). The SF36v2's subscale and summary measure scores are reported using standardized *z* scores ($M=50$, $SD=10$) where higher scores indicate better functioning/health. The SF36v2's summary measure and subscale change score values were interpreted based in the suggested minimally important difference mean group values as outlined in the SF36v2 Manual (Ware et al., 2007). Due to the exploratory nature of this study, the *p* value was not

adjusted for multiple testing. As such, it was accepted that without adjusting the p value, there is a likelihood of having made a Type 1 error and having rejected the null hypothesis when it is in fact true. Exact p values are presented for all findings along with Eta Squared (η^2) effect size. Eta squared effect size is commonly interpreted as 0.01 being small, 0.06 being medium, and 0.14 being large (Cohen, 1988).

The first hypothesis (see question 1 above) was tested by comparing the baseline and post-intervention means of participants using a paired samples t -test. The first t -test was performed on the POMS TMD score, comparing the pre-intervention means of the participants with the post-intervention means. Post-hoc explorations of findings were conducted using additional paired-samples t -tests on each of the six subscales.

The second hypothesis (see question 2 above) was tested by comparing the baseline and post-intervention means of participants using a paired samples t -test. Separate t -tests were performed on each of the two QOL Component Summary Scales (PCS, MCS), comparing the pre-intervention means of the participants with the post-intervention means. Post-hoc explorations of findings were conducted using additional paired-samples t -tests on each of the eight subscales.

Responses from the open-ended survey questions were transcribed word for word from the post-intervention questionnaires (Appendix N, p.247). A content analysis (Hsieh & Shannon, 2005) was conducted with the answers to the open-ended survey questions with the intent to identify any major themes with regard to caregiver PA practices/interests, motivations for participating in the study, perceived mental or physical benefits from participating in the program, being in the presence of other cancer caregivers, and what caregivers would have liked to have been different with regard to the VY intervention.

Chapter Four: Results

Participant Demographics

Fourteen individuals showed interest in participating in the yoga intervention, and all 14 individuals gave informed consent to participate and completed baseline and post-intervention questionnaires. Detailed demographic and caregiving characteristics are reported in Table 1. In brief, participants (N=14) ranged in age from 19 to 64 (M=40.9, SD=14.2), included 12 females (85.7%) and two males (14.3%), and had a mean distress score of 6.8 (SD=1.8) out of 10.

Participant yoga experience. Within the six months prior to start of the study, the majority of the participants (9; 64.3%) had participated in zero yoga sessions; four (28.6%) had participated in one to five yoga sessions; one (7.1%) had participated in six to 10 yoga sessions. Within the 12 months prior to the start of the study, the majority of the participants (6; 42.9%) had participated in zero yoga sessions; three (21.4%) had participated in one to five yoga sessions; four (28.6%) had participated in six to 10 yoga sessions; one (7.1%) had participated in 11-20 yoga sessions. The majority of the participants (11; 78.6%) perceived their level as a yoga practitioner as beginner; three (21.4%) as intermediate. When asked what style(s) of yoga they had previously practiced, most participants had tried more than one style of yoga. Ten (71.4%) participants indicated that they did not know what style(s) of yoga sessions they had previously participated in; four (28.6%) had tried Ashtanga; four (28.6%) had tried Hatha; three (21.4%) had tried Bikram; two (14.3%) had tried Vinyasa; two (14.3%) other (Kundalini, Kripalu); one (7.1%) had tried Iyengar.

Table 1

Baseline Characteristics of Caregivers Participating in Yoga (N=14)

Variable	N	%
Demographic profile		
Gender		
Female	12	(85.7%)
Male	2	(14.3%)
Race/ethnicity		
Caucasian	13	(92.9%)
Asian	1	(7.1%)
Marital status		
Married/common law	4	(28.6%)
Divorced/separated	5	(35.7%)
Single/never married	4	(28.6%)
Widowed	1	(7.1%)
Highest level of education completed		
High school	2	(14.3%)
Some university/college	1	(7.1%)
University/college	5	(35.7%)
Completed technical school	1	(7.1%)
Some graduate school	2	(14.3%)
Completed graduate school	3	(21.4%)
Annual personal income		
Less than \$10,000	2	(14.3%)
\$10,000-\$24,999	1	(7.1%)
\$25,000-\$49,999	3	(21.4%)
\$50,000-\$74,999	3	(21.4%)
\$75,000-\$99,999	1	(7.1%)
\$100,000-\$149,999	1	(7.1%)
Did not wish to respond	3	(21.4%)
Current employment status		
Paid work full time (>30 hrs/wk)	8	(57.1%)
Paid work part time (<30 hrs/wk)	1	(7.1%)
Unable to work (sickness/disability)	1	(7.1%)
Student	2	(14.3%)
Retired	2	(14.3%)
Months of caregiving		
1-3	4	(28.6%)
4-6	3	(21.4%)

7-12	1 (7.1%)
13-18	1 (7.1%)
19-24	1 (7.1%)
25-32	4 (28.6%)
Relationship to cancer survivor	
Daughter/son	8 (57.1%)
Sister	3 (21.4%)
Partner	1 (7.1%)
Other	2 (14.3%)
Yoga participation in one's lifetime	
1-5 classes	3 (21.4%)
6-10 classes	3 (21.4%)
11-20 classes	3 (21.4%)
21-30 classes	2 (14.3%)
> 40 classes	3 (21.4%)

Note: One participant cared for two cancer survivors (parent and sibling) but identified mainly as caring for her parent

Study Feasibility

Overall attendance was 57.1% or 6.9 classes out of 12 (M=6.9, SD=3.1).

The reasons for absences were: being sick or having physical pain (40.3%), having to work or attend school (19.4%), caregiving responsibilities (13.9%), being out of town or on vacation (12.5%), having a previous commitment (9.7%), and having no transportation (1.4%) (the yoga intervention was during the Halifax Transit strike). Two missed sessions (2.8%) were not reported. One person was out of the country with her care recipient who was receiving treatment over the span of four yoga sessions and one person was sick for eleven yoga sessions since the participant started cancer treatment the second week of the yoga intervention. Eleven of the 14 participants (78.6%) attended at least six (50%) of the yoga sessions, while almost half of the participants (6; 42.9%) attended at least eight (66.7%) of the 12 sessions.

PA

Baseline PA levels ranged from zero to 570 minutes (M=202.9, SD=178.3) per week whereas post-intervention PA levels ranged from zero to 730 minutes (M=245, SD=198.7) per week. At both baseline and post-intervention, six participants (42.9%) were insufficiently active and eight participants (57.1%) met the Canadian Society for Exercise Physiology's guidelines of an accumulated 150 minutes of moderate-to-vigorous PA per week.

Psychological Distress

To examine changes in overall psychological distress (TMD), a paired-samples *t*-test was used to compare the baseline TMD means with the post-intervention TMD means. There was a significant difference and large effect ($n^2 = .47$) in the TMD scores from baseline (M=63.7, SD=30.9) to post-intervention (M=40.4, SD=35.9); $t(13) = 3.43$, $p = .005$, 95% CI [8.6, 38.1] (Table 2).

QOL

To examine changes in overall QOL, two separate paired-samples *t*-tests were used to compare the baseline QOL means with the post-intervention QOL means for the SF36v2's two summary measure component scores (PCS & MCS). There was no significant difference in the PCS from baseline (M=54.6, SD=9.4) to post-intervention (M=51.6, SD=8.9); $t(13) = 1.70$, $p = .113$, 95% CI [-.8, 6.8], $n^2 = 0.18$. There was a significant difference and large effect ($n^2 = .30$) in the MCS from baseline (M=33.6, SD=12.1) to post-intervention (M=40.4, SD=14.6); $t(13) = -2.37$, $p = .034$, 95% CI [-12.9, -.6] (Table 2).

Perceptions of the Program

The following themes emerged from each of the open-ended survey questions:

Question 1: *Do you feel that you lead a physically active lifestyle? Why/why not?*

Nine (64.3%) participants felt they lived physically active lifestyles, mainly participating in PA for the purpose of relieving stress and being happier. Five (35.7%) participants did not feel that they lead physically active lifestyles, mainly because they found it hard to find time or had physical conditions prohibiting PA participation (e.g., eczema, cancer).

Question 2: *Do you consider yourself to be physically fit? Why/why not?*

Five (35.7%) participants noted being physically fit and three (21.4%) reported that they were moderately fit. The remaining participants (6; 42.9%) expressed that they did not feel that they were physically fit, mainly because they were overweight, not toned, did not sleep enough or eat healthily, or because caregiving has taken a lot out of them.

Question 3: *Since your care recipients' cancer diagnosis, do you feel that it is*

important to be physically and mentally fit, and if so, why? Almost all of the participants (13; 92.9%) expressed the importance of being physically and mentally fit; one (7.1%) participant did not respond. The participants noted the importance of being physically and mentally fit to ensure that they had the energy required to fulfill their role and support their care recipient, and so that they could stay positive.

Question 4: *What were your top three reasons/motivations for joining the yoga*

study? The most noted reasons for participating in the yoga study included to relax and de-stress (8; 57.1%) and to learn yoga (8; 57.1%). Other reasons for participating included to do something active/participate in PA (6; 42.9%), to be with other caregivers/social interaction (5; 35.7%), to have an outlet/reprieve from life (4; 28.6%), because it was free (3; 21.4%), to participate in a clinical study for caregivers (3; 21.4%), to do something for themselves/self-care (3; 21.4%), and to better help the care recipient and promote whole family health (2; 14.3%).

Question 5: *What physical or mental skills have you learned over the past 6 weeks, if any?* Breathing techniques and the use of breath for relaxation was the most reported learned skill (7; 50%) followed by learning to be in the present moment and to slow down (3; 21.4%) and let go/not think (2; 14.3%). Participants also noted learning physical skills such as balance (2; 14.3%) and proper stretching (2; 14.3%).

Question 6: *Over the past 6 weeks, do you feel that your mental or physical fitness has improved? If yes/no, why?* Almost all of the participants (12; 85.7%) perceived improvements in their mental or physical fitness over the course of the intervention, noting primarily improvements in flexibility (5; 35.7%), strength (4; 28.6%), and physical fitness (2; 14.3%). Perceived improvements in mindfulness/focus and relaxation (3; 21.4%) as well as increased energy (1; 7.1%) were also noted.

Question 7: *Has participating in the program changed your outlook on your current or future health (i.e., mental, physical, emotional, spiritual, social), and if so, how?* Several participants (11; 78.6%) noted changes in their outlook on their current or future health, particularly with regard to being more motivated to start taking care of themselves (1; 7.1%) and confirming how valuable a PA commitment can be (1; 7.1%). Four (28.6%) participants expressed their desire to continue to participate in yoga while one (7.1%) noted the benefit of connecting with other cancer caregivers.

Question 8: *Are there any parts of the program that you would have liked to have more training or instruction?* Nine (64.3%) participants noted that the program was either great as it was, that they wished it was longer, or that they would have liked to have been able to attend more sessions. Participants also noted their desire for more adjustments (1; 7.1%), private classes for advanced poses (1; 7.1%), nutrition and hydration tips (1; 7.1%), and more Yin yoga poses (1; 7.1%).

Question 9: *Has taking part in this program made a difference in how you are feeling day-to-day, and if so, how?* Eight (57.1%) participants noted that the program made a difference in how they were feeling day-to-day, mostly reporting that the program gave them something to look forward to (3; 21.4%) and helped them feel calmer and more relaxed (3; 21.4%). Participants also reported improved confidence (1; 7.1%), sleep (1; 7.1%), and breath awareness (2; 14.3%), as well as feeling more invigorated (1; 7.1%) and feeling comfort in being with other cancer caregivers (1; 7.1%).

Question 10: *Have you developed any new friendships as a result of being involved in this study? If yes, how important are these relationships to you? If no, please explain.* Most of the participants (9; 64.3%) reported that they did not really get to know anyone else in the study. The main reasons for this included arriving late (1; 7.1%), leaving early (2; 14.3%), missing yoga sessions (2; 14.3%), and focusing on their yoga practice and needing time for themselves instead of socializing (3; 21.4%).

Question 11: *What would you like to see different to make this program a better experience?* Six (42.9%) participants noted their interest in learning more about the other participants and four (28.9%) noted their desire for a longer intervention period (e.g., three or six months) as the main changes they would like to see to improve the program. One participant (7.1%) also noted their desire for a nutrition plan for the duration of the intervention.

Question 12: *How did you feel about the group composition? Did you find it helpful in any way to be with other caregivers of cancer survivors? If yes/no, why?* Seven (50%) participants noted that knowing that others are in a similar situation gave them a sense of support and helped them to not feel alone. Three (21.4%) participants felt that it did not matter whether or not they were amongst other caregivers, and one (7.1%)

participant noted that it was nice to be with the same group every week – to see familiar faces.

Question 13: *Have you shared anything you have learned during this yoga program with your care recipient? If yes/no, what and why?* Eight (57.1%) participants reported that they had shared their experience of the yoga intervention with their care recipient and other family members, mostly sharing the breathing techniques. Four (28.6%) participants did not share what they had learned with their care recipient, one of which (7.1%) noted that she did not want her care recipient to feel as though she had to participate because of her. Another participant (7.1%) noted not informing her care recipient of her participation in the study because it was her one “selfish indulgence”. Finally, one participant (7.1%) expressed that her care recipient desired to try yoga with her in the future.

Question 14: *On a scale from 0-10, 1 being “No Distress” and 10 being “Extreme Distress”, which number best describes how much distress you have been experiencing in the past week including today?* Participants’ mean distress level was 3.9 (SD=2.1). The majority of the participants (9; 64.3%) reported no distress (a score of zero to four on the distress thermometer), four (28.6%) reported significant distress (a score of five to seven on the distress thermometer), and one participant (7.1%) reported severe distress (a score of eight to ten on the distress thermometer).

Post-hoc Analyses

Psychological distress. Three of the POMS subscales showed significant differences from baseline to post-intervention, namely: tension-anxiety, $t(13) = 5.13, p = .000, 95\% \text{ CI } [3.6, 8.9], n^2 = 0.67$; depression-dejection, $t(13) = 2.85, p = .014, 95\% \text{ CI } [1.6, 11.3], n^2 = 0.38$; and confusion-bewilderment, $t(13) = 2.22, p = .045, 95\% \text{ CI } [.1,$

3.8], $n^2 = 0.28$. Five of the six POMS subscales' effect sizes were large, and one was medium. Anger-hostility ($t(13) = 1.99, p = .068, 95\% \text{ CI } [-.3, 7.6], n^2 = 0.23$), vigor-activity ($t(13) = -1.84, p = .089, 95\% \text{ CI } [-6.5, .5], n^2 = 0.21$), and fatigue-inertia ($t(13) = 1.07, p = .304, 95\% \text{ CI } [-2.1, 6.3], n^2 = 0.08$) were not significant (Table 2).

QOL. The only significant differences from baseline to post-intervention among the eight SF36v2 subscale means were in the following two subscales: role-emotional ($t(13) = -2.23, p = .044, 95\% \text{ CI } [-12.6, -.2], n^2 = 0.28$) and mental health ($t(13) = -2.16, p = .050, 95\% \text{ CI } [-9.3, -.0], n^2 = 0.26$). Two of the SF36v2's subscales were large, and three were medium. Physical functioning ($t(13) = -.56, p = .583, 95\% \text{ CI } [-1.5, .9], n^2 = .02$); role physical ($t(13) = .99, p = .336, 95\% \text{ CI } [-2.8, 7.7], n^2 = .07$); bodily pain ($t(13) = .52, p = .613, 95\% \text{ CI } [-3.7, 6.1], n^2 = 0.02$); general health ($t(13) = -1.23, p = .240, 95\% \text{ CI } [-4.4, 1.2], n^2 = .10$); vitality ($t(13) = -1.33, p = .207, 95\% \text{ CI } [-7.6, 1.8], n^2 = 0.12$); and social functioning ($t(13) = -.3, p = .770, 95\% \text{ CI } [-6.4, 4.9], n^2 = 0.00$) were not significant (Table 2). Finally, mean group change scores from before the VY program to post-intervention exceeded the threshold for minimally important difference values in the MCS (3 points) and role emotional (4 points) and mental health (3 points) subscales.

Table 2

Baseline and Postprogram Mean, SD, Reliability Coefficients, and P values of PA, QOL, and Psychological Distress Measures

Measure	Range	At Risk	Baseline			Post-Intervention				
			α	<i>M</i>	<i>SD</i>	α	<i>M</i>	<i>SD</i>	(95% CI); <i>P</i>	<i>n</i> ²
PA (mins per week)				202.9	178.3		245	198.7	(-163.5 to 79.2)	0.04
TMD	35 - 120	≥ 69	0.75	63.7	30.9	0.92	40.4	35.9	(8.6 to 38.1); 0.005	0.47 ^a
Tension-anxiety	0 - 36	≥ 66	0.81	18.4	5.9	0.9	12.1	6.6	(3.6 to 8.9); 0.00	0.67 ^a
Depression-dejection	0 - 60	≥ 23	0.89	20.4	11.1	0.92	13.9	9.9	(1.6 to 11.3); 0.014	0.38 ^a
Anger-hostility	0 - 48	≥ 20	0.93	13.4	10.4	0.89	9.7	7.2	(-3 to 7.6); 0.068	0.23 ^a
Vigor-activity	0 - 32	≤ 9	0.88	12.3	5.6	0.88	15.3	6.2	(-6.5 to .5); 0.089	0.21 ^a
Fatigue-inertia	0 - 28	≥ 18	0.88	12.4	5.8	0.92	10.3	6.6	(-2.1 to 6.3); 0.304	0.08 ^b
Confusion-bewilderment	0 - 28	≥ 13	0.81	11.5	5.7	0.9	9.6	5.8	(.1 to 3.8); 0.045	0.28 ^a
PCS			0.90	54.6	9.4	0.89	51.6	8.9	(-8 to 6.8); 0.113	0.18 ^a
MCS			0.89	33.6	12.1	0.93	40.4	14.6	(-12.9 to -.6); 0.034	0.30 ^a
Physical-functioning			0.75	51.5	4.8	0.78	51.8	4.8	(-1.5 to .9); 0.583	0.02
Role-physical			0.89	49.9	8.9	0.88	47.4	9.7	(-2.8 to 7.7); 0.336	0.07 ^b
Bodily-pain			0.92	48.1	9.2	0.52	46.9	6.9	(-3.7 to 6.1); 0.613	0.02
General-health			0.91	46.8	12.8	0.84	48.4	10.3	(-4.4 to 1.2); 0.24	0.10 ^b
Vitality			0.90	42.7	10.3	0.83	45.6	10.3	(-7.6 to 1.8); 0.207	0.12 ^b
Social-functioning			0.68	41.3	8.8	0.86	42	10.6	(-6.4 to 4.9); 0.77	0.0
Role-emotional			0.86	35.1	14.3	0.91	41.4	13.8	(-12.6 to -.2); 0.044	0.28 ^a
Mental-health			0.7	37.9	8.1	0.83	42.6	10	(-9.3 to -.0); 0.05	0.26 ^a

Note. QOL data is presented as normative data (M=50, SD=10).

Abbreviation: CI, confidence interval.

^a represents a large effect (≥ 0.14). ^b represents a medium effect ($\geq 0.06 - 0.13$).

Summary

Fourteen cancer caregivers participated in six weeks of VY and completed questionnaires designed to elicit demographic, PA, psychological distress, QOL, and intervention feasibility and interest information. The results of the analyses did not fully support the second hypothesis, that participating in a six-week VY intervention would significantly increase overall QOL. However, significant changes from baseline to post-intervention did occur in the MCS – overall mental-health related QOL, as well as the TMD score – overall psychological distress. Additional analyses indicated that several subdomains of psychological distress and QOL were significant, namely: tension-anxiety, depression-dejection, confusion-bewilderment, role-emotional, and mental health. Furthermore, mean group change from before the VY program to post-intervention exceeded the threshold for minimally important difference values in the MCS (3 points) and role emotional (4 points) and mental health (3 points) subscales. Finally, the content analysis revealed that the cancer caregivers in the current study were interested in and benefited from relaxation and stress-reduction techniques, perceived benefiting from the VY intervention physically and mentally, and desired for the VY intervention to be longer.

Chapter Five: Discussion

The purpose of the current study was to test the effects of a six-week VY intervention on key caregivers of cancer survivors with the objective of determining if VY is a viable intervention for increasing overall QOL and reducing overall psychological distress. Fourteen (12 female, 2 male) key cancer caregivers varying in months of caregiving, age, and relationship to their care recipient participated in the VY intervention, which included a variety of *asanas* (physical postures) and *pranayama* (breath) and meditation work. Such as is typically found in the caregiving literature, the majority (9; 64.3%) of the cancer caregivers in the current study were the cancer survivor's spouses/partners or adult children (Caregiving in the United States, 2009).

Overall, the findings of the present study supported the first hypothesis, that participating in a six-week VY intervention would significantly decrease overall psychological distress. The results did not, however, fully support the second hypothesis, that participating in a six-week yoga intervention would improve overall QOL. Specifically, significant improvement was found for only the MCS and not the PCS from baseline to post-intervention. Importantly however, improvement from baseline to post-intervention among all six of the psychological distress subscales as well as in four of the eight QOL subscales was noted. To the best of our knowledge, the present study is the first to implement a VY intervention solely for key cancer caregivers.

Contrary to the study's hypothesis, this study found no significant increase in physical-health related QOL (PCS) in this population. Unexpectedly, reductions in physical health from baseline to post-intervention actually occurred in the PCS and in the following QOL subscales: role physical and bodily pain. Surprisingly, the PCS's effect

size was large and the role-physical's effect size was moderate; indicating that the participants actually experienced a reduction in their physical ability to perform daily tasks and work roles within the six weeks of the VY intervention. Although previous research has suggested that caregivers often have lower levels of physical health (Pinquart & Soerensen, 2003), this discovery was especially surprising since yoga has previously been shown to improve physical functioning (Van Puymbroeck et al., 2007; Culos-Reed et al., 2006; Raub, 2002; Telles, Nagarathna, Nagendra, & Desiraju, 1993; Phoosuwan, Kritpet, & Yuktanandana, 2009).

The lack of improvement in two of the physical functioning subscales and the PCS may be explained due to the fact that at baseline, a majority of the participants (8; 57.1%) were meeting the Canadian Society for Exercise Physiology's PA guidelines for achieving health benefits. Moreover, since little information exists regarding the PA practices/preferences of cancer caregivers as well as their general perceptions of physical fitness since becoming a caregiver, participants were asked whether or not they felt they lead a physically active lifestyle, whether they felt it was important to be physically and mentally fit since their care recipient's diagnosis, and whether or not they felt they were physically fit. Interestingly, the majority of the participants (9; 64.3%) felt they lead a physically active lifestyle, eight participants (57.1%) perceived themselves to be at least moderately fit, and almost all of the participants (13; 92.9%) felt it was important to be physically and mentally fit since their care recipient's diagnosis. Therefore, the participants in this study may have been a select group of caregivers who were not only physically active enough to achieve health benefits, but who, since their care recipients' diagnosis, recognized the importance of physical and mental fitness and may have

already implemented lifestyle changes. As such, the participants in this study may have been too physically active and healthy to experience any physical benefits in such a short period of time. Furthermore, in contrast to the current study, previous yoga studies noting changes in physical health outcomes mainly involve ill populations (Raub, 2002; Baer, 2003; Kolasinski et al., 2005; Yang, 2007; Culos-Reed et al., 2006). The decrease in physical functioning in the present study may also be inflated since one participant (7.1%) started cancer treatment and one participant (7.1%) was in a car accident during the six weeks of the intervention. Moreover, two of the 14 individuals (14.3%) in the current study did not attend greater than one session, which may have diluted the effects of VY on the six individuals (42.9%) that attended at least two thirds ($\geq 66.7\%$ or ≥ 8 out of 12) of the sessions offered. Finally, using a subjective tool such as the SF36v2 may not be the most appropriate method to assess physical functioning and physical functioning related changes in this population. Although not the primary purpose of the study, the current study did not include objective measures of physical functioning, which previous studies have used to assess yoga's ability for improving objective components of physical functioning (Culos-Reed et al., 2006; Van Puymbroeck et al., 2007; Dash & Telles, 2001; Garfinkel et al., 1994).

Interestingly, despite the lack of improvement based on statistical significance, most participants (12; 85.7%) endorsed that they experienced improvements in either physical or mental fitness, as noted in the open-ended survey questions. Specifically, in response to Question 6, "*Over the past 6 weeks, do you feel that your mental or physical fitness has improved? If yes/no, why?*", several participants noted improvements in flexibility (5; 35.7%), core and upper body strength (4; 28.6%), and energy, control, and

overall fitness (4; 28.6%). Specifically, participant #2 noted: *“Yes, I am definitely more flexible. And I feel like I can hold balance poses longer and deeper now”*; participant #3 noted: *“Yes – I can do the yoga poses slightly better. I can do other sports better. I curl and the increase of flexibility in my hip helps tons”*; participant #5 wrote: *“Yes. Feel looser and more flexible and stronger. Feel light after class”*; and participant #1 wrote: *“Yes. My physical fitness has improved. I can almost touch my toes!! I feel like I’m building core strength and upper body strength. I’m beginning to focus on muscle groups I never exercise/stretch/build on when running, biking, or playing basketball/dodge ball”*. Finally, participants 8, 12, and 14 wrote, in response to the question above: *“My physical fitness has improved ...”*, *“ ... I have noticed that I have more energy and better control ...”*, and *“Yes! I can feel the difference every time I hold a pose longer or sink deeper. There’s also less pain 😊”*. This feedback may suggest that physical functioning variables require further examination using objective measures in larger RCTs of VY in key cancer caregivers.

Although it is unclear as to why statistically significant changes did not occur in the PCS and in various other psychological distress and QOL subscales, it is important to consider not only statistical significance, but clinical significance or minimally important differences as well. Using a three-point difference as a measure of a minimally important difference for the MCS, and a four and three-point difference as a measure of a minimally important difference for the role emotional and mental health subscales, the mean group change scores from before the VY program to post-intervention exceeded the threshold for clinically meaningful differences. Moreover, although the small sample size may have resulted in inadequate power to detect statistical significances, two of the three summary

measures had large effects, and 10 of the 14 subscales had moderate or large effects in the hypothesized direction.

While the effect sizes in the current study are very promising, they are not typical. In Waldron et al.'s (2012) systematic review of six RCT interventions seeking to improve QOL in adult cancer caregivers, no to small effects on QOL outcomes were found in four (66.7%) studies where the QOL effect sizes could be calculated; two of which reported significant changes in QOL (McMillan et al., 2006; Northouse et al., 2007). Furthermore, the effect sizes reported in Waldron et al.'s (2012) systematic review are similar to those reported by other meta-analyses and systematic reviews examining outcomes of psychosocial interventions for cancer caregivers (Harding & Higginson, 2003; Northouse et al., 2010). As such, additional research is required in order to corroborate the efficacy and feasibility of a VY intervention with this population.

To date, Waldron et al.'s (2012) systematic review is the only one specifically examining studies measuring QOL in cancer caregivers in a rigorous way using systematic and replicable methodology. The results of the current study are however more comparable to the findings of Petruzzello, Landers, Hatfield, Kubitz, and Salazar (1991) who conducted three separate meta-analyses and reported the effects of exercise on either self-reported state or trait anxiety and/or psychophysiological correlates of anxiety. All three meta-analyses noted overall effect sizes significantly greater than zero. Furthermore, such as may be the case in the current study, Ismail and Trachtman (1973) have advanced the idea that exercise may yield positive results because of mastery feelings or the sense of accomplishment that comes from the positive completion of exercise. Other authors have also considered exercise to be a disruption (or

distraction/time out) from daily routine (Bahrke & Morgan 1978). Such effects were noted in the current study's participants. Specifically, two (14.3%) participants noted "*relieve from life's responsibilities*" as a main motivation for participating in the intervention (participants #4 and 5, question 4), while participant #9 reported the intervention as an "*outlet*" (question 4) and that participating in the VY intervention was "*a chance to get away and close my brain off*" (question 8). Finally, participant #5 reported a sense of accomplishment from having participated in the intervention, noting, "*I feel a sense of accomplishment after class*" (question 7). In light of these discoveries, future research (both qualitative and quantitative) should seek to assess the effects of VY on feelings of mastery and accomplishment.

Positively, due to the small group size, more personal attention, modifications, and assurance of proper technical execution was made possible. Small group size (< 30) has been shown to positively affect perceptions of the instructor as well as show overall satisfaction with an exercise class (Prossin & Carron, 1989). Research has demonstrated that as the number of people in an exercise class increases, perceptions of group cohesiveness and satisfaction with the exercise experience decreases (Carron, & Spink, 1995; Carron, Brawley, & Windmeyer, 1990). Although the small sample size prohibited the use of more powerful statistics, several participants noted positive perceptions of the instructor as well as the instructor's ability to provide more personal attention and modifications in the post-intervention survey questions. For example: participant #2 noted "*I loved [the instructor] and how the personal attention made me want to get back into yoga and really focus on it*" (question 13), participant #4 wrote "*[The instructor] was terrific in every way: very well spoken, knowledgeable, caring for each class*

participant, always offering options to poses, just the right amount of change/progression each class” (question 7), and participant #8 wrote “[*The instructor*] was funny, caring, and helpful. She took her time” (question 11).

Although significant improvements in the individual subscales and minimally important difference values in mean group change was not the primary outcome of the present study, it was nonetheless surprising to see that significant changes and/or minimally important differences did not occur in some of the psychological distress and QOL subscales for which previous studies utilizing yoga have noted its benefits, namely: vigor/activity (Michalsen, 2011; Campbell et al., 2007), fatigue-inertia (Oken et al., 2004; Michalsen, 2011), bodily pain (McCall, 2007; Desikachar, Bragdon, & Bossart, 2005; Williams, Steinberg, & Petronis, 2003), and general health (Birkel & Edgren, 2000; McCall, 2007; Oken et al., 2006). The lack of statistical significance and/or minimally important differences in the above mentioned subscales may have been a result of the short duration of the study, the different yoga style in the current study as compared to those in previous studies (Speed-Andrews, 2010; Yang, 2007; Bijlani et al., 2005; Mnchanda et al., 2000; Yogendra et al., 2004; Raub, 2002; Danucalov, Simoes, et al., 2008; Duseket et al., 2006), the moderate attendance rate (57.1% or 6.9 sessions out of 12), or the small sample size (N=14). Positively however, the current study’s findings are consistent with the results of researchers who found increases in QOL and reductions in psychological distress in healthy and chronically ill populations with the use of yoga interventions (Sareen, Kumari et al., 2007; Pilkington et al., 2005; Woolery, Myers, Stemlieb, & Zeltzer, 2004; Pilkington, Kirkwood, Rampes, & Richardson, 2005; Oken, 2006).

Furthermore, it is typically the cancer survivor's spouse/partner who fulfills the caregiving role when available. In the current study, however, the majority of the participants (9; 64.3%) were the care recipients' son/daughter. While the literature notes that spouses/partners of cancer survivors are at greater risk of depression (Braun et al., 2007), recent findings demonstrate that those fulfilling the caregiver role, regardless of relationship to cancer survivor, are also at risk (Segrin & Badger, 2010). To date, the literature has been inconsistent regarding relationship to the care recipient. Research has noted that spouses may report worse physical health than adult children do, often because they are older and more likely to show age-related physical decline. On the other hand, many adult children have additional family and work responsibilities, which have been shown to conflict with caregiving (Pinquart & Soerenen, 2007). Dumont et al., (2006) also supported the notion that young caregivers may experience higher psychological distress, particularly closer to the impending death of their care recipient. Conversely, Pinquart and Soerenen (2003) noted, in their meta-analysis, that spousal caregivers had higher levels of objective burden than adult child caregivers and fewer psychological and physical resources to cope with stressors.

Although the literature notes that those fulfilling the caregiving role, regardless of relationship, are at risk for negative health outcomes, it may be that the population in this study was not representative of a typical cancer caregiving population. Therefore, the participants in the current study may not have been as distressed or burdened as a typical informal cancer caregivers population (e.g., spouses/partners). When compared to general adult populations, at baseline, the participants in the current study were, on average, greater than 1SD above population norms for overall psychological distress, and ranged

from .5SD to 1.5SDs above population norms on the psychological distress subscales. Also, in terms of QOL, the participants were within .5SDs of population norms for the PCS and slightly greater than 1.5SDs below population norms for the MCS. In terms of the QOL subscales, participants were mostly within .5SDs of population norms, except for the four MCS subscales, which ranged from 1 to 1.5 SD below population norms.

Several things were learned on which to improve upon for future research, such as recruitment and intervention design. Initially, the study sought to recruit more cancer caregivers to permit for a RCT – however, recruiting this population to participate in a six-week PA intervention proved challenging. Previous research studies (e.g., Harding et al., 2004) have also noted some difficulty in effecting clinical intervention studies with informal caregivers, especially RCTs. Moreover, Waldron et al. (2012) reported, in their systematic review of RCTs for cancer caregivers, an average retention rate of 72.9%. Research has noted that low to moderate retention rates in caregivers may be because informal caregivers are busy with family and work in addition to caregiving. In terms of cancer caregiving, Waldron et al. (2012) reported burden, scheduling, strain, lack of time, and death of the care recipient amongst the most problematic barriers to retention. Therefore, asking cancer caregivers to take time away from their loved one (care recipient) and take time for themselves by adding one more thing to their plate (participating in a clinical trial) is challenging. In line with Waldron et al. (2012), previous studies have also reported time constraints as a main reason why caregivers drop out, with attrition rates ranging from 16% to 50% (Jacobs et al., 2004; Mant, Carter, Wade, & Winner, 2000; Northouse et al., 2006). Additionally, PA interventions typically experience moderate attrition rates, ranging from 3% to 41% (Banks-Wallace & Conn,

2002). Although no participants actually dropped out of the current study, two participants (14.3%) only attended one VY session. Moreover, while informal cancer caregivers may want and be willing to participate in research, it is not necessarily a priority.

Participants were asked about their motivations for participating in the current study in order to shed light on the PA and intervention interests of cancer caregivers. When asked about their main reason for participating, most participants (7; 50%) noted stress relief, relaxation, or having an outlet as their main motivation for participation. Only two participants (14.3%) noted being a part of a clinical trial as one of their top three motivations for participating. Positively, eight participants (57.1%) noted PA as one of their top three motivations for participating in the current study. Additionally, the responses to the open-ended survey questions align themselves with previous research noting informal caregivers are interested in stress-reduction techniques and PA (Keir, 2007; Swartz & Keir, 2007), and may enjoy yoga as a form of intervention (Van Puymbroeck et al., 2007). Specifically, in one of the only studies involving a RCT and yoga intervention solely for caregivers (N=13), Van Puymbroeck et al. (2007) reported that the caregivers who participated in yoga chose to pursue additional yoga instruction; likely indicative of their satisfaction with yoga as an intervention and PA option. Moreover, Swartz and Keir (2007) reported that 73% (n=44; N=60) of informal caregivers of brain tumour patients were interested in exercise-based interventions and 42% (n=25) were interested in yoga. In line with Swartz and Keir (2007) and Van Puymbroeck et al. (2007), the participants in the current study noted their satisfaction with the yoga intervention and their desire to continue with yoga. Specifically, participant

#7 noted: *“My responses on the survey don’t adequately reflect the positive benefits of this class. It has been a tremendously stressful time [...]. The yoga has been manna from heaven”* (question 6); participant #2 noted: *“ ... I loved [the instructor] and how the personal attention made me want to get back into yoga and really focus on it ... ”* (question 13); participant #9 reported: *“I thought the program was great ... ”* (question 8), and finally, participant #4 wrote: *“The paperwork doesn’t capture the happiness!”* (question 9). Moreover, several participants noted their satisfaction with the yoga program or their desire to continue with yoga when asked if the yoga program had changed the participant’s outlook on their current or future health, and if so, how (question 7). Participant #2 noted: *“Yes, it really has made me see the benefit in continuing to do yoga ... ”*; participant #1 wrote: *“100% My new outlook/future health program includes yoga, building core strength, and upper body strength, staying well hydrated and rested! I need more ‘yoga-esque’ lifestyle ... ”*; participant #5 wrote: *“I realized how much yoga is something I enjoy and can easily do [...] I feel a sense of accomplishment after class”*; participant #14 noted: *“It reminded me how beneficial yoga is and encouraged me to continue it”*; and participant #11 wrote: *“Yes. I would like to continue with the yoga and build a stronger body and calmer mind”*. Additionally, it should be illustrated that the participants in this study noted several non-physical benefits from having participated in the VY intervention, namely: learning to let go and not think beyond the present moment, learning the importance of proper breathing and how to control the breath, mindfulness, and learning relaxation and meditation tools that they can use off the mat and throughout their daily lives.

Several participants (4; 28.6%) also noted that they wished for this program to

continue to be available for other cancer caregivers as well as last longer than six weeks. Namely; with response to question 11, *“What would you like to see different to make this program a better experience?”*, participant #4 wrote *“Longer duration please – i.e., 3 month course or up to 6 months. Anything that makes people feel better and be healthier will save health care dollars”* and participant #8 reported: *“I hope this can continue for people like me free of charge. Well, God willing”*. Moreover, participants #13 and #14 wrote, in response to the question above, *“Be held on a continual basis”* and *“It to be longer ☺!”* Finally, participant #4 also reported: *“I would LOVE to plug in for longer!!! I would like to continue on the journey of change/learning/discipline”* (question 8).

Positively, a strength of the current study was that the VY intervention was offered free of charge (including free parking and yoga mats and props). As such, the intervention may have reached cancer caregivers whom would have otherwise been unable to participate. That this intervention was offered free of charge was noted as one of the top three motivations for participating in the present study by three (21.4%) participants. Previous yoga studies have offered yoga programs where participants were required to pay to participate in the yoga program, which may have prevented and/or discouraged participation from otherwise eligible and interested participants. As in the literature, cancer caregivers and caregivers alike often take on additional expenses or experience lost wages as a result of their caregiving role. Offering PA options/interventions free of charge may not only reach a large proportion of this population, but also acknowledge the vital role cancer caregivers provide to their loved ones and society as a whole.

Overall, the findings suggest that participation in VY may reduce overall

psychological distress and increase overall mental-health related QOL as well as several psychological distress and QOL domain subscales. In addition to statistical significance, mean group change scores and effect sizes for several summary measures and subscales report exciting results for the clinical significance of a VY intervention with this population. Finally, answers to the open-ended survey questions indicated that many participants perceived benefiting from the yoga intervention.

Limitations

This study is the first to our knowledge to report a significant reduction in overall psychological distress and improvement in overall mental-health related QOL in cancer caregivers using quantitative, valid, and reliable measures. However, the current study possesses several limitations that warrant consideration. The main limitation of the study design was the lack of a control or comparison group – making it difficult to determine whether reductions in overall psychological distress and improvements in overall mental-health related QOL were due to the VY itself or other potential confounding variables. A lack of control group limits the ability to determine whether VY or any other number of factors influenced the increase or decrease in scores. For instance, simply the passage of time (without any intervention) or other confounds such as participating in other PA or altering PA behaviours, receiving other psychological distress treatment(s), participating in other QOL improving behaviours, or perceptions of the yoga instructor could have contributed to the outcomes. This study did not control for such confounds, and therefore, the results of this study do not mean that the VY intervention caused the reduction in overall psychological distress and increase in overall mental-health related QOL. Further research or replicating the study with more rigorous precautions against such potentially

confounding variables is required in order to determine VY's capability in improving overall QOL and reducing overall psychological distress in this population.

Moreover, the lack of controlling for caregivers whose care recipients passed away during the six-week period of the intervention is a further limitation and confounding variable. In the current study, two participants (2; 14.3%) noted on the post-intervention questionnaire that their care recipient had passed away during the six-weeks of the intervention. Research has shown that cancer caregivers' health-related QOL can fluctuate because of differing cancer stages and the responsibilities required at each stage (Persson & Ostlund, 2008) and that caregivers of cancer survivors with more advanced disease had poorer QOL outcomes as compared to newly diagnosed or recurrence caregivers (Northouse et al., 2007). Likewise, Kim, Spillers, et al. (2010) reported bereaved caregivers as having lower levels of psychological and spiritual adjustment than former caregivers whose care recipients were in remission. Therefore, bereaved and/or palliative caregivers in the present study may have significantly altered the results in the current study. Positively however, the two participants (14.3%) whose care recipient passed away during the course of the intervention did not drop out of the study and actually reported: *"It has been a tremendously stressful time [...] resulting from two deaths in close succession. The yoga has been manna from heaven"* (participant #7, question 6) and *"Being physically and mentally fit is calming and it allows me to go about my day (vs staying in bed). It helps me deal with the pain of recently losing my mom (vs spiraling out of control and not going to work and being social)"* (participant 1, question 3) and *"This class made me feel like I was normal and not the center of attention. Lately (since my mom's passing), being in a group of friends/family/co-workers*

has been overwhelming” (participant #1, question 12). Given this information and the positive feedback from the program evaluation, perhaps more qualitative based research would be of benefit to this population; not only for the purpose of assessing the effects of an intervention, but also in shedding light on the intervention interests and needs of this population.

Another main limitation related to this study included the small sample size (N=14). The sample size prohibited the use of more powerful statistics to detect differences such as the relationship between caregiver and care recipient, PA levels, and adherence to the VY intervention. Also on account of the small sample size, conducting subgroup analysis to determine any associations between the length of and adherence to the VY program and changes in psychological distress and QOL was not possible. Moreover, because of the pilot exploratory nature of this study, the *p* value was not adjusted for multiple testing. Thus, these present study’s findings should be interpreted with caution within the scope of the intention of this pilot study. In this study, 17 post-program *t*-tests with a probability value of .05 were conducted. As such, it should be concluded that without adjusting the *p* value, there is a likelihood of having made a Type 1 error and having rejected the null hypothesis when it is in fact true. Therefore, clinical significance of the findings is unclear.

Also, due to the time restraints of the present study, limitations regarding assessing the long-term outcomes of the VY intervention were not possible. Therefore, the results of this study are limited to the short-term (six weeks) effects of VY and do not include follow-up or maintenance of VY. Previous research has shown however, that yoga’s benefits seem to be immediate (Culos-Reed et al., 2006; Moadel et al., 2007;

Oken et al., 2004; Saeed, Antonacci, & Bloch, 2010; Tekur, Chametcha, Hongasandra, & Raghuram, 2010). In addition to the short length of the study, the inability to offer a varied yoga schedule was another limitation. The VY sessions were offered on Monday and Wednesday evenings during the Halifax Transit Strike. There were several participants who voiced their desire to come twice a week but were unable due to the days on which VY sessions were offered and the lack of public transportation. Furthermore, several participants voiced their desire to attend more than two yoga sessions per week. Offering several sessions per week on both weeknights and weekends, thus giving caregivers the opportunity to drop in at their convenience, may help with cancer caregiver attendance and adherence to a VY program.

Another limitation of the current study included its obvious nature. Due to the evident nature of this study, participating caregivers may have included a specifically selected group of individuals who were interested in or enjoy yoga as a PA option, be willing to take time for themselves, and recognize the importance of PA and their own well-being during this stressful time. Several participants (8; 57.1%) reported PA levels that met or exceeded the Canadian Society for Exercise Physiology's guidelines at baseline, and all participants had tried yoga at least once in their lifetime. However, nine (64.3%) participants had not practiced yoga in the six months prior to starting the study, and only two (14.3%) had ever tried VY. Furthermore, 10 (71.4%) participants did not know which style they had previously tried and 11 (78.6%) identified themselves as "beginner" yoga practitioners – indicating altogether that the participants were likely not avid yoga practitioners. Finally, the obvious nature of the current PA/yoga intervention may have contributed to the disproportionately low number of males (2; 14.3%) (Swartz

& Keir, 2007). Yoga interventions may be particularly enticing to females, who are also more likely to be caregivers. Swartz and Keir (2007) reported in one of the only reviews involving the PA preferences of caregivers, that although exercise was the most preferred form of intervention/stress reduction technique for both men and women, only 30% (n=6; N=20) of men, as compared to 48% (n=19; N=40) of women, chose yoga as one of their stress-reduction/intervention preferences.

Several factors also warrant consideration that may have effected change in the current study's population. For example, the adherence rate (57.1%) was moderate, the majority of the study's participants (12; 85.7%) were female, the care recipients had a variety of cancer diagnoses and stages, the caregivers ranged in months of caregiving from 1 to 32 months, the caregivers ranged in annual personal income from less than \$10,000 to \$100,000-\$149,999, and finally, the participants in the current study were not "typical" of the cancer caregiving population. That is, most of the participants in the current study were the cancer survivor's daughters/sons, whereas typically it is the spouses/partners of cancer survivors who 'step up', filling the gap in cancer care. A final limitation includes the potential influence of the yoga instructor who was also the PI. As a result, participants may have self-reported more positively. There is a possibility, however, that in assuming both the role of yoga instructor and PI, that a good rapport was built between the participants and the PI, and that participants felt more comfortable in answering the questionnaires truthfully. Future studies should seek to include not only various yoga instructors, but also various means of delivering VY interventions (home-based, internet-based) to determine whether it is the VY program itself, or the in-person

yoga sessions or presence of certain fitness leaders that participants are most benefiting from.

Despite these limitations, this study is an important first step in exploring the role that VY may play in enhancing overall QOL and reducing overall psychological distress in key caregivers of cancer survivors. The implications of this study are that in a group of middle-aged, mostly female cancer caregivers, VY may serve to reduce overall psychological distress and increase overall mental-health related QOL. The overall pattern of findings indicates changes in the expected direction, providing preliminary support for the benefits of VY in this select group of cancer caregivers.

Practical Implications and Recommendations for Future Research

Despite the current study's limitations, the findings add to the very limited literature involving PA interventions for cancer caregivers and suggests that VY is a feasible and enjoyable form of PA that may improve not only overall psychological distress and overall mental-health related QOL, but also several sub-domains of each. This study, to the best of our knowledge, is the first to examine the impact of VY on overall psychological distress and overall QOL using valid measures exclusively in cancer caregivers and the first to examine participant evaluation and overall satisfaction with VY using open-ended survey questions. Overall, the findings support the limited existing literature showing that VY is feasible and enjoyable for this population and can improve dimensions of QOL and psychological distress, such as TMD, overall mental health-related QOL, tension-anxiety, depression-dejection, confusion-bewilderment, role-emotional, and mental health.

Due to the small number of studies having been conducted with PA or yoga and

cancer caregivers as well as the methodological limitations of the current study, the results should be regarded as preliminary and treated with caution. While there is limited data involving cancer caregivers and PA/yoga, it is an area deserving of future research. These preliminary findings provide important information regarding VY as a possible complementary therapy to help manage or reduce overall psychological distress and improve overall mental-health related QOL exclusively in cancer caregivers.

Still, numerous questions remain unanswered. There is a need for the knowledge gained from the current study to be tested utilizing a RCT with a larger sample size and/or controlling for multiple testing. Additionally, research assessing VY's effectiveness on psychological distress and QOL subscales such as tension-anxiety, depression-dejection, confusion-bewilderment, role-emotional, and mental health warrant further investigation. As mentioned in the discussion and limitations, although the small sample size prohibited the use of more powerful statistics, the small group size was positively received and allowed for more personal attention and modifications. Perhaps a way around this in future research would be to hold multiple small-sized yoga sessions (≤ 20) and amalgamate the data.

Furthermore, future research is required to examine treatment effects in comparison to other forms of PA and styles of yoga, as well as according to the amount of VY practiced - including not only the optimal frequency, but at what time point in the cancer caregiving trajectory will VY create the greatest benefits. Specifically, it needs to be determined whether VY has differential effects in cancer caregivers at the time of diagnosis, treatment(s), survivorship, palliative care, or bereavement. With the distinct issues and treatments for cancer survivors across various cancers and at different stages,

the effects of a VY intervention will likely vary depending on these variables. Narrowing the eligibility of caregivers could help to determine when a VY intervention may be most useful or when caregivers are most likely to seek out and partake in PA interventions. Though there is strong evidence that cancer caregivers are most burdened at the end of the cancer survivor's life (Williams & McCorkle, 2011), research is lacking and PA interventions have yet to be created depending on the type and stage of cancer. Moreover, research has inferred that particular cancer diagnoses may not significantly influence the outcomes of caregiver interventions, but instead, that cancer stage may be a more critical factor. For example, Northouse et al. (2007) found significant differences in the emotional, functional, physical, and total QOL scales for both caregivers and patients based on the stage of disease (newly diagnosed, recurrence, and advanced). To date however, no studies have examined the impact of cancer stage, and therefore, cancer caregiver responsibilities, on intervention outcome.

As the literature has developed on cancer caregivers, further predictor variables for mental health problems have been identified, such as caregiver age, sex, relationship to the patient (Sörensen & Pinqart, 2002; Kozachik et al., 2001), declines in caregiver health, perceived burden of caregiving, (Northouse et al., 2002; Kim, Duberstein, Sorensen, & Larson, 2005; Rossi et al., 2003), ethnicity (Pinqart & Sörensen, 2005), lifestyle interferences, and social isolation (Cameron, Franche, Cheung, & Stewart, 2002; Goldstein et al., 2004). Based on the current literature, future research may want to separate caregivers according to PA level or age in order to more accurately determine VYs effectiveness, feasibility, and likeability across these variables. Moreover, future studies may want to include same-sex yoga sessions assessing the feasibility and

likeability of yoga by both genders. To date, studies have been underpowered to establish whether interventions result in differential improvement for female caregivers compared with male caregivers. What's more, research is also needed to further understand differences in psychological distress and QOL outcomes with the use of PA interventions with regard to caregiver's perceived burden, relationship to care recipient, length of caregiving, and ethnicity. Also, assessing cancer caregivers at baseline, middle, and post-intervention may be an appropriate method to capture and better understand other previously noted predictor variables such as financial burden and work disruptions, caregiving responsibilities, and disease progression and bereavement/death.

Although not the primary purpose of this study, the current study failed to include objective measures of physical functioning. While answers to the open-ended survey questions indicated that the participants perceived to have improved physically (e.g., flexibility, core and upper strength), the inclusion of objective measures is needed to substantiate such findings and determine whether VY is comparable to other forms of PA and yoga styles for improving objective components of physical functioning. Including objective measures would help to assess whether changes in physical functioning are related to reductions in overall psychological distress and improvements in overall QOL. Previous research has shown positive effects of yoga on objective physical outcomes such as range of motion and flexibility (Lox et al., 2006; McCall, 2007; Van Puymbroeck, 2007; Culos-Reed et al., 2006), body weight and cholesterol (Yang, 2007; Bijlani, 2005; Manchanda, 2000), heightened endurance and cardiorespiratory conditioning (Danucalov, Simoes, Kozasa, & Leite, 2008; Dusek et al., 2006; Tran, Holly, Lashbrook, & Amsterdam, 2001; Woolery, Myers, Stemlieb, & Seltzer, 2004),

and increased muscle mass and/or maintaining muscle strength (Desikachar, Bragdon, & Bossart, 2005).

Currently, there is no evidence to suggest the optimal volume, frequency, duration, style, or length of yoga program for improving health. Yoga intervention studies to date have ranged in duration from four weeks to six months (Speed-Andrews, 2010; Van Puymbroeck, 2007; Oken, et al., 2006; Woolery et al., 2004; Moadel et al., 2007; Michalsen et al., 2011), with 60 to 90 minute sessions once or twice a week, with or without home-based sessions. Consequently, future trials assessing response to specific amounts of yoga and specific yoga style(s) are required. Moreover, since there are so many different styles of yoga, one area that may be helpful not only with recruitment but in making yoga more appealing to cancer caregivers of all ages and PA levels, would be to clearly describe the style of the yoga in the intervention. This may help avoid misconceptions and attract cancer caregivers looking for a certain level of PA or a stress-reduction technique from an intervention; in turn perhaps leading to greater adherence and retention. Positively, caregivers in the current study noted their satisfaction with the VY intervention, their desire for the intervention to be longer, and their desire to continue to practice yoga. Additionally, several participants noted having realized the need to be more active and the importance of PA after the intervention. This may be indicative of the satisfaction of VY as a PA option in this select group of cancer caregivers. While the VY intervention appeared to be an acceptable and enjoyable form of PA intervention in this select group of cancer caregivers, this type of intervention may not be appropriate for all cancer caregivers. Specifically, in response to the overall satisfaction with the breathing and meditation techniques taught during the VY sessions, perhaps a more

meditative-based yoga program would be of benefit to this population. Furthermore, it should be noted that a VY intervention may be beneficial for certain cancer caregivers if used as a potential adjunct or complementary intervention to other interventions already offered to this population (i.e., psycho-educational, skills-training, therapeutic training), and not as a replacement for existing psychosocial interventions.

While a strength of the program was offering the intervention free of charge, allowing the cancer caregiver the flexibility to choose when and where to undertake the PA program could lead to greater participation and adherence to yoga. As previously noted, several participants were unable to attend yoga sessions because of the days on which the sessions were offered or lack of transportation. Although several benefits exist in delivering in-person interventions to cancer caregivers such as those noted in the current study (e.g., socializing, learning proper technique, assurance of proper use of props, motivation, something to look forward to), previous research has noted difficulty in retaining caregivers in interventions (Waldron et al., 2012; Jacobs et al., 2004; Mant, Carter, Wade, & Winner, 2000; Northouse et al., 2006); mostly noting time constraints as a main reason why caregivers drop out. The development of supervised home-based PA programs has shown promise in facilitating long-term exercise adherence with a minimal amount of face-to-face contact. Future studies may want to consider a more home-based yoga practice, perhaps with the use of a video/DVD and/or Internet or telephone-based yoga information/sessions, while only meeting face-to-face once per week. Home or internet-based intervention programs may help to reach those high need participants who are unable to access in-person classes. Internet-based interventions in particular may have the added benefit of enabling participants to access information/activities at their own

rate and on their own time, while also accessing video tutorials and participating in online support groups, assisting them to remain motivated and engaged. As Waelde et al. (2004) and King and Brassington (1997) noted, home-based activity might help alleviate some of the participation constraints often expressed by caregivers.

Based on the literature and participant feedback, conducting qualitative research may be a useful tool in not only understanding which types of interventions caregivers are interested in, but also in helping to reduce issues with caregiver adherence and retention. Qualitative research can provide valuable and complex descriptions of how cancer caregivers experience their crucial role. An advantage of qualitative methods in exploratory research is the use of open-ended questions and probing, which, with cancer caregivers in particular, could enable the more complex aspects of their vital role to be studied, understood, and considered (Mack, Woodson, MacQueen, Guest, & Namey, 2005). Additionally, using qualitative research alongside quantitative methods can help to interpret and better understand the implications of quantitative data. For example, with regard to the current study, the qualitative data shed light on numerous issues that were not discovered from the quantitative data (e.g., perceived physical benefits, motivations for participating, the PA practices of cancer caregivers, group composition) as well as substantiated some of the quantitative results (e.g., TMD, MCS, and qualitative responses regarding the mental skills learned during the course of the intervention). Future research should seek to conduct more qualitative research with this population, particularly with regard to assessing why or why not cancer caregivers partake in health-promoting behaviours and why or why not they may participate in VY, other yoga styles, or PA.

Finally, the use of a theoretical framework can offer a foundation upon which to

build evidence-based interventions. Theory plays a critical role in the development and implementation of best practices and theoretical models present a systematic way of understanding events and can help explain how health behaviours (e.g., PA) can be influenced (Keats & Culos-Reed, 2009). A number of theoretical models exist; however, the theory of planned behavior (Ajzen, 1991) has received substantial attention in research involving health-promoting behaviour. Notably, the theory of planned behavior has guided the majority of the theoretical research on PA, and a number of recent reviews have shown the theory of planned behavior's concepts to be valuable predictors for explaining exercise behaviour in both healthy and chronically ill populations (e.g., Blanchard, Courneya, Rodgers, & Murnaghan, 2002; Courneya & Friedenreich, 1999; Courneya, Friedenreich, Arthur, & Bobick, 1999; Keats, Culos-Reed, Courneya, & McBride, 2007; Symons Downs & Hausenblas, 2005). As such, both qualitative and theory-based research can help to shed light on who will likely engage in and/or maintain a particular behaviour (e.g., VY/PA), and how to best tailor interventions to meet their needs.

To date, studies involving cancer caregivers have mainly *examined* the effects of cancer on caregivers and interventions have predominantly focused on caregiving skills and managing symptoms via therapy and information. Few studies have sought to improve a cancer caregiver's overall QOL and overall psychological distress with the use of PA/yoga solely with caregivers. The preliminary data derived from this pilot study provides important information not only for future research, but also for practitioners working with cancer survivors and their caregivers. Nurses and physicians may help cancer caregivers remain physically and mentally healthy (or recover from lowered

functioning) by promoting participation in VY. In Campbell et al.'s (2007) study, the recruitment of the cancer caregivers mostly occurred (55%) from physicians. Therefore, physicians and nurses can be helpful in identifying coping strategies and promoting healthy behaviours such as PA. Nurses and physicians working with this population could inform cancer caregivers of their ability to participate in VY and the potential benefits of participation to psychological functioning and QOL.

As the cancer rates continue to increase, so does the number of caregivers. The foundation for improving the lives of caregivers exists; but translating that foundation into widespread practice still remains to be done. Caregivers need to be encouraged and supported to take care of their own health and participate in regular PA. Recognizing the commitment and sacrifice associated with being a cancer caregiver involves incorporating long-term planning and ensuring effective care. Learning skills that apply throughout the whole cancer journey, such as those offered by VY, could be beneficial for cancer caregivers, especially at the onset of diagnosis. These skills could be beneficial not only for the caregivers, but for the patients and other family members as well. Ultimately, the objective is to reach more cancer caregivers with effective evidence-based programs, improving not only their own health, but that of the cancer survivors and other family members as well. Meeting this challenge is critical, and yoga has the ability to reach a large number of caregivers of all ages, PA levels, and yoga experience with just one instructor using minimal equipment and for minimal costs. This research has explored VY as an alternative to traditional aerobic-based activities and psychosocial interventions in reducing overall psychological distress and improving overall QOL for cancer caregivers. The current study's findings can help to tailor programs and

interventions that will address the needs of this population, as well as contribute to the advancement of health care practices.

Conclusion

Caregivers play a vital role in the support and well-being of individuals diagnosed with cancer. PA interventions such as this one should be explored further in future research studies and target this at risk population. Enhancing the caregiver's own psychological well-being and QOL would not only help caregivers to remain physically and mentally healthy to fulfill the multiple demands of their role, but it could also help to ensure that cancer survivors continue to receive the best possible care and have the best possible outcome. The present study's findings require further and more rigorous exploration. However, the good adherence, complete retention, positive program evaluation, and statistical and clinical significance of two summary measures and several subscales provides further support for the feasibility and promotion of VY in cancer caregivers. Specifically, the use of VY would be most beneficial as an adjunct to other widely used psycho-educational interventions or interventions consisting of therapeutic counseling and/or skills training.

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Appendix A

Ethics Approval



Capital Health

Capital Health Research Ethics Board
 Centre for Clinical Research, Room 118
 5790 University Avenue
 Halifax, Nova Scotia, Canada B3H 1V7
 Phone: 473-6436 Fax: 473-5620

October 19, 2012

Dr. Deborah McLeod
 Cancer Care Program
 Victoria 11-006

ATTENTION: Andi Celine Martin

Dear Dr. McLeod:

*Full Board Review
 Full Approval Letter
 (September 12, 2011 – September 12, 2012)*

RE: *Yoga's Effect on Quality of Life and Psychological Distress in Key Caregivers of Cancer Survivors.*

REB FILE #: CDHA-RS/2012-143

Thank you for your response (received October 18, 2011) regarding your proposed study.

Documents Received	Version Number	Date
Cover Letter	n/a	Oct 18, 2011
Ethics Approval Submission Form	n/a	Sept 28, 2011
Consent Form	Version 3.0	Oct 18, 2011
Research Team Contact Page	Version 3.0	Oct 18, 2011
Research Protocol	Version 2.0	Sept 23, 2011
Appendix A – Pre Screening Tool	Version 2.0	Sept 23, 2011
Appendix C – Physical Activity Readiness-Medical Examination Form	Version 2.0	Sept 23, 2011
Appendix E – Baseline Questionnaire	Version 2.0	Sept 23, 2011
Advertisement	Version 2.0	Sept 23, 2011

I have reviewed these documents on behalf of the Research Ethics Board (REB) and note that all requested changes have been incorporated.

I am now pleased to confirm the Board's full approval for this research study, effective today. This includes approval / favourable opinion for the following study documents:

Documents	Version Number	Date
Researcher's Checklist for Submissions	n/a	August 11, 2011
Letter of Support from the Principal Investigator's Department / Division / Program / Support: <i>Signed by Victoria L. Sullivan</i>	n/a	August 11, 2011
Letter of Support from Collaborating CDHA Department / Division / Program / Service: <i>Signed by Dr. John Kozey</i>	n/a	July 18, 2011

Healthy People, Healthy Communities

Letter of Support:		
• Department of Radiation Oncology – Signed by Dr. Robert D. Rutledge	n/a	August 8, 2011
• Young Adult Cancer Canada – Signed by Karine Chalifour	n/a	August 5, 2011
• Canadian Psychosocial Oncology Partners Online – Signed by Lynne Robinson	n/a	August 5, 2011
Multi-Health Systems Inc. – Signed by Khira Ray	n/a	July 25, 2011
Ethics Approval Submission Form	n/a	Sept 28, 2011
Consent Form	Version 3.0	Oct 18, 2011
Research Team Contact Page	Version 3.0	Oct 18, 2011
Research Protocol	Version 2.0	Sept 23, 2011
Appendix A – Pre Screening Tool	Version 2.0	Sept 23, 2011
Appendix B – Physical Activity Readiness Questionnaire	Version 1.0	July 25, 2011
Appendix C – Physical Activity Readiness-Medical Examination Form	Version 2.0	Sept 23, 2011
Appendix D – Description of the Yoga Program	Version 1.0	July 25, 2011
Appendix E – Baseline Questionnaire	Version 2.0	Sept 23, 2011
Appendix F – Post-Intervention Questionnaire	Version 1.0	July 25, 2011
Advertisement	Version 2.0	Sept 23, 2011
Research Protocol	Version 1.0	July 29, 2011
Principal Investigator's completion certificate for the TCPS Tutorial (TCPS 2: CORE)	n/a	June 22, 2011
Principal Investigator's current CV: Deborah McLeod	n/a	August 11, 2011

Continuing Review

1. **The Board's approval for this study will expire one year after the date of full Board review (September 12, 2012).** To ensure continuing approval, submit a Request for Annual Approval to the Board 2-4 weeks prior to this date. If approval is not renewed prior to the anniversary date, the Board will close your file and you must cease all study activities immediately. To reactivate a study, you must submit a new Initial Submission (together with the usual fee) to the REB and await notice of reapproval.
2. Please be sure to notify the Board of any:
 - Proposed changes to the initial submission (i.e., new or amended study documents),
 - Additional information to be provided to study participants,
 - Material designed for advertisement or publication with a view to attracting participants,
 - Serious adverse events experienced by local participants,
 - Unanticipated problems involving risks to participants or others,
 - Sponsor-provided safety information (e.g., reports of serious unexpected adverse reactions, changes to the investigator's brochure / product monograph, DSMB reports)
 - Additional compensation available to participants,
 - Upcoming audits / inspections by a sponsor or regulatory authority,
 - Closure of the study (within 90 days of the event).
3. Approved studies may be subject to internal audit. Should your research be selected for audit, the Board will advise you and indicate any other requests at that time.

Important Instructions and Reminders

1. Submit all correspondence to Joan Morrison, Ethics Coordinator at the address listed at the top of this letter (do not send your response to the REB Chair or Co-Chair).
2. Be sure to reference the Board's assigned file number, CDHA-RS/2012-143, on all communications.
3. Highlight all changes on revised documents, and remember to update version numbers and/or dates.
4. If you plan to advertise. Print and electronic advertisements are to be submitted to the Audio Visual Department for placement in the appropriate Capital Health template. Complete a Request for Graphic Services form (Form CD 0019, available on the Intranet) and fax to Audio Visual Services together with the REB approved advertising materials and confirmation of REB approval.

Best wishes for a successful study.

Yours very truly,



Shelly McNeil, MD, FRCPC
Co-Chair, Research Ethics Board

This statement is in lieu of Health Canada's Research Ethics Board Attestation:

The Research Ethics Board for the Capital District Health Authority operates in accordance with:

- *Food and Drug Regulations, Division 5 "Drugs for Clinical Trials Involving Human Subjects"*
- *Natural Health Products Regulations, Part 4 "Clinical Trials Involving Human Subjects"*
- *ICH Good Clinical Practice: Consolidated Guideline (ICH-E6)*
- *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*
- *Title 45, U.S. Code of Federal Regulations.*

/jm



Capital Health Research Ethics Board
 Centre for Clinical Research, Room 118
 5790 University Ave., Halifax, NS B3H 1V7
 Phone: 473-2125 Fax: 473-5620

Protocols, Informed Consent Forms, Research Team Contact Pages: Amendment Form

Use this form to submit new or amended study protocols, informed consent forms / addendums and research team contact pages after the study has received full approval by the REB. Prior to study approval, these documents are to be included with the initial submission or with a cover letter.

To be completed by Research Ethics Office	Date Received:	<div style="border: 1px solid black; padding: 2px; display: inline-block;">RECEIVED</div> <div style="font-size: 1.2em; font-weight: bold; color: red;">JAN 4, 2012</div> <div style="font-size: 0.8em; color: red;">DEPT 118</div>
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Research Study			
REB File No.	CDHA-RS/2012-143	Protocol Identifier <i>(if applicable)</i>	N/A
Title of Protocol	Yoga's Effect on Quality of Life and Psychological Distress in Key Caregivers of Cancer Survivors		

Principal Investigator (PI)	
Name	Dr. Deborah McLeod

Site Investigator (SI)		<input checked="" type="checkbox"/> Not applicable <i>(clinical trial and/or PI has a CH appointment)</i>	
Name			
Mailing Address			
Phone No.		Fax No.	
Email Address			

Contact Person for this Research Study				<i>(person to whom correspondence should be sent)</i>
Name	Andi Celine Martin			
Mailing Address	Apt 203, 1239 Barrington Street			
Phone No.	902-488-9775	Fax No.	(902) 484-5120	
Email Address	andicelinemartin@dal.ca			

Important instructions and reminders:

- Incomplete submissions/documents will not be processed and will be returned to sender.
- Mailing address must be detailed enough to enable successful delivery of return correspondence. Specify dept./division/program/service, institution, building, and room no. as well as any other required information.
- Print this form as a single-sided document.
- Submit one copy of each document with this form.
- Be sure to highlight all changes on amended documents. "Track changes" versions will not be accepted.

- Distribute the attached documents to all affected parties (e.g., subinvestigators, research staff, service departments, study participants) after this form has been signed by the REB Co-chair.

Informed consent forms and research team contact pages:

- Remember to add / update version numbers and dates. All dates should be written as yyyy/mm/dd.
- Place the REB's file number in the lower left-hand corner of each page.
- The research team contact page is an optional tool designed to assist participants to contact relevant members of the study team. While the team contact page may be referenced on the cover page of the consent form, they are separate documents and can be modified independently.

Note: If the study is subject to Office for Human Research Protections (OHRP) regulations and/or the sponsor requires full Board review of study amendments, contact the REB manager to obtain the appropriate submission form.

Section A: Attached Documents

A1. Study Protocols, Informed Consent Forms, Research Team Contact Pages

Item No.	Document Type (e.g., amended protocol, protocol amendment, summary of changes, main consent form, consent form addendum, team contact page)	Version No.	Version Date
1	Informed Consent Form	4.0	Dec 18, 2011 ✓
2	Research Team Contact Page	4.0	Dec 18, 2011 ✓
3	Research Protocol	3.0	Dec 18, 2011 ✓
4	Baseline Questionnaire	3.0	Dec 18, 2011 ✓
5			
6			
7			
8			

A2. Letter of No Objection (NOL) from Health Canada N/A - Complete Section A3
Note: If an NOL is required, DO NOT submit this form unless it is attached!

Letter from Health Canada		Corresponding Study Protocol	
Date of Letter	Control No.	Version No.	Version Date

A3. Reason why a Letter of No Objection is not attached: Not applicable, NOL is attached

<input type="checkbox"/> Non-interventional study (not a clinical trial)	<input type="checkbox"/> Study protocol has not changed	<input type="checkbox"/> Protocol changes do not affect the quality / safety of the investigational product(s) and do not alter the risk to participants
<input type="checkbox"/> Test article(s) is not a drug or natural health product	<input type="checkbox"/> Phase IV clinical trial	<input checked="" type="checkbox"/> Other (describe): This is a Pilot (Graduate Student) Study that did not require Registration with Health Canada.

Section B: Changes from Previously Approved Versions

B1. Study Protocols and Amendments Not applicable

Item No. (as per Section A1)	Summarize and justify changes, with reference to appropriate page / section numbers. Pay particular attention to changes affecting: <ul style="list-style-type: none"> • Level of risk, discomfort, or inconvenience to study participants, • Eligibility criteria, • Number of study participants at this site and/or globally.
3	<p>Research Protocol.</p> <p>Changes to the research protocol were made on pages 5, 6, and 7. These changes do not affect the participant's level of risk or discomfort and will not inconvenience the study participants whatsoever.</p> <p>On page 5, "no previous yoga experience" was removed from the subject selection eligibility criteria since the study will now include all participants who fit the remaining eligibility criteria regardless of their previous experience with yoga. Since most of the currently interested participants have tried at least some form of yoga in the last 12 months, and since there are so many different forms of yoga that offer different benefits, "no yoga experience" is no longer a criteria for eligibility to ensure that all of those interested and who qualify based on the remaining eligibility criteria can participate, regardless of their previous experience with yoga. It is really difficult these days to find people who have not tried some form of yoga at least once in their lifetime. Since this intervention is a specifically designed program for the target population which is different from most of the mainstream yoga that is offered in studios and gyms, it is unlikely that interested participants would have been exposed to this style of yoga. Furthermore, as with the outlines of the study, participants are not to start any new physical activities during the duration of the study, and participants will only be doing the yoga in this study during the 6 weeks.</p> <p>On page 6, "yoga experience" was added as part of the information that will be collected with the pre-intervention questionnaire (BASELINE QUESTIONNAIRE).</p> <p>On page 7, the specific information regarding experience with yoga that will be collected in the baseline questionnaire has been added.</p> <p>Finally, the version number and date have been updated in the bottom right corner of the document.</p>

a) Has this amendment(s) already been implemented to eliminate an Yes No

immediate hazard to study participants? (ICH GCP 4.5.2)

- b) How will current participants be informed of any changes / information that may affect them?
Participants must be informed in a timely manner if new information becomes available that may affect their willingness to continue in the study.

N/A

B2. Informed Consent Forms and Addendums Not applicable

Item No. (as per Section A1)	Describe and justify all changes, with reference to appropriate page / section numbers:
1	<p>Informed Consent Form.</p> <p>Changes were made to page 8 of the informed consent form. Changes to page 8 were made to include the participant's previous "yoga experience". Since "no yoga experience" is no longer a criteria for eligibility, participants will be asked to answer questions regarding their previous yoga experience (e.g., number of yoga classes participated in throughout one's lifetime, within the last 12 months, and within the last 6 months), perceived level as a yoga practitioner (e.g., brand new-never tried yoga, beginner, intermediate, advanced, expert), and style(s) of yoga previously practiced (e.g., Ashtanga, Vinyasa, Bikram, etc.).</p> <p>Additionally, the version number and date have been updated in the bottom right corner of the document.</p>
4	<p>Baseline Questionnaire.</p> <p>Changes made to the baseline questionnaire are on page 3. Since "no yoga experience" is no longer a criteria for eligibility, questions regarding the participant's previous yoga experience, perceived level as a yoga practitioner, and style(s) of yoga previously practiced were added.</p> <p>Additionally, the version number and date have been updated in the bottom right corner of the document.</p>

Item No. (as per Section A1)	Who will be asked to sign these consent forms / addendums? (e.g., new participants, current participants, a particular subset of participants who are impacted by the study changes)
1	<p>All participants will be required to sign the informed consent form. However, the study has not yet begun and therefore all participants will be signing the same informed consent form and are unaware of any changes. The changes to the informed consent form do not affect the participants. Only "yoga experience" was added to page 8 of the informed consent form to inform participants that in addition to other demographic information, they will be asked questions regarding their experience with yoga. Also, version number and date were updated on the bottom right corner of the document.</p>

B3. Research Team Contact Page Not applicable

Item No. (as per Section A1)	Describe and justify all changes, with reference to appropriate page numbers (as applicable):	
2	<input type="checkbox"/> N/A (new)	The version and date on the bottom right corner of the document were updated as this document will be included at the end of the Informed Consent Form. Only font size was modified in this document. No other changes were made.

Section C: Financial Impact

Will these amendments / modifications directly impact your current departmental service agreements or the study budget? Yes No

If unsure, contact the Office of Contract / Grant Facilitation & Support at 473-6682.

Signature Page
 Protocols, Informed Consent Forms,
 Research Team Contact Pages: Amendment Form

Research Study			
REB File No.	CDHA-RS/2012-143	Protocol Identifier <i>(if applicable)</i>	N/A

Principal Investigator's Signature

Signature: Debra McLeod Date: 2011/12/21
 (Principal Investigator) (yyyy/mm/dd)

Research Ethics Board Use Only	
The Capital Health REB approves the use of the study documents described in this Amendment Form.	
Is referral to the REB Executive Committee recommended?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Signature: <u>Patrick For</u> Date: <u>12-01-06</u> (Chair/Co-Chair, REB) (yyyy/mm/dd)	
Print Name: <u>SHELLY McNEILY MD, FRCPC</u> (Chair/Co-Chair, REB)	
<i>Attestation: The REB carries out its functions in a manner consistent with good clinical practices and applicable regulations.</i>	
Processed by:	Date Processed (yyyy/mm/dd)
<u>Jean Morrison</u>	<u>2012-Jan-04</u>

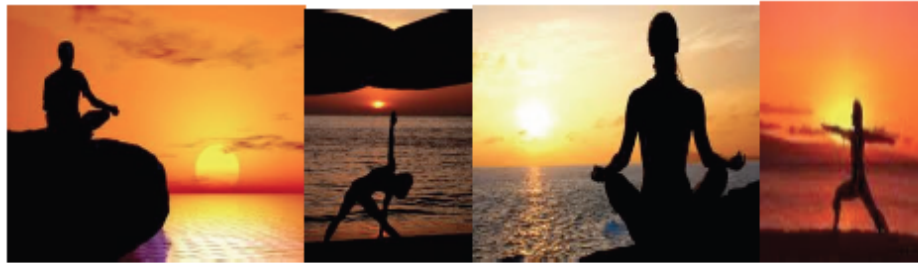
Appendix B

Recruitment Poster



Capital Health

Do you want to try yoga?



Have you ever wanted to explore what the ancient practice of yoga has to offer?

If you are...

- ✓ 18 to 65 years of age, and
- ✓ Provide care* to a partner/spouse, family member, friend, or loved one who has been diagnosed with cancer (from the time of cancer discovery throughout the balance of life; before, during, or after treatment).

You may qualify for a yoga based research study starting in January 2012 at Dalhousie University's Dalplex in Halifax, Nova Scotia.

We are conducting a 6-week study that will explore how yoga affects the quality of life of key caregivers (support persons) of individuals who have cancer.

Participants will be encouraged to attend as many of the 12 yoga sessions offered over the 6-week period as possible.

Want to know more? Please contact Andi Céline Martin at andicelinemartin@dal.ca or (902) 488-9775.

* Providing care (or caregiving) for a person who has been diagnosed with cancer refers to providing any physical, emotional, financial, social, and/or personal care/support (e.g., by caring for someone who has cancer at home, visiting someone in the hospital, phoning a friend or family member regularly to check in on them).

Appendix C

Webpage Advertisements

<http://www.cpoonline.ca/yoga-for-caregivers.html>

Yoga for Cancer Caregivers

Researcher: Andi Céline Martin, MSc (c)

Do you want to try yoga?



Have you ever wanted to explore what the ancient practice of yoga has to offer?

WHAT: We are conducting a six-week study that will explore how yoga affects the quality of life of key caregivers (support persons) of individuals who have cancer.

WHO: If you are 18 to 65 years of age, and provide care* to a partner/spouse, family member, friend, or loved one who has been diagnosed with cancer (from the time of cancer discovery throughout the balance of life; before, during or after treatment). More than one support person/caregiver/loved one is eligible to participate per cancer survivor

WHEN: Study begins January 2012.

WHERE: Halifax, NS

TIME: Participants will be encouraged to attend as many of the 12 yoga sessions offered over the six-week period as possible.

Contact

Andi Céline Martin
andicelinemartin@dal.ca
902-488-9775

* Providing care (or caregiving) for a person who has been diagnosed with cancer refers to providing any physical, emotional, financial, social, and/or personal care/support (e.g., by caring for someone who has cancer at home, visiting someone in the hospital, phoning a friend or family member regularly to check in on them)

http://www.youngadultcancer.ca/community/news/this_ones_for_the_supporters_halifax

Young Adult Cancer Canada > Community > News

This one's for the supporters (Halifax)



Do you live in Halifax? Have you supported a cancer survivor? Are you interested in the effects of yoga?

Andi Celine Martin is a MSc candidate at Dalhousie University. She is conducting a six-week study beginning in January 2012 to determine how yoga affects the quality of life for key supporters of people with cancer.

She invites all loved ones, support persons, caregivers of people dealing with cancer, between the ages of 18 and 65 to register for twelve cost-free yoga sessions. The classes will be held at Dalplex. The dates and times will be determined once the participants are identified and their availability is assessed. Full attendance is not necessarily required, but it strongly encouraged.

If you are interested in helping Andi with her research, please contact her at andicelinemartin@dal.ca or (902) 488-9775.

This study has received full ethical approval from Capital Health and Dalhousie University.

Posted on Nov 24, 2011 - 08:19 AM by Angie
Cancer news monthly archives

Appendix D

Pre-Screening Tool

PRE-SCREENING TOOL

Criteria	Eligible?	
1. Are you between 18 and 65 years of age? ___Yes ___No	No	Yes
2. Do you provide some form of informal (unpaid) care and/or support to a loved one diagnosed with cancer?	No	Yes
3. On a scale from 0-10, 1 being "No Distress" and 10 being "Extreme Distress", which number best describes how much distress you have been experiencing in the past week including today?: ___ (If 0-4, circle "No" under the eligibility column)	No	Yes
(0-4: Indicates distress levels that are well under control at present) NOT ELIGIBLE		
(5-7: Indicates distress that may be affecting life quite significantly) ELIGIBLE		
(8-10: Indicates high levels of distress that may be difficult for the person) ELIGIBLE		
4. Are you available to participate in two 75-minute yoga sessions per week for 6 weeks and be willing to not initiate or alter your current physical activity behaviours during the 6 weeks of the study intervention?	No	Yes

FOR WOMEN ONLY:

5. Are you pregnant or have you given birth within the last two months? No Yes
Yes ___ No ___ (If yes, circle "No" under the eligibility column)

If the potential participant does not meet the eligibility criteria ('no' is circled once or more in the eligibility column), thank them for their interest, and disqualify them from the study.

If the potential participant meets the eligibility criteria, proceed to the Physical Activity Readiness Questionnaire on the next page.



Physical Activity Readiness Questionnaire

Physical Activity Readiness
Questionnaire - PAR-Q
(revised 2002)

PAR-Q & YOU

(A Questionnaire for People Aged 15 to 69)

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	1. Has your doctor ever said that you have a heart condition <u>and</u> that you should only do physical activity recommended by a doctor?
<input type="checkbox"/>	<input type="checkbox"/>	2. Do you feel pain in your chest when you do physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	3. In the past month, have you had chest pain when you were not doing physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	4. Do you lose your balance because of dizziness or do you ever lose consciousness?
<input type="checkbox"/>	<input type="checkbox"/>	5. Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
<input type="checkbox"/>	<input type="checkbox"/>	7. Do you know of <u>any other reason</u> why you should not do physical activity?

If
you
answered

YES to one or more questions

Talk with your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.

- You may be able to do any activity you want — as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.
- Find out which community programs are safe and helpful for you.

NO to all questions

- If you answered NO honestly to all PAR-Q questions, you can be reasonably sure that you can:
- start becoming much more physically active — begin slowly and build up gradually. This is the safest and easiest way to go.
 - take part in a fitness appraisal — this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively. It is also highly recommended that you have your blood pressure evaluated. If your reading is over 144/94, talk with your doctor before you start becoming much more physically active.

DELAY BECOMING MUCH MORE ACTIVE:

- If you are not feeling well because of a temporary illness such as a cold or a fever — wait until you feel better; or
- If you are or may be pregnant — talk to your doctor before you start becoming more active.

PLEASE NOTE: If your health changes so that you then answer YES to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.

Informed Use of the PAR-Q: The Canadian Society for Exercise Physiology, Health Canada, and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.

No changes permitted. You are encouraged to photocopy the PAR-Q but only if you use the entire form.

NOTE: If the PAR-Q is being given to a person before he or she participates in a physical activity program or a fitness appraisal, this section may be used for legal or administrative purposes.

"I have read, understood and completed this questionnaire. Any questions I had were answered to my full satisfaction."

NAME _____

SIGNATURE _____

DATE _____

SIGNATURE OF PARENT
or GUARDIAN (for participants under the age of majority) _____

WITNESS _____

Note: This physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if your condition changes so that you would answer YES to any of the seven questions.



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continued on other side...

Physical Activity Readiness-Medical Examination Form

Physical Activity Readiness
Medical Examination
(revised 2002)

PARmed-X PHYSICAL ACTIVITY READINESS MEDICAL EXAMINATION

The PARmed-X is a physical activity-specific checklist to be used by a physician with patients who have had positive responses to the Physical Activity Readiness Questionnaire (PAR-Q). In addition, the Conveyance/Referral Form in the PARmed-X can be used to convey clearance for physical activity participation, or to make a referral to a medically-supervised exercise program.

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. The PAR-Q by itself provides adequate screening for the majority of people. However, some individuals may require a medical evaluation and specific advice (exercise prescription) due to one or more positive responses to the PAR-Q.

Following the participant's evaluation by a physician, a physical activity plan should be devised in consultation with a physical activity professional (CSEP-Certified Personal Trainer™ or CSEP-Certified Exercise Physiologist™). To assist in this, the following instructions are provided:

PAGE 1: - Sections A, B, C, and D should be completed by the participant BEFORE the examination by the physician. The bottom section is to be completed by the examining physician.

PAGES 2 & 3: - A checklist of medical conditions requiring special consideration and management.

PAGE 4: - Physical Activity & Lifestyle Advice for people who do not require specific instructions or prescribed exercise.

- Physical Activity Readiness Conveyance/Referral Form - an optional tear-off tab for the physician to convey clearance for physical activity participation, or to make a referral to a medically-supervised exercise program.

This section to be completed by the participant									
<p>A PERSONAL INFORMATION:</p> <p>NAME _____</p> <p>ADDRESS _____</p> <p>TELEPHONE _____</p> <p>BIRTHDATE _____ GENDER _____</p> <p>MEDICAL No. _____</p>	<p>B PAR-Q: Please indicate the PAR-Q questions to which you answered YES</p> <p><input type="checkbox"/> Q 1 Heart condition</p> <p><input type="checkbox"/> Q 2 Chest pain during activity</p> <p><input type="checkbox"/> Q 3 Chest pain at rest</p> <p><input type="checkbox"/> Q 4 Loss of balance, dizziness</p> <p><input type="checkbox"/> Q 5 Bone or joint problem</p> <p><input type="checkbox"/> Q 6 Blood pressure or heart drugs</p> <p><input type="checkbox"/> Q 7 Other reason: _____</p>								
<p>C RISK FACTORS FOR CARDIOVASCULAR DISEASE: <i>Check all that apply</i></p> <p><input type="checkbox"/> Less than 30 minutes of moderate physical activity most days of the week.</p> <p><input type="checkbox"/> Excessive accumulation of fat around waist.</p> <p><input type="checkbox"/> Currently smoker (tobacco smoking 1 or more times per week).</p> <p><input type="checkbox"/> Family history of heart disease.</p> <p><input type="checkbox"/> High blood pressure reported by physician after repeated measurements.</p> <p><input type="checkbox"/> High cholesterol level reported by physician.</p> <p><i>Please note: Many of these risk factors are modifiable. Please refer to page 4 and discuss with your physician.</i></p>	<p>D PHYSICAL ACTIVITY INTENTIONS:</p> <p>What physical activity do you intend to do?</p> <p>_____</p> <p>_____</p> <p>_____</p>								
This section to be completed by the examining physician									
<p>Physical Exam:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Ht</td> <td style="width: 15%;">Wt</td> <td style="width: 15%;">BP I)</td> <td style="width: 15%;">/</td> </tr> <tr> <td> </td> <td> </td> <td>BP II)</td> <td>/</td> </tr> </table> <p>Conditions limiting physical activity:</p> <p><input type="checkbox"/> Cardiovascular <input type="checkbox"/> Respiratory <input type="checkbox"/> Other</p> <p><input type="checkbox"/> Musculoskeletal <input type="checkbox"/> Abdominal</p> <p>Tests required:</p> <p><input type="checkbox"/> ECG <input type="checkbox"/> Exercise Test <input type="checkbox"/> X-Ray</p> <p><input type="checkbox"/> Blood <input type="checkbox"/> Urinalysis <input type="checkbox"/> Other</p>	Ht	Wt	BP I)	/			BP II)	/	<p>Physical Activity Readiness Conveyance/Referral:</p> <p>Based upon a current review of health status, I recommend:</p> <p><input type="checkbox"/> No physical activity</p> <p><input type="checkbox"/> Only a medically-supervised exercise program until further medical clearance</p> <p><input type="checkbox"/> Progressive physical activity:</p> <p style="margin-left: 20px;"><input type="checkbox"/> with avoidance of: _____</p> <p style="margin-left: 20px;"><input type="checkbox"/> with inclusion of: _____</p> <p style="margin-left: 20px;"><input type="checkbox"/> under the supervision of a CSEP-Certified Exercise Physiologist™</p> <p><input type="checkbox"/> Unrestricted physical activity—start slowly and build up gradually</p> <p>Further Information:</p> <p><input type="checkbox"/> Attached</p> <p><input type="checkbox"/> To be forwarded</p> <p><input type="checkbox"/> Available on request</p>
Ht	Wt	BP I)	/						
		BP II)	/						

Appendix E

Description of the Yoga Program

The yoga program, taught by a certified yoga instructor, is composed of bi-weekly group yoga classes over a six-week period. Each yoga session is 75 minutes in length, and will emphasize balancing lightness with heaviness, movement with stillness, and strength with flexibility. The yoga sessions will feature moderate to vigorous yoga postures, with numerous variations and options for each pose. Vinyasa yoga, the style of yoga taught in this program, is a series of ‘connecting postures’ that flow through standing, sitting, twisting, stretching, balancing, and forward and backward bending poses. The core philosophy of Vinyasa yoga is to continually alter the practice to the individuals’ changing needs in order to achieve maximum benefits. The yoga program will emphasize the therapeutic aspect of combining breath work, physical postures, and meditation. At the beginning and end of each class, practitioners will be given the opportunity to ask questions or express any concerns that they may have regarding their practice.

Appendix F

Informed Consent Form



Capital Health

INFORMED CONSENT FORM

STUDY TITLE: Yoga's Effect on Quality of Life and Psychological Distress in Key Caregivers of Cancer Survivors.

PRINCIPAL INVESTIGATOR Dr. Deborah McLeod, Clinician Scientist - QEII Cancer Care Program; School of Nursing - Dalhousie University.
Victoria 11-006, 1278 Tower Road
Halifax, N.S. B3H 2Y9
(902) 473-2964
Email: DeborahL.mcleod@dal.ca

ASSOCIATE INVESTIGATORS: Please see the attached Research Team Contact Page for a full list of the investigators for this study.

PART A

GENERAL INFORMATION

1. Introduction

You have been invited to take part in a research study. Taking part in this study is voluntary. It is up to you to decide whether to be in the study or not. Before you decide, you need to understand what the study is for, what risks you might take and what benefits you might receive. This consent form explains the study.

Please read this carefully. Take as much time as you like. Mark anything you don't understand, or want explained better. After you have read it, please ask questions about anything that is not clear.

The researchers will:

- Discuss the study with you;
- Answer your questions;
- Keep confidential any information which could identify you personally; and
- Be available during the study to deal with problems and answer questions.

We do not know if taking part in this study will help you. You may feel better. On the other hand, it might not help you at all. It might even make you feel worse. We cannot always predict these things. We will always give you the best possible care no matter what happens.

If you decide not to take part or if you leave the study early, your usual health care will not be affected.

PART B

EXPLAINING THIS STUDY

2. What is the purpose of this study?

Studies have demonstrated that key caregivers of cancer survivors will sometimes experience a reduced quality of life and psychological distress that is equal to, or in excess of, the distress experienced by the survivors themselves. Research has shown that physical activity is helpful in coping with psychological distress and improving overall quality of life.

The goal of this study is to examine what role a yoga program might play in helping to minimize psychological distress and improve overall quality of life in caregivers of cancer survivors.

3. Why Am I Being Asked To Join This Study?

You have been asked to participate in this study because you provide informal (unpaid) care to someone who has been diagnosed with cancer and have expressed an interest when you were told about the study.

To join the study, you must be:

- Between the ages of 18-65 years;
- Able to read and write English;
- Provide informal (unpaid) care to a cancer survivor*; and
- Have indicated that you are experiencing a moderate amount of stress.

* A cancer survivor, as defined by the National Coalition for Cancer Survivorship (2011), refers to any individual who has been diagnosed with cancer, from the time of discovery and for the balance of life.

4. How Long Will I Be In The Study?

Study participation will last 6 weeks. If you decide to participate, you will be encouraged to attend as many of the 12 yoga sessions (2 per week) offered during the 6-week yoga program period. Each yoga session is 75 minutes.

5. How Many People Will Take Part In This Study?

This study is taking place in Halifax, Nova Scotia. A total of 20 people are expected to participate in this study. Ten (10) participants will be randomly (i.e., by chance, similar to flipping a coin) selected to take part in one of two yoga groups. One group will begin the program immediately; the other will begin after the first group is completed.

6. How Is The Study Being Done?

Participants will be randomly (i.e., by chance, similar to flipping a coin) selected to take part in one of two yoga programs. One group will begin the program immediately; the other will begin after the first group is completed. Participants in both programs will be asked to complete a brief survey at the start of the first yoga program, and another brief survey following the completion of the first yoga program. Participants randomly selected to the yoga program that starts following the completion of the first group will also be asked to complete a brief survey once they have completed their yoga program. The yoga program, which is taught by a certified yoga instructor, will be held twice a week over a six-week period (i.e., 12 classes). Each yoga session will be 75 minutes in length. Participation is voluntary, but you will be encouraged to attend as many of the 12 yoga sessions as possible. The yoga sessions will feature yoga postures with a number of options based on your comfort and ability. The yoga program will focus on combining breath work, physical postures, and meditation. At the beginning and end of each class, participants will be given

the opportunity to ask questions or express any concerns that they may have regarding their practice.

7. What Will Happen If I Take Part In This Study?

Before taking part in the study, you will be asked to complete a physical activity readiness questionnaire (PAR-Q). This is a simple tool that will help ensure that it is safe for you to participate in a physical activity program. If you have any health concerns that may put you at risk of participating in the yoga program, you will be asked to speak with your physician and have him/her provide you with permission to participate.

Before beginning the program, you will be asked to sign and return a copy of this consent form and complete a brief survey. Once we have received this information, you will be randomly selected (i.e., by chance) to one of two yoga groups. Both groups will receive the same 6-week yoga program at Dalhousie University's Dalplex. However, one group will start their program right away and the second group will start their yoga program following the completion of the first program. Once the yoga program to which you have been assigned starts, you will be encouraged to attend as many yoga sessions as possible, but attendance at each session is completely voluntary. Following the 6-week yoga program (12 sessions), you will be asked to once again complete a brief participant survey at home and return it to the researcher in the self-addressed stamped envelope provided. Once you have returned the survey, your participation in the study is finished.

If at any time during the study you change your mind and decide you no longer wish to participate, you may leave at any time without explanation. Simply contact the principal investigator or sub-investigators with your decision.

In brief, if you agree to participate in this study, you will need to:

- Complete a physical activity readiness questionnaire;
 - If you have any medical concerns regarding your participation, you will need to have your physician provide medical permission for you to participate.
- Sign and return a copy of this consent form;
- Complete a brief survey before starting the yoga program;
- Attend as many of the two (2) weekly, 75-minute yoga sessions as you are able; and
- Complete a brief survey following the completion of the 6-week yoga program.

8. What About Birth Control and Pregnancy?

The practice of yoga in no way affects or interferes with the use of any form of birth control. If you are a woman and you get pregnant during the study, you will be required to stop participating in the study. The yoga in this study is not appropriate for pregnant women, even with modifications.

9. Are there risks or potential burdens or harms to participating in the study?

As with any physical activity program, there are some risks associated with your participation. For example, you may experience muscle stiffness, or soreness, as well as increased body temperature. These symptoms will vary depending on your level of fitness. For example, if you have not exercised for a long time, it is likely that you will experience greater muscle soreness at the beginning of the program than at the end. We ask that you bring a water bottle to each activity session. Should you be unable to continue with any activity session or the program, you are free to stop the activity at any time.

In addition to the yoga program, you will be asked to complete some pen and paper surveys. The surveys will ask you to report your current activity level, psychological well-being, and quality of life. If you are uncomfortable responding to any of the questions, you can leave them blank or you are free to choose not to take part. Should you find during the study that you need additional emotional support, the research team would strongly encourage you to return to your physician to receive the needed care.

Although the research staff will make every effort to ensure your safe participation, there could possibly be unforeseen harms. In the unlikely event of a serious medical issue (i.e., heart attack), the study staff and certified yoga instructor are trained in CPR and emergency medical care will be called to respond.

10. What are the possible benefits in participating in the study?

As this is a physical activity study, you may experience improvements in fitness, psychological wellbeing, and/or quality of life. However, taking part in this study may be of no help to you personally. It is hoped that what is learned in this study will be of future benefit to informal (unpaid) caregivers of cancer survivors.

11. What alternatives to participation do I have?

You do not have to take part in this study. If you chose not to take part at this time, but you are interested in learning more about physical activity and yoga, we suggest that you speak to your physician and a trained fitness professional.

12. What Happens at the End of the Study?

This study is being conducted to better understand how yoga can benefit caregivers of cancer survivors. If you would like a summary of the results, please notify the primary investigator and a summary will be mailed or emailed to you upon completion of the study. Should you be interested in learning more about the yoga or physical activity options in your area, we encourage you to speak to your physician, oncologist, or a certified fitness professional.

13. What Are My Responsibilities?

As a study participant you will be expected to:

- Follow the directions of the principal investigator and/or research team;
- Complete a brief screening tool to ensure that it is safe for you to participate (physician approval may be necessary for some);
- Read and sign this consent form if you would like to volunteer for this study;
- Complete the brief participant surveys (pre and post-study);
- Attend as many yoga sessions as you can (as many as 12 over 6 weeks); and
- Notify the principal investigator if you decide to withdraw from the study.

14. Can I Be Taken Out Of The Study Without My Consent?

Yes. Your doctor, the principal investigator, or a member of the research team may take you out of the study at any time, if:

- There is new information that shows being in this study is not in your best interest; or
- Capital Health, the Principal Investigators, or the Capital Health Research Ethics Board decides to stop the study;

You will be told about the reasons why you might need to be taken out of the study.

15. What About New Information?

While unlikely, it is possible that new information may become available regarding yoga and caregivers of cancer survivors while you are in the study. You will be told about any other new information that might affect your health, welfare, or willingness to stay in the study and will be asked whether you wish to continue taking part in the study.

16. Will It Cost Me Anything?

Compensation

You will not be paid to be in the study. There will be no costs to you to take part in the study and yoga program. However, there may be parking fees associated with the times the yoga sessions are held (free 2 hour street parking is available). Also, should you require your physician to provide you with medical permission to participate, he/she may charge a fee. If this is necessary, you will be responsible to pay for this fee.

Research Related Injury

If you become ill or injured as a direct result of participating in this study, necessary medical treatment will be available at no additional cost to you. Your signature on this form

only indicates that you have understood to your satisfaction the information regarding your participation in the study and agree to participate as a subject. In no way does this waive your legal rights nor release the principal investigator, the research staff, or involved institutions from their legal and professional responsibilities.

17. What About My Privacy and Confidentiality?

Protecting your privacy is an important part of this study. Every effort to protect your privacy will be made. No identifying information (such as your name or phone number) will be used outside of study purposes. Any information that is learned about you will be kept private. All of the information will be recorded using a unique coding number that will not identify you by name. If the results of this study are presented to the public, nobody will be able to tell that you were in the study. The research team's email addresses are private, password protected email addresses and all phone numbers correspond to the research member's personal work phone in their own offices. Mrs. Martin's phone number (Sub-Investigator) is her own personal phone (which is both locked and password protected), to which she solely has access. Furthermore, her email address is password protected.

All study materials will be stored in a locked filing cabinet in the sub-investigator's (Dr. Melanie Keats) research office located within the Dalplex at Dalhousie University. Electronic materials will be stored on secured, password-protected computers. Only the research team will have access to the study materials, which will be kept for up to seven (7) years after publication of this research as required by Capital Health's Ethics Board.

By nature of the yoga intervention, it is not possible for participants to be anonymous. Nevertheless, every effort to protect your privacy and confidentiality will be made. However, complete privacy cannot be guaranteed. For example, the investigator may be required by law to allow access to research records.

When you sign this consent form, you give us permission to:

- Collect information from you;
- Share information with the people conducting the study; and
- Share information with the people responsible for protecting your safety while participating in this research.

Access to Records

The research team will not collect any data from your personal health records. All surveys collected from this study will be kept in a locked cabinet in the sub-investigator's (Dr. Melanie Keats) research lab (Office 216C within the Dalplex building at Dalhousie University) for seven (7) years after the publication of the results from the study, at which point all physical and electronic data from this study will be destroyed.

Use of Records

The research team will collect and use only the information they need to complete the study. This information will only be used for the purposes of this study.

This information will include your:

- demographic information such as age, sex, employment status, education level, annual income, religion, race/ethnicity, marital status, months of caregiving, score on the distress thermometer, relationship with the care recipient, care recipients' cancer diagnosis and treatment(s) received, yoga experience; and
- the information you provide in the brief participant surveys.

18. What If I Want To Quit The Study?

If you chose to participate and later change your mind, you can say no and stop the research at any time. If you wish to leave the study please inform the principal investigator or the thesis advisor. All data collected up to the date you withdraw your consent will remain in the study records, to be included in study related analyses.

19. Declaration of Financial Interest

The principal investigators and research team have no financial interests in conducting this research study.

20. Are There Any Conflicts of Interest?

There are no conflicts of interest on the part of the researchers and/or institution to report.

21. What About Questions Or Problems?

For further information about the study call **Andi Céline Martin or Dr. Melanie Keats**. Mrs. Martin and Dr. Keats are sub-investigators of this study. Mrs. Martin's work telephone number is (902) 488-9775 and Dr. Keats' work telephone number is (902) 494-7173. If you can't reach Mrs. Martin or Dr. Keats, please refer to the Research Team Contact Page for a full list of the people you can contact for further information about the study.

The principal investigator is:

Dr. Deborah McLeod
Telephone: (902) 473-2964

The sub investigators are:

Andi Céline Martin
Telephone: (902) 488-9775

Dr. Melanie Keats.
Telephone: (902) 494-7173

22. What Are My Research Rights?

After you have signed this consent form you will be given a copy. If you have any questions about your rights as a research participant, contact the **Patient Representative at (902) 473-2133.**

In the next part you will be asked if you agree (consent) to join this study. If the answer is "yes", you will need to sign the form.

PART C

23. Consent Form Signature Page

I have reviewed all of the information in this consent form related to the study titled:

Yoga's Effect on Quality of Life and Psychological Distress in Key Caregivers of Cancer Survivors

I have been given the opportunity to discuss this study. ALL of my questions have been answered to my satisfaction.

I agree that my personal health and study information may be used as described in this consent form.

This signature on this consent form means that I agree to take part in this study. I understand that I am free to withdraw at any time without affecting my future care.

Signature of Participant Name (Printed) Year / Month / Day*

Witness to Participant's Signature Name (Printed) Year / Month / Day*

Signature of Investigator Name (Printed) Year / Month / Day*

Signature of Person Conducting Consent Discussion Name (Printed) Year / Month / Day*

I would like to receive a copy of the study results when available (please circle one):
Yes or No: (initial) _____

If yes, please provide your email or mailing address: _____

** Note: Please fill in the dates personally*

YOU WILL BE GIVEN A SIGNED COPY OF THIS CONSENT FORM.

Thank you for your time and patience!

Appendix G

Research Team Contact Page

Research Team Contact Page

STUDY TITLE

Yoga's Effect on Quality of Life and Psychological Distress in Key Caregivers of Cancer Survivors

Name	Role	Work Address	Telephone Number	E-Mail Address
Dr. Deborah McLeod	Principal Investigator	School of Nursing, Dalhousie University, Clinician Scientist, QEII Cancer Care Program, Victoria 11-006 1278 Tower Rd. Halifax, N.S. B3H 2Y9	(902) 473-2964	Deborah.mcleod@dal.ca
Mrs. Andi Céline Martin	Sub-Investigator	School of Health and Human Performance, MSc in Kinesiology Candidate, Dalhousie University 6230 South Street Halifax, NS B3H 1T8	(902) 488-9775	Andicelinemartin@dal.ca
Dr. Melanie Keats	Sub-Investigator	School of Health and Human Performance, Assistant Professor, Dalhousie University 6230 South Street Halifax, NS B3H 1T8	(902) 494-7173	Melanie.Keats@dal.ca
Dr. Chris Blanchard	Sub-Investigator	Dept. of Medicine, Dalhousie University, Associate Professor and Canada Research Chair, Centre for Clinical Research – Suite 205 5790 University Avenue Halifax, NS, B3H 1V7	(902) 473-3789	Chris.blanchard@dal.ca

Appendix H

Baseline Questionnaire

Participant ID: _____

GETTING TO KNOW YOU

Thank you for taking the time to participate in this research study. The first part of the questionnaire is needed to help us understand more about you. For this reason, it is very important information. All of the information is held in strict trust and your name will NOT appear on any public documents. Please answer the following questions based on your present status.

PERSONAL HISTORY

1. How old are you? _____

2. Are you: Male OR Female

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

- Some high school Completed high school Some university/college
 Completed university/college Some technical school Completed technical school
 Some graduate school Completed graduate school

4. Marital status: Single/never married Divorced/separated
 Married/common law/living with partner Widowed

5. Annual income: less than \$10,000 \$10,000-\$24,999
 \$25,000-\$49,999 \$50,000-\$74,999
 \$75,000-\$99,999 \$100,000-\$149,999
 \$150,000-\$199,999 \$200,000 or more
 Do not wish to respond

6. What is your current employment status? Please choose the one that best describes your current situation. If you are self-employed, choose full-time or part-time as appropriate.

- Working in paid job full-time (30 or more hours per week)
 Working in a paid job part-time (Less than 30 hours per week)
 Unemployed Unable to work due to sickness or disability
 Looking after home and/or family Student
 Doing unpaid or voluntary work Retired

Version 3.0, December 18, 2011

Participant ID: _____

7. Religion: Buddhist Catholic Hindu Jewish Mormon
 Muslim Protestant Other: _____
 No religious affiliation Do not wish to respond

8. Race/Ethnicity: Asian Black Caucasian First Nations
 Hispanic Other: _____ Do not wish to respond

The following questions will ask you to describe you care recipients' (loved one's) cancer diagnosis, details regarding the nature of your caregiving, as well as questions regarding how you are feeling.

If you care recipient has had more than one cancer diagnosis, based on his/her *most recent diagnosis*, please answer the following questions:

1. What type of cancer did/does your family member/friend have?: _____

2. In what month and year was he/she diagnosed?: _____

3. What type of treatment did he/she receive? (please check ALL that apply)

- Surgery Radiation therapy Chemotherapy
 Bone marrow/stem cell transplant Other (specify): _____

3b. Has he/she completed treatment? Yes No (If no, skip to question 4)

3c. If he/she has/had completed treatment, when was his/her last treatment (month/year)? _____

4. Has/had he/she experienced a recurrence or metastases (spread to other organs) of this cancer?

- Yes No

Please specify (include type of recurrence, month/year of recurrence, and any treatment

received): _____

If the care recipient has had *more than one* cancer diagnosis, please answer question 5, if not, please skip to questions 6 and 7:

5. What other type of cancer has/had he/she had?: _____

5b. In what month and year was this cancer diagnosed?: _____

Participant ID: _____

5c. What type of treatment did he/she receive? (please check ALL that apply)

- Surgery Radiation therapy Chemotherapy
 Bone marrow/stem cell transplant Other (specify): _____

6. For how many months (*in total*) have you fulfilled the caregiver role for this specific care recipient?:

7. What is your relationship to the care recipient?: (e.g., friend, cousin, spouse/partner, brother, mother, etc.). _____

8. On a scale from 0-10, 1 being "No Distress" and 10 being "Extreme distress", which number best describes how much distress you have been experiencing in the past week including today?: _____

The following questions will ask you to describe your previous yoga experience, perceived level as a yoga practitioner, and style(s) of yoga previously practiced.

1. How many yoga sessions have you participated in throughout your lifetime?:

- 0 1 – 5 6 – 10 11 – 20
 21 – 30 31 – 40 41 – 50 +50

2. How many yoga sessions have you participated in within the last 12 months?:

- 0 1 – 5 6 – 10 11 – 20
 21 – 30 31 – 40 41 – 50 +50

3. How many yoga sessions have you participated in within the last 6 months?:

- 0 1 – 5 6 – 10 11 – 20
 21 – 30 31 – 40 41 – 50 +50

4. What is your perceived level as a yoga practitioner?:

- Brand new – never tried yoga Beginner Intermediate
 Advanced Expert

5. What style(s) of yoga have you practiced? (please check/list all that apply):

- Ashtanga (Power) Vinyasa Bikram (Hot) Hatha
 Iyengar Don't Know N/A (None) Other: _____

Please continue on the next page...

Version 3.0, December 18, 2011

Participant ID: _____

LEISURE TIME EXERCISE QUESTIONNAIRE

The following portion of the questionnaire asks you to recall your *average weekly* level of physical activity *over the past month*.

When answering the following question, please remember to:

- a. Consider a typical (*average*) week over the past month.
- b. Only count activity/exercise sessions that lasted 10 minutes or longer.
- c. Include *all* exercise/physical activity that you do.
- d. Please also record the average duration or time that you performed each activity.

(Please record a number in each of the spaces provided below. If you did no activity, then please record as '0')

A. STRENUOUS ACTIVITY (heart beats rapidly, sweating)

(e.g., running, jogging, hockey, soccer, squash, cross country skiing, judo, roller-blading, vigorous swimming, vigorous long distance bicycling, vigorous aerobic classes, heavy weight training, laser tag)

During the past month, in an average week I was involved in *strenuous activities* _____ times/week for an average duration of _____ minutes each session.

B. MODERATE ACTIVITY (not exhausting, light perspiration)

(e.g., fast walking, baseball, tennis, easy bicycling, shooting hoops, volleyball, badminton, easy swimming, alpine skiing, popular and line dancing, leisure skating)

During the past month, in an average week I was involved in *moderate activities* _____ times/week for an average duration of _____ minutes each session.

C. MILD ACTIVITY (minimal effort, no perspiration)

(e.g., easy walking, yoga, archery, fishing, bowling, horseshoes, golf, darts, frisbee)

During the past month, in an average week I was involved in *mild activities* _____ times/week for an average duration of _____ minutes each session.

Your Health and Well-Being

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. Thank you for completing this survey!

For each of the following questions, please mark an in the one box that best describes your answer.

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

2. Compared to one year ago, how would you rate your health in general now?

Much better now than one year ago	Somewhat better now than one year ago	About the same as one year ago	Somewhat worse now than one year ago	Much worse now than one year ago
▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

3. The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
	▼	▼	▼
1. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
2. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
3. Lifting or carrying groceries	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
4. Climbing <u>several</u> flights of stairs	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
5. Climbing <u>one</u> flight of stairs	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
6. Bending, kneeling, or stooping	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
7. Walking <u>more than a kilometre</u>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
8. Walking <u>several hundred metres</u>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
9. Walking <u>one hundred metres</u>	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
10. Bathing or dressing yourself	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3

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 (SF-36v2® Health Survey Standard, Canada (English))

4. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
▼	▼	▼	▼	▼

- a. Cut down on the amount of time you spent on work or other activities 1 2 3 4 5
- b. Accomplished less than you would like 1 2 3 4 5
- c. Were limited in the kind of work or other activities 1 2 3 4 5
- d. Had difficulty performing the work or other activities (for example, it took extra effort) 1 2 3 4 5

5. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
▼	▼	▼	▼	▼

- a. Cut down on the amount of time you spent on work or other activities 1 2 3 4 5
- b. Accomplished less than you would like 1 2 3 4 5
- c. Did work or other activities less carefully than usual 1 2 3 4 5

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 SF-36® is a registered trademark of Medical Outcomes Trust.
 (SF-36v2® Health Survey Standard, Canada (English))

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?

Not at all	Slightly	Moderately	Quite a bit	Extremely
▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

7. How much bodily pain have you had during the past 4 weeks?

None	Very mild	Mild	Moderate	Severe	Very severe
▼	▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks...

All of the time	Most of the time	Some of the time	A little of the time	None of the time
▼	▼	▼	▼	▼

- a. Did you feel full of life? 1 2 3 4 5
 b. Have you been very nervous? 1 2 3 4 5
 c. Have you felt so down in the dumps that nothing could cheer you up? 1 2 3 4 5
 d. Have you felt calm and peaceful? 1 2 3 4 5
 e. Did you have a lot of energy? 1 2 3 4 5
 f. Have you felt downhearted and depressed? 1 2 3 4 5
 g. Did you feel worn out? 1 2 3 4 5
 h. Have you been happy? 1 2 3 4 5
 i. Did you feel tired? 1 2 3 4 5

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
▼	▼	▼	▼	▼
<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

11. How TRUE or FALSE is each of the following statements for you?

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
a. I seem to get sick a little easier than other people	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
b. I am as healthy as anybody I know	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
c. I expect my health to get worse.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
d. My health is excellent.....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

Thank you for completing these questions!

Participant ID: _____

POMS™ Standard Form

BY DOUGLAS M. McNAIR, Ph.D., MAURICE LORR, Ph.D., J.W.P. HEUCHERT, Ph.D., & LEO F. DROPPLEMAN, Ph.D.

Client ID: _____ Age: _____ Gender: Male Female
(Circle one)

Birth Date: ____/____/____ Today's Date: ____/____/____
Month Day Year Month Day Year

To the Administrator:

Place a checkmark ✓
 in one box to specify the
 time period of interest.

To the Respondent:

Below is a list of words that describe feelings that people have. Please read each word carefully. Then circle the number that best describes

- how you have been feeling during the PAST WEEK, INCLUDING TODAY.
- how you feel RIGHT NOW.
- other: _____

If no box is marked, please follow the instructions for the first box.



	Not at all	A little	Moderately	Quite a bit	Extremely
1. Friendly	0	1	2	3	4
2. Tense	0	1	2	3	4
3. Angry	0	1	2	3	4
4. Worn out	0	1	2	3	4
5. Unhappy	0	1	2	3	4
6. Clear-headed	0	1	2	3	4
7. Lively	0	1	2	3	4
8. Confused	0	1	2	3	4
9. Sorry for things done	0	1	2	3	4
10. Shaky	0	1	2	3	4
11. Listless	0	1	2	3	4
12. Peeved	0	1	2	3	4
13. Considerate	0	1	2	3	4
14. Sad	0	1	2	3	4
15. Active	0	1	2	3	4
16. On edge	0	1	2	3	4
17. Grouchy	0	1	2	3	4
18. Blue	0	1	2	3	4
19. Energetic	0	1	2	3	4
20. Panicky	0	1	2	3	4
21. Hopeless	0	1	2	3	4
22. Relaxed	0	1	2	3	4
23. Unworthy	0	1	2	3	4
24. Spiteful	0	1	2	3	4
25. Sympathetic	0	1	2	3	4
26. Uneasy	0	1	2	3	4
27. Restless	0	1	2	3	4
28. Unable to concentrate	0	1	2	3	4
29. Fatigued	0	1	2	3	4
30. Helpful	0	1	2	3	4

*Please flip over.
 Items continue on the back page...*



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Version 3.0, December 18, 2011

POMS™ Standard Form

BY DOUGLAS M. McNAIR, Ph.D., MAURICE LORR, Ph.D., JW P. HELCHERT, Ph.D., & LEO F. DROPPLEMAN, Ph.D.

POMS Profile



POMS™

	Not at all	A little	Moderately	Quite a bit	Extremely
31. Annoyed	0	1	2	3	4
32. Discouraged	0	1	2	3	4
33. Resentful	0	1	2	3	4
34. Nervous	0	1	2	3	4
35. Lonely	0	1	2	3	4
36. Miserable	0	1	2	3	4
37. Muddled	0	1	2	3	4
38. Cheerful	0	1	2	3	4
39. Bitter	0	1	2	3	4
40. Exhausted	0	1	2	3	4
41. Anxious	0	1	2	3	4
42. Ready to fight	0	1	2	3	4
43. Good natured	0	1	2	3	4
44. Gloomy	0	1	2	3	4
45. Desperate	0	1	2	3	4
46. Sluggish	0	1	2	3	4
47. Rebellious	0	1	2	3	4
48. Helpless	0	1	2	3	4
49. Weary	0	1	2	3	4
50. Bewildered	0	1	2	3	4
51. Alert	0	1	2	3	4
52. Deceived	0	1	2	3	4
53. Furious	0	1	2	3	4
54. Efficient	0	1	2	3	4
55. Trusting	0	1	2	3	4
56. Full of pep	0	1	2	3	4
57. Bad-tempered	0	1	2	3	4
58. Worthless	0	1	2	3	4
59. Forgetful	0	1	2	3	4
60. Carefree	0	1	2	3	4
61. Terrified	0	1	2	3	4
62. Guilty	0	1	2	3	4
63. Vigorous	0	1	2	3	4
64. Uncertain about things	0	1	2	3	4
65. Bushed	0	1	2	3	4

*Please ensure you have answered every item.
Thank you for completing this questionnaire.*

Thank you for taking the time to complete this questionnaire!!

Appendix I

Pictures of the Yoga Room Set-Up and Projected DVD





Appendix J

***Asanas* (physical postures) utilized in the program and the benefits/therapeutic applications thought to be associated with each**

TOE STRETCH



photo from www.vinyoga.com

The benefits of this pose include opening the toes and feet as well as strengthening the ankles. In this pose, the six lower body meridians are stimulated through the toes, and the compression on the front of the ankle stimulates the spleen, liver, stomach, and gall bladder meridians (Clark, 2007; Clark, 2012).

ANKLE STRETCH



photo from www.vinyoga.com

The benefits of this pose include opening and strengthening the ankles. This pose strongly stimulates the four meridians flowing through the feet and ankles, namely the stomach, spleen, liver, and gall bladder meridians (Clark, 2007; Clark, 2012).

BUTTERFLY



photo from www.yinyoga.com

The benefits of this pose including opening the hips and lower back while stretching the hamstrings, groin, and the adductor muscles. This pose stimulates the kidneys and prostate gland, as well as promotes proper ovary function and regulates menstruation. In this pose, the gall bladder meridian lines as well as the urinary bladder lines are stimulated (Clark, 2007; Clark, 2012).

HALF BUTTERFLY



photo from www.yinyoga.com

This pose is great for stretching the lower back, and does not require loose hamstrings. This pose stimulates the liver and kidney meridians (Clark, 2007; Clark, 2012).

FROG



photo from www.yinyoga.com

The benefits of this pose include a deep groin stretch, a slight back bend, and a hip and shoulder opener. This pose also helps with digestion and helps to relieve cramps. The pressure on the inner legs works the spleen, liver, and kidney meridians. Should the practitioner stretch their arms forward, the meridians in the upper body are stimulated (namely the heart, lungs, and small and large intestines) (Clark, 2007; Clark, 2012).

DRAGONFLY/STRADDLE



photo from www.yinyoga.com

The benefits of this pose include opening the hips, groin, inner knees, and back of the thighs. Additionally, this pose stimulates the ovaries, as well as the liver, kidney, and spleen meridians (Clark, 2007; Clark, 2012).

SWAN/ONE-LEGGED KING PIGEON POSE – *EKA PADA RAJAKAPOTASANA*



MARTY SCONDUTO

photo from www.yogajournal.com

The benefits of this pose include opening and stretching the hips, groins, thighs, psoas, chest, and quadriceps (Yoga Journal, 2012). Through the inner groin, the liver and kidney meridians are stimulated, and through the top of the back leg, the stomach and spleen meridians are stimulated. Finally, urinary bladder meridian is stimulated through the lumbar arch (Clark, 2007; Clark, 2012).

SLEEPING SWAN



photo from www.yinyoga.com

This pose opens the hips. Additionally, the liver and kidney meridians are stimulated through the inner groin, while the stomach and spleen meridians are stimulated from the top of the back leg (Clark, 2007; Clark, 2012).

SHOELACE/COW FACE POSE - *GOMUKHASANA*



photo from www.yogajournal.com

The benefits of this pose include opening and stretching the hips, thighs, shoulders, armpits, ankles, chest, and triceps while decompressing the lower spine when folding forward (Yoga Journal, 2012). In this pose, the liver and kidney meridians are stimulated through the groin in addition to the gall bladder meridians being stimulated on the outside of the legs. Furthermore, if folding forward, the stomach is compressed and the urinary bladder meridian is stimulated (Clark, 2007; Clark, 2012).

SQUARE/BOX POSE - *AGNISTAMBHASANA*



photo from www.yinyoga.com

The benefit of this pose includes opening the hips externally. While performing this pose, the liver and kidney meridians are stimulated through the inner groin, while the gall bladder meridian is stimulated through the outer legs (Clark, 2007; Clark, 2012; Yoga Journal, 2012).

CATERPILLAR



photo from www.yinyoga.com

This pose stresses the ligaments along the back of the spine. It compresses the stomach organs, stimulates the kidneys, and massages the heart. This pose also stimulates the urinary bladder meridian (Clark, 2007; Clark, 2012).

SPHINX/SEAL



photo from www.yinyoga.com

The benefits of this pose include a deep compression and stimulation of the low back, and, if the neck is dropped back, the thyroid is stimulated. This pose affects to urinary bladder and kidney meridians, which run through the lower back and sacrum, as well as the stomach and spleen meridians which run along the top of the legs (Clark, 2007; Clark, 2012). The benefits of this pose also include strengthening the spine, firming the buttocks, and stretching the shoulders, abdomen, and chest (Yoga Journal, 2012).

CHILD'S POSE – *BALASANA*



RORY EARNSHAW

photo from www.yogajournal.com

The benefits of this pose include gently stretching the spine while gently compressing the stomach and chest. This pose helps to relieve back and neck pain and it stimulates the spleen, stomach, kidney, and urinary bladder meridians (Clark, 2007; Clark, 2012). This pose also stretches the ankles, hips, and thighs, and helps to relieve back and neck pain and calm the brain (Yoga Journal, 2012).

DRAGON



photo from www.yinyoga.com

The benefits of this pose include opening the hips and groin and stretching the back leg's hip flexors and quadriceps. This pose is great for relieving sciatica. In this pose, the stomach, spleen, liver, gall bladder, and kidney meridians are stimulated (Clark, 2007; Clark, 2012).

CAMEL POSE - *USTRASANA*



CHRIS ANDRE

photo from www.yogajournal.com

The benefits of this pose include a slight or deep backbend, as well as the opening of the top of the thighs. Additionally, there is opening in the ankles and shoulders. The meridians stimulated in this pose include the urinary bladder, kidney, and stomach meridians. When the hands reach back and the shoulders are stretched, the heart and lung meridians are also stimulated. Furthermore, should the practitioner drop their head back, the thyroid meridian is stimulated (Clark, 2007; Clark, 2012). The benefits of this pose also include improving posture and stimulating the organs of the abdomen and neck (Yoga Journal, 2012).

SPINAL TWIST/SUPINE TWIST



photo from www.yinyoga.com

The benefits of this pose include restoring equilibrium in the nervous system and letting go of tension in the spine. This pose also provides relief from sciatica. In this pose, twisting the spine helps to stimulate the urinary bladder meridian along the spine, and by putting the arms overhead, the heart, lung, and small intestine meridians can be stimulated. Finally, the twisting through the rib cage stimulates the gall bladder meridian (Clark, 2007; Clark, 2012).

SIDE BODY STRETCH - *BANANASANA*

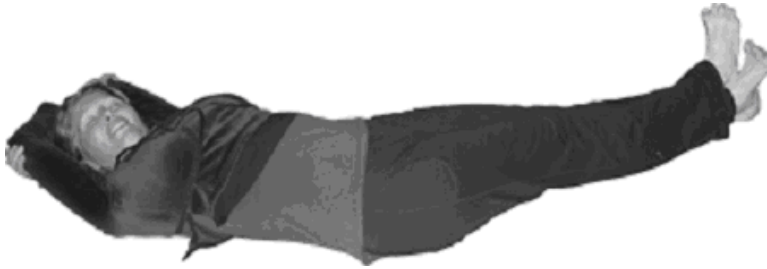


photo from www.yinyoga.com

The benefits of this pose include the complete stretching of the whole side of the body. This pose even stretches the armpits! While in this pose, the gall bladder meridian, which runs along the whole side of the body, is stimulated. Furthermore, with the arms overhead, the heart and lung meridians are stimulated (Clark, 2007; Clark, 2012).

HAPPY BABY



photo from www.yogajournal.com

The benefits of this pose include a deep hip opener, building arm strength, and releasing the sacrum. While in this pose, the urinary bladder, spleen, liver, and kidney meridians are stimulated. This pose also helps calm the brain and relieve stress and fatigue (Yoga Journal, 2011; Clark, 2007; Clark, 2012).

CORPSE POSE - *SAVASANA*



MARTIN SCONDUTO

photo from www.yogajournal.com

This pose helps to relieve stress, relax the body and brain, reduce fatigue, headaches, and insomnia, as well as help to lower blood pressure (Yoga Journal, 2011; Clark, 2007).

DOWNWARD FACING DOG - *ADHO MUKHA SVANASANA*



MARTY SCONDUTO

photo from www.yogajournal.com

This pose is of great benefit to the low back. In addition, this pose helps to calm the brain and relieve stress. This pose stretches the shoulders, hamstrings, hands, and calves while energizing the body. Furthermore, this pose strengthens the arms and legs, relieves menstrual discomfort, headaches, insomnia, back pain, fatigue, and symptoms of menopause, helps to prevent osteoporosis, and improves digestion. Finally, this pose is therapeutic for high blood pressure, asthma, sinusitis, and sciatica (Kaminoff, 2007; Yoga Journal, 2011).

UPWARD FACING DOG - *URDHVA MUKHA SVANASANA*



DAVID MARTINEZ

photo from www.yogajournal.com

This pose helps to strengthen the wrists and relieve sciatica. Additionally, benefits of this pose include improved posture, strengthening the spine, and arms, and stretching the chest, shoulders, and abdomen. This pose is also therapeutic for asthma and helps with mild depression and fatigue (Kaminoff, 2007; Yoga Journal, 2011).

STANDING FORWARD BEND - *UTTANASANA*



DAVID MARTINEZ

photo from www.yogajournal.com

The benefits of this pose include calming the brain, helping to relieve stress, stimulating the liver and kidneys, and stretching the hamstrings, calves, and hips. Additionally, this pose helps to strengthen the thighs and knees, improve digestion, reduce fatigue and anxiety, and relieve insomnia. This pose also has therapeutic applications for asthma, infertility, high blood pressure, osteoporosis, and sinusitis (Kaminoff, 2007; Yoga Journal, 2011).

FOUR-LIMBED STAFF POSE - *CHATARANGA DANDASANA*



DAVID MARTINEZ

photo from www.yogajournal.com

This pose tones the abdomen while helping to strengthen the arms and wrists (Kaminoff, 2007; Yoga Journal, 2011).

BIG TOE POSE - *PADANGUSTHASANA*



DEBRA MCCLINTON

photo from www.yogajournal.com

The benefits of this pose includes relieving stress and anxiety, calming the brain, stretching the hamstrings and calves, strengthening the thighs, improving digestion, stimulating the liver and kidneys, preventing osteoporosis, and relieving headaches and insomnia (Kaminoff, 2007; Yoga Journal, 2011).

EXTENDED TRIANGLE POSE – *UTTHITA TRIKONASANA*



photo from www.yogajournal.com

The benefits of this pose include strengthening the ankles, knees, and thighs, and stretching the hamstrings, groins, hips, calves, shoulders, chest, and spine, while stimulating the abdominal organs. This pose helps to relieve stress, backaches, and symptoms of menopause. Furthermore, this pose is associated with improved digestion, and has been found to be therapeutic for anxiety, infertility, osteoporosis, flat feet, neck pain, and sciatica (Kaminoff, 2007; Yoga Journal, 2011).

REVOLVED TRIANGLE POSE - *PARIVRTTA TRIKONASANA*



photo from www.yogajournal.com

The benefits of this pose including strengthening and stretching the legs, stretching the hips, spine, and chest, relieving mild back pain, and improving balance. Therapeutic applications for this pose include relieving digestive problems, constipation, asthma, and sciatica (Kaminoff, 2007; Yoga Journal, 2011).

EXTENDED SIDE ANGLE POSE – *UTTHITA PARSVAKONASANA*



RORY EARNSHAW

photo from www.yogajournal.com

This pose helps to strengthen the legs and ankles while opening the groins, chest, shoulders, spine, and abdomen. Therapeutic applications of this pose include constipation, infertility, osteoporosis, sciatica, low backache, and menstrual discomfort (Kaminoff; 2007 Yoga Journal, 2011).

REVOLVED TRIANGLE POSE – *PARIVRITA PARSVAKONASANA*



DEBRA MCCLINTON

photo from www.yogajournal.com

The benefits of this pose include strengthening and stretching the ankles, knees, and legs, stretching the groins, spine, chest, and shoulders, improving stamina, digestion, and waste elimination, and improving balance. Therapeutic applications of this pose include constipation, infertility, low backache, osteoporosis, and sciatica (Kaminoff, 2007; Yoga Journal, 2011).

INTENSE SIDE STRETCH POSE – *PARVOTTANASANA*



RORY EARNSHAW

photo from www.yogajournal.com

The benefits of this pose include stretching the spine, shoulders, wrists (in the full pose), hips, and hamstrings, calming the brain, strengthening the legs, improving digestion, posture, and balance. Therapeutic applications of this pose include flat feet (Kaminoff, 2007; Yoga Journal, 2011).

WIDE LEGGED FORWARD BEND - *PRASARITA*



RORY EARNSHAW

photo from www.yogajournal.com

The benefits of this pose include strengthening and stretching the inner and back legs and the spine, calming the brain, and relieving backaches. The therapeutic applications of this pose include fatigue and headaches (Kaminoff, 2007; Yoga Journal, 2011).

EXTENDED HAND TO BIG TOE POSE – *UTTHITA HASTA PADANGUSTASANA*



photo from www.yogajournal.com

The benefits of this pose include strengthening the ankles and legs, stretching the backs of the legs, and improving balance. Therapeutic applications of this pose include osteoporosis (Kaminoff, 2007; Yoga Journal, 2011).

TREE POSE - *VRKSASANA*



photo from www.yogajournal.com

The benefits of this pose include strengthening the ankles, calves, thighs, and spine, stretching the inner thighs, chest, and shoulders, improving balance and posture, and relieving sciatica. Therapeutic applications for this pose include flat feet (Kaminoff, 2007; Yoga Journal, 2011).

CHAIR POSE - *UTKATASANA*



CHRIS ANDRE

photo from www.yogajournal.com

The benefits of this pose include strengthening the ankles, calves, thighs, and spine, stretching the shoulders and chest, and stimulating the abdominal organs and heart (Kaminoff, 2007; Yoga Journal, 2011).

WARRIOR I – *VIRABHADRASANA A*



RORY EARNSHAW

photo from www.yogajournal.com

The benefits of this pose include stretching the chest, shoulders, neck, low back, and groins, as well as strengthening the shoulders, arms, back, thighs, calves, and ankles. Therapeutic applications for this pose include sciatica (Kaminoff, 2007; Yoga Journal, 2011).

WARRIOR II – *VIRABHADRASANA B*



CHRIS ANDRE

photo from www.yogajournal.com

The benefits of this pose include stretching the chest and shoulders, increasing stamina, and strengthening and stretching the ankles and legs. Therapeutic applications for this pose include flat feet, osteoporosis, sciatica, and infertility (Kaminoff, 2007; Yoga Journal, 2011).

WARRIOR III – *VIRABHADRASANA C*



CHRIS ANDRE

photo from www.yogajournal.com

The benefits of this pose include strengthening the ankles, legs, shoulders, and muscles of the back. Additionally, this pose helps to tone the abdomen and improve balance and posture (Yoga Journal, 2011).

HALF MOON POSE – *ARDHA CHANDRASANA*



photo from www.yogajournal.com

The benefits of this pose include strengthening the ankles, thighs, abdomen, buttocks, and spine while stretching the calves, groins, hamstrings, shoulders, chest, and spine. This pose helps to improve balance and coordination, improve digestion, and relieve stress. Therapeutic applications include anxiety, backaches, osteoporosis, sciatica, fatigue, indigestion, and menstrual pain (Yoga Journal, 2011).

SEATED FORWARD BEND I – *PASCHIMOTTANASANA A*



MARTIN SCONDUTO

photo from www.yogajournal.com

The benefits of this pose include relieving stress and calming the brain, and stretching the shoulders, spine, and uterus. This pose also helps to relieve menstrual discomfort, appease headaches and anxiety, and reduce fatigue. Therapeutic applications for this pose include high blood pressure, insomnia, infertility, and sinusitis (Kaminoff, 2007; Yoga Journal, 2011).

HEAD TO KNEE FORWARD BEND I – *JANU SIRSASANA A*



MARTIN SCONDUTO

photo from www.yogajournal.com

The benefits of this pose include calming the brain, relieving anxiety, headaches, menstrual discomfort, and fatigue, stretching the spine, groins, shoulders, and hamstrings, and stimulate the liver and kidneys. This pose is therapeutic for insomnia, high blood pressure, and sinusitis (Kaminoff, 2007; Yoga Journal, 2011).

POSE DEDICATED TO THE SAGE MARICHI I – *MARICHYASANA A*



photo from www.yogajournal.com

The benefits of this pose include stretching the shoulders and spine, calming the brain, and improving digestion. Therapeutic applications for this pose include flatulence and constipation (Kaminoff, 2007; Yoga Journal, 2011).

POSE DEDICATED TO THE SAGE MARICHI III – *MARYCHIASANA C*



photo from www.yogajournal.com

The benefits of this pose include massaging the liver and kidneys, stretching the shoulders, relieving mild hip pain and backaches, and strengthening and stretching the spine. Therapeutic applications of this pose include digestive problems, constipation, fatigue, sciatica, lower backaches, and menstrual discomfort (Kaminoff, 2007; Yoga Journal, 2011).

BOAT POSE - *NAVASANA*



CHRIS ANDRE

photo from www.yogajournal.com

The benefits of this pose include strengthening the hip flexors, abdomen, and spine, stimulating the thyroid, prostate glands, kidneys, and intestines, as well as improving digestion and relieving stress (Kaminoff, 2007; Yoga Journal, 2011).

BOUND ANGLE POSE – *BADDHA KONASANA A*



photo from www.vogajournal.com

The benefits of this pose include stimulating the prostate gland, ovaries, abdominal organs, bladder, kidneys, and heart. In addition, this pose helps to improve general circulation, stretch the groins, inner thighs, and knees, and relieve anxiety and fatigue. Therapeutic applications for this pose include high blood pressure, asthma, flat feet, and infertility (Kaminoff, 2007; Yoga Journal, 2011).

WIDE ANGLE SEATED FORWARD BEND – *UPAVISTA KONASANA*



photo from www.vogajournal.com

The benefits of this pose include stretching the insides and backs of the legs, strengthening the spine, and releasing the groins. This pose also stimulates the abdominal organs and calms the brain. Therapeutic applications for this pose include sciatica and arthritis (Kaminoff, 2007; Yoga Journal, 2011).

BRIDGE POSE – *SETU BANDHA SARVANGASANA*



DAVID MARTINEZ

from www.yogajournal.com

The benefits of this pose include stretching the back, chest, and spine, calming the brain and alleviating stress, and stimulating the lungs, thyroid, and abdominal organs. This pose also has great benefit in rejuvenating tired legs, improving digestion, relieving menstrual discomfort, and reducing backaches, anxiety, fatigue, insomnia, and headaches. Therapeutic applications for this pose include osteoporosis, sinusitis, asthma, and high blood pressure (Kaminoff, 2007; Yoga Journal, 2011).

DOLPHIN PLANK POSE



DAVID MARTINEZ

photo from www.yogajournal.com

The benefits of this pose include strengthening the core, arms, and legs, relieving stress, and stretching the hamstrings, calves, shoulders, and arches. Therapeutic applications of this pose include osteoporosis (Yoga Journal, 2011).

DOLPHIN POSE



DAVID MARTINEZ

photo from www.yogajournal.com

The benefits of this pose include strengthening the arms, legs, and core, stretching the hamstrings, calves, arches, and shoulders, calming the brain and relieving stress, symptoms of menopause, and menstrual discomforts. This pose helps to prevent osteoporosis, improve digestion, and relieve insomnia, back pain, headaches, and fatigue. This pose is therapeutic for high blood pressure, asthma, sciatica, and flat feet (Yoga Journal, 2011).

LOCUST POSE – *SALAMBHASANA*



MARTY SCONDUTO

photo from www.yogajournal.com

The benefits of this pose include strengthening the buttocks, back of the legs and arms, and the spine. This pose also stretches the chest, belly, shoulders, and thighs, improves posture, and helps to relieve stress. Therapeutic applications for this pose include indigestion, lower-back pain, fatigue, flatulence, and constipation (Yoga Journal, 2011).

SIDE PLANK POSE – *VASISTHASANA*



MARTIN SOONDUTO

photo from www.yogajournal.com

The benefits of this pose include strengthening the core, arms, and legs, stretching and strengthening the wrists and backs of the legs, and improving balance (Yoga Journal, 2011).

YOGA MUDRA



DEBRA McCLINTON

photo from www.yogajournal.com

The benefits of this pose include strengthening the back, calming the brain, and stretching the ankles and knees. Therapeutic applications for this pose include stress (Yoga Journal, 2011).

HALF LORD OF THE FISHES POSE – *ARDHA MATSYENDRASANA*



photo from www.yogajournal.com

The benefits of this pose include stimulating the liver and kidneys, energizing the spine, stretching the shoulders, neck, and hips, and relieving sciatica, backaches, and menstrual discomfort. Therapeutic applications for this pose include asthma and infertility (Yoga Journal, 2012; Kaminoff, 2007).

EAGLE POSE - *GARUDASANA*



photo from www.yogajournal.com

The benefits of this pose include improving balance and concentration, strengthening and stretching the calves and ankles, and stretching the upper back, shoulders, thighs, and hips (Yoga Journal, 2012; Kaminoff, 2007).

REVOLVED HEAD-TO-KNEE POSE – *PARIVRTTA JANU SIRSASANA*



MARTY SCONDUTO

photo from www.yogajournal.com

The benefits of this pose include stimulating the liver and kidneys, improving digestion, and stretching the spine, hamstrings, and shoulders (Yoga Journal, 2012).

HIGH LUNGE



DAVID MARTINEZ

photo from www.yogajournal.com

The benefits of this pose include strengthening the legs and arms and stretching the groins (Yoga Journal, 2012).

HIGH LUNGE, VARIATION



photo from www.yogajournal.com

The benefits of this pose include strengthening the ankles, calves, groins, shoulders, abdomen, and thighs (Yoga Journal, 2012).

REVOLVED HALF MOON POSE – *PARIVRITA ARDHA CHANDRASANA*



Photo from www.yogajournal.com

The benefits of this pose include strengthening the ankles, thighs, abdomen, buttocks, and spine while stretching the calves, groins, hamstrings, shoulders, chest, and spine. This pose helps to improve balance and coordination, improve digestion, and relieve stress. Therapeutic applications include anxiety, backaches, osteoporosis, sciatica, fatigue, indigestion, and menstrual pain (Yoga Journal, 2011).

LORD OF THE DANCE POSE - *NATARAJASANA*



Photo from www.yogajournal.com

The benefits of this pose include improving balance, stretching the thighs, abdomen, shoulders, chest, and groins, and strengthening the ankles and legs (Yoga Journal 2012).

MOUNTAIN POSE - *TADASANA*



Photo from www.yogajournal.com

The benefits of this pose include improving posture, reducing flat feet, and strengthening the thighs, knees, and ankles (Yoga Journal, 2012; Kaminoff, 2007).

LOW LUNGE - *ANJANEYASANA*



photo from www.yogajournal.com

The benefits of this pose include relieving sciatica, and stretching the groins, thighs, chest, shoulders, armpits, and thighs (Yoga Journal, 2012).

STANDING HALF FORWARD BEND – *ADHA UTTANASANA*



photo from www.yogajournal.com

The benefits of this pose include strengthening the back, stretching the front torso, and improving posture (Yoga Journal, 2012).

STANDING SPLIT – *URDHVA PRASARITA EKA PADASANA*



photo from www.yogajournal.com

The benefits of this pose include stimulating the liver and kidneys, stretching the hamstrings, calves, and thighs, and strengthening the knees, ankles, and thighs. Therapeutic applications for this pose include calming the brain (Yoga Journal, 2012).

UPWARD SALUTE – *URDHVA HASTASANA*



photo from www.yogajournal.com

The benefits of this pose include stretching the belly, armpits, and shoulders, and improving digestion. Therapeutic applications for this pose include relieving mild anxiety (Yoga Journal, 2012).

EIGHT-ANGLE POSE - *ASTAVAKRASANA*



CHRIS ANDRE

photo from www.yogajournal.com

The benefits of this pose include strengthening the arms and wrists and toning the abdominal muscles (Yoga Journal, 2012; Kaminoff, 2007).

SHOULDER-PRESSING POSE - *BHUJAPIDASANA*



KATRINE NALEID

photo from www.yogajournal.com

The benefits of this pose include improving balance, toning the belly, and strengthening the wrists and arms (Yoga Journal, 2012; Kaminoff, 2007).

PLANK POSE



DAVID MARTINEZ

photo from www.yogajournal.com

The benefits of this pose include toning the abdomen and strengthening the wrists, spine, and arms (Yoga Journal, 2012; Kaminoff, 2007).

SCALE POSE - *TOLASANA*



DAVID MARTINEZ

photo from www.yogajournal.com

The benefits of this pose include strengthening the abdomen, arms, and wrists (Yoga Journal, 2012).

OPEN-LEG SEATED BALANCE POSE – *URDHVA UPAVISTA KONASANA*



photo from <http://www.abqjournalfit.com/blog/2011/06/16/pose-brings-body-spirit-into-balance/>

The benefits of this pose include strengthening the spine and core, improving balance, and stretching groins, hamstrings, and inner knees (Schultz, 2006).

SIDE-RECLINING LEG LIFT - *ANANTASANA*



photo from www.yogajournal.com

The benefits of this pose include toning the belly, improving balance, and stretching the sides of the torso and backs of the legs (Yoga Journal, 2012).

BOW POSE - *DHANURASANA*



ROBY EARNSHAW

photo from www.yogajournal.com

The benefits of this pose include stretching the entire front of the body (throat, chest, abdomen, groins, thighs, and psoas) (Yoga Journal, 2012; Kaminoff, 2007).

UPWARD BOW OR WHEEL POSE – *URDHVA DHANURASANA*



CHRIS ANDRE

photo from www.yogajournal.com

The benefits of this pose include stretching the chest, armpits, thighs, and throat, strengthening the wrists, arms, spine, legs, buttocks and abdomen, and stimulating the thyroid and pituitary. Therapeutic applications of this pose include increasing energy, counteracting depression, osteoporosis, infertility, back pain, and asthma (Yoga Journal, 2012; Kaminoff, 2007).

PLOW POSE - *HALASANA*



RORY EARNSHAW

photo from www.yogajournal.com

The benefits of this pose include reducing stress and fatigue, relieving menopausal symptoms, stretching the spine and shoulders, and stimulating the abdominal organs and thyroid gland. Therapeutic aspects of this pose include backaches, headaches, infertility, insomnia, and sinusitis (Yoga Journal, 2012; Kaminoff, 2007).

SUPPORTED SHOULDERSTAND – *SALAMBA SARVANGASANA*



RORY EARNSHAW

photo from www.yogajournal.com

The benefits of this pose include calming the brain, stimulating the thyroid and prostate and abdominal glands, improving digestion, relieving menopausal symptoms, and stretching the neck and shoulders. Therapeutic applications for this pose include relieving stress and mild depression, asthma, sinusitis, and infertility (Yoga Journal, 2012; Kaminoff, 2007).

LEGS-UP-THE-WALL-POSE – *VIPARITA KARANI*



photo from www.yogajournal.com

The benefits of this pose include relieving mild backaches and tired or cramped legs and feet, calming the mind, and gently stretching the back of the legs, torso, and neck (Yoga Journal, 2012).

RECLINING BIG TOE POSE 1 – *SUPTA PADANGUSTHASANA II*



RORY EARNSHAW

photo from www.yogajournal.com

The benefits of this pose include relieving sciatica, backaches, and menstrual discomfort, improving digestion, stimulating the prostate gland, and stretching the hips, hamstrings, groins, calves, and thighs. Therapeutic applications for this pose include flat feet, infertility, and high blood pressure (Yoga Journal, 2012).

RECLINING BOUND ANGLE POSE – *SUPTA BADDHA KONASANA*



CHRIS ANDRE

photo from www.yogajournal.com

The benefits of this pose include stretching the back, shoulders, and hips. This pose helps to relieve stress, relax the body and brain, reduce fatigue, headaches, and insomnia, as well as help to lower blood pressure (Yoga Journal, 2011).

REVOLVED HAND TO FOOT POSE - *PARIVRTTA HASTA PADANGUSTHASANA*



photo from <http://www.damngoodvoga.com/2010/11/asana-of-week-parivrtta-hasta.html>

The benefits of this pose include strengthening the ankles and legs, stretching the hamstrings and backs of the legs, and improving balance. Therapeutic applications of this pose include osteoporosis (Schultz, 2006; Yoga Journal, 2011).

EXTENDED HAND TO BIG TOE POSE 1 – *UTTHITA HASTA PADANGUSTHASANA I*



photo from <http://www.vogaartandscience.com/poses/Standing%20Poses/uhastpad1/uhastpad1.html>

The benefits of this pose include strengthening the ankles and legs, stretching the hamstrings and backs of the legs, and improving balance. Therapeutic applications of this pose include osteoporosis (Schultz, 2006; Yoga Journal, 2011).

RECLINED BIG TOE POSE 2 – *SUPTA PADANGUSTHASANA II*



photo from <http://www.vogaartandscience.com/poses/Standing%20Poses/uhastpad1/uhastpad1.html>

The benefits of this pose include relieving sciatica, backaches, and menstrual discomfort, improving digestion, stimulating the prostate gland, and stretching the hips, hamstrings, groins, calves, and thighs. Therapeutic applications for this pose include infertility and high blood pressure (Schultz, 2006; Yoga Journal, 2011).

HALF BOUND LOTUS STANDING FORWARD BEND VARIATION – *ARDHA BADDHA PADMOTTANASANA*

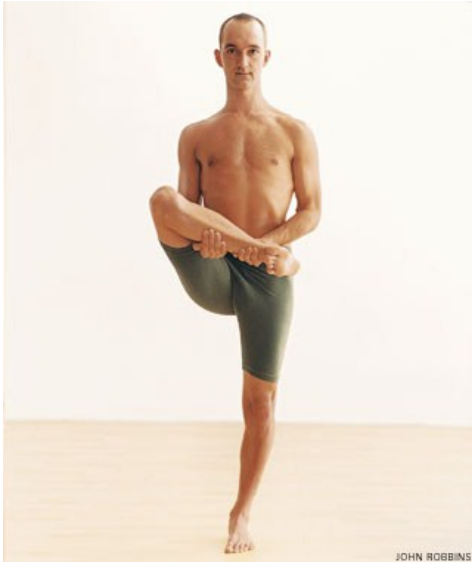


photo from www.yogajournal.com

The benefits of this pose include strengthening the ankles, calves, thighs, and spine, improving balance and posture, stretching the hips, and relieving sciatica. Therapeutic applications for this pose include flat feet (Yoga Journal, 2011).

FISH POSE - *MATSYASANA*



photo from www.yogajournal.com

The benefits of this pose include improving posture, strengthening the upper back and back of the neck muscles, stretching the psoas and intercostals, and stimulating the organs of the belly and the throat (Yoga Journal, 2012; Kaminoff, 2007).

Appendix K

***Pranayama* (breathing) exercise and Meditation poses utilized in the program**

Pranayama: Victorious breath - Ujjayi breath



photo from www.yogajournal.com

Ujjayi = victorious

VY is based on synchronizing *asanas* (physical poses) with *Ujjayi* breath. *Ujjayi* breathing is mainly known for its slow and rhythmic ocean sound, which is created as the breath is drawn down toward the back of the throat and swirled there during nostril exhalation (Schultz, 2006; Fraser, 2007). *Ujjayi* breath helps to guide the yoga practitioner's yoga session by giving the practitioner a rhythm to follow. Additionally, *Ujjayi* breathing helps to reduce distractions while keeping the practitioner self-aware and present in their practice (Fraser, 2007; Schultz, 2006).

The benefits of utilizing and performing *Ujjayi* breath include developing respiratory stamina and mental focus, detoxifying the tissues and organs, calming the brain and body, increasing concentration, increasing *prana* (Chi, life force), and strengthening the nervous and digestive systems (Fraser, 2007; Schultz, 2006; Yoga Journal, 2012).

Pranayama: Alternate Nostril Breathing - Nadi Sodhana



photo from www.yogajournal.com

Alternate nostril breath is a *pranayama* (breathing) technique where the practitioner alternates inhales and exhales from one nostril to the next. A person's natural breath alternates from one nostril to the next approximately every two to three hours. Individuals are not aware of this, as the change happens on its own (Planinz, 2010).

The nose is directly linked to the brain and nervous system. Breathing in through only the left nostril will access the right "creative thinking" hemisphere of the brain, and breathing in through only the right nostril will access the left "logical thinking" hemisphere of the brain. Consciously alternating the breath between both nostrils can activate the whole brain (Stapleton & Stapleton, 2010; Schultz, 2006). The exercise of *Nadi Sodhana*, or alternate nostril breathing, produces the most advantageous function of both sides of the brain. This can create balance between a person's logical and creative thinking (Stapleton & Stapleton, 2010; Schultz, 2006).

Meditation pose: Modified Lotus Pose - Padmasana



photo from www.yogajournal.com

Meditation pose: Salutation Seal - Anjali Mudra



photo from www.yogajournal.com

Meditation pose: Corpse pose – Savasana



MARTIN SCONDUTO

photo from www.yogajournal.com

Meditation pose: Reclining Bound Angle Pose – Supta Baddha Konasana



CHRIS ANDRE

photo from www.yogajournal.com

Appendix L

Information Sheet

REFERRALS FOR EXTRA SUPPORT

Contact your family physician

If it's an emergency - call 911 (within the Province of Nova Scotia)
IWK Emergency Department - (902) 470-8050 (administration)
Mental Health and Addictions Services Central Referral (for all services) –
(902) 464-4110

QEII Health Sciences Centre

QEII - Administration Switchboard

Tel: (902) 473-2700

QEII - Patient Switchboard

Tel: (902) 473-1510

QEII - Halifax Infirmary

1796 Summer St

Halifax, NS B3H 3A6

QEII - Dickson Building

1276 South Park Street

Halifax, NS B3H 2Y9

Dartmouth General Hospital

325 Pleasant Street

Dartmouth, NS B2Y 3S3

Tel: (902) 465-8300

Main Switchboard: (902) 465-8300

- 24-hour emergency care

The Nova Scotia Hospital

300 Pleasant Street
Dartmouth, NS
Tel: (902) 464-3111
Fax: (902) 464-6032

Web: <http://www.cdha.nshealth.ca/>

Association of Psychologists of Nova Scotia

<http://www.apns.ca/index.html>

Suite 417
1657 Barrington Street, Halifax
(902) 422-9183

Self-Help Connection

<http://www.selfhelpconnection.ca/contactus.htm>

selfhelp@eastlink.ca

Phone/Toll Free:
(902) 466-2011 / 1-866-765-6639
Fax:(902) 404-3205

Mail:
Self-Help Connection
63 King Street
Dartmouth, Nova Scotia
Canada B2Y 2R7

Healing and Cancer Foundation

<http://www.healingandcancer.org/>

Healing and Cancer Foundation

Dickson Building Rm 2025 / Rob Rutledge, MD
Nova Scotia Cancer Centre
5820 University Avenue, Halifax, Nova Scotia, Canada
B3P-1V7

Email: info@healingandcancer.org

The Healing and Cancer Foundation helps people affected by cancer with a practical, integrated approach to their diagnosis. They offer life skills training and a unique perspective on mind, body, and spirit that can transform the experience of illness into a journey toward wholeness.

They endorse 'integrated cancer care' which means getting the best of scientifically proven medical care and combining it with wisdom-based healing practices. They focus on the many simple and effective things you can do for yourself every day to improve your health and overall well-being, and to live a life filled with love and purpose.

Their core belief is that every person possesses the wisdom, compassion, and power within to heal - including you.

Yoga Studios

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info@yogastudio.ns.ca

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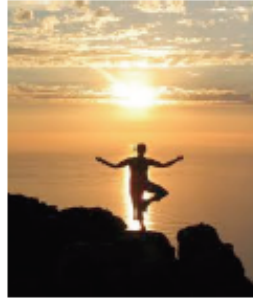
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Appendix M

Perceptions of the Program - Open-Ended Survey Questions

This last portion of the questionnaire asks you open-ended questions regarding your physical activity habits, motivations for joining the yoga study, and overall satisfaction with the yoga program. Please write as little or as much as you would like.



1. Do you feel that you lead a physically active lifestyle? Why/why not?

2. Do you consider yourself to be physically fit? Why/why not?

3. Since your care recipients' cancer diagnosis, do you feel that it is important to be physically and mentally fit, and if so, why?

4. What were your top three reasons/motivations for joining the yoga study?

- i. _____
- ii. _____
- iii. _____

5. What physical or mental skills have you learned over the past 6 weeks, if any?

6. Over the past 6 weeks, do you feel that your mental or physical fitness has improved? If yes/no, why?

7. Has participating in the program changed your outlook on your current or future health (i.e., mental, physical, emotional, spiritual, social), and if so, how?

8. Are there any parts of the program that you would have liked to have more training or instruction?

9. Has taking part in this program made a difference in how you are feeling day-to-day, and if so how?

10. Have you developed any new friendships as a result of being involved in this study? If yes, how important are these relationships to you? If no, please explain.

11. What would you like to see different to make this program a better experience?

12. How did you feel about the group composition? Did you find it helpful in any way to be with other caregivers of cancer survivors? If yes/no, why?

13. Have you shared anything you have learned during this yoga program with your care recipient? If yes/no, what and why?

14. On a scale from 0-10, 1 being "No Distress" and 10 being "Extreme distress", which number best describes how much distress you have been experiencing in the past week including today?: _____

THANK YOU FOR YOUR TIME!!

Version 1.0, July 25, 2011

Appendix N

Answers to the Open-Ended Survey Questions (Perceptions of the Program)

1. Do you feel that you lead a physically active lifestyle? Why/why not?

- #1 Yes I do. I play at least one sport once a week at all times (i.e., basketball, dodge ball, or baseball) and I run or bike 3 times a week between 5-10kms/workout.
- #2 Yes. I try as much as possible to be active...walking/biking vs. driving etc.
- #3 Yes. I try to participate in activities regularly. Physical activity is one of the best ways to relieve stress. It really helps to work the body and get out there to feel better mentally and physically.
- #4 Yes. It's routine; part of me; defining me. My body and brain are happiest when I'm busy. Movement feels good. It's part of my job; getting around (on my bicycle). It makes me happy to be able to walk the dog and get a lot of joy out of seeing her so animated. To be able to work or play (tennis, curling, games, etc.) with others creates bonding and good feelings.
- #5 As much as I can easily fit into evenings after work without it becoming stressful. I try to incorporate and after work activity if I can.
- #6 If you take the results of my survey it would seem like I am not very active but the reality is due to being assaulted and bullied in the workplace – I developed severe eczema which is exacerbated by strenuous exercise.
- #7 Moderately active because I walk to and from work (60+ minutes per day) and to most other activities during the week. I usually take the stairs rather than an elevator. I do morning stretches – not vigorous, but energizing.
- #8 (left blank).
- #9 Yes. I run and bike 4-6 times a week because it helps me feel better.
- # 10 I did until diagnosed with cancer. Been very difficult since surgery and treatment.
- #11 Quite active. Hockey once a week, walking quite a bit with the dog (and husband), carrying in wood.
- #12 Not as much as I should. Mostly because I find it hard to find the time, and motivation.
- #13 No. I find it hard to find time to be physically active during the day. I would like to though.

#14 Yes. I play competitive softball and in order to succeed I need to stay physically fit.

2. Do you consider yourself to be physically fit? Why/why not?

#1 Yes. Because I look physically fit and it's how all my friends would describe me. I can run, I bike for 75+ minutes, and enjoy doing it and I'm a decent basketball player.

#2 Well... I'd like to be more fit. I don't consider myself overweight, but I'd like to be more toned, etc.

#3 Yes. I can walk for several hours at a time. I can play hockey with much younger women. I am not very flexible though and intend to work on that.

#4 Yes. I'm fit and not overweight. I'm not as fit as 20 or 30 years ago but wisdom, fortitude, determination, and attitude make up for what my body is capable of or is not).

#5 Probably not as much as I should be. My weight is too high. I don't eat well enough and should sleep more.

#6 Not now. I was but because of the above and being on prednisone I cannot run like I used to. I was very active. Running, cycling, snowboarding, etc.

#7 Moderately. I'm not fond of cardio, or strength training, and would probably benefit from both.

#8 I am not physically fit because for years I have been inactive. For the past five months I have been looking after my friend who has cancer and it has taken a lot out of me.

#9 Yes. I make it a part of my lifestyle.

#10 I was, a lot weaker now.

#11 To some degree. However, I don't have great deal of strength, bit overweight. I don't have a great deal of self-discipline when it comes to physical activity.

#12 I think I am starting to get more fit. I have let myself go over the past few years and am trying to get more fit.

#13 No. I am extremely out of shape!

#14 A little. I stay pretty active but have injuries that often prevent me from being as fit as I would like to be.

3. Since your care recipients' cancer diagnosis, do you feel that it is important to be physically and mentally fit, and if so, why?

- #1 Very important because striving to be physically fit and mentally fit gives me an outlet and it gives me structure to my day. Being physically and mentally fit is calming and it allows me to go about my day (vs staying in bed). It helps me deal with the pain of recently losing my mom (vs spiraling out of control and not going to work and being social).
- #2 Yes, absolutely. I think if your body is healthy you can just do so much more for the people around you.
- #3 Absolutely. A caregiver must take measures to ensure he/she is up to the tasks involved.
- #4 Absolutely. You need to have energy and compassion to give it.
- #5 Yes. In order to be as great a support to them as possible – so as to not add greater stress on them. To be a positive force.
- #6 Absolutely but it is difficult due to my circumstances.
- #7 Absolutely! My care recipient has died, and so my state of mind and state of health are affected by that change and by the effects on our extended.
- #8 It is very important to be fit in all ways because it helps war off illness. It is good for body, mind, and spirit. You are able to enjoy and participate in life.
- #9 Yes, physically because that makes me happy and mentally so I can be strong for him.
- # 10 (left blank).
- #11 Definitely. I feel so lucky to be healthy. I also want to ensure I am present and healthy – both physically and mentally for whatever is needed by my sister.
- #12 I do. Mostly so that I can make sure I can be there for her.
- #13 I should be, but I use this as another “excuse” not to have time to be physically active. I am physically and emotionally exhausted.
- #14 Yes!!! It helps you stay positive as well as focus on something besides their illness for a little while.

4. What were your top three reasons/motivations for joining the yoga study?

- #1
 - 1. Recommended by my doctor for “calming” reasons.
 - 2. Learn yoga and improve my flexibility, core strength, and breathing.
 - 3. As an outing, to be with people going through similar circumstances.

- #2
 - 1. De-stress.
 - 2. Get back into yoga.
 - 3. Free 😊

- #3
 - 1. Curious about yoga and the benefits of it.
 - 2. Wished to be helpful in a study which may prove quite beneficial.
 - 3. Hope to relax more and learn methods of relaxation.

- #4
 - 1. To help my partner deal with outward events and support him
 - 2. To participate in a medical study and take part in the opportunity to learn more about yoga and push myself to go to new places physically and emotionally.
 - 3. Reprieve from life’s responsibilities and turn that into more resources to bring back to my family and my group of people.

- #5
 - 1. Reprieve.
 - 2. Free.
 - 3. Physical Activity.

- #6
 - 1. I love yoga.
 - 2. Relax more.
 - 3. Doing more to try to relieve stress.

- #7
 - 1. Focused time to practice/relax.
 - 2. Self-care.
 - 3. To support/promote the idea of whole-family health.

- #8
 - 1. Stress relief.
 - 2. I wanted to learn yoga.
 - 3. Meet people dealing with cancer.

- #9
 - 1. Was looking for an outlet as a caregiver.
 - 2. Like yoga (from past experiences).
 - 3. Free! 😊

- #10
 - 1. Activity.
 - 2. To do something with caregivers.
 - 3. Never tried yoga.

- #11
 - 1. I liked the underlying reason it was given.

2. I used to do some long ago and it helped me.
3. I would like to have better physical fitness.

- #12
1. Stress relief.
 2. Social interaction.
 3. To get some more exercise.

- #13
1. Do something active.
 2. Be with other caregivers.
 3. Do something for myself.

- #14
1. To clear my mind.
 2. Be more active.
 3. Feel better.

5. What physical or mental skills have you learned over the past 6 weeks, if any?

- #1 Mental skill – just letting go and not thinking. Focusing on my body and breathing vs general stress of the day. Physical skill – stretching properly and how much better you feel after stretching (totally new concept for me).
- #2 Breathing...definitely. I've learned the importance of breathing which has helped me in yoga, and sleeping, etc. I didn't realize how important it was to yoga before.
- #3 To relax more – just from the breathing. Also I was reminded of how good it feels to stretch.
- #4 Mind and body training is very important. It works. All of the skills we worked on improved or got easier. It made me feel good. Balance was an issue. No surprise {???}. I concentrated on that aspect the most. I was able to notice the biggest {change?} with that.
- #5 Breathe. Stretch. Take time for yourself. Push limits physically.
- #6 How important it is to breathe. How flexible I am regardless of running in the past. How I am not balanced in yoga but do well in balance sports.
- #7 Balance (physical balancing – how hard it is and how useful it is for promoting focus). Unforced Yin poses – love those!
- #8 I have learned some yoga quite a lot actually. I also learned to breath properly. I am still learning. I learned to relax more.
- #9 Just a good refresher of yoga as it has been a while since I had been in a class.

- # 10 (left blank).
- #11 My breathing has improved a lot.
- #12 I think that I have learned to slow down and concentrate on what I have been doing. To relax and let go of the pressures of the day.
- #13 I've learned to be mindful and be present. I cannot control what has happened or what the future will hold.
- #14 The importance of taking time to clear my mind.

6. Over the past 6 weeks, do you feel that your mental or physical fitness has improved? If yes/no, why?

- #1 Yes. My physical fitness has improved. I can almost touch my toes!! I feel like I'm building core strength and upper body strength. I'm beginning to focus on muscle groups I never exercise/stretch/build on when running, biking, or playing basketball/dodge ball.
- #2 Yes, I am definitely more flexible. And I feel like I can hold balance poses longer and deeper now.
- #3 Yes – I can do the yoga poses slightly better. I can do other sports better. I curl and the increase of flexibility in my hip helps tons.
- #4 Definitely both. At the end of each class I was able to relax more and results would last longer.
- #5 Yes. Feel looser and more flexible and stronger. Feel light after class.
- #6 Yes for sure. I looked forward to this class every week. Sad that it's over. It has given me motivation to get back in shape.
- #7 Yes, definitely. My responses on the survey don't adequately reflect the positive benefits of this class. It has been a tremendously stressful time, particularly because of estate issues and family conflicts resulting from two deaths in close succession. The yoga has been manna from heaven.
- #8 My physical fitness has improved because of the moves. It helped me mentally because of the focus you need for you.
- #9 Not really – has been pretty much the same.
- #10 (left blank).

- #11 Yes. I notice a difference in my body in the first yoga class and this last one.
- #12 I think so. I was unable to attend all of the classes. But I have noticed that I have more energy and better control in some classes.
- #13 A little bit, yes. I find being mindful of the “now” helps me when I feel anxious.
- #14 Yes! I can feel the difference every time I hold a pose longer or sink deeper. There’s also less pain 😊

7. Has participating in the program changed your outlook on your current or future health (i.e., mental, physical, emotional, spiritual, social), and if so, how?

- #1 100% my new outlook/future health program includes yoga, building core strength, and upper body strength, staying well hydrated and rested! I need more “yoga-esque” lifestyle – eliminating caffeine, drinking more water, eating more natural foods, stretching, less work, and stress (sorry to be stereotypical...I’m being complementary!)
- #2 Yes, it really has made me see the benefit in continuing to do yoga and connecting with other cancer caregivers for support.
- #3 Not really I have always been very conscious about my health – all aspects.
- #4 Absolutely. Extremely uplifting effects. The flip side would be trying to recapture all of the components: free classes! AndiCeline was terrific in every way: very well spoken, knowledgeable, caring for each class participant, always offering options to poses, just the right amount of change/progression each class. Socially, it gives you something to talk about. Getting out with others is a chance to help support other people’s efforts. Spiritually, I’ve meditated for a few years. It has helped my concentration. I have noticed by class 4 that I stopped watching the fish video and paid attention to how things felt.
- #5 I realized how much yoga is something I enjoy and can easily do. It does get easier. I feel a sense of accomplishment after class.
- #6 Yes. I am struggling because of a work issue and it has drained me. I found that this class had a huge impact on making me feel better.
- #7 Yes. It has reminded me that I need a schedule and community to stay engaged in fitness activities, and it has affirmed how valuable that commitment can be.
- #8 It sure has. I really really really want them all. Yoga is good for them all.
- #9 No I already have an active lifestyle. It was nice to have this added to my weekly routine 😊

- # 10 (left blank).
- #11 Yes. I would like to continue with the yoga and build a stronger body and calmer mind.
- #12 I feel more motivated to start taking care of myself.
- #13 yes. It made me realize that in order to get through these cancer diagnoses that I must try to take care of myself!
- #14 It reminded me how beneficial yoga is and encouraged me to continue it.

8. Are there any parts of the program that you would have liked to have more training or instruction?

- #1 Tips for preparing for the class (i.e., nutrition and hydration).
- #2 Well because I had done a bit of yoga before, I knew some of the basics. I would've liked to have some private classes with those wanting to explore more advanced poses ☺
- #3 No.
- #4 All of it!!! I would LOVE to plug in for longer!!! I would like to continue on the journey of change/learning/discipline.
- #5 Downward dog!!
- #6 I have taken different styles of yoga but I found the approach that AndiCeline takes is awesome. She has the compassion and the ability to make you not only feel better but make you want to strive.
- #7 The instruction and guidance were superb – gentle, encouraging, affirming.
- #8 All of it.
- #9 I thought the program was great – for me it was just a chance to get away and close my brain off for an hour and a bit.
- # 10 (left blank).
- #11 Perhaps to have been “adjusted” more if not doing a pose properly.
- #12 I enjoyed the yin poses, and would like to learn a bit more about those.

#13 I wish I had been able to attend more. AndiCeline was fantastic!!

#14 It was great as is!

9. Has taking part in this program made a difference in how you are feeling day-to-day, and if so how?

#1 Yes. I do feel calmer and I have an avenue to cope with stress. Yoga and well being (rested, hydrated and healthy).

#2 I just feel more confident in my own skin...better posture, more relaxed and definitely more aware of breathing.

#3 Yes – I looked forward to coming. The stretching makes me feel great. I intend to continue.

#4 The paperwork doesn't capture the happiness!

#5 I look forward to coming to a scheduled class after work.

#6 Very much so. No matter how down I feel or fatigued when I am finished the class I feel invigorated I need to start a regular yoga practice.

#7 Yes. For the reasons stated above.

#8 Yes! I am more conscious of my breathing and any tension and I can focus and release some of the tension.

#9 I don't think so other than it's nice to know that other people are going through similar struggles, which is comforting.

10 (left blank).

#11 I feel better the day after class – which helps emotionally.

#12 I am a bit more relaxed after the class. I notice that I sleep better after class.

#13 A little bit. Just knowing that I have to do something for myself has been eye opening.

#14 Yes! Gave me something to look forward to.

10. Have you developed any new friendships as a result of being involved in this study? If yes, how important are these relationships to you? If no, please explain.

- #1 No, not really. This is entirely my fault for coming late to class (right before class) and leaving as soon as it was over. I really liked everyone though!
- #2 Yes! Well I reconnected with someone I went to University with in the class which has been great! I also was so glad to connect with Andi and find out more about great yoga places in Halifax!
- #3 No. I didn't get to know anyone. I strongly believe that caregivers should have support group as caregiving is so taxing.
- #4 I enjoy meeting new people. All of the group seemed like kind and LIKE minded people.
- #5 No.
- #6 Not with the other participants because there is not a lot of interactive like on a course where you have lunch together or share experiences.
- #7 No. I certainly like the people in the group, but the focus has been on practice, not socializing. That's fine for me.
- #8 I didn't make any new friends but we did chat a little. I am not online and I have to leave as soon as the session was over.
- #9 Kind of re-kindled an old one coincidentally being in this program. Was great to know someone and be able to talk to them about what is going on.
- # 10 (left blank).
- #11 No I haven't. I missed some classes for various reasons. Also I am with people all day – and I don't come for the socializing – I need some time to myself.
- #12 Since I have not been to all the classes it was a bit hard to get to know people.
- #13 My brother, his girlfriend, and I have all fallen in love AndiCeline. She is so kind and thoughtful!
- #14 Sort of. We didn't (or I didn't) get to know each other that much since while practicing there's no time to talk.

11. What would you like to see different to make this program a better experience?

- #1 Nutrition plan before class. One vague plan for the six weeks of what we should eat the day of the class and after class.
- #2 I don't know if it would work...or if it's too personal, but find out everyone's names and why they are there at the beginning to get a sense of who is in the class and where they are coming from.
- #3 It might be nice if people introduced themselves to at least said hello as they came in.
- #4 Longer duration please – i.e., 3 month course of up to 6 months. Anything that makes people feel better/ and be healthier will save health care dollars.
- #5 Perhaps some voluntary reflections after each class. Sharing. Identifying an intention at the beginning.
- #6 Maybe an intro session where you could meet people prior to starting the actual yoga so you could get a background of their experiences.
- #7 Nothing.
- #8 It was wonderful just as it was. AndiCeline was funny, caring, and helpful. She took her time. She is Brilliant. What a wonderful idea. I hope this can continue for people like me free of charge. Well, God willing.
- #9 Maybe provide a more open line of communication between participants so that possible connections can be made. Perhaps have a 5 minute “reason why you are here” talk before.
- # 10 (left blank).
- #11 Nothing, except to continue.
- #12 Maybe a bit more time getting to know the other participants. Some more conversations.
- #13 Be held on a continual basis.
- #14 It to be longer! ☺

12. How did you feel about the group composition? Did you find it helpful in any way to be with other caregivers of cancer survivors? If yes/no, why?

- #1 Great. Yes, just knowing everyone here is in a similar situation. This class made me feel like I was normal and not the center of attention. Lately (since my mom's passing), being in a group of friends/family/co-workers has been overwhelming. They all know of her passing and feel as though they need to comfort me. Very overwhelming.
- #2 Yes, although I only spoke with a few about their situations, it was nice to know I wasn't the only one and that it was a supportive environment.
- #3 The overall atmosphere was supportive in a passive way. I didn't really find it helpful or unhelpful to be with other caregivers.
- #4 Yes. We all have struggles in life. It is helpful to know that you are not the only one going through this. There is strength in numbers.
- #5 Perhaps a common energy, experience but really it just felt like a common yoga class with participants. It was nice to see familiar faces each week and watch each other improve and grow stronger and enjoy the classes and feel more peace.
- #6 Never really had the opportunity because everybody comes in at the start of class and are gone at the end of class.
- #7 It seems irrelevant, and that's fine.
- #8 The group was great. I found it very helpful to be with other caregivers because I knew I was not alone. This is a BIG thing.
- #9 It was nice to know those who were in the room with you and for me to re-connect with a friend from school.
- # 10 (left blank).
- #11 Not applicable.
- #12 I think that knowing that everyone was there for the same reason made me feel less alone. Like someone also knew what I was going through.
- #13 It's helpful, even if you don't talk, to know you are with people who are in your shoes!
- #14 Yes. It made the focus more on the caregivers, which allowed everyone to take care of themselves without guilt.

13. Have you shared anything you have learned during this yoga program with your care recipient? If yes/no, what and why?

- #1 N/A – passed away.
- #2 Yes, I just told her how much I loved Andi how the personal attention made me want to get back into yoga and really focus on it – so now she’s buying me a pass to Ashtanga ☺
- #3 No. She is not in town now (away all of these weeks). However, when she returns we will talk about it.
- #4 Breathing is the most important thing about being alive. It can help how you feel. Encouraging my many care recipients to focus on better breathing, especially because I am doing more of it myself. Training my mind to create more relaxed breathing has worked for me and I try to share that.
- #5 No. I haven’t told her I’m involved because of her. She just knows I’ve been taking a free yoga class. I don’t want her to feel like I’ve done anything because of her.
- #6 Yes the importance of movement and breathing.
- #7 I have shared stories and insights with my family – especially my daughter. My care recipient is dead.
- #8 Yes. I have talked to my friend because I feel so wonderful and proud that I was doing it. I felt I had something in my life.
- #9 Not really because its kind of my one selfish indulgence.
- # 10 (left blank).
- #11 A bit – to say I’m going. She likes yoga too.
- #12 I have not yet, but when she feels better I will.
- #13 My care recipient (one of) also attended the yoga program.
- #14 Yes. I told her what it was about and it encouraged her to want to try yoga with me.

14. On a scale from 0-10, 1 being “No Distress” and 10 being “Extreme distress”, which number best describes how much distress you have been experiencing in the past week including today?:

#1 5

#2 3

#3 2

#4 2

#5 6

#6 4

#7 6 (Yesterday I would have said 4 or 5). Thank you so much!

#8 9

#9 3

#10 4

#11 2 Thank you Andi. You are a great teacher!

#12 2

#13 5

#14 2