Examining the Health Behaviours of Older Spousal Caregivers: Gender and the Healthy Caregiver Effect

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Melissa L. Badger

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Name:	**Melissa L. Badger**
Degree:	**Master of Arts**
Title:	***Examining the Health Behaviours of Older Spousal Caregivers: Gender and the Healthy Caregiver Effect***
Examining Committee:	**Chair:** Dr. Sharon Koehn Clinical Research Professor

Dr. Barbara Mitchell
Senior Supervisor
Professor

Dr. Andrew Wister
Supervisor
Professor

Dr. Andrew Sixsmith
Supervisor
Professor

Dr. Lynne Young
External Examiner
Professor
School of Nursing,
University of Victoria

Date Defended/Approved: June 16, 2015

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Abstract

This mixed methods study examines how physical and nutritional health behaviours compare between married older adults (aged 65+) caregiving for their spouse and older married non-caregivers, with attention to differences between men and women. Using data from the 2008-2009 Canadian Community Health Survey, Healthy Aging module, hierarchical regression analyses were performed to investigate the association between spousal caregiving and engagement in regular physical activity and healthy eating among married older adults (N = 5,579). Qualitative interviews were also conducted with 14 older spousal caregivers to contextualize the survey findings. Integrated results indicate a potential healthy caregiver effect, especially among women, in relation to increased caregiving physical activity. However, the impact of spousal caregiving on health behaviours is complex and influenced by gender, caregiving intensity and time. Leisure and nutritional health behaviours are negatively affected by the demands of caregiving. Study implications are relevant for caregiver interventions, community programs, and healthy public policy.

Keywords: spousal caregiving; health behaviours; gender; the healthy caregiver effect; mixed methods

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Table of Contents

List of Tables

List of Figures

Chapter 1. Introduction

Recognition of informal caregivers for their contribution to Canadian society is growing, with an estimated economic value of between $24 and $31 billion in 2007 (Keefe, 2011). Informal or "family" caregivers have been described as providing, without pay, support for both instrumental activities of daily living (IADLs) and activities of daily living (ADLs), help with care management, as well as emotional and social support for not only care receivers but also other carers (Armstrong & Kits, 2001). Indeed, this informal care work is of critical importance against the backdrop of population aging and recent health reforms. Notably, government cutbacks have shifted the onus of care from formal services to informal family and community support. Moreover, shifting social norms in Western societies over past decades have resulted in a growing proportion of male caregivers (Poysti et al., 2012; Baker & Robertson, 2008). In light of these significant socio-demographic trends, family caregiving emerges as an increasingly important area of inquiry.

Informal caregivers of older adults represent 2.7 million Canadians and include spouses, adult children, extended family members and friends (Cranswick & Dosman, 2008). One quarter of these individuals are over the age of 65 and are most likely to be caring for a spouse (CRNCC, 2011). Further, older people who provide care are often managing their own age-related health challenges (Kim & Keshian, 1994) and may be more vulnerable to the negative effects of caregiving (CAOT, 2010). For example, older caregivers may be disadvantaged compared to younger carers in terms of financial, physical, and psychological resources, as well as opportunities to engage in stress-buffering activities (Pinquart & Sörensen, 2003). While spousal relationships are an essential source of social support to offset the negative effects of stress, it may be compromised for caregivers when their partner's health declines (Gallant & Connell, 1998). Moreover, due to the increased care demands associated with co-residence, spouses are more likely to provide not only more comprehensive care but also for longer durations of time as compared to other types of informal caregivers (Connell, 1994; Schulz & Sherwood, 2008)

While a multitude of health problems associated with being a family caregiver have been identified in the literature (see, for example: CRNCC, 2011; Fuller-Jonap & Haley, 1995; Pinquart & Sorensen, 2003/2007; Schulz et al., 1997; Schulz & Sherwood, 2008; Taylor et al., 1995; Vitaliano et al., 2003), less research has focused on the behaviours of older caregivers in preventing their own health problems (Acton, 2002). The vast majority of studies have been based within a stress-illness framework (Acton 2002), using concepts such as caregiver burden and stress to "quantify, describe, predict, and prevent negative outcomes" for family caregivers (Ayres, 2000, p.24). Literature on the positive effects of caregiving is small but growing. Notably, the 'healthy caregiver effect' has been proposed to account for the relationship between caregiving and beneficial health outcomes (Fredman et al., 2008; Bertrand et al., 2012). The healthy caregiver effect proposes that older adults who engage in caregiving tasks may experience better health outcomes as compared to non-caregivers due to the caregiving role (Bertrand et al., 2012). However, this effect may be compounded by a selection bias wherein older adults who become and remain caregivers are likely to be healthier than their non-caregiving peers (Fuller-Jonap & Haley, 1995). Additionally, if indeed there is a healthy caregiver effect, it may emerge differently for male and female caregivers, given the gendered nature of caregiving. Thus, it remains unclear how the healthy caregiver effect may apply to engagement in health promoting behaviours among caregivers, especially across gender and for specific types of healthy behaviours, such as physical and recreational activities, healthy eating, and health care utilization.

Overall, more research is needed to examine the interplay between health outcomes and caregiving among older persons, and the role of specific health behaviours (Furlong & Wuest, 2008). It is crucial to explore the experience of older adults providing care to their spouse in order to address these gaps and further inform health promotion initiatives and healthy public policy for these individuals. As Vitaliano and colleagues (2003) argue, health promotion for caregivers will not only benefit individuals but is likely to have positive effects for society as a whole.

The purpose of this research is to understand in what ways, and why, the health behaviours of older spousal caregivers may differ in comparison to their non-caregiving counterparts and whether these behaviours are gendered. Using data from the 2008-2009 Canadian Community Health Survey, this study aims to determine how various physical and nutritional health behaviours compare between married older adults (aged 65+) caregiving for their spouse and older married non-caregivers, with special attention to differences between men and women. In addition, a subsample of interview participants is included to further explore and contextualize the factors underlying the survey findings. This research was conducted in Metro-Vancouver, British Columbia. The proposed design and hypotheses for this study are outlined following a review of the literature to study the conceptual and theoretical framework for this research.

Chapter 2. Review of Literature

2.1. Conceptualizing the Healthy Caregiver Effect

This chapter summarizes key ideas in the theoretical and research literature pertaining to the health of spousal caregivers in order to provide a foundation for the current research. In theoretical discussions of spousal caregiving and the health behaviours of older adults (see, for example: Bookwala & Schulz, 2000; Braithwaite, 1996; Gallant & Connell, 1998; Mitrani et al., 2006; Pearlin, 1994/1996; Sisk, 2000), common concepts relate to theories of caregiver health (including stress and coping), gender (such gender role socialization), and health promotion (with respect to engagement in self-care activities). This literature is used to select variables for the quantitative analyses, formulate guiding questions and analyze emergent themes for the qualitative interviews, and finally, to integrate the quantitative and qualitative findings.

Despite their growing prevalence, theories related to caregiver burden and stress present mixed findings (Bertrand et al., 2012). Along with the literature on volunteering and social support, caregiving research is paradoxical in that help-related health outcomes can be both deleterious and beneficial (Beach et al., 2000; Brown et al., 2009). In recent decades, researchers have called attention to a selection bias termed the ‘healthy caregiver effect’, which predicts that those persons in sufficient physical and mental health are most likely to become and remain caregivers (Bertrand et al., 2012; Fredman et al., 2004; Fredman et al., 2008; Fuller-Jonap & Haley, 1995). Indeed, the study of health in this area is confounded by the fact that individuals in poor health are more likely to institutionalize their spouse or recruit a healthier caregiver (such as an adult child or a paid caregiver) (Fuller-Jonap & Haley, 1995).

According to the healthy caregiver effect, caregivers experience better health-related outcomes compared to their non-caregiving peers due to the health-related selection bias associated with becoming, and remaining, a caregiver in old age (Bertrand et al., 2012). It is further hypothesized that engagement in caregiving tasks may even promote physical and cognitive health (Fredman et al., 2008). For example, the physical demands of intensive caregiving might actually improve physical health and buffer the negative health effects associated with caregiving stress (Fredman et al., 2008). Indeed, physical activity has been underscored in reducing the risk of functional (Buchman et al., 2007) and cognitive decline (Colcombe & Kramber, 2003; Lachman et al., 2006) among older persons. Fredman and colleagues (2008) note that moderate physical activity has protective effects against heart disease, mobility disability, as well as stress and depressive symptoms among older adults. However, the beneficial health outcomes associated with the healthy caregiver effect have yet to be fully reconciled with theories of caregiver stress. Physical activity levels must be examined in exploring the impact of caregiving on health (Fredman et al., 2008). Further, while the healthy caregiver effect may explain physical and mental health outcomes for caregivers, there remains a knowledge gap regarding the relationship between family caregiving and levels of engagement in health promoting self-care (Acton & Kang, 2001; Braithwaite, 1996; Furlong & Wuest, 2008), such as leisure-time activities and eating habits.

2.2. Theoretical Frameworks to explain Caregiver Health

2.2.1. Stress and Caregiving

Theories of stress and illness are widespread within the caregiving literature. Caregiving has been described as a chronic stressor and chronic stress is related to high blood pressure, poor immune function, and mortality (Fredman et al., 2010). The stress and coping framework proposed by Lazarus & Folkman (1984) suggests that the effect of stress on individual wellbeing is influenced by cognitive appraisals, which in turn are affected by factors such as caregiving resources, characteristics of the care recipient, and caregiver vulnerabilities (Gatz et al., 1990). In a similar vein, the stress of caregiving has been described by Vitaliano (1997) as a factor leading carers to neglect their health, resulting in a decreased sense of wellbeing as per the caregiver stress hypothesis. Similarly, the construct of caregiver burden or strain has been useful to describe the physical, emotional, social and financial issues faced by caregivers of impaired older adults (George & Gwyther, 1986), and associated adverse health effects.

Pearlin's stress-outcome model distinguishes between primary and secondary stressors associated with caregiving (Pearlin, 1994; Pearlin et al., 1990). Primary stressors are described as stress-inducing demands that arise from the caregiving situation, such as the care receiver's behaviour problems, while secondary stressors are described as stressful experiences due to primary stressors, such as restricted engagement in self-care activities (Bookwala & Schulz, 2000). Thus, this model hypothesizes that primary stressors give rise to secondary stressors, both of which are linked to poorer health outcomes among caregivers. Here, gender may be seen as a contextual factor influencing the stress process by representing a caregiver's social location and access to power and resources (Pearlin, 1994). Accordingly, gender differences in caregiver health outcomes may be explained by gender differences in caregiving stressors and resources (Lutzky & Knight, 1994). Caregiving women, who report more stressors and fewer resources as compared to caregiving men, may therefore have poorer psychological and physical health (Bookwala & Shulz, 2000; Pearlin et al., 1990).

Research using these frameworks has allowed for a better understanding of primarily detrimental caregiver health outcomes and protective effects, although a large amount of variance has yet to be accounted for (Hooker et al., 1998). Personality factors such as optimism may also play a role in the stress process. According to the theory of self-regulation, optimistic caregivers are able to maintain goal-oriented efforts to confer more positive outcomes over time (Carver & Scheier, 1991). In addition, the stress-buffering hypothesis suggests that positive interpersonal relationships may moderate negative changes in physiological functioning related to stress, such as immune response (Cohen & Willis, 1985). Indeed, perceptions of social support among spousal caregivers of persons with Alzheimer's disease have been found to significantly predict both self-reported health (Monahan & Hooker, 1995) and caregiver burden (Clipp & George, 1990; George & Gwyther, 1986; Johnson & Catalano, 1983; Vitaliano et al., 1991). Also noteworthy is the implicit assumption that the caregiving experience is largely deleterious. In order to re-frame informal caregiving in a more positive light, research in recent years has shifted toward a health promotion paradigm, as discussed next.

2.2.2. Caregiver Health Promotion

The traditional concepts of caregiver burden and stress have been criticized for limiting the exploration of informal caregiving within the context of health promotion (Acton, 2002; Furlong & Wuest, 2008). Researchers have called for models that focus on positive health outcomes related to disease prevention, hope, satisfaction and the rewards of caregiving based in a health promotion paradigm (Ostwald, 2009). Health promotion is “motivated by the desire to increase wellbeing and actualize human health potential” (Pender et al., 2011, p.5). While caregiving may restrict leisure-time physical activity and other health behaviours, it may also demand certain types of health promoting activities. The question remains: to what extent may caregiving have both positive and negative effects concurrently?

Several health promotion theories concerning health behaviour can be applied to family caregiving, such as the health belief model (Lewin et al., 1944), the theories of reasoned action (Fishbein & Ajzen, 1975) and planned behaviour (Ajzen, 1991), as well as social cognitive theory and self-efficacy (Bandura, 1997, 2004). In the aim to integrate the multiple bio-psycho-social processes that influence healthy behaviours, Pender and colleagues (1990) proposed the Health Promotion Model (HPM). According to Pender’s revised HPM (1996; 2011), the likelihood for a person to engage in a particular health behaviour is determined by individual characteristics and experiences (including prior related behaviour and personal factors, both biological and psychological), as well as behaviour-specific cognitions and affect (including the perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences, and situational influences).

With respect to caregiving and the HPM, the association between spousal caregiver status and health behaviour (e.g., engagement in regular physical activity, participation in recreation activities, maintaining a healthy diet) is moderated by factors related to the individual (e.g., age, gender, ethnicity, education, self-perceived health status, number of chronic conditions) and psychosocial factors related to the health behaviour (e.g., perceived need to improve health, perceived barriers to engaging in the health behaviour, social support, life stress). Caregiver burden and stress are seen here as psychosocial situational influences (Pender et al., 2011; Sisk, 2000). Positive health outcomes will ultimately result if family caregivers are able to regularly engage in health-promoting behaviours, to further conserve wellbeing and buffer the stress effects of caregiving.

2.3. Research Literature

2.3.1. Health Behaviours and Caregiving

The empirical literature on the health promotion of older adults demonstrates a number of positive health outcomes for those who regularly engage in healthy behaviours and use preventative services (Hickey & Stillwell, 1991). Defined as "those actions persons take to improve their health, maintain optimal functioning, and increase general well-being" (Acton, 2002, p.73), health promoting behaviours include healthy eating, regular exercise, stress management, health monitoring, and the avoidance of toxic substances such as cigarettes and alcohol (Pender et al., 2011). Health promoting behaviours are influenced by a number of modifying factors such as education, income, knowledge about self-care, culture, functional ability, and the needs of family members (Sisk, 2000). However, there is less evidence regarding the health promoting activities of older adults who are also family caregivers (Acton, 2002). Connell (1994) investigated the impact of caregiving on the health behaviour of spouses caring for persons with dementia. Her results were among the first to suggest that the provision of full-time care interferes with eating nutritiously and exercising, and further contributes to risky behaviours such as overeating, as well as alcohol and substance use.

As Killeen (1989) has argued, caregivers simply do not have the time or energy to support their own health behaviours. In particular, the chronic stress experienced by spousal caregivers of persons with dementia may compromise their ability to care for not only their spouse but also themselves (Caswell et al., 2003). In qualitative work identifying self-care among the main educational needs of informal caregivers, "time is not your own" was a prevalent sentiment (Mastel-Smith & Stanley-Hermanns, 2012). Thus the importance of respite to afford family caregivers the opportunity for health promoting activities must be emphasized (Mastel-Smith & Stanley-Hermanns, 2012).

In a study comparing health promoting self-care among family caregivers and non-caregivers, lower scores were found for caregivers on a variety of health promotion measures including perceived importance of self-care, total health-promoting actions, and physical activity levels (Acton, 2002). Ostwald's 2009 literature review reports that caregiving spouses are less involved in health-promoting activities and have poorer self-perceived health compared to non-caregivers. These findings have been echoed in a recent survey by Hoffman and colleagues (2012) on the health behaviours of baby boomer family caregivers. Carers among this cohort were more likely than non-caregivers to regularly smoke and consume soda and fast foods. However, there were no significant differences in the likelihood of poorer health behaviour among caregivers who provided more hours of weekly care or who had been caring for a longer period of time compared to other caregivers.

While research has presented differential outcomes for high and moderate-level caregiving, where high-level caregivers may lack sufficient resting and illness recuperation time, and be less likely to engage in regular physical activity (Burton et al., 1997), more recent findings are indicative of the healthy caregiver effect. For example, a longitudinal study of caregiving intensity and two-year change in physical performance among older women found that those who were involved in more caregiving activities maintained the highest functioning through to follow-up compared to the low-intensity caregivers and non-caregiving women (Fredman et al., 2009). Additional panel study findings indicate that older caregivers have lower rates of mortality than non-caregiving older adults (Brown et al., 2009; Fredman et al., 2010) and better self-reported health (Taylor et al., 1995). Moreover, both improved physical health (McCann et al., 2004) and cognitive health outcomes in older caregiving women (Bertrand et al., 2012) have been reported.

Evidence for the healthy caregiver effect is inconsistent with meta-analyses reporting that informal caregivers generally experience poorer physical health that non-caregiving adults (Pinquart & Sorensen, 2003), for both objective and subjective health measures (Vitaliano et al., 2003). An updated meta-analysis on the correlates of physical health among informal caregivers by Pinquart and Sorensen (2007) found that poorer physical health was related to the severity of the care-receiver's behaviour problems and cognitive impairment, length of time in the caregiving role, co-residence with the care-recipient, not being a spousal caregiver, higher reported caregiver burden and depression, higher age, lower socioeconomic status, and lower levels of informal support. In addition, engagement in more caregiving activities was related to better physical health. As the authors submit, "this result indicates a suppressor effect, because these effects are reversed in the bivariate analysis. The suppressor effect suggests that after the level of impairments of the [care-receiver] is statistically controlled for, caregivers with better health are able to provide higher levels of support" (P131). It is possible that this suppressor effect reflects the selection bias among caregivers, where those persons who become caregivers are physically healthier than their non-caregiving counterparts (McCann et al., 2004).

The association between caregiving and physical health remains to be fully established (O'Reilly et al., 2008). Moreover, research on the healthy caregiver effect should make clear the distinction between health behaviours versus health status, where caregiving can affect health status indirectly through engagement in health-promoting behaviours as per Pearlin's stress outcome model and Pender's HPM. In an examination of caregiving status, health behaviours, and uptake of preventative health services among older adults aged 65 and older, caregiving older adults were more likely than non-carers to meet recommended levels of physical activity, thus supporting the healthy caregiver effect (McGuire et al., 2010). Of the additional health behaviours investigated, the two groups of older adults had similar patterns of engagement. It is important that multiple health-promoting self-care activities are examined in assessing the healthy caregiver effect among older family caregivers.

2.3.2. Caregiving for a Spouse

Statistics Canada reports that one in ten family caregivers in 2007 were providing care to a spouse (Cranswick & Dosman, 2008), a number which may be underreported since spouses may not consider certain tasks as “caregiving” but rather “the way we do things” (Cranswick et al., 1999). A meta-analysis reporting on the physical health of informal caregivers found spouses to represent 50% of caregivers in studies published between 1986 and 2006 (Pinquart & Sorensen, 2006). Based on the hierarchical compensatory model (Connidis, 2010), husbands and wives are noted as being the most dependable caregivers where marriage decreases the likelihood of institutionalization among older adults (Quadagno, 2005; Stoller & Miklowski, 2008). Indeed, spousal caregivers report their responsibilities as ‘part of the marriage contract’ (Miller & Montgomery, 1990) and as an act of ‘love and duty’ (Davidson et al., 2000).

Associations between spousal status and physical health among caregivers are inconsistent (Pinquart & Sorensen, 2007). For example, although spousal caregivers may report worse health than adult-children caregivers due to age-associated health declines, spousal caregivers may face less demands from competing work and other family roles since they are typically older than adult-children caregivers (Cantor, 1992). However, spouses who provide informal care, especially those expressing caregiver strain, are more likely to have functional limitations, lower incomes and less education versus non-caregivers (Schulz et al., 1997). Increased caregiving stress among spousal caregivers is also influenced by co-residence with the care-receiver since opportunities for respite may be especially limited. Estimates suggest that spousal caregivers spend up to 56.5 hours per week providing care (NAC & AARP, 1997). Spouses who experience increased caregiving burden and strain may therefore be more vulnerable to the negative effects of caregiving.

The relationship between caregiving and engagement in health-promoting behaviours is further complicated for spousal caregivers as one’s partner plays a key role in regulating and motivating one’s own lifestyle, including both health-promoting and health-damaging behaviours (Reczek & Umberson, 2012; Tucker, 2002; Umberson & Montez, 2012). While there are many positive health outcomes from regular engagement in physical and leisure activities, activities typically shared by partners can be increasingly difficult for spousal caregivers to maintain (Janevic & Connell, 2004; Stahl & Schulz, 2013). Regarding nutritional health, spousal caregivers may face challenges related to time, resources, and the dietary needs of the care recipient, which affect their ability to plan and prepare nutritious meals (Alzheimer's Association, 2004; Riviere et al., 2002).

A longitudinal study of 150 spousal caregivers of persons with dementia found caregiver health to differ from the control group only when demands were great (Shaw et al., 1997). These caregivers were also less likely to be hospitalized versus the non-caregivers. Regarding activity levels, older spousal caregivers report less time and engagement in exercise (Burton et al., 1997; Vitaliano et al., 2002) as well as reduced physical activity since becoming a caregiver (Gallant & Connell, 1997). These findings are only partially supported by the work of Fredman and colleagues (2006) who found that while older female caregivers reported lower levels of engagement in leisure-time exercise, levels of overall physical activity did not differ between spousal caregiving women and married non-caregiving women. While they may have less time for leisure activities, spousal caregivers may not necessarily be less physically active since certain caregiving tasks can be very physically demanding (Fredman et al., 2006). The physical activity associated with caregiving could therefore have conferred health-buffering benefits, as suggested by the healthy caregiver effect. Accordingly, it is important to assess specific activities performed during caregiving (Fredman et al., 2006) and the role that gender may play in the healthy caregiver effect, as discussed in the next section.

2.3.3. Gender and Caregiving

Gender is a fundamental aspect of social organization within our society. A feminist structural approach (Risman, 1987) is commonly applied to family caregiving, which emphasizes the gender and situation specific ideals of behaviour that influence men and women over their lifetimes (Calasanti & King, 2007). Behaviour ideals may be related to an individual's structural location (class, race, ethnicity), and/or gender repertoire (i.e. the skills and resources affirming one's identity and formed in the context of gender inequality), which create differing experiences of stress in providing care (Calasanti & King, 2007). For example, gendered labour divisions and expectations about work habits can influence caregiving and the associated stressors faced by men and women (Calasanti & King, 2007). According to the gendered nature of caregiving, social forces shape women as natural caregivers irrespective of individual skills or preferences to partake in caregiving, while it is assumed that men in the caregiving role require secondary support from others (Brazil et al., 2008; Brody, 2004). Here, it is important to distinguish gender from sex as a social construction (as opposed to a biological or physiological difference). Researchers have argued that "noting the impact of gender (and not only sex) means tying observed differences to the structure of gender relations–the processes by which divisions of labor, authority, and wealth shape sex-specific ideals of behavior" (Calasanti & King, 2007, p.517). Although caregiving discussions are often framed within a feminist lens, increased research attention on the experience of older caregivers specifically, and that of older men in particular, has been called for (Calasanti, 2006).

The gender-role socialization (Gilligan, 1982) and gender-role expectation frameworks (Barusch & Spaid, 1989) both suggest that women provide care to more highly impaired care-receivers for an increased number of hours and for longer durations compared to men. Further, women may more readily give up secondary responsibilities (presumably engagement in healthy behaviours) to provide care and assume a nurturing role (Bookwala & Schulz, 2000). Indeed, informal caregivers are mostly female (Dahlberg et al., 2007). Caregiving wives in particular tend to be the most involved, both for a longer duration and at higher degrees of disability (Brody, 2004; Stoller & Miklowski, 2008). In a Canadian study of family caregivers of terminally ill spouses, wives had twice the odds of providing support for toileting-related tasks compared to husbands (Brazil et al., 2008). The caregiving wives also reported lower odds of receiving secondary help from extended family and friends. Due to this increased involvement, it is possible that women have higher levels of physical activity due to caregiving, and therefore the healthy caregiver effect may be stronger among women than men. Nevertheless, a growing proportion of family caregivers are men, who represent a reported 43% of persons over age 45 who provided care to a senior in Canada during 2008/2009 (Turner & Findlay, 2012) and 41% of spousal caregivers in the United States (Brown et al., 2007).

Women generally express greater burden, stress, anxiety, depression, and physical symptoms due to the caregiving role compared to caregiving men (Almberg et al., 1998; Kramer & Kipnis, 1995; Navaie-Walker et al., 2002; Gallicchio et al., 2002; Bedard et al., 2004; Yee & Schulz, 2000). A recent scoping review suggests that men caregiving for a spouse with dementia experience high levels of physical stress but report low levels of caregiver burden (Robinson et al., 2014). However, it has been suggested that gender differences in caregiver health may actually represent gender differences in population health (Pinquart & Sorensen, 2006; Vitaliano et al., 2003; Yee & Schulz, 2000). To clarify this, Pinquart & Sorensen (2006) conducted a meta-analysis on gender differences in caregiver stressors, social resources and health. Their results suggest that gender differences in caregiver health are in fact larger than those observed among the general population. In particular, gender differences in burden, depression, and number of caregiving tasks may be of practical importance. As the authors explain,

> …[since] statistically controlling for the level of stressors reduces gender differences in psychological and physical health… we conclude that higher levels of caregiving stressors and, in part, lower levels of social resources among female (vs male) caregivers account for the elevated gender differences in these measures. This has implications for the design of interventions, because gender differences in caregiving health can be reduced by reducing women's levels of stressors. The remaining gender differences may be based on differences in resources and stressors that are not specific to caregiving… and on women's greater readiness to disclose negative feelings and health problems… (P39).

In a similar vein, researchers emphasize the importance for gender-sensitive analyses of informal caregiving since policy shifts from formal care to informal family and community support will have different consequences for women and men (Brazil et al., 2008; Morris, 2001).

Regarding caregiving, gender, and engagement in health promoting behaviours, the literature presents mixed findings. Older women who provide care to a spouse with a dementia have been identified as facing a 'triple risk' for being sendentary due to their age, gender, and caregiving role (Wolinsky et al., 1995; Connell, 1994). Although caregiving men have been found to exercise less, experience more sleep problems, and use more medication than caregiving women (Fuller-Jonap & Haley, 1995), other work has failed to detect gender differences in health behaviours (Scharlach et al., 1997).

Notably, none of the studies herein reviewed commented on gender differences in the healthy caregiver effect.

Bookwala & Schulz (2000) suggest that men may be able to preserve their personal activities after becoming a caregiver. Indeed, older men have been found to be more likely to protect continued engagement in recreational activities compared to older women (Barer, 1994), as per gender role and socialization theories. However, in a sample of rural spousal caregivers, older caregiving men exercised less, smoked more cigarettes, and received less health advice about nutrition compared to both the non-caregivers and the female caregivers (Castro et al., 2007). Male caregivers have been shown to be less aware of available community support services compared to female caregivers, to result in reduced utilization among men versus women (Strain & Blandford, 2002). It is possible that caregiving men are especially vulnerable to reduced health promoting self-care (Castro et al., 2007).

2.4. Limitations of the Literature

The existing research appears to be complicated by a loose definition regarding the parameters of being a caregiver, including duration, intensity and what constitutes specific caregiving activities. In consideration of caregiver subgroups, caregiving research has been criticized for ignoring individual differences (Vitaliano et al., 2003) and generally presents mixed findings regarding differences in health behaviours according to caregiver status (Bedard et al., 2004; Castro et al., 2007). Furthermore, more “extreme” caregiving experiences may be over-emphasized in the literature because caregivers of persons with dementia (a relatively distressed caregiver subgroup) are often recruited as study participants (Beach et al., 2000).

Methodological issues among the caregiving literature include the dominance of cross-sectional studies and self-selected samples, as well as studies that lack control groups. Larger sample sizes are needed in order to detect for differences in caregiving variables according to gender and spousal caregiver status. Further, research employing mixed methods is required to contextualize and expand the depth of inquiry for this complex topic area. Finally, as noted by Beach and colleagues (2000), the literature on male caregivers (despite their growing societal prevalence) is small and based on unstructured sample sizes.

This study addresses these limitations and knowledge gaps by: 1) comparing physical activity levels, engagement in leisure activities and healthy eating habits of spousal caregivers and non-caregiving spouses, 2) exploring gender differences in health behaviours by conducting separate analyses for men and women spousal caregivers, 3) setting the traditional caregiver stress hypothesis against the healthy caregiver effect to determine if the healthy caregiver effect may apply to engagement in specific health behaviours, and 4) using a mixed methods design to contextualize the experiences and relationship between spousal caregiver status, gender, and engagement in health behaviours. It is intended that the study findings advance theoretical understanding in this area (especially with respect to the healthy caregiver effect) and inform health promotion initiatives. Specifically, the findings are anticipated to be useful for caregiver interventions, health education, and the development of healthy public policy for this growing group of individuals.

2.5. Hypotheses

Based on the theoretical frameworks and literature reviewed, a number of hypotheses can be developed. Firstly, in comparing engagement in health behaviours of older spousal caregivers to their non-caregiving counterparts, it is hypothesized that spousal caregiver status will have a mediating effect on the health behaviours of older spouses. The direction of this effect will depend on whether or not the healthy caregiver effect applies to engagement in health behaviours, while the magnitude will be influenced by caregiving frequency and length of time. Secondly, with regard to gender differences, it is hypothesized that there will be an interaction effect by gender in the relationship between spousal caregiver status and health behaviours. However, the influence of gender may differ with respect to the particular health behaviour examined. It is intended that the qualitative inquiry contextualize how gender differences in various health behaviours emerge among older spousal caregivers.

2.5.1. Regular Physical Activity

Regarding overall levels of physical activity, it is hypothesized that spousal caregivers will have higher levels of physical activity compared to non-caregivers. This will be due to the increased physicality associated with caregiving tasks, which is likely to be enhanced for spousal caregivers who provide care on a more intense basis (in terms of both frequency and length of time). These results would support the potential for a healthy caregiver effect among this sample. Further, it is hypothesized that this association will be stronger among women than men, since older women are more likely to provide care at a higher intensity and without secondary support than older men.

With respect to participation in leisure physical activities, it is hypothesized that spousal caregivers, especially those who provide care at a higher intensity, will have reduced participation in this form of physical activity compared to non-caregivers. According to Pearlin's stress-outcome model, reduced participation in leisure exercise should result as a secondary stressor triggered by the primary stressors of caregiving. Spousal caregivers are expected to face challenges related to time and available resources that impact regular participation in leisure-time physical activity. Since older women are more likely than men to become and remain a primary caregiver, to provide care at a higher intensity, more readily give up competing demands, and be less likely to have secondary help, this association is expected to be stronger among women.

2.5.2. Eating Habits

It is hypothesized that, due to the stressors of caregiving such as limited time and resources, spousal caregivers will have reduced engagement in healthy eating habits compared to non-caregivers. They may therefore be at higher nutritional risk compared to non-caregiving spouses, such as skipping meals. This association is expected to be stronger among spousal caregivers who provide care at higher intensities. However, since older males typically have poorer eating habits and may be disadvantaged in domestic skills due to the gendered nature of household tasks (such as meal preparation), it is further hypothesized that this association will be stronger among men than women.

Chapter 3. Methodology

This chapter provides an overview and rationale for this study's design: mixed methods. A mixed methods design simultaneously uses inductive and deductive logic to answer both confirmatory and exploratory questions (Teddlie & Tashakkori, 2008). It is particularly appropriate given the study's two main objectives: 1) to demonstrate that spousal caregiving status is associated with varying patterns of engagement in physical and nutritional health behaviours, and 2) to contextualize these quantitative findings by exploring the lived experience of spousal caregivers (McLaughlin et al., 2011; Teddlie & Tashakkori, 2008). Neither quantitative nor qualitative methods alone would adequately address these objectives. Quantitative data is useful to determine associations between variables, while qualitative data facilitates an understanding of why the associations may exist (Clarke, 2009). Qualitative data also shed light on weak or nonsignificant findings and important intervening factors (Clarke, 2009). A mixed-method research agenda thus supports a more comprehensive understanding of the phenomenon under study (Clarke, 2009).

The main advantage of mixing methods has been deemed 'the fundamental principle of mixed methods research' (Teddlie & Tashakkori, 2008). The methods are "mixed in a way that has complementary strengths and non-overlapping weaknesses" (Johnson & Turner, 2003, p.299), allowing for stronger research inferences over using a single method alone (Teddlie & Tashakkori, 2008). As Bryman (2007) notes, "the end product is more than the sum of the individual quantitative and qualitative parts" (p.8). The idea of 'connected contributions' is also underscored as a motivation for combining methods (Morgan, 2006). In this way, the findings from one method enhance the design and implementation of the other method (Krause et al., 2000; Morgan, 2006).

Although the quantitative and qualitative components of a mixed methods study could confer different conclusions, divergent findings are important as they signal the need to re-evaluate conceptual frameworks and assumptions (Teddlie & Tashakkori, 2008). Clarke (2009) outlines research challenges related to mixed methods research including logistical complexity, methodological difficulties with respect to integration and interpretation of the findings, and potentially increased costs due to extra time, training and collaboration. Nevertheless, there is growing acceptance of mixing methods within a single health research study (Saks & Allsop, 2007). This approach is especially pertinent as experts move towards using multidisciplinary approaches and a more holistic view of health (Saks & Allsop, 2007).

3.1. Sequential Mixed Design

This study uses a sequential mixed design. In this type of mixed methods design, the questions and data collection procedures from one strand depend on the previous strand and findings are integrated in chronological phases (Ivankova, 2014; Teddlie & Tashakkori, 2008). The first strand of this research is quantitative. This strand's work is used as a basis for developing the study procedures for a subsequent qualitative strand and for interpreting the qualitative data (Fig 3.1). In this form of sequential mixed design (i.e., quant -> qual), statistical findings are useful to describe major differences between subgroups of participants, guide purposive sampling and define topics to pursue during qualitative data collection (Ivankova, 2014; Morgan, 2006). The follow-up qualitative work expands the statistical findings by focusing on experiences and circumstances that influence the quantitative data (Morgan, 2006). In order to completely address the research questions, results from both strands are integrated to create 'meta-inferences' (Ivankova, 2014; Teddlie & Tashakkori, 2008).

The first strand of this work is a secondary data analysis based on a quantitative survey method. This is useful to examine variation in physical and nutritional health behaviours among different groups of married older adults. However, it can be difficult to properly operationalize theoretical concepts using pre-set measures, and the data collected were cross-sectional (thus causation cannot be inferred). Furthermore, surveys generally do not address the subjective perceptions and meanings of the individuals acting in the context under study. Therefore, qualitative interviews are conducted as a second strand in order to access the experience of older caregivers in understanding “how” and “why” the relationship between spousal caregiver status, gender, and engagement in regular exercise and eating habits may occur. The qualitative inquiry also provides an indication of temporality in terms of better understanding the timing of key transitions and turning points in the participants’ experience (Corden & Hirst, 2008). Finally, the inferences from each strand are integrated to contextualize the associations described by the quantitative data (McLaughlin et al., 2011; Mitchell, 2014).

3.2. Maintaining Validity and Trustworthiness

Although methodological “purists” have argued that it is unsuitable to integrate qualitative and quantitative methods due to underlying paradigmatic differences, mixed methodologists advocate for “the pragmatism of employing multiple research methods to study the same general problem by posing different specific questions” (Brewer & Hunter, 2006, p.55). Principles and procedures to maintain scientific rigour must be followed (Morse et al., 2006). Threats to the validity of mixed methods research include using inappropriate participants and/or sample sizes, choosing weak results to expand upon, and failure to integrate the findings from each strand (Ivankova, 2014). The fundamental assumptions of the individual methods must not be violated in order to produce quality meta-inferences (Ivankova, 2014; Morse et al., 2006). For this study, the reliability and validity of the quantitative data were established separately from the trustworthiness and credibility of the qualitative data. The use of secondary data (the Canadian Community Health Survey) informed the qualitative analysis. A discussion of this study’s limitations is presented in Chapter 8.

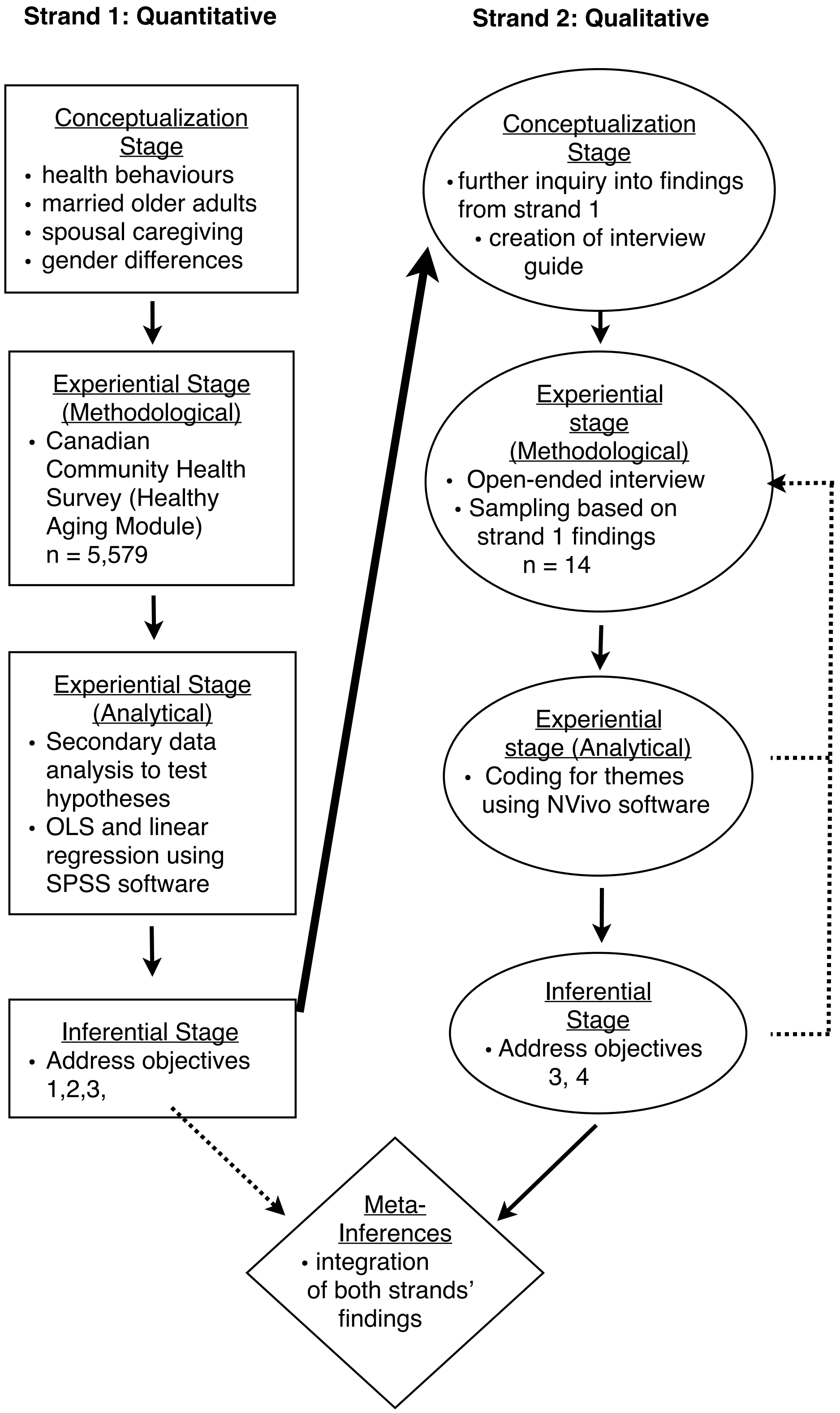


Figure 3.1. **Quant => Qual Sequential Mixed Methods Design**

Chapter 4. Quantitative Data

4.1. Data Source

Data are drawn from the 4.2 Canadian Community Health Survey – Healthy Aging (CCHS-HA), which was conducted from December 2008 to November 2009. The Canadian Community Health Survey was originally created in 1991 by the Canadian Institute for Health Information, Statistics Canada, and Health Canada. The 4.2 CCHS-HA is a nationally representative cross-sectional survey that focused specifically on the health of Canadians over age 45 (N = 30,865), including health determinants such as health care utilization, social support, as well as caregiving, work and retirement transitions (Statistics Canada, 2010). The sample design consisted of three stages: selection of geographical clusters, selection of households within each cluster, and random selection of one respondent per household. Data was collected using computer assisted personal interviewing. The CCHS-HA produced public use micro-data files (PUMF), which were developed from the master files and released in 2011. According to Statistics Canada (2010), “the PUMF must meet stringent security and confidentiality standards required by the Statistics Act before they are released for public access” (58). These files are available free-of-charge to individuals in a post-secondary educational institution that is part of the Data Liberation Initiative, such as Simon Fraser University, and therefore considered to be in the public domain.

The CCHS-HA sampled persons living in private residences throughout the ten provinces. Persons residing in the three territories, on Indian Reserves or Crown lands, in an institution, a remote region or as a member of the Canadian Forces were excluded. The total sub-sample size for the CCHS-HA was 30,865, with a combined response rate of 74.4%. The sub-sample used for this analysis includes 5,579 married Canadians aged 65 years and older who are either spousal caregivers or non-caregivers. A filter was created to exclude all other types of caregivers (e.g., those older adults caring for a parent, adult child, other relative, or friend/neighbour in their main care relationship) from the analyses in order to focus on the unique caregiving experience of older spouses. It is acknowledged that a limitation of this approach is the potential exclusion of older adults who may still provide care for a spouse, though not as their main care relationship. The resulting sample was weighted to adjust for sampling error by sex, age, and geographical region and re-scaled to the original sample size in order to conduct meaningful statistical analyses, which addresses the problem of an ‘overpowered’ sample size.

4.2. Measurement

While the caregiver selection bias may complicate measurement of concepts in this topic area, this health selection effect is addressed by: 1) controlling for covariates, including socio-demographics, health variables, life stress, and social support, 2) including measures of overall physical activity levels (including activity associated with caregiving tasks) as well as leisure-time exercise, and 3) including measures of caregiving intensity (both frequency and duration) to capture spouses who provide care on a more regular basis as part of the spousal caregiving variable.

4.2.1. Dependent Variables

Two main health behaviour domains are examined in the secondary data analysis: regular physical activity and eating habits. These domains are selected to capture both physical and nutritional health behaviours in order to test the hypotheses pertaining to a healthy caregiver effect among this sample (see rationale for each measure below). Table 4.1 shows frequencies and percentages by category for each dependent variable.

Regular physical activity

In order to test for the healthy caregiver effect among this sample, the health behaviour domain ‘regular physical activity’ is investigated. Physical activity is defined here to encompass both activities of daily living (i.e., caregiving, household tasks, transportation) and leisure-time activity (i.e. sports, exercise, recreation activities) (Ashe et al., 2009). Accordingly, measures are selected from the CCHS-HA to represent the following possible sources of physical activity for older adults: total physical activity score from the physical activity scale for the elderly (PASE) (Washburn et al., 1993), the caregiving activity item from the PASE, and participation in various leisure physical activities for at least 30 minutes per day including going for a walk, engagement in light, moderate, and strenuous exercise, and exercise to increase muscle strength and endurance. Specific details on measurement are provided below.

These measures are chosen to expose the potential for a healthy caregiver effect among this sample. In addition to levels of overall physical activity, Fredman and Lyons (2012) recommend examining the physical activity specifically associated with caring for another person in order to separate the physicality of caregiving tasks (and potential health benefits) from other forms of physical activity. To examine regular physical activity beyond what may be conferred during daily tasks, engagement in various leisure-time physical activities is analyzed. Participation in leisure-time exercise reflects not only increased levels of physical activity but also the availability of free time and resources to do so, which may be key in identifying potential differences between caregivers and non-caregivers.

Total Physical Activity Score

Total physical activity score is selected to describe the sample's overall physical activity levels. In the CCHS-HA, the physical activity score is calculated using questions modified from the Physical Activity Scale for the Elderly (PASE) concerning participation in 12 activities over the past week. These include sitting activities, walking outside, muscle strength or endurance exercise, light and/or heavy housework, home repairs, lawn or yard care, outdoor gardening, caring for another person, volunteer or paid work, as well as light, moderate, and strenuous sports or recreational activity. Responses are measured on a scale ranging from “never” to “often”.

The PASE tool is noted as being easy to administer, score, and reflective of activities that older adults may regularly engage in (Washburn et al., 1999). PASE scores are calculated from participants' subjective responses regarding the activities they engaged in over the past week. Scoring is based on movement counts from an electronic physical activity monitor, activity logs, and self-reported activity levels from a general population of non-institutionalized adults aged 65 and over (Washburn et al., 1999). A general population of older adults has been reported to have a mean PASE score of 103.0 (SD 64.1) (Washburn et al., 1993). Among a sample of Canadians aged 50 and over, mean PASE scores for men were 129.6 (SD 72.3) and for women were 102.9 (SD 61.4) (Chad et al., 2005).

The validity and reliability of the PASE have been established in prior studies (Washburn et al., 1999). PASE scores have been shown to significantly correlate with measures of total energy expenditure and resting metabolic rate (r = 0.68 and r = 0.58, respectively) among healthy older adults (Schuit et al., 1997). A high intraclass correlation coefficient (r = 0.91) has been reported between PASE scores measured 3 days apart for the same seven-day reporting period (Dinger et al., 2004). However, PASE scores may not be useful to predict certain physical health measures such as body composition, cardiovascular and blood parameters, and strength measures (Logan et al., 2013). In addition, subgroup analyses have revealed gender differences in the association between PASE scores and validity measures, where significant associations were found for women only between PASE scores and restricted activity days, systolic blood pressure, and leg strength (Washburn et al., 1993).

The current sample has a mean PASE score of 106.7 (SD 64.4). For the purpose of bivariate analysis (which requires that variables be of either two or three categories), the PASE score variable is trichotomized into the following categories: 0-67, 68-121, 122 to max. The majority of participants have a PASE score either between 122 and the maximum value (35.9%, n = 2,004) or between 68 and 121 (33.6%, n = 1,875). Missing cases for this variable (0.1%) are recoded to the mean.

Physical activity from caring for another person

While it has been hypothesized that caregivers may experience increased levels of physical activity through caregiving tasks (Fredman et al., 2006), no tools to date are known to measure objective physical activity levels during caregiving. In order to describe physical activity levels from caregiving for this analysis, a measure is selected based on a single item from the PASE which asks participants whether they engaged in caring for another person, such as a child, dependent spouse or older adult, during the past 7 days. Dependency of the care receiver is defined as needing assistance with activities of daily living, such as food preparation, household cleaning, and personal hygiene (Washburn et al., 1993). Responses include either “yes” or “no”, with “no” as the reference category. In a sample of 120 older adults, this item was found to contribute to 12.7% of total PASE scores (Washburn et al., 1999).

Although this sample is filtered to include older persons who care for their spouse as their main care relationship (as well as non-caregiving older adults), some measurement error exists in using this caregiving physical activity measure since the identity of the care receiver is kept open (i.e. as “another person” including child, dependent spouse or older adult). For example, some respondents who cared for another person in the past 7 days may have answered this item in terms of providing care for someone other than their spouse; however, this would be a minority since the spousal caregiving filter is applied. The majority of participants in this sample (76.5%, n = 4,269) did not engage in caring for another person in the past 7 days. There are no missing data for this item.

Time spent engaging in leisure physical activities

Leisure-time physical activity is selected to examine levels of physical activity separate from overall PASE scores and that which may be conferred during caregiving activity. As part of the modified PASE, the CCHS-HA asks participants to indicate the number of hours per day they engage in physical activity during their ‘free time’. This includes taking a walk outside the home, engaging in light, moderate, or strenuous sports or recreational activities, and engaging in exercise specifically to increase muscle strength and endurance. Responses on these items include “less than 30 minutes”, “30 minutes but less than 1 hour”, “1 hour but less than 2 hours”, “2 hours or more” and “not applicable” (i.e., zero minutes per day).” Studies report that leisure time physical activity may contribute anywhere from 10.7% to 36.0% of total PASE scores depending on the sample of older adults (Schuit et al., 1997; Washburn et al., 1993; Washburn et al., 1999).

For the purpose of this analysis, the PASE leisure physical activity items are dichotomized into the following categories: “zero to less than 30 minutes per day” and “30 minutes per day or more”, with the former as the reference category. This dichotomy is categorized according to guidelines recommended by The American Heart Association and the American College of Sports Medicine that older adults should engage in 30 minutes of physical activity or more at least 5 days per week to experience health benefits (Nelson et al., 2007). It has been estimated that only one-third of older Canadians meet recommended guidelines for leisure physical activities (Ashe et al., 2009). Among this sample, the vast majority of participants report engaging in zero to less than 30 minutes of activity per day for light leisure exercise (87.6%, n = 3,233), moderate leisure exercise (91.8%, n = 5,124), strenuous leisure exercise (88.8%, n = 4,955), and muscle strength and endurance leisure exercise (93.1%, n = 5, 194). For the item ‘taking a walk’, the majority of participants (57.9%, n = 3,233) report engaging in 30 minutes per day or more. Missing cases (0.1%) are recoded to the modal category.

Eating Habits

In order to determine whether the healthy caregiver effect may apply to health behaviours beyond physical activity, the health behaviour domain ‘eating habits’ is selected. This domain is measured by three variables: nutritional risk score, high nutritional risk (dichotomy), and frequency of skipping meals. The nutritional risk score provides a global picture of eating habits according to characteristics that affect food intake and nutritional status including weight change, difficulty eating, meal satisfaction, as well as fruit, vegetable and fluid intake (Keller & McKenzie, 2003; Lengyel et al., 2014). The dichotomous nutritional risk variable provides a more direct comparison according to these characteristics between persons who are at high nutritional risk versus those who are not. As some of the items in the nutritional risk scale may be less relevant to the situation of older spousal caregivers, the single item ‘frequency of skipping meals’ is selected. While this measure does not necessarily suggest that persons who skip meals less frequently have healthier eating habits (as they could be consuming fast food meals, for example), skipping meals is meant to capture challenges related to time and resources that affect caregivers in their ability to prepare meals (Alzheimer’s Association, 2004; Riviere et al., 2002). Skipping meals “almost every day” has been identified as a risk factor for poor nutrition (Ramage-Morin & Garriguet, 2013).

Nutritional Risk Score

Nutritional risk score is selected to identify persons in the sample who may be at risk or who have poor nutritional states. In the CCHS-HA, the nutritional risk score is calculated using questions modified from the Seniors in the Community: Risk Evaluation for Eating and Nutrition version II (SCREEN II) tool. The abbreviated SCREEN II instrument is based on 11 items concerning weight change, skipping meals, appetite, difficulty eating, daily fruit and vegetable servings, daily fluid consumption, eating meals with someone, meal preparation, and meal satisfaction. Answers on these items include several possible response options, which are used to calculate a nutritional risk score ranging from 0 to 48. Lower total scores indicate a higher nutritional risk, particularly scores less than 38 (Keller & McKenzie, 2003).

The SCREEN II tool is noted as a valid and reliable means for identifying individuals of poor nutritional status or who may be at risk for poor food intake for intervention and follow-up care (Keller, 2007; Keller et al., 2005; Lengyel et al., 2014). Nutritional risk scores are based on anthropometry, physical measures, 24 hour dietary recall, medical and nutritional history from community dwelling seniors (aged 55 years and older), including a number of frailer older adults recruited from a geriatrician's clinic (Keller et al., 2005). Using the 2008-2009 CCHS data (n = 15,669), Ramage-Morin and Garriguet (2013) report that 34% of Canadians aged 65 and over were at nutritional risk. In the Manitoba Follow-up Study (n = 522), two-thirds of men aged 78 and over were identified at moderate or high nutritional risk (Lengyel et al., 2014). In parallel, the What Older Women Want health study (n = 2,484) identified high nutritional risk among over one-third of older Canadian women (Tannenbaum & Shatenstein, 2007).

The validity and reliability of SCEEN II have been established for cognitively intact community dwelling older adults (Keller et al., 2005; Phillips et al., 2010). A high intraclass correlation coefficient (r = 0.83) has been reported between SCREEN II scores measured 2 weeks apart (Keller et al., 2005). Positive correlations have been found for SCREEN II scores and total PASE score (r = 0.20*), grip strength (r = 0.20*), and muscle mass percentage (r = 0.31**) (Wham et al., 2011). In addition, both self and interviewer-administered versions of SCREEN II yield similar results in consistently identifying nutritional risk in older adults (Beath & Keller, 2007).

The current sample has a mean nutritional risk score of 40.3 (SD 5.5). For the purpose of bivariate analysis, the nutritional risk score variable is trichotomized into the following categories: 6-38, 39-43, 44-48. The majority of participants have a nutritional risk score either between 39 and 43 (34.5%, n = 1,922) or between 44 and 48 (33.9%, n = 1,889). Missing cases for this variable (0.1%) are recoded to the mean.

High Nutritional Risk

The CCHS-HA uses a derived variable based on nutritional risk scores to differentiate persons of high nutritional risk from persons not at high nutritional risk. This dichotomy is comprised of the categories "high nutritional risk" (consisting of nutritional risk scores below 38) and "not at high nutritional risk" (consisting of nutritional risk scores 38 and over) (Ramage-Morin & Garriguet, 2013). The latter is used as the reference category. The majority of participants (73.2%, n = 4,082) are not at high nutritional risk. Missing cases are recoded to the modal category.

Frequency of Skipping Meals

In the CCHS-HA as part of SCREEN II, participants are asked to indicate how often they generally skip meals. Responses range from "never or rarely" to "almost every day". For the purpose of this analysis, these categories are recoded to "frequently skip meals" (often or almost every day) and "infrequently skip meals" (sometimes or never/rarely), with the former as the reference category. The wide majority of participants (92.4%, n = 5,154) report skipping meals infrequently. There are no missing cases.

Table 4.1. Dependent variable frequencies and percentages by category

Variable	N	%
Physical activity score (PASE): Mean (range), SD	106.7 (0 - 498), 64.4	
0 to 67	1,701	30.5
68 to 121	1,875	33.6
122 to 498	2,004	35.9
Past 7 days caregiving physical activity (PASE)		
No	4,269	76.5
Yes	1,310	23.5
Leisure physical activities		
Taking a walk		
Less than 30 min/day	2,346	42.1
At least 30 min/day	3,233	57.9
Light sport or recreational activity		
Less than 30 min/day	4,890	87.6
At least 30 min/day	689	12.4
Moderate sport or recreational activity		
Less than 30 min/day	5,124	91.8
At least 30 min/day	455	8.2
Strenuous sport or recreational activity		
Less than 30 min/day	4,955	88.8
At least 30 min/day	624	11.2
Exercise to increase muscle strength and endurance		
Less than 30 min/day	5,194	93.1
At least 30 min/day	385	6.9
Nutritional risk score (SCREEN): Mean (range), SD	40.3 (6 - 48), 5.5	
0 to 38	1,768	31.7
39 to 43	1,922	34.5
44 to 48	1,889	33.9
High nutritional risk		
No	4,082	73.2%
Yes	1,497	26.8%
Frequency of skipping meals		
Infrequently (never/sometimes)	5,154	92.4
Frequently (often/daily)	425	7.6

4.2.2. Independent Variables

To capture differences between spousal caregivers and non-caregivers, three main independent variables are chosen for analysis. Table 4.2 shows frequencies and percentages by category for each independent variable.

Spousal Caregiver Status

The first independent variable, spousal caregiver status, compares older spousal caregivers with their non-caregiving counterparts more generally. In the CCHS-HA, caregivers are defined as individuals who have provided assistance because of a health condition or limitation over the past 12 months to a family member, friend, and/or any other people living both inside and outside of their household. This excludes assistance related to a volunteer or paid position. A filter is applied to capture participants who are spousal caregivers. The resulting variable consists of two categories: spousal caregivers (16.2%, n = 902) and non-caregivers (those who responded "not applicable", 83.8%, n = 4,677), with the latter serving as the reference category. There are no missing cases.

Caregiving Frequency

Since caregiving outcomes are suggested to differ by caregiving intensity, a second independent variable is created to describe how frequently the spousal caregivers provided care to their main care recipient. The CCHS-HA asks participants how frequently they provided assistance to their main care recipient, where responses range from "daily" to "occasionally or rarely". Missing cases (0.2%) are recoded to the mode ("not applicable", i.e. the non-caregivers). Next, these responses are combined with the main spousal caregiver status variable to create a 'caregiving frequency' variable consisting of non-caregivers and spousal caregivers. Responses include "not a caregiver" (83.8%, n = 4,677) which serves as the reference category, "low level spousal caregiver" (provide care occasionally, rarely, or less than once a month, 3.5%, n = 197), "medium level spousal caregiver" (provide care at least once a month or at least once a week, 1.4%, n = 77), and "high level spousal caregiver" (provide care daily, 11.2%, n = 627). For the purpose of this analysis, this variable is trichotomized into the following categories: "not a caregiver" (83.8%, n = 4,677), "low or medium level spousal caregiver" (4.9%, n = 274), "high level spousal caregiver" (11.2%, n = 627).

Length of Time as a Caregiver

Similar to the caregiving frequency variable, a third independent variable is created to measure the length of time a spousal caregiver have been providing assistance in their main care relationship. Responses on this item of the CCHS-HA include “less than 6 months”, “six months to less than one year”, “one year to less than three years, “three years to less than five years”, and “five years or more”. These responses are combined with the main spousal caregiver status variable to create a ‘length of time as a caregiver’ variable consisting of non-caregivers and spousal caregivers. Responses include “not a caregiver” (83.9%, n = 4,678) which serves as the reference category, “less than 6 months spousal caregiver” (4.1%, n = 229), “6 months to less than one year spousal caregiver” (1.9%, n = 105) “one year to less than 3 years spousal caregiver” (3.0%, n = 168), “3 years to less than 5 years spousal caregiver” (2.0%, n = 109), and “5 years or more spousal caregiver” (5.2%, n = 290). The majority of spousal caregivers have been providing care for one year or more (10.2%, n = 567). There are no missing cases. In the bivariate analysis, this variable is trichotomized into the following categories: “not a caregiver” (83.9%, n = 4,678), “less than one year spousal caregiver” (6.0%, n = 334), and “one year or more spousal caregiver” (10.2%, n = 567).

Table 4.2. Independent variable frequencies and percentages by category

Variable	N	%
Spousal caregiver status		
Non-caregiver	4,677	83.8
Spousal caregiver	902	16.2
Caregiving frequency		
Non-caregiver	4,677	83.8
Low (occasionally, rarely, less than once a month)	197	3.5
Medium (at least once a month, at least once a week)	77	1.4
High (daily)	627	11.2
Caregiving length of time		
Non-caregiver	4,678[a]	83.9
Less than six months	229	4.1
Six months to less than one year	105	1.9
One year to less than three years	168	3.0
Three years to less than 5 years	109	2.0
5 years or more	290	5.2

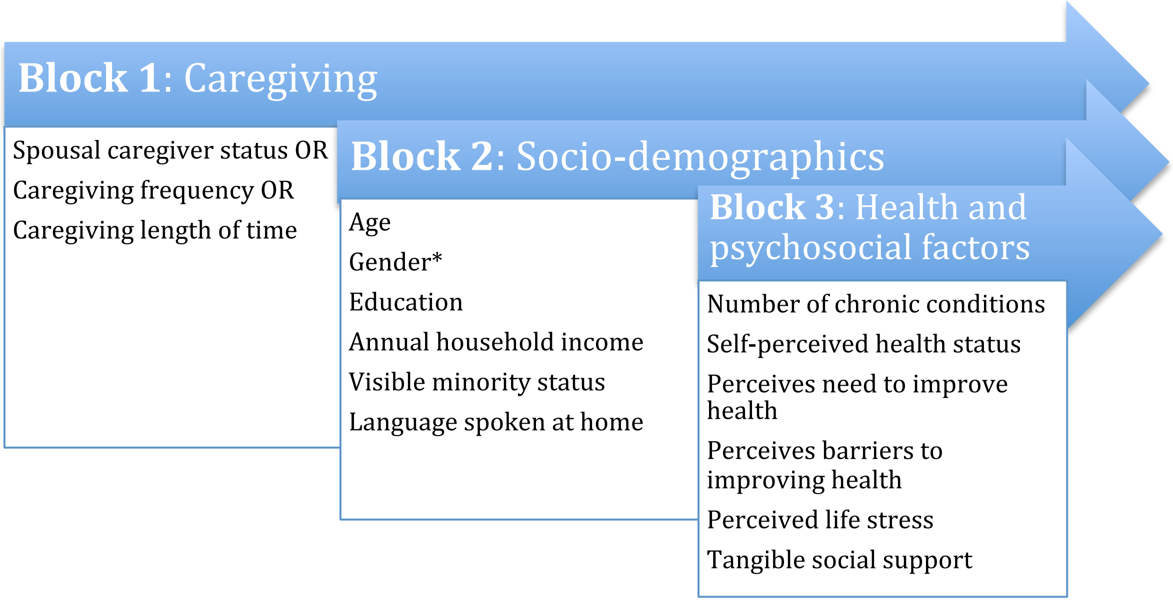
[a] Note: Rounding error due to weighting and scaling

4.2.3. Covariates

Drawing from Pender’s Health Promotion Model (Pender et al., 2011), a number of covariates are included in the regression models. These covariates include socio-demographic variables as well as health and psychosocial factors, and are further detailed below. It is important for the covariates to be held constant in the statistical analyses in order to control for the caregiver selection bias.

The covariates have been identified in the literature as having an influence on engagement in health promoting behaviour. They are assigned to blocks according to logical groupings from Pender’s HPM (i.e. individual characteristics, health and psychosocial factors). These blocks are outlined in the same manner for both the linear and logistic regression analyses (Fig. 4.1). To assess for a mediating effect of spousal caregiving, the first block encompasses one of the three spousal caregiving variables (i.e. spousal caregiver status, caregiving frequency, or caregiving length of time). The second block comprises of socio-demographic variables (age, education, annual household income, visible minority status, language spoken at home). The final block considers health and psychosocial factors (number of chronic conditions, self-perceived health status, perceives need to improve health, perceives barriers to improving health, perceived life stress, as well as the availability of tangible social support). The regression analyses are conducted separately by gender when significant gender differences emerge in the bivariate analyses. Further detail regarding the regression analyses is provided below.

Figure 4.1. **Hierarchical model strategy for the OLS regression and logistic regression analyses**



*Note: Gender was excluded from Block 2 for analyses conducted using a split file by gender

Socio-demographics

Age

The age variable provided by the CCHS-HA consists of five-year age groups. These include: ages 65 to 69 (reference category; 31.7%, n = 1,770), ages 70 to 74 (27.4%, n = 1,528), ages 75 to 79 (22.0%, n = 1,227), ages 80 to 84 (11.9%, n = 666) and ages 85 and over (6.9%, n = 387). There are no missing cases.

Gender

The gender variable consists of two categories: men (56.8%, n = 3,172) and women (43.2%, n = 2,407) with the former as the reference category. There are no missing cases.

Education

Highest educational attainment is represented by four levels. These are: less than secondary school education (reference category; 39.7%, n = 2,216), secondary school graduate (15.5%, n = 866), some post-secondary education (4.6%, n = 255), and post-secondary graduate (40.2%, n = 2,243). Missing cases (1.0%) are recoded to the modal category.

Total household income

The total household income variable represents 5 categories. These include: less than $20,000 per year (reference category; 4.2%, n = 236), $20,000 to $39,999 per year (31.4%, n = 1,751), $40,000 to $59,999 (20.1%, n = 1,121), $60,000 to $79,999 (10.3%, n = 574), and $80,000 per year and over (13.4%, n = 750). The large number of missing cases (20.6%, n = 1,148) is left as its own category for comparison with the other income brackets.

Visible minority status

The variable for visible minority status consists of two categories: white (89.0%, n = 4,967) and non-white (aboriginal or other visible minority; 11.0%, n = 612), with the former as the reference category. Missing cases (0.8%) are recoded to the mode.

Language spoken at home

The CCHS-HA asks respondents to indicate the language(s) spoken at home. These includ English (with or without other, reference category; 62.2%, n = 3,468), French (with or without other; 22.8%, n = 1,272), English and French (with or without other; 0.7%, n = 38), and neither English nor French (14.4%, n = 801). Missing cases (0.6%) are recoded to the mode.

Health and psychosocial factors

Number of chronic conditions

The CCHS-HA creates an interval variable based on the number of chronic conditions reported by each respondent, with a range of 0 to 12. The current sample has a mean of 1.9 (SD 1.5) chronic conditions. The vast majority of participants report having at least one chronic condition (90.5%, n = 5,047). There are no missing cases.

Self-perceived health status

To measure self-perceived health status, participants are asked to rate their general health on the following 5 point Likert scale: poor (reference category; 5.5%, n = 309), fair (18.0%, n = 1,003), good (33.4%, n = 1,864), very good (28.3%, n = 1,578), and excellent (14.8%, n = 824). Missing cases (0.1%) are recoded to the mode.

Perceives need to improve health

The CCHS-HA asks participants, “Do you think there is anything you should do to improve your physical health?” Responses include “no” (54.1%, n = 3,018) and “yes” (45.9%, n = 2,561), with the former as the reference category. Missing cases (0.4%) are recoded to the mode.

Perceives barriers to improving health

Respondents who perceived the need to improve their health are also asked, “Is there anything stopping you from making this improvement?” Responses include “no” (22.4%, n = 1,250), “yes” (23.4%, n = 1,308) and “not applicable” (53.7%, n = 2,993). These categories are recoded to include “perceives no barriers” (consisting of “no” and "not applicable" responses; 76.6%, n = 4,271) and "perceives barriers" ("yes" responses; 23.4%, n = 1,308), with the former as the reference category. Missing cases (0.5%) are recoded to the modal category.

Perceived life stress

The CCHS-HA asks respondents to indicate the amount of life stress they experience on most days. Responses are recorded based on the following 5 point Likert scale: not at all stressful (reference category; 27.4%, n = 1,529), not very stressful (27.5%, n = 1,537), a bit stressful (33.8%, n = 1,883), quite a bit stressful (9.7%, n = 544), and extremely stressful (1.6%, n = 87). Missing cases (0.2%) are recoded to the modal category.

Tangible social support

The CCHS-HA measures social support using 19 items from the Medical Outcome Study (MOS) – Social Support Survey (Sherbourne & Stewart, 1991). These items represent four categories of social support including tangible social support, affection, positive social interaction, and emotional or informational support. Tangible social support is chosen for the purpose of this study since it represents assistance that may be especially useful to older spousal caregivers. The tangible social support subscale is based on four items related to the availability of someone to provide help if the respondent was confined to bed, needed to see a doctor, required assistance preparing meals, and needed help with daily chores. Responses for each item are measured on a 5-point Likert scale ranging from "none of the time" to "all of the time" and were combined to produce an interval scale ranging from 0 to 16. Higher scores indicate greater levels of tangible social support. This sample has a mean score of 14.2 (SD 2.7). Missing cases (6.1%) are recoded to the mean.

Table 4.3. Covariate frequencies and percentages by category

Variable	N	%
Age		
65 to 69 years	1,770	31.7
70 to 74 years	1,528	27.4
75 to 79 years	1,227	22.0
80 to 84 years	666	11.9
85 years and over	387	6.9
Gender		
Men	3,172	56.8
Women	2,407	43.2
Education		
Less than secondary school education	2,216	39.7
Secondary school graduate	866	15.5
Some post-secondary education	255	4.6
Post-secondary graduate	2243	40.2
Total household income per year		
Less than $20,000	236	4.2
$20,000 to $39,999	1751	31.4
$40,000 to $59,999	1121	20.1
$60,000 to $79,999	574	10.3
$80,000 and over	750	13.4
Missing, not stated	1148	20.6
Visible minority status		
White	4,967	89.0
Non-white	612	11.0
Language(s) spoken at home		
English (with or without other)	3,468	62.2
French (with or without other)	1,272	22.8
English and French (with or without other)	38	0.7
Neither English or French (other)	801	14.4
Number of chronic conditions: Mean (range), SD	1.9 (0 – 12), 1.5	
None	532	9.5
At least one	5,047	90.5
Self-perceived health status		
Poor	309	5.5
Fair	1,003	18.0
Good	1,864	33.4
Very good	1,578	28.3
Excellent	824	14.8

Variable	N	%
Perceives need to improve health		
No	3,018	54.1
Yes	2,561	45.9
Perceives barriers to improving health		
No	4,271	76.6
Yes	1,308	23.4
Perceived life stress		
Not at all stressful	1,529	27.4
Not very stressful	1,537	27.5
A bit stressful	1,883	33.8
Quite a bit stressful	544	9.7
Extremely stressful	87	1.6
Tangible social support: Mean (range), SD	14.2 (0 – 16), 2.7	

Chapter 5. Quantitative Analysis and Results

This chapter describes the series of bivariate and multivariate statistical analyses used to test the hypotheses of this research. All analyses were performed using IBM SPSS Statistics Version 21 software. The bivariate analyses are presented next, followed by multivariate analyses and a summary of the key quantitative findings.

5.1. Bivariate Analysis

In order to provide a preliminary examination of the research hypotheses, a series of bivariate analyses are performed. The full set of analyses describing the bivariate results is presented in Appendix A. These analyses test for basic associations between the independent and dependent variables, and thus causation between variables cannot be definitively conferred. For nominal-level variables, the chi-square statistic is reported to identify differences between observed and expected table values. Given that these analyses are overpowered due to the large weighted sample size of the CCHS-HA, small differences can be found as statistically significant. Therefore, a correspondence rule is used to assess the strength of associations when chi-square statistics are statistically significant. Differences between variables of less than 5% are deemed not substantively important (even if the test statistic was statistically significant), while differences of 5-19%, 20-49%, and 50% and over indicate a weak, moderate, and strong relationship respectively.

Dichotomous nominal-level variables are treated as interval-level variables so that their categories may be described as percentages (Salkind, 2014). Here, the Pearson r statistic is reported in addition to the chi-square statistic in order to describe the magnitude of association between the variable pairs. For ordinal-level variables, the tau-b statistic is reported to describe the association between variables that have an equal number of categories, while the tau-c statistic is reported for those with an unequal number of categories. To describe correlation strength (weak, moderate and strong) for ordinal and interval level statistics, the correspondence rule of less than 0.2 is used to indicate a weak relationship between variables, while a correlation size between 0.2 and 0.4 indicates a weak-moderate relationship, between 0.4 and 0.6 indicates a moderate relationship, and associations equal or greater than 0.6 indicates a strong relationship (Salkind, 2014). Non-statistically significant correlations ($p > 0.05$) are interpreted as no relationship.

The bivariate analyses consist of four sets of cross-tabulations (see Appendix A): 1 - Independent variables (all spousal caregiving variables) by dependent variables (health behaviour domains; Table A1.1); 2 – Spousal caregiver status by dependent variables, controlling for gender (Table A2.2); 3 – Frequency of caregiving by dependent variables, controlling for gender (Table A3.3); 4 – Length of time as a caregiver by dependent variables, controlling for gender (Table A4.4). The analyses by gender are conducted to provide insight as to a potential interaction effect between the spousal caregiving variables and engagement in health behaviour by gender.

5.2. Summary of Results from Bivariate Analyses

Weak positive bivariate associations between the caregiving variables and PASE scores provide preliminary support for the hypothesis that spousal caregivers have higher levels of total physical activity versus non-caregivers. For the caregiving physical activity item of the PASE, moderate positive associations with the spousal caregiving variables demonstrate that spousal caregivers are more likely to report engaging in caregiving physical activity over the past 7 days compared to non-caregivers. The potential for a healthy caregiver effect among this sample is thus supported and will be further examined in the multivariate analyses. This effect may be especially prevalent among woman, as stronger associations are found among spousal caregiving women versus men. However, very weak negative associations are shown between the caregiving variables and time spent engaging in various leisure physical activities. These findings suggest that spousal caregivers have similar or lower levels of leisure-time physical activity in comparison to non-caregivers. As expected, spousal caregivers may be less likely to obtain physical activity through leisure-time exercise.

The weak bivariate associations between the spousal caregiving variables and the two measures of nutritional risk (nutritional risk score and high nutritional risk) support the hypothesis that spousal caregivers, particularly those who have been providing care for a longer period of time, are less likely to have healthy eating habits compared to non-caregivers. The analyses conducted by gender suggest that this may be particularly the case for spousal caregiving men. For caregiving length of time, men show weak inverse and weak positive associations with nutritional risk score and frequency of skipping meals respectively. Among women, there is a very weak positive association between caregiving length of time and high nutritional risk. Overall, these findings suggest that a healthy caregiver effect does not apply to eating habits among this sample.

Based on these preliminary results, a number of variables are selected for examination in the multivariate analyses. For the independent variables, each caregiving variable that emerged as statistically significant in the bivariate analysis is examined. When there is more than one statistically significant caregiving variable for the particular independent variable under examination, the caregiving variable with the strongest regression model is selected for reporting. The continuous dependent variables, physical activity score (PASE) and nutritional risk score, are analyzed using linear regression. The dichotomous dependent variables, caregiving physical activity (single item from the PASE), high nutritional risk, and frequently skipping meals, are analyzed using logistic regression. Since the bivariate analyses support the potential for gender to have an interaction effect on the health behaviours of older spousal caregivers, the regression analyses are conducted separately across gender to further examine for gender differences.

5.3. Regression Analyses

Regression analyses are conducted to investigate whether certain variables have an association with physical and nutritional health behaviours of older married Canadians. Linear regression analysis is used to examine the effect of an independent variable (i.e., spousal caregiver status, caregiving frequency, caregiving length of time) on a continuous outcome variable (i.e., physical activity score, nutritional risk score) using a series of hierarchically ordered independent covariates (i.e., socio-demographics, health and psychosocial factors). Linear regression predicts values of the continuous outcome variable according to levels of the independent variables; the produced regression coefficients (B) estimate the linear association between variables. R-squared (R^2) values estimate how much of the variance in the outcome variable may be attributed to the independent variables for each model. The adjusted R-squared (Adj-R^2) is reported here since this value accounts for the number of independent variables in the regression model that significantly contribute to change in R-squared.

Logistic regression analysis is used to predict a binary outcome variable (i.e. the caregiving activity item from the PASE, high nutritional risk, skipping meals frequently) based on an independent variable (i.e. spousal caregiver status, caregiving frequency, caregiving length of time) using a series of hierarchically ordered covariates (i.e., socio-demographics, health and psychosocial factors). For this type of analysis, the outcome variables are coded as "0" and "1" so that the probability of membership in one of these two categories may be estimated according to levels of the independent variables. The produced regression coefficient (B) for each association is converted to the odds ratio (Exp(B) = OR), which value ranges from zero to infinity to represent the estimated odds that the predicted outcome will occur. An odds ratio over 1 indicates a positive association between variables; an odds ratio between 0 and 1 indicates an inverse association (Abu-Bader, 2010). Model chi-square values are also presented to demonstrate whether the hierarchical factors significantly predict the outcome variable.

Multivariate analysis is based on a number of assumptions in order for results to be accurate (Abu-Bader, 2010). These pertain to sample representativeness, level of measurement, multi-collinearity, and sample size. For linear regression, these also concern linearity, normal distribution, and homoscedasticity. The sampling methods of the CCHS-HA (i.e., stratified random sampling, large sample size) and the variables selected for this analysis sufficiently meet these assumptions. In addition, a correlation matrix was produced during analysis to calculate the correlations (Pearson R) between each independent variable. None of the factors had a correlation of 0.7 or higher, indicating that they are independent (i.e. are not collinear) and can remain in the model strategy. As in the bivariate analyses, Salkind's (2014) correspondence rule for correlation coefficients is used. A significance level of $p<0.05$ is used for all regression analyses.

5.4. Results of Regression Analyses

5.4.1. Physical Activity

Linear regression of physical activity score and caregiving frequency, by gender

To test the hypothesis that older spousal caregivers who provide care at greater frequencies will have higher levels of total physical activity compared to non-caregivers, linear regression is used. All three hierarchical models are statistically significant for both men and women (Table 5.5). The full model explains 21.3% of the variance in PASE scores for men, and 23.5% of the variance in PASE scores for women. For men, caregiving frequency in model 1 explains 2.7% of the variance in PASE scores (R2 = 0.027, $p<0.001$). The inclusion of the socio-demographic factors in model 2 accounts for an additional 10.9% of the variance ($\Delta R^2 = 0.109$, $R^2 = 0.132$, $p<0.001$). The health and psychosocial factors added in model 3 explain an additional 8.4% of the variance in PASE scores ($\Delta R^2 = 0.084$, $R^2 = 0.213$, $p<0.001$). For women, caregiving frequency in model 1 explains 4.5% of the variance in PASE scores ($R^2 = 0.045$, $p<0.001$). The inclusion of the socio-demographic factors in model 2 accounts for an additional 7.6% of the variance ($\Delta R^2 = 0.076$, $R^2 = 0.116$, $p<0.001$). A further 12.2% of the variance in PASE scores results upon the addition of the health and psychosocial factors in model 3 ($\Delta R^2 = 0.122$, $R^2 = 0.235$, $p<0.001$).

In order to assess the caregiving association prior to, and after, groups of covariates are included in the analyses, beginning with only the caregiving variable. Among the first block for men, low caregiving frequency shows a very weak positive association with PASE scores (B = 0.04, $p<0.05$) compared to non-caregivers. High caregiving frequency shows a weak-moderate positive association with PASE scores (B = 0.16, $p<0.001$). Among women, medium caregiving frequency has a very weak positive association with PASE scores (B = 0.06, $p<0.01$). In addition, for women, high caregiving frequency shows a weak-moderate positive association with PASE scores (B

= 0.21, p<0.001). The associations for high caregiving frequency remain statistically significant in the subsequent models. These associations suggest that physical activity levels are higher for both men and women spousal caregivers who provide care at higher levels, compared to non-caregivers (reference category). Further, the spousal caregiving variable has a stronger association to physical activity levels among women than men.

Among the socio-demographic block for men, there are weak-moderate inverse associations between age and PASE scores for those aged 75 to 84 years (B = -0.17, p<0.001) and aged 85 years and over (B = -0.18, p<0.001) compared persons aged 65 to 74 years (reference). There are weak to moderate positive associations between household income and PASE scores for men reporting an income between $20,000 to $39,999 per year (B = 0.13, p<0.01), $40,000 to $59,999 per year (B = 0.15, p<0.001), $60,000 to $79,999 per year (B = 0.16, p<0.001), $80,000 per year and over (B = 0.21, p<0.001), and the missing/no answer category (B = 0.16, p<0.001), compared to those with an income of less than or equal to $19,999 per year (reference). For language spoken at home, there is a weak inverse association for persons speaking neither English nor French and PASE scores (B = -0.10, p<0.001), compared to speaking English (reference). In the final model, a very weak negative association also emerges between speaking French at home and PASE scores (B = -0.04, p<0.05). Very weak positive associations emerge between education levels and PASE scores for persons who are secondary graduates (B = 0.09, p<0.001), have other post-secondary education (B = 0.08, p<0.001), and for those who are post secondary graduates (B = 0.05, p<0.01), compared to persons with less than a secondary level education (reference).

Among the socio-demographic block for women, weak-moderate inverse associations emerge for persons aged 75 to 84 (B = -0.19, p<0.001) and aged 85 years and over (B = -0.19, p<0.001) and PASE scores, compared to those aged 65 to 74 (reference). Household income shows a very weak positive association with PASE scores for women in the $60,000 to $79,999 per year bracket only (B = 0.09, p<0.05), compared to women reporting less than or equal to $19,999 per year (reference). This association is not statistically significant in the final model. There are very weak inverse associations for speaking French (B = -0.06, p<0.01) and speaking neither English nor

French (B = -0.07, p<0.01) and PASE scores in both model 2 and 3 (compared to the reference category of speaking English at home).

In the final block of health and psychosocial factors for men, there are weak to moderate positive associations for fair self-perceived health (B = 0.18, p<0.001), good self-perceived health (B = 0.34, p<0.001), very good self-perceived health (B = 0.36, p<0.001), and excellent self-perceived health (B = 0.38, p<0.001) and PASE scores (compared to the reference category of poor self-perceived health). Number of chronic conditions shows a weak inverse association with PASE scores (B = -0.09, p<0.001). Very weak positive associations emerge between perceived life stress and PASE scores for persons reporting their life as “a bit stressful” (B = 0.06, p<0.01) and “extremely stressful” (B = 0.07, p<0.001), compared to those reporting “not at all stressful” (reference).

For women, the final block of health and psychosocial factors show weak to moderate positive associations for fair self-perceived health (B = 0.18, p<0.001), good self-perceived health (B = 0.41, p<0.001), very good self-perceived health (B = 0.48, p<0.001) and excellent self-perceived health (B = 0.37, p<0.001) and PASE scores (compared to the reference category of poor self-perceived health). Number of chronic conditions shows a very weak inverse association with PASE scores (B = -0.08, p<0.001). For ‘perceived need to improve health’, there is a very weak positive association with PASE scores (B = 0.08, p<0.001). For ‘perceived barriers to improving health’, there is a very weak inverse association with PASE scores (B = -0.05, p<0.05). Very weak positive associations emerge between perceived life stress and PASE scores for women reporting their life as “not very stressful” (B =0.11, p<0.001) and “a bit stressful” (B = 0.09, p<0.001), compared to those reporting “not at all stressful” (reference).

Table 5.1. **Ordinary least-squares regression model for physical activity score among older married Canadians, by gender**

Variables and categories	B1		B2		B3	
	Men	Women	Men	Women	Men	Women
Block 1: Caregiving (Ref: non-caregiver)						
Low caregiving frequency	0.04*	n/s	n/s	n/s	0.03*	n/s
Medium caregiving frequency	n/s	0.06**	n/s	0.05*	n/s	0.04*
High caregiving frequency	0.16***	0.21***	0.17***	0.23***	0.17***	0.23***
Block 2: Socio-demographics						
Age (Ref: 65-74)						
75-84	-	-	-0.17***	-0.19***	-0.15***	-0.14***
85+	-	-	-0.18***	-0.19***	-0.16***	-0.16***
Household income (Ref: <$20,000)						
$20k to $39,999	-	-	0.13**	n/s	0.09*	n/s
$40k to $59,999	-	-	0.15***	n/s	0.09*	n/s
$60k to $79,999	-	-	0.16***	0.09*	0.11***	n/s
$80k+	-	-	0.21***	n/s	0.13***	n/s
Missing	-	-	0.16***	n/s	0.11**	n/s
Visible minority (Ref: Caucasian)	-	-	n/s	n/s	n/s	0.05*
Language at home (Ref: English)						
French	-	-	n/s	-0.06**	-0.04*	-0.07**
English and French	-	-	n/s	n/s	n/s	n/s
Neither Eng. nor French	-	-	-0.10***	-0.07**	-0.10***	-0.06**
Education (Ref: <secondary)						
Secondary grad.	-	-	0.09***	n/s	0.07***	n/s
Other post-sec.	-	-	0.08***	n/s	0.06***	n/s
Post-sec grad.	-	-	0.05**	n/s	n/s	n/s
Block 3: Health and psychosocial factors						
Self-perceived health (Ref: poor)						
Fair	-	-	-	-	0.18***	0.18***
Good	-	-	-	-	0.34***	0.41***
Very Good	-	-	-	-	0.36***	0.48***
Excellent	-	-	-	-	0.38***	0.37***
Chronic conditions	-	-	-	-	-0.09***	-0.08***
Perceived need to improve health (Ref: no)	-	-	-	-	n/s	0.08***

Variables and categories	B1		B2		B3	
	Men	Women	Men	Women	Men	Women
Perceived barriers to improving health (Ref: no)	-	-	-	-	n/s	-0.05*
Perceived life stress (Ref: Not at all)						
Not very	-	-	-	-	n/s	0.11***
A bit	-	-	-	-	0.06**	0.09***
Quite a bit	-	-	-	-	n/s	n/s
Extremely	-	-	-	-	0.07***	n/s
Tangible social support	-	-	-	-	n/s	n/s
R2	0.027***	0.045***	0.132***	0.116***	0.213***	0.235***
Change in R2	0.028	0.046	0.109	0.076	0.084	0.122

Notes: Dependent variable = PASE scores. Sample size: 5,579. Ref: reference group. n/s: not statistically significant. Significance levels: * p<0.05, ** p<0.01, *** p<0.001

Logistic regression of the caregiving physical activity dichotomy and caregiving frequency, by gender

To test the hypothesis that older spousal caregivers who provide care on a more frequent basis will be more likely to report caregiving physical activity compared to non-caregivers, logistic regression, which examines a dichotomous dependent variable, is used. All three hierarchical models are statistically significant for both men and women (Table 5.6). Among men, model 1 includes measures of caregiving frequency (X^2 = 436.95, df = 3, p<0.001). For model 2, the variables are language spoken at home and education (X^2 = 557.13, df = 17, p<0.001). The model 3 variables include self-perceived health, number of chronic conditions, perceived life stress, and tangible social support (X^2 = 616.28, df = 29, p<0.001). For women, model 1 includes caregiving frequency (X^2 = 436.64, df = 3, p<0.001). For model 2, the variables are age, household income, visible minority status, and education (X^2 = 501.41, df = 17, p<0.001). The model 3 variables include self-perceived health status, number of chronic conditions, perceived need to improve health, perceived life stress, and tangible social support (X^2 = 600.74, df = 29, p<0.001).

Among the first block for men, the likelihood of reporting caregiving physical activity increases by a factor of 2.44 for the low frequency caregivers (B = 0.89, p<0.001, OR = 2.44), a factor of 5.50 for the medium frequency caregivers (B = 1.71, p<0.001, OR = 5.50), and a factor of 14.64 for the high frequency caregivers (B = 2.68, p<0.001, OR = 14.64), compared to non-caregivers. In model 2, these increase to a factor of 2.57 (B = 0.94, p<0.001, OR = 2.57), a factor of 7.40 (B = 2.00, p<0.001, OR = 7.40), and a factor of 19.42 (B = 2.97, p<0.001, OR = 19.42) for low, medium and high frequency caregivers respectively. These associations decrease slightly in model 3.

For women, the likelihood of reporting caregiving physical activity increases by a factor of 2.10 for the low frequency caregivers (B = 0.74, p<0.01, OR = 2.10), a factor of 11.89 for the medium frequency caregivers (B = 2.48, p<0.001, OR = 11.89), and a factor of 13.45 for the high frequency caregivers (B = 2.60, p<0.001, OR = 13.45), compared to non-caregivers. In model 2, these increase to a factor of 2.32 (B = 0.84, p<0.01, OR = 2.32), a factor of 12.2 (B = 2.52, p<0.001, OR = 12.21), and a factor of

15.56 (B = 2.75, $p<0.001$, OR = 15.56) for low, medium and high frequency caregivers respectively. These associations remain similar or decrease slightly in model 3.

Among the block of socio-demographic factors, the likelihood of reporting caregiving physical activity decreases by a factor of 0.48 for men who speak French at home (B = -0.73, $p<0.001$, OR = 0.48), compared to men who speak English (reference). The likelihood of reporting caregiving physical activity increases by a factor of 3.69 for men who speak English and French (B = 1.31, $p<0.01$, OR = 3.69) and by a factor of 2.27 for men who speak neither English nor French (B = 0.82, $p<0.001$, OR = 2.27). For men with a secondary-level education, the likelihood of reporting caregiving physical activity increases by a factor 2.01 (B = 0.70, $p<0.01$, OR = 2.01), compared to those with less than a secondary-level education (reference).

For women, among the block of socio-demographic factors, the likelihood of reporting caregiving physical activity decreases by a factor of 0.75 for those aged 75 to 84 (B = -0.29, $p<0.01$, OR = 0.75) and a factor of 0.40 for those aged 85 and over (B = -0.92, $p=0.001$, OR = 0.40), compared to women aged 65 to 74 (reference). For household income, the likelihood of reporting caregiving physical activity increases by factor of 1.88 for women reporting $40,000 to $59,999 per year (B = 0.63, $p<0.05$, OR = 1.88) and by a factor of 2.03 for those reporting $60,000 to $79,999 per year (B = 0.71, $p<0.05$, OR = 2.03), compared to those reporting less than $20,000 per year (reference). The likelihood of reporting caregiving physical activity increases by factor of 1.64 for women who do not identify as Caucasian (B = 0.48, $p<0.05$, OR = 1.64), compared to those who identify as Caucasian (reference). For education, the likelihood of reporting caregiving physical activity decreases by a factor of 0.74 for women who are post-secondary graduates (B = -0.30, $p<0.05$, OR = 0.74), compared to those who have less than a secondary-level education (reference).

In the final block of health and psychosocial factors, the likelihood of reporting caregiving physical activity increases by a factor of 2.01 for men with “good” self-perceived health (B = 0.70, $p<0.05$, OR = 2.01), compared to those with “poor” self-perceived health (reference). The likelihood of reporting caregiving physical activity decreases slightly for every unit increase in the number of chronic conditions (B = -0.11,

$p<0.01$, OR = 0.90). For life stress, the likelihood of reporting caregiving physical activity increases by a factor of 1.39 for men reporting “not very stressful” (B = 0.33, $p<0.05$, OR = 1.39), a factor of 1.47 for those reporting “a bit stressful” (B = 0.39, $p<0.01$, OR = 1.47), and a factor of 1.67 for those reporting “quite a bit stressful” (B = 0.51, $p<0.05$, OR = 1.67), compared to men reporting “not at all stressful” (reference). The likelihood of reporting caregiving physical activity decreases slightly for every unit increase in tangible social support (B = -0.11, $p<0.001$, OR = 0.89).

For women, in the final block of health and psychosocial factors, the likelihood of reporting caregiving physical activity increases by a factor of 1.81 for those with “fair” self-perceived health (B = 0.59, $p<0.05$, OR = 1.81), a factor of 3.25 for those with “good” self-perceived health (B = 1.18, $p<0.001$, OR = 3.25), a factor of 2.74 for those with “very good” self-perceived health (B = 1.00, $p=0.001$, OR = 2.74), and a factor of 5.33 for those with “excellent” self-perceived health (B = 1.67, $p<0.001$, OR = 5.33), compared to those with “poor” self-perceived health (reference). The likelihood of reporting caregiving physical activity increases slightly for every unit increase in the number of chronic conditions (B = 0.11, $p<0.01$, OR = 1.12). The likelihood of reporting caregiving physical activity increases by factor of 1.67 (B = 0.51, $p<0.001$, OR = 1.67) for women who perceive a need to improve their health, compared to those who do not perceive a need to improve their health (reference). For life stress, the likelihood of reporting caregiving physical activity increases by a factor of 1.87 for women reporting “not very stressful” (B = 0.62, $p<0.001$, OR = 1.87), a factor of 2.27 for those reporting “a bit stressful” (B = 0.82, $p<0.001$, OR = 2.27), a factor of 2.26 for those reporting “quite a bit stressful” (B = 0.82, $p<0.05$, OR = 2.26), and a factor of 6.28 for those reporting “extremely stressful” (B = 1.84, $p<0.001$, OR = 6.28), compared to women reporting “not at all stressful” (reference). Finally, the likelihood of reporting caregiving physical activity decreases very slightly for every unit increase in tangible social support (B = -0.04, $p<0.05$, OR = 0.96).

Table 5.2. Logistic regression models for caregiving physical activity among older married Canadians, by gender

Variables and categories	Model 1		Model 2		Model 3	
	OR-Men	OR-Women	OR-Men	OR-Women	OR-Men	OR-Women
Block 1: Caregiving (Ref: non-caregiver)						
Low caregiving frequency	2.44***	2.10**	2.60***	2.31**	2.53***	2.42***
Medium caregiving frequency	5.50***	11.89***	7.43***	12.21***	5.56***	10.80***
High caregiving frequency	14.64***	13.45***	19.42***	15.56***	16.51***	13.40***
Block 2: Socio-demographics						
Age (Ref: 65-74)						
75-84	-	-	n/s	0.75**	n/s	n/s
85+	-	-	n/s	0.40**	n/s	0.45**
Household income (Ref: <$20,000)						
$20k to $39,999	-	-	n/s	n/s	n/s	n/s
$40k to $59,999	-	-	n/s	1.88*	n/s	n/s
$60k to $79,999	-	-	n/s	2.03*	n/s	n/s
$80k+	-	-	n/s	n/s	n/s	n/s
Missing	-	-	n/s	n/s	n/s	n/s
Visible minority (Ref: Caucasian)	-	-	n/s	1.64**	n/s	2.04***
Language at home (Ref: English)						
French	-	-	0.48***	n/s	0.51***	n/s
English and French	-	-	3.69**	n/s	4.83**	n/s
Neither Eng. nor French	-	-	2.27***	n/s	2.45***	n/s
Education (Ref: <secondary)						
Secondary grad.	-	-	n/s	n/s	n/s	n/s
Other post-sec.	-	-	2.01**	n/s	2.04**	n/s
Post-sec grad.	-	-	n/s	0.74*	n/s	0.72**
Block 3: Health and psychosocial factors						
Self-perceived health (Ref: poor)						
Fair	-	-	-	-	n/s	1.81*
Good	-	-	-	-	2.01*	3.25***
Very Good	-	-	-	-	n/s	2.74**
Excellent	-	-	-	-	n/s	5.33***
Chronic conditions	-	-	-	-	0.90**	1.12**

Variables and categories	Model 1		Model 2		Model 3	
	OR-Men	OR-Women	OR-Men	OR-Women	OR-Men	OR-Women
Perceived need to improve health (Ref: no)	-	-	-	-	n/s	1.67***
Perceived barriers to improving health (Ref: no)	-	-	-	-	n/s	n/s
Perceived life stress (Ref: Not at all)						
Not very	-	-	-	-	1.39*	1.87***
A bit	-	-	-	-	1.47**	2.27***
Quite a bit	-	-	-	-	1.67*	2.26***
Extremely	-	-	-	-	n/s	6.28***
Tangible social support	-	-	-	-	0.89***	0.96*
Chi-squared statistic	436.95**	436.64***	557.13***	501.41***	616.28***	600.74***

Notes: Dependent variable = Caregiving item from the PASE. Ref: reference group. n/s: not statistically significant. OR: odds ratio. Significance levels: * p<0.05, ** p<0.01, *** p<0.001

5.4.2. Eating Habits

Linear regression of nutritional risk score and caregiving length of time, by gender

This analysis tests the hypothesis that older spousal caregivers, especially those who have been caregiving for an extended period of time, will be at higher levels of nutritional risk compared to non-caregivers. The nutritional risk score, a continuous dependent variable where lower scores on the nutritional risk scale indicate higher nutritional risk, is examined and thus linear regression is used. All three hierarchical models are statistically significant for men only (Table 5.7). The full model in its entirety explains 9.0% of the variance in nutritional risk score for men, and 14.1% of the variance in nutritional risk score for women. For men, caregiving length of time in model 1 explains 0.3% of the variance in nutritional risk score ($R^2 = 0.003$, $p<0.01$). The inclusion of the socio-demographic factors in model 2 accounts for an additional 2.1% of the variance ($\Delta R^2 = 0.021$, $R^2 = 0.020$, $p<0.001$). The health and psychosocial factors added in model 3 explain an additional 7.3% of the variance in nutritional risk score ($\Delta R^2 = 0.073$, $R^2 = 0.090$, $p<0.001$). For women, model 1 does not reach statistical significance. The inclusion of the socio-demographic factors in model 2 account for 2.0% of the variance in nutritional risk score ($\Delta R^2 = 0.025$, $R^2 = 0.020$, $p<0.001$). The health and psychosocial factors added in model 3 explain a further 12.4% of the variance in nutritional risk score ($\Delta R^2 = 0.124$, $R^2 = 0.141$, $p<0.001$).

Among the first block for men, very weak inverse associations emerge between the caregiving variable and nutritional risk score for those who have been caregiving between 6 months and one year ($B = -0.05$, $p<0.01$) and between 3 and 5 years ($B = -0.04$, $p<0.05$), compared to non-caregivers. By the final model, there is a very weak association for the 6-month to one-year caregivers only ($B = -0.04$, $p<0.05$). These associations suggest that men who have been caregiving between 6 months and one year as well as between 3 and 5 years are more likely to have low scores (indicative of higher nutritional risk) compared to non-caregivers. For women, the non-significant findings suggest that the caregiving variable does not have a mediating effect on nutritional risk score.

Among the socio-demographic block for men, a very weak inverse association emerges for persons aged 85 years and over and nutritional risk scores (B = -0.04, p<0.05), compared those aged 65 to 74 (reference). There are weak-moderate positive associations for household income and nutritional risk score for persons reporting $20,000 to $39,999 per year (B = 0.21, p<0.001), $40,000 to $59,999 per year (B = 0.18, p<0.001), $60,000 to $79,999 per year (B = 0.14, p<0.001), $80,000 and over per year (B = 0.20, p<0.001) and the missing/not applicable category (B = 0.25, p<0.001), compared to those reporting less than $20,000 per year (reference). These associations weaken in the final model.

For women, among the socio-demographic block, household income shows a very weak positive association with nutritional risk score for those reporting $60,000 to $79,999 per year (B = 0.08, p<0.05), compared to the reference category of less than $20,000 per year. This association is not statistically significant in the final model. Very weak to weak positive associations emerge between language spoken at home and nutritional risk score for women who speak English and French (B = 0.06, p<0.01) and who speak neither English nor French (B = 0.11, p<0.001), compared to speaking English at home (reference). Only the latter is significant in model 3 (B = 0.10, p<0.001).

In the final block of health and psychosocial factors, weak to moderate positive associations emerge for self-perceived health and nutritional risk score for men reporting fair self-perceived health (B = 0.16, p<0.001), good self-perceived health (B = 0.30, p<0.001), very good self-perceived health (B = 0.35, p<0.001), and excellent self-perceived health (B = 0.30, p<0.001), compared to poor self-perceived health (reference). Number of chronic conditions shows a very weak inverse association with nutritional risk score (B = -0.06, p<0.01). There is a very weak inverse association between perceived life stress and nutritional risk score for men reporting their life as “quite a bit stressful” (B = -0.04, p<0.05), compared to the reference category of “not at all stressful”. Tangible social support shows a very weak positive association with nutritional risk score (B = 0.09, p<0.001).

For women, in the final block of health and psychosocial factors, there are moderate positive associations for self-perceived health and nutritional risk score among those reporting good self-perceived health (B = 0.24, p<0.001), very good self-perceived health (B = 0.33, p<0.001), and excellent self-perceived health (B = 0.24, p<0.001), compared to poor self-perceived health (reference). Number of chronic conditions shows a weak inverse association with nutritional risk score (B = -0.11, p<0.001). There is a weak inverse association for women who perceive a need to improve their health and nutritional risk score (B = -0.11, p<0.001) compared to those who do not (reference). There is a very weak positive association for women who perceive barriers to improving their health and nutritional risk score (B = 0.07, p<0.01), compared to those who do not (reference). For life stress, very weak to weak inverse associations emerge with nutritional risk score for women reporting “a bit stressful” (B = -0.11, p<0.001), “quite a bit stressful” (B = -0.09, p<0.001), and “extremely stressful” (B = -0.09, p<0.001), compared to the reference category of “not at all stressful”. Tangible social support shows a very weak positive association with nutritional risk score (B = 0.04, p<0.01).

Table 5.3. Ordinary least-squares regression model for nutritional risk score among older married Canadians, by gender

Variables and categories	B1		B2		B3	
	Men	Women	Men	Women	Men	Women
Block 1: Caregiving (Ref: non-caregiver)						
<6 months	n/s	n/s	n/s	n/s	n/s	n/s
6 months to <1 year	-0.05**	n/s	-0.05**	n/s	-0.04*	n/s
1 year to <3 years	n/s	n/s	n/s	n/s	n/s	n/s
3 years to <5 years	-0.04*	n/s	-0.04*	n/s	n/s	n/s
5 years +	n/s	n/s	n/s	n/s	n/s	n/s
Block 2: Socio-demographics						
Age (Ref: 65-74)						
75-84	-	-	n/s	n/s	n/s	n/s
85+	-	-	-0.04*	n/s	n/s	n/s
Household income (Ref: <$20,000)						
$20k to $39,999	-	-	0.21***	n/s	0.17***	n/s
$40k to $59,999	-	-	0.18***	n/s	0.13**	n/s
$60k to $79,999	-	-	0.14***	0.08*	0.10***	n/s
$80k+	-	-	0.20***	n/s	0.13***	n/s
Missing	-	-	0.25***	n/s	0.20***	n/s
Visible minority (Ref: Caucasian)	-	-	n/s	n/s	n/s	n/s
Language at home (Ref: English)						
French	-	-	n/s	n/s	n/s	n/s
English and French	-	-	n/s	0.06**	n/s	n/s
Neither Eng. nor French	-	-	n/s	0.11***	n/s	0.10***
Education (Ref: <secondary)						
Secondary grad.	-	-	n/s	n/s	n/s	-0.05*
Other post-sec.	-	-	n/s	n/s	-0.04*	n/s
Post-sec grad.	-	-	n/s	0.06*	n/s	n/s
Block 3: Health and psychosocial factors						
Self-perceived health (Ref: poor)						
Fair	-	-	-	-	0.16***	n/s
Good	-	-	-	-	0.30***	0.24***
Very Good	-	-	-	-	0.35***	0.33***
Excellent	-	-	-	-	0.30***	0.24***
Chronic conditions	-	-	-	-	-0.06**	-0.11***

Variables and categories	B1		B2		B3	
	Men	Women	Men	Women	Men	Women
Perceived need to improve health (Ref: no)	-	-	-	-	n/s	-0.11***
Perceived barriers to improving health (Ref: no)	-	-	-	-	n/s	0.07**
Perceived life stress (Ref: Not at all)						
Not very	-	-	-	-	n/s	n/s
A bit	-	-	-	-	n/s	-0.11***
Quite a bit	-	-	-	-	-0.04*	-0.09***
Extremely	-	-	-	-	n/s	-0.09***
Tangible social support	-	-	-	-	0.09***	0.04**
R2	0.003**	n/s	0.020***	0.020***	0.090***	0.141***
Change in R2	0.005	n/s	0.021	0.025	0.073	0.124

Notes: Dependent variable = Nutritional risk score. Sample size: 5,579. Ref: reference group. n/s: not statistically significant. Significance levels: * p<0.05, ** p<0.01, *** p<0.001

Logistic regression of high nutritional risk and caregiving length of time, by gender

To test the hypothesis that older spousal caregivers, especially those who have been caregiving for an extended period of time, are more likely to be at high nutritional risk (a dichotomous dependent variable) compared to non-caregivers, logistic regression is used. The three hierarchical models are statistically significant for women only (Table 5.8). Among men, model 1 is not significant. Model 2 includes household income and education (X^2 = 53.96, df = 19, $p<0.001$). The model 3 variables are self-perceived health and number of chronic conditions (X^2 = 182.88, df = 31, $p<0.001$). For women, the model 1 measure includes caregiving length of time (X^2 = 14.90, df = 5, $p<0.05$). Model 2 includes language spoken at home (X^2 = 59.62, df = 19, $p<0.001$). The model 3 variables are self-perceived health, number of chronic conditions, perceived need to improve health, perceived barriers to improving health, perceived life stress, and tangible social support (X^2 = 280.24, df = 31, $p<0.001$).

The caregiving length of time variable is not statistically significant for men. Among the first block for women, the likelihood of high nutritional risk decreases by a factor of 0.61 for those who have been caregiving for less than 6 months (B = -0.50, $p<0.05$, OR = 0.61), compared to non-caregivers. Among women who have been caregiving for 5 years or more, the likelihood of high nutritional risk increases by a factor of 1.57 (B = 0.45, $p<0.05$, OR = 1.57). These likelihoods are similar in model 2. In model 3, only the decreased likelihood of high nutritional risk among women caregiving for 6 months or less remains.

Among the block of socio-demographic factors for men, the likelihood of high nutritional risk decreases by a factor of 0.51 for those reporting a household income of $80,000 and over per year (B = -0.67, $p<0.01$, OR = 0.51) and by a factor of 0.4 for those in the missing category (B = -0.85, $p<0.001$, OR = 0.43), compared to men reporting a household income of less than $20,000 per year (reference). For men with some post secondary education, the likelihood of high nutritional risk increases by a factor 1.67 (B = 0.51, $p<0.01$, OR = 1.67), compared to those with less than a secondary-level education (reference).

For women, among the block of socio-demographic factors, the likelihood of high nutritional risk decreases by a factor of 0.54 for women who speak neither English nor French at home (B = -0.63, p<0.001, OR = 0.54), compared to those who speak English (reference).

In the final block of health and psychosocial factors, the likelihood of high nutritional risk decreases by a factor of 0.51 for men with “fair” self-perceived health (B = -0.67, p<0.001, OR = 0.51), by a factor of 0.34 for those with “good” self-perceived health (B = -1.09, p<0.001, OR = 0.34), by a factor of 0.25 for those with “very good” self-perceived health (B = -1.41, p<0.001, OR = 0.25) and “excellent” self-perceived health (B = -1.37, p<0.001, OR = 0.25), compared to those with “poor” self-perceived health (reference). The likelihood for high nutritional risk increases slightly for every unit increase in the number of chronic conditions (B = 0.07, p<0.05, OR = 1.07).

For women, in final block of health and psychosocial factors, the likelihood of high nutritional risk decreases by a factor of 0.54 for those with “fair” self-perceived health (B = -0.62, p<0.01, OR = 0.54), a factor of 0.33 for those with “good” self-perceived health (B = -1.10, p<0.001, OR = 0.33), a factor of 0.19 for those with “very good” self-perceived health (B = -1.69, p<0.001, OR = 0.19), and a factor of 0.29 for those with “excellent” self-perceived health (B = -1.25, p<0.001, OR = 0.29), compared to those with “poor” self-perceived health (reference). The likelihood of high nutritional risk increases slightly for every unit increase in the number of chronic conditions (B = 0.15, p<0.001, OR = 1.16). The likelihood of high nutritional risk increases by factor of 1.60 for those who perceive a need to improve their health (B = 0.47, p<0.001, OR = 1.60), compared to women who do not perceive a need to improve their health (reference). For perceived barriers to improving health, the likelihood for high nutritional risk decreases by a factor of 0.60 among women who perceive barriers (B = -0.51, p<0.001, OR = 0.60), compared to those who do not (reference). For life stress, the likelihood of high nutritional risk increases by a factor of 1.44 for women reporting “a bit stressful” (B = 0.37, p<0.01, OR = 1.44) and a factor of 1.62 for those reporting “quite a bit stressful” (B = 0.49, p<0.01, OR = 1.62), compared to women reporting “not at all stressful” (reference). Finally, the likelihood of high nutritional risk decreases very slightly for every unit increase in tangible social support (B = -0.04, p<0.05, OR = 0.96).

Table 5.4. Logistic regression models for high nutritional risk among older married Canadians, by gender

Variables and categories	Model 1		Model 2		Model 3	
	OR-Men	OR-Women	OR-Men	OR-Women	OR-Men	OR-Women
Block 1: Caregiving (Ref: non-caregiver)						
<6 months	n/s	0.61*	n/s	0.60*	n/s	0.61*
6 months to <1 year	n/s	n/s	n/s	n/s	n/s	n/s
1 year to <3 years	n/s	n/s	n/s	n/s	n/s	n/s
3 years to <5 years	n/s	n/s	n/s	n/s	n/s	n/s
5 years +	n/s	1.57*	n/s	1.46*	n/s	n/s
Block 2: Socio-demographics						
Age (Ref: 65-74)						
75-84	-	-	n/s	n/s	n/s	n/s
85+	-	-	n/s	n/s	n/s	n/s
Household income (Ref: <$20,000)						
$20k to $39,999	-	-	n/s	n/s	n/s	n/s
$40k to $59,999	-	-	n/s	n/s	n/s	n/s
$60k to $79,999	-	-	n/s	n/s	n/s	n/s
$80k+	-	-	0.52**	n/s	n/s	n/s
Missing	-	-	0.43***	n/s	n/s	n/s
Visible minority (Ref: Caucasian)	-	-	n/s	n/s	n/s	n/s
Language at home (Ref: English)						
French	-	-	n/s	n/s	n/s	n/s
English and French	-	-	n/s	n/s	n/s	n/s
Neither Eng. nor French	-	-	n/s	0.54***	n/s	0.54**
Education (Ref: <secondary)						
Secondary grad.	-	-	n/s	n/s	n/s	1.5**
Other post-sec.	-	-	1.67*	n/s	1.97**	n/s
Post-sec grad.	-	-	n/s	n/s	n/s	n/s
Block 3: Health and psychosocial factors						
Self-perceived health (Ref: poor)						
Fair	-	-	-	-	0.51***	0.54**
Good	-	-	-	-	0.34***	0.33***
Very Good	-	-	-	-	0.25***	0.19***
Excellent	-	-	-	-	0.25***	0.29***
Chronic conditions	-	-	-	-	1.07*	1.16***

Variables and categories	Model 1		Model 2		Model 3	
	OR-Men	OR-Women	OR-Men	OR-Women	OR-Men	OR-Women
Perceived need to improve health (Ref: no)	-	-	-	-	n/s	1.60***
Perceived barriers to improving health (Ref: no)	-	-	-	-	n/s	0.60***
Perceived life stress (Ref: Not at all)						
Not very	-	-	-	-	n/s	n/s
A bit	-	-	-	-	n/s	1.44**
Quite a bit	-	-	-	-	n/s	1.62**
Extremely	-	-	-	-	n/s	n/s
Tangible social support	-	-	-	-	n/s	0.96*
Chi-squared statistic	n/s	14.90*	53.96***	59.62***	182.88***	280.24***

Notes: Dependent variable = High nutritional risk. Sample size: 5,579. Ref: reference group. n/s: not statistically significant. OR: odds ratio. Significance levels: * p<0.05, ** p<0.01, *** p<0.001

Logistic regression of frequently skipping meals and spousal caregiver status, by gender

To test the hypothesis that spousal caregivers will be at an increased likelihood for skipping meals frequently (a dichotomous dependent variable) compared to non-caregivers, logistic regression is used. The three hierarchical models are statistically significant for men only (Table 5.9). Among men, the model 1 measure is spousal caregiver status (X^2 = 4.18, df = 1, $p<0.05$). For model 2, the variables are age and household income (X^2 = 50.95, df = 14, $p<0.001$). The model 3 variables include self-perceived health, number of chronic conditions, and tangible social support (X^2 = 80.70, df = 27, $p<0.001$). For women, neither model 1 nor model 2 is statistically significant. Model 3 includes perceived life stress (X^2 = 53.76, df = 27, p=0.01).

Among the first block for men, the likelihood of frequently skipping meals increases by a factor of 1.43 for spousal caregivers (B = 0.36, $p<0.05$, OR = 1.43), compared to non-caregivers. This likelihood increases slightly in model 2 and model 3. As previously noted, the spousal caregiving variable is not statistically significant for women.

Among the block of socio-demographic factors for men, the likelihood of frequently skipping meals decreases by a factor of 0.51 for those between age 75 and 84 (B = -0.68, $p<0.001$, OR = 0.51), compared to men between age 65 and 74 (reference). The likelihood of frequently skipping meals decreases by a factor of 0.53 for men with a household income between \$20,000 and \$39,999 per year (B = -0.64, $p<0.05$, OR = 0.53), by a factor of 0.40 for \$40,000 and \$59,999 per year (B = -0.92, $p<0.01$, OR = 0.40), by a factor of 0.38 for the \$80,000 and over per year (B = -0.97, $p<0.01$, OR = 0.38), and by a factor of 0.52 for the missing income category (B = -0.66, $p<0.01$, OR = 0.52), compared to men with a household income of less than \$20,000 per year (reference). The socio-demographics block is not statistically significant for women.

In the final block of health and psychosocial factors, the likelihood of frequently skipping meals decreases by a factor of 0.52 for men with “fair” self-perceived health (B = -0.65, $p<0.05$, OR = 0.52), by a factor of 0.35 for “good” self-perceived health (B = -1.04, $p<0.001$, OR = 0.35), by a factor of 0.33 for “very good” self-perceived health (B = -

1.11, p<0.001, OR = 0.33), and by a factor of 0.45 for “excellent” self-perceived health (B = -0.80, p<0.05, OR = 0.45), compared to men with “poor” self-perceived health (reference). The likelihood of frequently skipping meals decreases very slightly for every unit increase in the number of chronic conditions (B = -0.10, p<0.05, OR = 0.90) and for every unit increase in tangible social support (B = -0.05, p<0.05, OR = 0.95).

For women, in final block of health and psychosocial factors, the likelihood of frequently skipping meals increases by a factor of 3.90 for those reporting their life as “extremely stressful” (B = 1.36, p<0.01, OR = 3.90), compared to women reporting their life as “not at all stressful” (reference).

Table 5.5. Logistic regression models for frequently skipping meals among older married Canadians, by gender

Variables and categories	Model 1		Model 2		Model 3	
	OR-Men	OR-Women	OR-Men	OR-Women	OR-Men	OR-Women
Block 1: Caregiving (Ref: non-caregiver)						
Spousal caregiver	1.43*	n/s	1.59**	n/s	1.57*	n/s
Block 2: Socio-demographics						
Age (Ref: 65-74)						
75-84	-	-	0.51***	n/s	0.49***	0.58**
85+	-	-	n/s	n/s	n/s	n/s
Household income (Ref: <$20,000)						
$20k to $39,999	-	-	0.53*	n/s	0.56*	n/s
$40k to $59,999	-	-	0.40**	n/s	0.42**	n/s
$60k to $79,999	-	-	n/s	n/s	n/s	n/s
$80k+	-	-	0.38**	n/s	0.41**	n/s
Missing	-	-	0.52*	n/s	0.55*	n/s
Visible minority (Ref: Caucasian)	-	-	n/s	n/s	n/s	n/s
Language at home (Ref: English)						
French	-	-	n/s	n/s	n/s	n/s
English and French	-	-	n/s	n/s	n/s	n/s
Neither Eng. nor French	-	-	n/s	n/s	n/s	n/s
Education (Ref: <secondary)						
Secondary grad.	-	-	n/s	n/s	n/s	n/s
Other post-sec.	-	-	n/s	n/s	n/s	n/s
Post-sec grad.	-	-	n/s	n/s	n/s	n/s
Block 3: Health and psychosocial factors						
Self-perceived health (Ref: poor)						
Fair	-	-	-	-	0.52*	n/s
Good	-	-	-	-	0.35***	n/s
Very Good	-	-	-	-	0.33***	n/s
Excellent	-	-	-	-	0.45***	n/s
Chronic conditions	-	-	-	-	0.90*	n/s
Perceived need to improve health (Ref: no)	-	-	-	-	n/s	n/s
Perceived barriers to improving health (Ref: no)	-	-	-	-	n/s	n/s

Variables and categories	Model 1		Model 2		Model 3	
	OR-Men	OR-Women	OR-Men	OR-Women	OR-Men	OR-Women
Perceived life stress (Ref: Not at all)						
Not very	-	-	-	-	n/s	n/s
A bit	-	-	-	-	n/s	n/s
Quite a bit	-	-	-	-	n/s	n/s
Extremely	-	-	-	-	n/s	3.90**
Tangible social support	-	-	-	-	0.95*	n/s
Chi-squared statistic	4.18*	n/s	50.95***	n/s	80.70***	53.76**

Notes: Dependent variable = Skipping meals frequently. Sample size: 5,579. Ref: reference group. n/s: not statistically significant. OR: odds ratio. Significance levels: * p<0.05, ** p<0.01, *** p<0.001

5.4.3. Summary of Multivariate Analyses

The weak to weak-moderate positive associations between caregiving frequency and PASE scores support the hypothesis that spousal caregivers have higher levels of total physical activity versus non-caregivers. In particular, older Canadians who provide care at a high frequency have higher PASE scores compared to their non-caregiving counterparts. As expected, the stronger association among women suggests that caregiving frequency interacts with gender to produce a stronger effect on PASE scores for women than men. These findings provide evidence for a possible healthy caregiver effect, which may be especially pronounced among high frequency caregivers and women. As hypothesized by the healthy caregiver effect, the increased levels of physical activity experienced by these older adults could have health-promoting or stress-buffering effects. However, some of this effect could be due to selection of healthier older spouses into a caregiving role.

The logistic regression of the caregiving activity item from the PASE allows for more direct assessment of non-selection effects. The results support the hypothesis for an increased likelihood of reporting caregiving physical activity among spousal caregivers compared to non-caregivers. For men, this increased likelihood is especially prominent among high frequency caregivers. For women, both medium and high frequency caregivers show a marked increase in the likelihood for reporting caregiving physical activity versus non-caregivers. These findings therefore shed light on physical activity specific to caregiving since this item is singled out from the overall PASE score. However, this measure is a crude estimate of spousal caregiving physical activity since the identity of the care receiver cannot be confirmed as the spouse (due to how the item was conceptualized in the CCHS). In addition, there may be some overlap between this measure and the spousal caregiving variables, and thus the effect of spousal caregiving on caregiving physical activity may be overestimated by these analyses.[1] Nevertheless, in accordance with the healthy caregiver effect, the findings point to higher levels of physical activity (and potential for associated health-promoting effects) among spousal

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[1] These measurement errors are discussed in more detail in the limitations section of this thesis (Chapter 8).

caregivers compared to non-caregivers, which may be in large part due to the physical demands of caregiving.

Notably, there is an increased likelihood of reporting caregiving physical activity among men who are in good self-perceived health, compared to those reporting poor health. Similarly, this increased likelihood is also reported among women in excellent self-perceived health, compared to those reporting poor health. These findings thus also align with the healthy caregiver effect. Older adults who are in better health are more likely to engage in physical activity associated with caregiving compared to persons in poor health. Interestingly, there is an increased likelihood of reporting caregiving physical activity among men who reported their life as “quite a bit stressful” and especially among women who reported their life as “extremely stressful”, compared to persons reporting their “not at all stressful”. While a causal association cannot be inferred from this cross-sectional data, these results align with theories of caregiver stress.

In terms of healthy eating habits, the three measures examined (nutritional risk score, high nutritional risk, and frequently skipping meals) paint a different picture. Among men, the linear regression of nutritional risk score indicate a very weak inverse association among persons who had been caregivers between 6 months and 1 year and between 3 and 5 years compared to non-caregivers. This finding suggests that men who are fairly recent caregivers and men who have been caregiving for an extended period of time are more likely to have low nutritional risk scores (which indicates higher nutritional risk) compared to non-caregivers. These results coincide with the findings from the logistic regression of frequently skipping meals, where there is an increased likelihood of frequently skipping meals among spousal caregiving men versus non-caregiving men. Thus, as hypothesized, the potential for a healthy caregiver selection effect with regard to healthy eating habits among men is not supported among this sample.

For women, the logistic regression of high nutritional risk presents contrasting findings. Unexpectedly, there is a decreased likelihood for high nutritional risk among women who have been caregiving for 6 months or less compared to non-caregivers, but an increased likelihood for high nutritional risk among women who have been caregiving for 5 years or more versus non-caregivers. These results suggest that spousal caregiver status may be protective against high nutritional risk for women initially, perhaps reflecting the health selection effect between persons who become caregivers and those who do not. However, this advantage with respect to nutritional risk is lost over time as long-term caregivers are likely to have poorer eating habits compared to non-caregiving women.

The findings from the quantitative analysis have been useful to examine variation in regular exercise and eating habits among this sample of older married Canadians. Furthermore, the bivariate and multivariate analyses demonstrate the potential for a healthy caregiver effect among this sample. As hypothesized, spousal caregiver status has a mediating effect on the health behaviours of married older adults. Certain spousal caregivers (according to caregiving length of time and frequency) are more likely to experience higher levels of physical activity compared to non-caregivers. There is also evidence for a caregiver selection effect wherein healthier individuals are more likely to report caregiving activity than older adults in poor health. However, the healthy caregiver effect may not apply to nutritional health behaviours, perhaps due to the stresses of caregiving. Furthermore, gender has an interaction effect in the association between spousal caregiver status and engagement in health behaviours to result in significant differences between men and women. Moving forward, a number of issues were selected for exploration in addressing this study's second objective: understanding "how" and "why" the observed statistical associations occur, as described in the following chapter.

Chapter 6. Qualitative Data

The next phase of the research process involves the collection of qualitative data. The purpose of this research is to contextualize the lived experience of spousal caregivers in understanding “how” and “why” the relationship between caregiving, gender, and engagement in physical and nutritional health behaviours may occur. Recruitment strategies, the sample profile, and data collection procedures are described next.

6.1. Recruitment Strategies

In order to recruit participants for this phase of the study, a variety of third party agencies were contacted. Information about the research study was provided and permission was sought to advertise the study. These agencies included neighbourhood houses, seniors’ centres, seniors’ societies, family caregiver support programs, community centres, city libraries, local resource centres of the Alzheimer’s Society of BC, the Parkinson Society of BC, and the data collection site of the Canadian Longitudinal Study on Aging. Study advertisements consisted of posters and pamphlets that were left in reception areas and included the following information: study name, purpose, required commitment and offer of a $5 gift card, and PI contact information (see Appendix B). In some cases, agencies distributed information about the study through e-mail lists and during organized meetings (e.g., support group session). Snowball technique, whereby interviewees recommend friends and acquaintances as potential participants, recruited several additional respondents. In total, fourteen participants were recruited between September and December 2014. These recruitment sources are outlined in Table 6.1. The total number of participants (N = 14) was selected based on the breadth and depth of the emergent findings and how well these findings improved our understanding of the quantitative data until theoretical saturation was achieved.

Therefore, participants were recruited using purposive sampling. Key survey findings underscored the importance of sampling a balanced representation of men and women, persons who provide care at different frequencies and over varying lengths of time, as well as based on health and socio-economic status. From the caregiving literature, we also know that it is important to explore different groups of caregivers based on characteristics such as age, immigrant status, social support availability, and the care receiver's health diagnosis. With the aim of obtaining diversity in perspectives, these factors were kept in mind throughout the duration of recruitment and data collection. The experience of both current and former caregivers was also included since their insights may differ according to individual situations and the passage of time. Specific inclusion criteria included: aged 60 years or older, experience as family caregiver to a spouse or partner, English speaking, and resident of Metro-Vancouver.

After an individual expressed interest in the study they were provided with a consent form detailing the study's purpose, protocol, their voluntary participation, and opportunity for debriefing (see Appendix C). An individual's decision to participate was formalized through signed consent. In appreciation of their involvement, respondents received a $5 gift card to Tim Horton's. The personal information of study participants was stored in a locked file on the PI's password protected computer and kept separate from all other research materials. ID numbers were used to disguise personal identities in all written and electronic documents. These ID numbers were linked to pseudonyms for the purpose of this report. Any details regarding the participants' life situation that could be linked to their identity have been excluded from this report according to the discretion of the PI and supervisory committee. This study's protocol received ethics approval from Simon Fraser University's Office of Research Ethics prior to participant recruitment.

Table 6.1. Recruitment sources for interview participants

Source	**N**
Alzheimer's Society of BC	2
Canadian Longitudinal Study on Aging	2
Caregiver support program	1
Seniors' Centre	1
Neighbourhood House	2
Snowball technique	6
Total	*14*

6.2. Sample Profile

The participants' socio-demographic background and factors related to their caregiving context are summarized in Table 6.2 and Table 6.3 respectively followed by a summary using pseudonyms (Table 6.4). The majority of respondents are women (57%, n = 8). The perspectives of six men (43%) are included. The mean age of the sample is 75 years (range 63 to 91 years). Respondents primarily represent a heterosexual partnership (93%, n = 13), with the experience of one self-identified LGBT participant included. Six participants (43%) were born in Canada. The remaining interviewees immigrated to Canada from China (7%, n = 1), India (14%, n = 2), the United Kingdom (14%, n = 2), or the United States (21%, n = 3). The participants come from a range of work activity backgrounds including management, sciences, health and education (e.g., teaching, nursing, engineering, 50% or n = 7), sales and services (e.g., real estate, tourism, 14% or n = 2), trades (7%, n = 1), arts and culture (7%, n = 1) and several homemakers (21%, n = 3).

Six participants (43%) are former spousal caregivers. Eight participants (57%) are currently in a care relationship with their spouse/partner. Of the current caregivers, half (n = 4) reside with their partner. The partners of the other half (n = 4) reside in a care home. The average length of relationship between participants and their spouse/partner is 43 years (minimum 19 years, maximum 62 years). For five of these individuals (62%), the relationship to the care receiver represents their second or third marriage. The majority of respondents (43%, n = 6) have experience in the spousal caregiving role for five years or more. Four participants (29%) have experience providing care for 3 to 5 years, two participants (14%) for one to 3 years, one participant (7%) for between 6 months and one year, and one participant (7%) for less than 6 months.

Care recipients include nine men (64%) and five women (36%). The large majority of care recipients (71%, n = 10) were diagnosed with a form of dementia including Alzheimer's disease, fronto-temporal dementia, and mild cognitive impairment (or pre-dementia). One care receiver (7%) was diagnosed with Parkinson's disease (including cognitive impairment). The remainder of care recipients (21%, n = 3) faced multiple morbidities including chronic obstructive pulmonary disorder, stroke, Addison's disease, kidney disease, heart disease, and diabetes. In fact, nearly half of the care recipients (43%, n = 6), including those with dementia, faced more than one health condition.

Table 6.2. Socio-demographic background of interview participants (N=14)

Socio-demographic characteristic	N
Age (mean, range)	(75, 63 – 91)
60 to 64 years	1
65 to 69 years	3
70 to 74 years	3
75 to 79 years	2
80 to 84 years	3
85 years and over	2
Gender	
Men	6
Women	8
Sexual orientation	
Heterosexual	13
LGBT	1
Immigration status	
Canadian-born	6
Foreign-born	8
China	1
India	2
United Kingdom	2
United States	3
Years since immigration (mean, range)	40, 18 - 70
Work activity/occupational group	
Management, sciences, health, education	7
Sales, services	2
Trades, transportation, labour	1
Arts and culture	1
Homemaker	3

Table 6.3. Factors related to interview participants' caregiving context (N=14)

Contextual factor	N
Caregiver status	
Former	6
Current	8
Spouse in care home	4
Care recipient's main health condition	
Dementia	10
Parkinson's disease	1
Other	3
Care recipient's gender	
Men	9
Women	5
Length of time caregiving	
Less than 6 months	1
6 months to less than one year	1
One year to less than 3 years	2
3 years to less than 5 years	4
5 years or more	6
Partnership	
Length of partnership, years: mean, range	43, 19 – 62
Not first marriage	5

Table 6.4. Summary of participants using pseudonyms

Pseudonym	Gender	Age	Caregiver status	Caregiving length of time	Partner's health condition
Ann	F	78	Former	~6 months	Kidney disease, diabetes (end-of-life)
Kurt	M	80	Former	3 years	Dementia, leukemia
Jeff	M	68	Current	~7 years	Alzheimer's disease
Camille	F	83	Current	3 years	Alzheimer's disease
Jayanti	F	71	Former	~6 months	Stroke, heart disease (end-of-life)
Harvey	M	82	Current	3 years	Alzheimer's disease
Jean	F	83	Former	10+ years	Alzheimer's disease, leukemia, heart disease
John	M	66	Current	5 years	Dementia
Shu	F	72	Current	~8 years	Mild cognitive impairment/dementia
Daniel	M	65	Former	4.5 years	Dementia
Gladys	F	91	Former	2+ years	Alzheimer's disease, diabetes, heart disease
Linda	F	79	Current	~1 year	Parkinson's disease, dementia
Jack	M	63	Current	6+ years	Alzheimer's disease
Vina	F	74	Current	10+ years	COPD, CAD, CKD, Addison's disease

6.3. Data Collection

Data were collected during face-to-face interviews with the care recipients not present. The interview process consisted of a single audio-recorded interview per participant which lasted 60 minutes on average[2]. The majority of interviews (71%, n = 10) took place in the participants' home, although several (29%, n = 4) were conducted in a community setting (e.g., private area of a community centre, university or library). Data collection took place from September 2014 to January 2015.

An interview guide approach (see Appendix D) was used which included a list of ten open-ended questions as well as brief background questionnaire to capture socio-demographic and spouse caregiving contextual information. The interview questions were selected according to key issues and preliminary questions that emerged from the quantitative analysis related to the participants' caregiving role, physical activity levels, eating habits, and general health. This process is depicted in Table 6.5. The interview guide was pilot-tested with two respondents to ensure that the questions made sense and resonated with their experiences. Minor changes were made to the wording of several questions following the pilot interviews. The data from the pilot process have been included in the final sample. The interview guide was not strictly adhered to, but rather, provided guidelines to ensure that each interview covered the same topics. Participants were encouraged to share whatever experiences felt pertinent to them related to caregiving and its impact on their health and health behaviours. The verb tense of the questions was altered depending on whether the interviewee was a current or former caregiver.

Elaboration probes and follow-up questions were used throughout the interview to ensure that the researcher correctly understood the participant's perspective (i.e. member-checking). Immediately following each interview, a participant memo was written. Memos included the interviewer's observations regarding the interview dynamic,

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[2] In one case, an interview was not completely recorded due to a technical problem with the audio-recorder. Immediately following this interview, the PI wrote a detailed summary of the interview and key emergent issues. This summary was e-mailed to the participant who verified the accuracy of its content and made two additional comments. This summary report was combined with the brief interview transcript for data analysis.

issues central to the participants' experience, and any thoughts regarding the concepts under study and their interrelations. This helped the interviewer to define key areas for further exploration in subsequent interviews and also provided direction for purposive sampling.

Table 6.5. Key quantitative findings selected for qualitative expansion

Quantitative Strand	**Qualitative Strand**
Survey Findings	Preliminary Questions
Caregiving & Physical Activity	
• Weak-moderate positive associations between caregiving frequency and PASE scores; stronger association among women than men • Increased likelihood for reporting caregiving physical activity among spousal caregivers vs. non-caregivers; esp. among high freq. caregiving men and medium and high freq. caregiving women • Potential for healthy caregiving effect supported • Increased likelihood of reporting caregiving physical activity among persons in good or excellent self-perceived health (vs. poor health) • Increased likelihood of reporting caregiving physical activity among persons reporting greater degrees of life stress (vs. no life stress)	• How do caregivers describe their physical activity levels? • What is the nature of caregiving physical activity? What kinds of tasks are involved? • How does caregiving physical activity change over time? • How do caregivers perceive their health status? Mental versus physical health? • How does health status influence caregiving activity and vice versa? Change over time? • How do caregivers perceive their life stress? • How does life stress influence caregiving activity and vice versa? Change over time?
Leisure-time Activities	
• Overall, similar patterns of engagement in leisure-time physical activities between caregivers and non-caregivers • Caregiving men may be more likely than non-caregivers to go for walks • Caregiving women may be less likely to engage in light and/or strenuous physical activities (vs. non-caregivers)	• What kinds of leisure physical activities do caregivers participate in? • What other types of leisure activities (i.e., non-physical) do caregivers participate in? • How has engagement in leisure activities changed over time? • What are barriers and enablers to engaging in leisure activities?
Eating Habits	
• Men who are recent caregivers and men who have been caregiving for an extended period of time are more likely to be at higher nutritional risk (vs. non-caregivers) • Increased likelihood to frequently skip meals among spousal caregiving men (vs. non-caregivers) • Decreased likelihood for high nutritional risk among women who are recent caregivers • Increased likelihood for high nutritional risk among women who have been caregiving for 5+ years	• What are the nutritional habits of caregivers? • How have eating habits changed over time? • Differences between men and women?

Chapter 7. Qualitative Analysis and Results

7.1. Data Analysis

Interview transcripts were prepared verbatim from the audio-recordings and imported into NVivo 10 qualitative analysis software. Transcripts were reviewed at least twice to gain an understanding of the data (Creswell & Plano Clark, 2011). Participants' comments were initially highlighted according to the key quantitative findings (e.g., caregiving activities, leisure time activities, and eating habits). In this way, the quantitative findings outlined general conceptual domains *a priori* and content-specific codes were developed inductively within each domain (Bradley & Curry, 2006; Lofland, 1971; Miles & Huberman, 1994). Coding allows for data to be sorted according to a common meaning or concept and promotes the identification of themes (Mason, 2002; Miles & Huberman, 1994; Strauss & Corbin, 1998). Codes were also generated inductively from the data in order to capture inter and intrapersonal factors related to the caregiving experience that were not explored in the quantitative analysis (e.g., relationship quality, caregiver's mindset, caregiver's changing identity). Codes were compared and contrasted across interview participants and grouped into thematic categories (Creswell & Plano Clark, 2011). These qualitative themes are presented next. Several themes emerged which extended beyond the quantitative analysis. These are also presented and discussed in terms of topics for future research.

Several strategies were undertaken to promote rigour and trustworthiness of the findings. These included using a method log to record analytic decisions, sharing emergent codes and themes with supervisors (i.e., peer debriefing) to promote transparency, and triangulation of methods (i.e., comparing qualitative data with quantitative findings). The data analysis process took place from September 2014 to February 2015. Qualitative researchers recommend simultaneous data collection and analysis to facilitate researcher reflexivity, memo writing, and documentation of analytic decisions through an audit trail (Bradley & Curry, 2006; Strauss & Corbin, 1998).

7.2. Results

7.2.1. Major Thematic Categories

The persistent demands of caregiving physical activity

The qualitative data shed light on the nature of spousal caregiving physical activity. Many participants (n = 9) spoke of their caregiving role as a full-time job. Jack explained,

> Don't get paid very well for it, but it is a job. And uh, it's very demanding and I certainly have tackled it like it's a job although this is my wife and I love her and we have a wonderful marriage, but it is work without question.

The caregiving job became more intense over time as their partner's health and abilities deteriorated. Harvey reflected on his wife's changing abilities since her recent diagnosis:

> Now, what's really interesting, in the last five or six months, she gets so tired washing. … But I think it's wearing her down. … and so probably I'm going to have to do some of this in the future, but not so far.

Caregiving work was repeatedly described as physically demanding. Physical strength was required to complete tasks such as bathing, dressing, and walking due to the care receiver's reduced abilities. Daniel explained the physicality of caregiving for his partner with dementia:

> … no matter how much weight I lifted at the gym and all this stuff, he was still, you know, 160-170 pounds of dead weight in the sense that he didn't have the awareness, the neural ability sort of, to help me to lift him.

Gladys similarly reflected how she was "running up and down the stairs a lot" between doing household chores and attending to her husband. When the physicality of caregiving became too much, participants turned to options for additional support including hiring a care worker, making home modifications (e.g., installing stair lifts), and institutionalizing their spouse. In the words of Daniel,

> … towards the end, I mean it became so physical in a sense that that's what I had to… I shouldn't use the word 'give up' but that's when I had to sort of raise my hands and say, "I need more help."

The qualitative data illuminated the specific tasks associated with caregiving physical activity. These tasks were related to eating, bathing, toileting, walking, continence and housework. John explained, "It's like being a single mum. You are on the go." For the end-of-life caregivers, bedside care involved lifting and moving their spouse to prevent bedsores. The caregivers of persons with dementia faced unique tasks related to fine motor control, paranoia, confusion, as well as wandering and disorientation. Jack elaborated,

> She operates now at a one-year old level, physically. … I mean there are so many things that she cannot do. She can't dress, undress, even sitting on the toilet she needs assistance. Um, also, vision goes and hers is hugely compromised.

The gendered nature of new responsibilities

In addition to the physical activities of caregiving, participants described increasing involvement in tasks related to instrumental activities of daily living. These included managing finances, medication, transportation, shopping, meal preparation, and home maintenance. Linda, whose husband recently moved to a care home, explained,

> …it's not only going out to see [my husband] and taking care of him, it's all these other additional. So in some ways you have more to do. And then it's um... annoying.

Vina similarly reflected,

> I have to do all the shopping, most cooking, booking appointments, Handi-darts, and going with [my husband] to the doctors' appointments and hospitals … he cannot go [alone], his English is not that good.

The majority of caregivers oversaw dealings with health professionals such as case managers, occupational and physical therapists, and specialists. Medication management was described as a “project” requiring ongoing organization and dedication. Participants also spent time educating themselves about their partner’s health and related resources, such as the programs and services offered by the Alzheimer’s Society.

Since it had been normal for participants to divide daily responsibilities with their spouse, these changes were significant. Linda commented: “… I did feel like I was living alone in the sense that I had to do more and more of these things on my own.” Jack noted, “… the list goes on and it’s pretty long! All of a sudden now you are everything.” Several of the men (n = 4) described the challenge of having to take on their wife’s usual roles related to cleaning and making meals. Recently widowed, Kurt reflected, “The laundry, I haven’t really figured out what to put in it, what temperature [laughs], or what size a load,” although he was “getting to be more friendly with the food.” The women were more likely to encounter challenges related to banking, paying bills, investments, insurance and making major decisions. However, some participants (n = 3) mentioned that they had shared household roles with their partner throughout their married life. This arrangement seemed to smoothen the transition for the caregiver in taking over responsibilities as opposed to learning a completely new role.

The growing challenge of maintaining leisure-time activities

The spousal caregivers described their participation in a variety of leisure-time activities. Taking walks emerged as central form of leisure exercise for several participants (n = 6). Jack noted, “The walking is the big deal. And I walk and walk and walk. And I would say almost it’s between one and two hours a day I walk which is pretty good.” Jean commented how taking morning walks with her husband was a routine activity that continued until no longer possible due to his deteriorating health. Other leisure physical activities that participants engaged in included yoga, going to the gym, swimming, golfing, biking, playing soccer, kayaking in the summertime, and the Minds in Motion activity program offered through the Alzheimer’s Society.

The caregivers were also involved in less physical leisure activities. For some, activities related to religion and spirituality were central. In the words of John: “Some people start their days off by going for a jog or doing yoga or whatever, all of which is good. I start my day off by going to church.” Meditation, prayer, and sharing “stories of Gita” were essential for Jayanti, who noted: “This was my exercise.” Travelling was also important to the spousal caregivers. Trips included vacation getaways, visits to family, and time for respite. Many participants (n = 6) had foreseen that their freedom to travel would be restricted due to their partner’s ill health. Other leisure activities included reading, volunteering (e.g., on a seniors committee, housing council, or in a care home), doing puzzles and playing card games, gardening, arts and crafts (such as knitting and sewing), and activities offered by the seniors’ centre.

Interestingly, the qualitative analysis also illuminated important barriers and enablers to engaging in leisure activities. Common barriers included lack of interest, competing responsibilities (such as running errands, household chores), lack of time, and having to stay with their partner. Nearly all of the participants felt that they could not leave their spouse alone or with other people. At the same time, doing certain activities with their partner was not ideal. Jeff explained,

> I would try to get her out walking and even then, like they slow down so it’s something that you just have to adjust your own pace to but you’re not getting the exercise that you really want. So you are limited to the degree of exercise.

Lack of free time was underscored by many participants (n = 6), as Gladys explained: “You don’t have time for anything, you know, you’re whole time is devoted to that person”. Shu noted, “It’s hard to squeeze time. And I have to be very disciplined right now. I always use every minute to do my, to do the chores, to organize things.” Other barriers included poor physical health (e.g. muscle injuries, arthritis, poor eyesight, lack of strength), limited finances, inclement weather and low English language proficiency. In parallel, participants described important enablers to engaging in leisure-time activity. These facilitators frequently included assistance from friends and family, care workers, day programs, care home placement, and respite care. Close proximity of activities to home, encouragement from friends to join in, and using personal devices (such as cell phones) to keep in touch with their partner while apart also enabled participants to participate in leisure activities.

The qualitative data indicated how participation in leisure activities changed over time as caregiving activity grew more central in the participants' lives. For many (n = 9), leisure activities were reduced or scaled back. Kurt explained the impact of caregiving:

> … it interrupts your life. You can't just go out and have a beer with the boys or anything, go play tennis for four hours or something [small laugh]. … Yeah, I have to sort of be inactive too, when she's sick.

A few participants (n = 4) reported no change in their leisure activities. Daniel had actually started a new activity, yoga, since he was getting a sore back from the physicality of caregiving. Camille explained how she was able to prioritize her time:

> So my day is divided. … I mean, my life is devoted to him in one phase but in other phases, I have to. [The support group members] keep rubbing, not rubbing it in but uh, encouraging that you have to have life of your own and not really spend all your time because there's going to come a time when he's not around and what are you gonna do? You know, so you have to be careful to cultivate other activities and that sort of stuff.

Relatedly, the former caregivers reflected on how their leisure activities changed after their partner had passed away. Although they enjoyed new freedoms, Daniel explained how difficult it was to resume his 'normal' activities:

> … there is that dimension that when caregiving stops, it's almost like hitting a wall and you think um, "Woah, what do I do with myself now?" You get through that and you get back to your usual, your other pattern.

Although leisure-time was commonly restricted, the benefits of participating in these activities were many-fold. First and foremost, the caregivers explained how leisure activity "helps to wash away if there is stress". Daniel noted how yoga was "an hour and half's mental vacation" explaining: "…it's very intense and it's very much you use your mind a lot. You have to sort of focus on what you are doing and if you don't, you'll fall out of the postures." Jack reflected,

> I love the walking. And it's- I do it in a solitary way. I'll go by myself to [the market], read the paper and just enjoy and just kind of get caught up. And if we meet people great, I enjoy that. But I also do it with [my wife] and it's not too stressful with [her].

Some participants enjoyed physical health benefits such as weight control. Certain leisure activities were important to the caregivers' self-esteem. Camille regularly participated in running races since it was "good encouragement" and she enjoyed winning medals for her age group. In the words of Vina,

> … [community members] call me 'number one' in singing because God has gifted me [a] beautiful voice. … I enjoy my music and [when] I go to [community] centres, I feel that [it's] made up, like there is a gap that is filled by my going out. And when somebody appreciates me, "Your voice is very good, you sing so good!" … I feel like energy is really pumped up in me!

Interestingly, several caregivers (n = 5) experienced an overlap between their working career and their caregiving career. Although paid work is not a leisure-time activity, the qualitative data demonstrated how caregiving similarly affected participants' paid work activities. Several caregivers had retired because of their partner's diagnosis. Shu explained,

> In fact, I don't really want to retire at that time but um I realized that [my husband] has to be on medication for dementia, 'cuz [he] is getting quite forgetful, lots of things. And then I have to take too much time off to uh take him to see the doctor and et cetera and et cetera. So I said, "Well, may as well retire then.

John reflected how the emotional energy required to care for his wife with dementia affected the energy required to deal with customers at his job, and vice versa. Consequently, John had hired a live-in caregiver and explained,

> The alternative would be for me to completely retire but I think that I would go absolutely crazy. Looking after anybody 24/7… it's not something that you can do by yourself, I don't think.

The draining effects of spousal caregiving on physical and mental health

Reflecting on the influence of caregiving on their health, the participants first and foremost described emotional health effects including depression, grief, guilt, stress and fatigue. Daniel commented, “I’m really amazed that I didn’t have a nervous breakdown.” Shu recounted how “shocked”, “sad and depressed” she felt when her then 60-year-old husband was diagnosed with mild cognitive impairment. Jayanti described her “mental sickness” which at that time made her feel, “This world is not for me.” The heartache of losing a spouse was especially salient. Daniel explained,

> … that idea of losing the companionship. It was uh… I guess it’s not a real physical thing but I think all these emotional things impinge on the physical side of your body too, obviously they do.

Jack noted the interplay between mental and physical health effects:

> So then there’s this always physically having to go and be and do and… to intercept or to assist or whatever. So it does take a physical toll, it does. The energy is just drained. But the physical is also the mental, which causes more fatigue, right? Do you know what I’m saying? It’s a mental and a physical drain.

Experiences of caregiver guilt and stress were common. Participants felt guilty for wanting their situation to end, for taking time to themselves or using respite services, for ‘abandoning’ their partner in a care home, and somewhat ironically, for not feeling “more full of grief and sadness and tragedy”. The stress they experienced was related to their partner’s difficult symptoms (such as repetitive or argumentative behaviour) as well as “knowing what to do and anticipating what may or may not happen”. As John explained,

> I tried not to get stressed out but it was stressful. Because you’re juggling, you’re doing all the motherly things of the laundry and cooking and buying and shopping and everything else. … I was trying to do a job as well, and still get out to play in my band and play soccer and still trying to juggle all of that stuff. So that was uh… so physically that’s stressful.

These negative health effects were compounded by sleep problems. Lack of sleep resulted from worrying about their partner and being woken by their partner’s activity (e.g., needing the bathroom, violent dreams, requiring assistance or a ‘check-in’).

Reflecting on their physical health status, several participants reported feeling ‘generally healthy’ yet the majority (n = 10) were dealing with their own health issues. The caregivers experienced chronic health conditions (and often comorbidities) such as diabetes, arthritis, hypertension, high cholesterol, and back problems. Participants commonly attributed their current health status to “the aches and pains of somebody this age.” Jack explained, “My health has changed but I can’t say that it’s my wife. … I think that’s just my normal aging.” In contrast, some caregivers felt their health had deteriorated due to the stresses of caregiving. Daniel reported how his diabetes worsened:

> I think it’s a physical symptom of the caregiving for sure. And I still am on the insulin and I think, “Well, you don’t have that stress anymore” but I think there’s other stresses on my own now.

It was very common for participants to feel that their own health was not a priority. This sentiment was true for Vina, who experienced the effects of culture-based gender norms: “His health is always priority. And he will never worry that how I am doing. In our culture, they think women is nothing. She is to serve the family, to the husband.” Gladys questioned, “How can you tell somebody to look after themselves when they are overwhelmed with this person that they’ve got to look after? You haven’t got time to think about yourself.” Kurt had delayed a hip replacement operation for two years while taking care of his wife in the hopes that either “I was going to get better or she was going to get better”. For Linda, ignoring her health was a coping strategy:

> I don’t obsess. I don’t think about my own health. … I think that I have this mindset: I don’t want anymore to deal with right now. So I, I am not going to deal with anything about my health and I am just sort of sending a message to my body saying, “Okay you hang in there because I don’t want to deal with you right now.” … I feel a little fragile, emotionally. One more thing right now would be more difficult for me to handle. So that’s why I ignore.

Interestingly, a couple of the participants felt that they were actually healthier since they began caregiving. Shu had joined a research study program and explained:

> We have our personal trainer. So she work[s] with us and educate[s] us about the nutrition and diet and et cetera, what to watch and what to eat. And so I think in a way from [my husband]'s disease I've become more knowledgeable.

Daniel explained how his partner's illness made him take better care of himself: "I just always felt this strong sense of commitment and responsibility that I could not get ill." Family doctors and support groups played an essential role in reminding the caregivers about the importance of self-care and keeping healthy.

The multiple layers of social support

The qualitative data showed that social support from family members, friends and professionals is key in contextualizing caregiving activity. Care workers, both part-time and full-time, provided hands-on support with caregiving activities as well as time for respite, household tasks and errands. Although hesitant to bring a stranger into his home on a full-time basis, John explained how "it became apparent that that was the best route." He elaborated,

> [Our care worker]'s been absolutely phenomenal. … Now we have [our care worker] we've got two single mums who are on the go. So we pinch it for each other and that works all right.

In several cases, home support was essential to bridge the time required to obtain a care home placement. For some participants, hiring a cleaning person was the only assistance necessary.

Support from family was particularly valuable to the caregivers, although not every participant had a supportive family network. Adult children, when they lived close by, provided instrumental and emotional support. Siblings (including in-laws) were also called upon for assistance. However, adult children commonly lived in another part of the country or overseas. For several caregivers (n = 4), multiple marriages meant that ties with their spouse's adult children were less dependable or else the participant's own children felt less close to the care receiver. A couple participants did not have children at all, and others felt that their children were "too busy" with their own lives and families. Shu described the influence of familial norms:

> I don't want to put a burden on them because um… The first thing, I don't know how much their wife can accept the father-in-law, that's the first thing. And I don't know, I don't want to ruin their relationship. And then the other thing as a mother, I think that's from the Eastern culture … my children's career to me, it is important. Their success is my success so I want them to have a good career, okay. And I don't want our burden to trap them down.

Similar trends emerged when discussing support from friends and neighbours. Linda noted how lifelong friendships are a "huge resource" due to shared history. However, some participants felt their friendship network had dwindled. Kurt commented on how friends are deterred by the parking fees at the hospital, "Who's gonna go pay 5 bucks to go visit someone who may not even remember their name?" Daniel reflected,

> I didn't have a lot of friends during this period. I felt like a hermit. I mean some friends fell by the wayside because I was so busy taking care of him; I just didn't have the strength to maintain everything like before. Um, so there wasn't a big group of friends. What I found was that some people, it's very difficult to be around anybody with a disability for some people.

Finally, social support from community groups and organizations was essential. Most notably were the resources provided by the Alzheimer's Society including support groups, education sessions, and the Minds in Motion program. Jack explained how these resources amplified his social network:

> How can people get through without this kind of support? … So you get exercise, you get socialization. "Hey well why don't we get together over coffee? Let's get together for a meal!" So, another way of feeling normal with another couple.

Camille expressed conflicted feelings about her support group,

> … when you go to these support groups you come out and you say, "Now why on earth did I go to that?" And that's so totally depressing looking to see what I'm in for because they have so many more problems than I do at this point. Um, and then on the other hand you say, "Well, they come up with some good ideas on how to cope with it so I'll go back next month."

Support groups were rewarding even for some of the former caregivers who felt they had a wealth of experience to share with others.

Spousal caregiving, gender, and the difficulties of eating well

The qualitative data illuminated the eating habits of spousal caregivers and changes throughout the caregiving career. The participants reflected that they had typically eaten well throughout their adult life. Some participants shared that they were "not into nutrition" and ate however they pleased yet still aimed to make healthy food choices. Health concerns due to diabetes, reflux-esophagitis, gastric problems, and heart conditions affected the eating habits of several caregivers (n = 5). Jack reflected, "…I am forced to have a proper diet because I am a diabetic, not because I'm caring for myself because of the Alzheimer's. Do you see the difference there?" Daniel, who had experienced lifelong weight issues, explained, "I've always been interested in nutrition. I'm a wannabe nutritionist I think and I know quite a lot about it."

The eating habits of many participants were affected by the caregiving role. Several of the spousal caregivers (n = 3) experienced stress eating and over-eating. Daniel described how "binge eating" was his "special way of coping with the stress" especially in the year before his partner died. Linda explained how after her husband moved into care, "that discipline, that sort of regularity in your life, disappears". She elaborated how her new diet of take-out and sweets was a source of happiness: "… it was like these things were becoming like a drug. … It's no wonder people take drugs and drink and everything like that to get away from reality a little bit."

In addition to changed diets, the participants described how other aspects of their eating habits had been affected by caregiving such as grocery shopping (n = 4), meal preparation (n = 12), and mealtimes (n = 5). Jack commented on the added stress of having his wife accompany him while grocery shopping due to her confusion and reduced mobility. Vina, who relied on public transit to run errands, commented on the hassle of getting to an ethnic grocery store and hauling the grocery bags back home via multiple bus transfers by herself. Jean similarly reflected how finding a "grocery store that delivered was just absolutely a dream". She explained,

> Because carrying all the bags of groceries and everything like that was hard and um, you know, so they would bring them right to the door so that was huge. … And getting groceries, also finding time for it and of course you can't do it in half an hour, you know.

The participants also described similar difficulties related to meal preparation. This was often an activity shared with their partner, but as Jeff explained about his wife with dementia:

> …she'd always want to participate, even in cooking, but she couldn't do the cooking. She couldn't follow a recipe or she couldn't do the proper things so that was a challenge in itself. And um saying, "Okay, well you do the salad." Something simple that she could actually do. So you um, you know, direct her into something where you knew she wasn't going to be able to mess it up and could participate in doing that. … That's the main thing. They do want to feel like they're part of the family still and can participate and help you out.

For the participants who had been more heavily involved in caregiving due to their spouse's care needs, finding time "to cook a real meal" was very difficult. These caregivers turned to 'easy options' such as prepared and frozen meals. Changes in the mealtime experience itself were significant for the spousal caregivers. Ann, who was involved in intense end-of-life care for her husband, explained how there wasn't any real mealtime at all: "I guess hunger, if you got hungry, you ate something but otherwise, you didn't really think about it." Caregivers of persons with dementia described how meals became increasingly stressful and physically draining as their partner lost the ability to feed him or herself. Participants also spoke about the sadness of losing their spouse's company during meals, either intellectually (i.e. due to cognitive deterioration) or after their partner had moved into care.

The impact of gender norms also surfaced in the qualitative data, whereby men were more likely to describe the "learning curve" of having to take on household roles related to food. John reflected:

> Well as I've never cooked in my life before, it was a bit of learning exercise! I'm one of those dreadful English husbands

> that didn't, never cooked. I mean, my wife did the cooking and it was just, I went out and made the money and fixed the cars.

Some of the women reflected how their lives had been "spent in the kitchen". Linda experienced a major transition to cooking for one after her husband moved into care:

> I think it's enormous because all of a sudden your whole life, or your whole adult life, you've been cooking for other people. Your husband, your children, you know, whatever. And, and most women my age case, that's been true. And so all of a sudden, within a day, you're not cooking for anybody else. … I have no interest in cooking for myself. I used to like to cook, but I don't anymore.

Not every participant experienced a negative change in eating habits. A few participants (n = 3) had routinely shared cooking duties with their spouse throughout their married life, which lessened the effect of caregiving on eating habits. Kurt explained how he had kept a written record of the food he was buying and eating so that he didn't waste food or overeat. Shu had enrolled in a study program and received educational materials about healthy eating. Jayanti explained how the doctor had put her husband on a healthy new diet that she also began to follow so that her husband wouldn't feel bad or that he was missing out.

7.2.2. Other Factors

Positive adaptation

An individual's mindset played a key role in how participants were influenced by caregiving activities and how well they adapted to caregiving stressors. Positive orientations rooted in acceptance (i.e., "this is what it is"), faith, and one's personality were common. Several participants recognized that they couldn't change their situation. Linda commented, "And I say the sooner you get used to that idea and accept that idea, the healthier you are emotionally. I mean, it's just not going to go back to the way it was." Daniel, who had started yoga, explained the meaning behind his meditation pose:

> You just have to sort of think of nothing but it helps to have a mantra or a slogan. So I, being a frustrated Latin scholar, I said, "Well I'll take 'Ave Verum': behold the truth. This is your reality;

> don't run away from it; this is what's happening." And I would just meditate on that sort of "this is the truth."

Faith-based mindsets were underscored by several participants (n = 4) as a "source of solace and strength and insight and understanding" with regard to their caregiving situation. Regard for "God's will" and "trust in God" provided a strong frame of mind in getting through caregiving. Jack explained:

> So in the midst of an ugly disease, we have still joy, we have peace, we still have patience, kindness... Um, all of those things that the bible says are the fruit of the spirit. And um, while I hate the disease, my faith has kept me more than sane. It's given me purpose. ... God was asking us, "Could I use you in the midst of Alzheimer's?" And you know, "I didn't come to take you out of the world but in the midst, to be there to give you peace and to give you purpose." And that is why we can move forward to be doing what we're doing.

Finally, it was clear that personality attributes influenced the degree to which participants were affected by caregiving. Key attributes included patience, openness, empathy, compassion, and being a "steady" person. Jean reflected:

> Because I always in my whole life wanted to be a teacher, I wanted to work with little kids, that I think maybe I have patience or the compassion that's needed. Because he was towards, you know for many years, he was like a three year old. And to me, I could accept and work with it.

In contrast, Daniel explained how he was a "very high strung type of person" and "always reacted poorly to stress". He elaborated, "I'm not a calm person. I think if I had a different personality and could react to stress better…"

Relationship attachment and quality

The qualitative data underscored the salience of relationship attachment and commitment to one's partner in the spouse caregiving experience. A majority of participants (n = 11) spoke of their duty to care for their partner. Shu explained: "I'm committing to my marriage and I just accept my fate." These comments were also made in relation to marriage duration or length of partnership. Jack noted, "35 years of marriage, this is why we had to be married, for this circumstance. So I really know who my wife is and I can meet her needs." Jean similarly reflected,

> …we had almost 60 years together and, and you know the last ten were so increasingly difficult. But there are many, many years that I can remember, and that kept me going through the hard times too.

Interestingly, Jeff shared how surprised his friends were at his dedication to caregiving for his partner, as she happened to be his fourth wife. Daniel reflected on similar comments from friends:

> They said, "We never thought you had it in you, that you, we thought you would have bailed and ran." Um uh, I don't know what that says about gay relationships so much. I mean do many gay people think they can't be that committed? I don't know.

Relatedly, relationship quality was key to one's sense of duty and commitment to their partner. Jean reflected on the special relationship she had with her husband, which gave her "a lot of strength, and that commitment too". Daniel added, "…we were really in a loving relationship. I loved this person, I wouldn't abandon somebody that I loved." In the words of John, duty and commitment were not enough:

> I cannot imagine what it would be like to have your spouse with dementia when you don't love them anymore. Oh [sighs]. You've gotta love the person, you've gotta care. Because just doing this, just for duty sake or the fact that you're still wearing their ring but it doesn't mean anything, oh my goodness. You'd kill yourself or you'd kill them. Because it does get so straining. I'm really lucky. I chose well. Or she chose well, I'm not sure. We got lucky.

Inter and intra-personal facets are important to explore in examining the influence of spousal caregiving on health-promoting behaviours and health outcomes.

7.3. Summary of Qualitative Findings

The qualitative findings illuminate the nature of spousal caregiving as physically demanding and persistent over time. Caregiving physical activity occurs through hands-on support of the care receiver’s activities of daily living. In addition to increased caregiving physical activity, spousal caregivers often take on new responsibilities related to household tasks (e.g., managing finances, shopping, meal preparation). Here, there are distinct gender dimensions as older caregivers must adjust to new household roles and responsibilities depending on how household tasks were negotiated with their spouse during their married life. Pertinent for men are a lack of kitchen skills related to meal preparation, while women may be more likely to encounter difficulties managing finances and household maintenance, for example. The spousal caregivers must adapt to these challenges as their partner’s health deteriorates over time. Spousal caregivers may sometimes feel as though they cannot prioritize their own health needs due to the demands of caregiving.

Although there may be a certain level of physical activity associated with caregiving activities, participation in leisure-time physical activity paints a different picture. It can be very difficult for older spouses to maintain leisure-time activities throughout the duration of the caregiving career. Important barriers include lack of time, lack of interest/motivation, competing responsibilities, limited finances, poor health, and dependence of their ill spouse. Important facilitators include caregiver respite and adult day programs, support from informal (i.e. family and friends) and formal sources (i.e. paid care workers), as well as conveniently located programs and facilities. Where caregiving physical activity appears to be more related to the demands of caregiving, leisure-time activities, on the other hand, are related to caregiver health and wellbeing, especially in terms of stress management.

In turning attention to health behaviour beyond physical and leisure-time activity, the qualitative data suggest that spousal caregivers face difficulties engaging in healthy eating. This is largely due to challenges of grocery shopping, meal preparation, and loss of the mealtime. In certain cases, negative health behaviours, such as binge eating, may be a way for older spouses to cope with caregiving stress. While caregiving men may be disadvantaged in terms of meal preparation due to the gendered nature of household tasks, caregiving women also negotiate changes when, after decades of preparing meals for their family, they only have themself to cook for.

While the qualitative data suggest that spousal caregiving generally has a negative impact on engagement in health behaviours such as leisure-time activity and healthy eating, there are several positive aspects of spousal caregiving to acknowledge. These include access to health information and resources, increased sense of health responsibility, as well as improved self-esteem as a result of learning new skills and engaging in new activities such as caregiver support groups. The qualitative findings also highlight how inter and intra-personal dimensions are key in examining how the physical and mental health of older adults is impacted by the spousal caregiving career. These include social support from informal and formal sources, positive orientations rooted in acceptance and faith-based mindsets, as well as a loving relationship with their partner.

Chapter 8. Discussion

This research sought to understand how and why the physical activity levels, engagement in leisure activities, and healthy eating habits may differ for older spousal caregivers relative to their non-caregiving counterparts, with special attention to differences between men and women. This mixed methods inquiry was important to examine dimensions of a healthy caregiver effect with respect to physical, leisure and nutritional health behaviours as well as caregiving outcomes related to stress and burden. This chapter integrates both the quantitative and qualitative findings and discusses key meta-inferences relative to the theoretical and research literature. The study's limitations and suggestions for future work are also outlined. Finally, the study's implications and recommendations for practitioners working in applied settings are highlighted.

8.1. Integrated Findings

8.1.1. Physical Activity and the Healthy Caregiving Effect

This study hypothesized that older spousal caregivers would have higher levels of physical activity compared to non-caregivers due to a healthy caregiver effect. This effect should be seen through spousal caregivers' greater engagement in caregiving physical activity compared to non-caregivers. The study findings support this effect in so far as spousal caregivers show higher levels of total physical activity and caregiving physical activity compared to non-caregiving older adults. These results align with previous research on the healthy caregiver effect reporting greater levels of overall physical activity among older caregivers than non-caregiving older adults (Fredman et al., 2006; McGuire et al., 2010). Thus, this study supports the physical activity of caregiving as a possible mechanism through which older adults may experience physical health benefits from spousal caregiving. Caregiving physical activities encompass tasks related to eating, bathing, toileting, walking, continence and housework.

As hypothesized, this study shows higher levels of physical activity among spousal caregiving women than men. Granted gender-role socialization (Gilligan, 1982) and expectation (Barusch & Spaid, 1989) frameworks, women are likely to be more heavily involved in caregiving physical activity both over time and in supporting a greater diversity of tasks compared to men (Levine, 2000; Stoller & Miklowski, 2008). Indeed, the qualitative data underscore the salience of gender as well as caregiving intensity and time in relation to the healthy caregiver effect. Accordingly, this effect may be stronger among women and among persons who provide care at greater intensities. For longer-term caregivers, such as dementia caregivers, caregiving physical activity appears to grow more intense over time as the care receiver's health deteriorates. For end-of-life caregivers, this activity is likely to have a more sudden, though less sustained, impact. These dimensions must be taken into account when considering how the healthy caregiver effect may play out for married older adults.

While this study provides preliminary support for a potential healthy caregiver effect among this sample, the integrated findings underscore the complexities of caregiving physical activity in relation to health. The survey findings indicate a possible caregiver health selection bias among the CCHS sample, as there was an increased likelihood of reporting caregiving physical activity among persons in good or excellent self-perceived health (versus poor health). However, the qualitative findings paint a different picture: caregiving physical activity is physically and mentally exhausting and persistent over time. In accordance with theories of caregiver stress and burden (George & Gwyther, 1986; Pearlin, 1994; Pearlin et al., 1990; Vitaliano, 1997), several participants described the detrimental influence of caregiving on their health. Many caregivers experienced their own health issues including chronic back pain, diabetes, hypertension, arthritis and depression. In some cases, caregiving stress exacerbated existing health conditions. Longitudinal research suggests that extensive ADL support is associated with poorer health outcomes among spousal caregivers of persons with Alzheimer's disease versus caregiving per se (Shaw et al., 1997). Interestingly, past research has also reported higher rates of health decline among high intensity caregivers compared to non-caregivers upon adjusting for total physical activity levels and other confounders (Fredman et al., 2008). While engagement in regular physical activity is associated with numerous health benefits for older adults, this study suggests that caregiving physical activity is qualitatively distinct. The multifaceted dimensions of spousal caregiving are essential to consider in reconciling physical activity and the healthy caregiver effect.

8.1.2. Spousal Caregiving and Health Behaviours

Upon investigation of caregiver health behaviours beyond physical activity, such as engagement in leisure activities and healthy eating habits, neither the quantitative nor qualitative findings support the healthy caregiver effect. Leisure-time activities are often sacrificed as the demands of spousal caregiving mount. For example, the interview participants commonly reported going for walks as an enjoyable leisure physical activity, but this activity was restricted over time. Here, relevant barriers include increased dependence of one's partner, lack of time, lack of interest, competing responsibilities, and poor physical health. These findings align with research describing that caregivers commonly give up social and leisure activities in order to provide care (Bookwala & Schulz, 2000; Gallant & Connell, 2003; Keating et al., 1999). Activity restriction may be especially pronounced among end-of-life caregivers (Sautter et al., 2014; Williams et al., 2014). For spousal caregivers, the regulatory support of their partner on engagement in health-promoting activities is often lost (Janevic & Connell, 2004; Padula, 1997; Reczek & Umberson, 2012; Tucker, 2002). Although older spousal caregivers may experience higher levels of physical activity as per the healthy caregiver effect, engagement in leisure-time activities is likely to be restricted throughout the duration of the caregiving career.

This study also suggests that spousal caregiving is associated with deteriorating eating habits. The qualitative work reveals that this is largely due to challenges related to grocery shopping, meal preparation, as well as lost meaning of the mealtime. Here, Pearlin's stress outcome model (1990; 1994) may be seen to apply where these factors represent secondary stressors that result from primary stressors related to the caregiving situation (i.e., lack of time, dependence of the care-receiver, spouse's poor health) which ultimately result in negative nutritional health behaviours. The qualitative data also highlight emotional health factors, such that negative health behaviours (e.g., binge eating) may sometimes be used to cope with caregiving stress. In Connell's early study (1994) on the health behaviours of caregivers, 40% of the participants reported poorer nutritional health due to caregiving and 75% revealed 'finding comfort in food'. Spousal caregivers have also reported less satisfying mealtime social interaction, relying on convenience foods, and having less regularly scheduled meals (Connell, 1994; McIntosh et al., 1989).

In addition, the gendered dimensions of spousal caregiving are distinct in terms of eating habits. The quantitative analyses suggest that men who are either recent spousal caregivers or who have been caregiving for a longer period of time are more likely to be at a slightly higher nutritional risk compared to non-caregiving men. Men in the spousal caregiving role may also have an increased likelihood for frequently skipping meals. Qualitatively, the men described role changes associated with taking on their wife's usual household responsibilities and the learning curve related to cooking. Indeed, older men receive nutritional support from their partner and take pleasure in sharing meals with another person (Kullberg et al., 2011). These reinforcing factors disappear when spousal caregiving takes precedence. In qualitative work, older men attributed significant weight fluctuations to caregiving demands (Russell, 2008).

Among women, the quantitative findings indicate a decreased likelihood of high nutritional risk among new spousal caregivers compared to non-caregiving women. This finding may reflect the health selection bias between older persons who are healthy enough to take on caregiving responsibilities compared to those who are not. It may also be indicative of the less intense demands of early stage caregiving. On the other hand, the quantitative findings suggest an increased likelihood for high nutritional risk among women who have been in the spousal caregiving role for 5 or more years compared to non-caregivers. Qualitatively, the women described the changed meaning of meal preparation and mealtimes in light of their spouse's ill health. Research suggests that home-dwelling older women value shopping, preparing food, and family meals as positive resources in daily life (Gustafsson et al., 2003; Gustafsson & Sidenvall, 2002). It is clear that gender plays a salient role in the relationship between spousal caregiving and engagement in nutritional health behaviours.

8.1.3. The Paradoxical Dimensions of Spousal Caregiving

The integrated findings of this study underscore that spousal caregiving has both positive and negative effects. While there is potential for health benefits to be conferred through the physical activity of caregiving, it is clear that caregiving tasks are physically and mentally demanding and connected to stress and burden. Although spousal caregivers may be healthier than non-caregiving older adults at the outset of caregiving, this advantage is likely to diminish over time. In accordance with frameworks of caregiving stress (George & Gwyther, 1986; Vitaliano, 1997), a stress and burden narrative was common among this study's qualitative data. The spousal caregivers expressed feelings of grief, guilt, stress and depression. These negative health effects are often compounded by a lack of sleep and a perception that the caregiver's own health is low priority. These findings correspond with previous work suggesting that caregivers may neglect their own health and may not believe that they are entitled to time for self-care (Bedini et al., 1996; Tang & Chen, 2002), leading to negative health outcomes (Tang & Chen, 2002). An inverse relationship has been reported between caregivers' total health promoting behaviours and care receivers' dependency levels (O'Brien, 1993). Lee and colleagues (2003) argue that the mental distress of seeing one's partner deteriorate, increased financial burdens (i.e. from medical expenses and managing household finances) as well as the pressure of juggling new responsibilities contributes to the risk of disease among caregiving women.

However, this study also calls attention to the positive effects of spousal caregiving. Some interview participants described an increased awareness of their own health and sense of health responsibility, as well as improved self-esteem from learning new roles and providing guidance and socio-emotional support to other caregivers. These findings add to a growing body of literature on the positive health effects of caregiving (e.g., Brown et al., 2009, Cohen et al., 2002; Fredman et al., 2008; Parveen & Morrison, 2012). Although caregiving is stressful, spousal caregivers may experience mental health benefits due to helping their partner and feeling a sense of purpose compared to non-caregivers (Beach et al., 2000; Gruenewald et al., 2007). In some cases, increased engagement in health-promoting behaviours may be used to cope with caregiving stress (Gallant & Connell, 2003). Thus, paradoxically, spousal caregiving has both stress inducing and stress buffering dimensions that must be simultaneously examined when exploring caregiver health behaviours.

8.1.4. Balancing the Demands of Spousal Caregiving

This research highlights spousal caregiving as a tenuous balancing act associated with a multitude of demands that shift over time throughout the caregiving career. Factors to consider include gender, the care receiver's illness, positive adaptation, and social support. Not only do the physical activities of caregiving increase over time, but also tasks related to managing finances, medication, transportation, shopping, meal preparation and home maintenance. Indeed, previous work has described caregivers' involvement in health and personal services, household chores, errands, medication management, transportation to medical appointments, and in offering socio-emotional support to others (Carpenter & Mak, 2007; Dumont et al., 2010; Essue et al., 2010; Meuser & Marwit, 2001). In this study, both men and women described the challenge of having to take on their spouse's usual household roles. Indeed, the qualitative findings largely reflect the gendered division of household tasks. Men encountered difficulties surrounding kitchen and housework while women described dilemmas related to managing finances and making major decisions. Carpenter and Mak (2007) note that spousal caregiving tilts the balance of a relationship, prompting a shift in activities whereby "the couple must come to terms with what these new roles mean to them and how they are woven into the couple's history and habits" (p.49). The renegotiation of roles and changed couple identity can be challenging but also rewarding in terms of learning new skills and talents (Carpenter & Mak, 2007).

For disease trajectories such as dementia, the beginning stages of caregiving may be less challenging but demands accumulate over time and spouses often juggle responsibilities for a period of many years. In contrast, caregiving demands have more of a sudden impact among end-of-life caregivers. The qualitative data call attention to factors that help spousal caregivers to balance the demands of caregiving such as positive social support. As per the stress buffering hypothesis (Cohen & Willis, 1985), both formal (paid caregivers, home services, community agencies) and informal (friends, family and support groups) sources are essential to assist with caregiving tasks, allow time for respite, provide informational and emotional support, and for motivating engagement in health behaviours. Internal mechanisms related to positive adaptation (e.g., acceptance based mindsets) are also important, as well as interpersonal factors related to the spouse relationship (e.g. love and commitment). Social support is highlighted to reduce the impact of caregiving stress and burden (Brummett et al., 2006; Mitrani et al., 2006) and may have protective effects on the health of spousal dementia caregivers (Monahan & Hooker, 1995). Studies have outlined positive aspects on spousal caregiver health to include high positive affect (Lyons et al., 2004; Robertson et al., 2007), use of problem-solving strategies (Kramer, 1997; Rose et al., 1997), positive illusions of marital relationships (O'Rourke et al., 2011), relationship mutuality (Shim et al., 2011), compassionate love (Monin et al., 2014), as well as self-efficacy, feelings of accomplishment and sense of purpose (Carbonneau et al., 2010).

8.2. Study Limitations

The scope and design limitations of this research must be taken into account. The quantitative analysis used a secondary dataset, the Canadian Community Health Survey (CCHS), which was limited in its choice of variables and measures (e.g., to capture spousal caregiving status, types of physical activity, nutritional health, as well as health status and stress levels). The reliance on self-report data by the CCHS may bias results, for example due to errors from proxy reporting and social desirability effects. Furthermore, there is some selection bias (e.g., the target population must be household residents), which resulted in CCHS respondents of relatively high socio-economic backgrounds and levels of health. In addition, the cross-sectional survey design prevents the investigation of causality in the relationship between variables, such as caregiver status and engagement in health-promoting behaviours. The findings from these analyses should not be generalized to groups that differ by age, nationality or ethno-cultural characteristics from this sample of older Canadians.

Importantly, the physical activity of caregiving measure used in this study is limited as it provides only a crude estimate of spousal caregiving physical activity. The measure, which was a single item from the PASE, introduces some error since the identity of the care receiver is kept open as “another person”. In effect, participants who report caregiving physical activity may be doing so in relation to a person other than their spouse. However, after applying the spousal caregiving filter to the sample, we can assume that the analyses were mostly able to capture spousal caregiving physical activity. Nevertheless, future research should use a better-defined measure. In addition, this measure conceptualized caregiving physical activity to include assistance with activities of daily living, such as food preparation, household cleaning, and personal hygiene (Washburn et al., 1993). Therefore, the measure may be partly overlapping with the spousal caregiving variables (i.e. not completely independent). As a result, this study likely overestimated the effect of spousal caregiving on caregiving physical activity.

With regard to the qualitative work, the sample was recruited using a snowball, convenience sampling technique from community sources. A weakness of this technique is that the experiences of some caregivers, such as socially isolated caregivers, are excluded. The interview participants were relatively well connected to their community and support services. In addition, the small sample size of English-speaking urban dwellers is biased towards the dementia caregiving context. Therefore, the qualitative findings have limited generalizability to other caregiving contexts (e.g., stroke and cancer caregiving) and living circumstances (e.g., rural areas, persons who lack proficiency in English language, participants from lower socio-economic statuses).

8.3. Future Research

This work calls attention to several avenues for future research. Longitudinal panel data would be useful to gain a sense of how health behaviours and health outcomes are affected by the caregiving trajectory, both quantitatively and qualitatively. Future work should ideally conduct multiple surveys and/or interviews per participant over a longer-term basis to follow patterns of engagement in health behaviours with respect to the caregiving career. This would also be useful to determine the extent to which caregiving physical activity and health-promoting behaviours may mediate caregiving stress, and thus the potential for enduring effects in relation to the healthy caregiver hypothesis.

It is important for future work to examine a range of negative and positive health behaviours, both general (e.g., risky behaviours, self-care activities) and specific to caregiving (e.g., stress management, social engagement). Ideally, a measure of healthcare utilization could examine for patterns of service uptake in relation to health prevention and management. Future research should also assess health outcomes beyond health behaviours, especially with respect to mental health, to more completely determine whether spousal caregivers do indeed experience health benefits from caregiving activities. Similarly, measures tailored towards monitoring daily caregiving activities are required to objectively indicate the energy expenditure associated with caregiving demands and thus estimate the potential physical health benefits of the healthy caregiver effect. This could be complimented by the concurrent use of a journal method to gauge caregivers' feelings and perceptions during times of increased or decreased caregiving physical activity. Finally, as this study used a crude indicator of caregiving physical activity, a new measure of physical activity specific to caregiving is required. This measure should ideally be sensitive to different types of caregiving relationships as well as variation in physical activity over time. Furthermore, a specific measure of caregiving physical activity could be compared with total physical activity levels in order to estimate what proportion of caregivers' increased physical activity is actually due to caregiving.

Conceptually, the healthy caregiver effect needs to be reconciled with theories of caregiver stress, especially if hypotheses pertaining to healthy caregivers propose that caregiving physical activity has the capacity to be health-promoting/stress-buffering. The mechanism(s) by which both beneficial and deleterious effects may occur require multi-disciplinary research attention. Ultimately, a caregiver health model is required that can account for the paradoxical nature of caregiving and describe the extent to which positive and negative caregiving effects influence physical and mental health outcomes. Researchers are beginning to revise models of caregiver health to address the benefits and costs of caregiving (e.g. Brown & Brown, 2014). It is clear that the caregiving career is highly fluid and unstable, and thus a life course perspective may also be useful to capture the dynamic influences of the caregiving trajectory on health in later life. This will be an exciting area of research to follow in the coming years.

In a similar vein, the paradoxical dimensions of spousal caregiving are of relevance to Pender's Health Promotion Model (1990; 1996; 2001), which was the guiding framework for this study's quantitative analyses. Pender's Health Promotion Model suggests that engagement in health-promoting behaviours is moderated by individual level factors as well as psychosocial influences. This study highlights factors that may cause older spousal caregivers to be more or less likely to engage in health behaviours (both positive and negative such as leisure-time exercise and binge eating). For example, caregiving burden and stress can be viewed as psychosocial situational influences on health behaviours. As caregiving situational factors are likely to change over time, it is recommended that future work using Pender's Health Promotion Model attempt to capture temporal influences on engagement in health behaviours by older spousal caregivers.

This research also points to the value of adopting an intersectional approach to caregiver health promotion research and policy. It is crucial to consider health behaviours and outcomes at the intersection of dimensions such as social class, ethnicity, sexuality, ability, age, and geography and the impact of institutions and social systems (Hankivsky et al., 2009). In a study of the intersectionality of gender and relationship among caregivers of persons with dementia, Chappell and colleagues (2014) confirm the utility of an intersectionality framework "to articulate the multidimensional and relational nature of caregiving and the social conditions under which well-being is experienced by individuals cohabiting their roles as both family member and care provider" (P5-6). This approach compliments an expanded view of health to include social relations, families and community and the multifaceted concept of well-being (Chappell et al., 2014; Reid et al., 2012).

While unfortunately beyond the scope of the current study, the qualitative data point to a number of additional dimensions to explore in this vast topic area. These relate to: individual level factors, such as socio-economic status, immigrant status, ethno-cultural background; family level factors, such as family care networks (especially in light of societal trends toward remarriage and blended families), marital history, type of intimate relationship, LGBT contexts; intra-personal factors: including identity and role change, resilience and coping, processes of health behaviour change; and the caregiving context: such as other types of family caregivers, transition to institutional care, the post-caregiving trajectory, differences by care-receiver illness, and the urban versus rural setting.

8.4. Study Implications and Conclusion

This thesis contributes to the body of literature on caregiver health outcomes by considering gender differences in health behaviours and the potential for both positive and negative health effects. While research during the 1980s and 1990s was predominantly focused on experiences of stress and burden, work within the last decade and a half has increasingly recognized the potential for caregiving benefits and rewards. There has also been a shift toward a holistic view of health in light of a growing emphasis on health promotion for older adults. This study has highlighted the paradoxical nature of caregiving in relation to both beneficial and deleterious health behaviours, and its mixed methods approach was useful to provide a rich understanding of these multifaceted processes. Older spousal caregivers are likely to have higher levels of overall physical activity compared non-caregivers. However, their engagement in health behaviours related to leisure-time activity and healthy eating are negatively affected by caregiving with important variation by gender and caregiving context. From this work, a number of applied implications can be identified in order to improve caregiver services, supports, technological innovations, and health promotion initiatives.

8.4.1. Caregiver Health Promotion

The everyday importance of health-promoting behaviours for the mental and physical health of caregivers should be underscored. Participation in leisure activities, both physical and nonphysical, is essential for positive health, self-esteem and stress management. The interplay between mental and physical health must be recognized, where positive experiences in one domain can have far-reaching benefits for the other (and conversely with negative experiences). As older spousal caregivers are very likely to have their own health issues to look after, and often comorbidities, it is essential that they understand the importance of regularly engaging in health-promoting behaviours. The health beliefs and perceptions of family caregivers must be shifted so that they recognize their health as a priority and attend to health concerns rather than delay consultation and treatment. Regular health reminders and check-ins, for example by health professionals or through mobile apps, may be helpful to this end. In addition, spousal caregivers require access to educational materials that relay the importance of health promoting activities both immediately and over the long term.

Furthermore, as an increasing number of older persons are required to take on spousal caregiving responsibilities, the rhetoric and negative perceptions surrounding family caregiving must be shifted. Although spousal caregiving is a stressful experience, there are a number of rewards and positive outcomes associated with family caregiving that must be recognized.

8.4.2. Physical Activities

Older spousal caregivers may meet recommended levels of physical activity to achieve health benefits, although it is likely that caregiving physical activity is not perceived as beneficial by caregivers. Exercise programs that compliment the physical activities of caregiving are warranted. These programs may emphasize activities including stretching, yoga, muscle relaxation as well as mindfulness and stress release. Social exercise programs such as walking groups and practical home-based programs may be especially useful for persons who face logistical barriers to participating. In addition, caregivers may require assistance in recognizing and accepting when caregiving physical activity has become too much and additional support is needed. Connection to community based caregiver groups and helping professionals, such as through the Alzheimer’s Society, is especially important in this regard.

8.4.3. Leisure-time Activities

Older spousal caregivers enjoy participating in a range of leisure-time activities, but face a multitude of challenges to maintaining participation throughout the duration of the caregiving career. The diverse set of barriers and enablers affecting spousal caregivers' engagement in leisure activities are important to consider in planning and implementing health promotion programs. Common barriers include: lack of interest, competing responsibilities, poor physical health, perception of own health as low priority, lack of time, dependency of one's partner, limited finances, poor weather, and low English language proficiency. Common enablers include: assistance from friends and family, care workers, day programs, respite care, close proximity of activities to home, encouragement from others to join in, and using personal devices to keep in touch with one's partner. Leisure activity programs for spousal caregivers must be mindful of these factors; flexibility and convenience are key. Special leisure passes and subsidies may also be important to promote uptake and continued engagement in leisure activities among family caregivers.

8.4.4. Healthy Eating

Older spousal caregivers encounter difficulties maintaining healthy eating habits, especially with regard to the logistics of grocery shopping, time and interest in meal preparation, and loss of mealtime socialization. Overly burdened caregivers may engage in negative nutritional behaviours, such as stress eating and skipping meals. Health promotion programs for family caregivers should consider factors surrounding food security. Grocery delivery services and nutritious options for prepared and frozen meals may be areas for intervention. In addition, cooking and mealtime social programs are likely to benefit older caregivers who would like to learn new cooking skills and enjoy mealtime socialization.

8.4.5. Social Support

Social support from family, friends, paid workers, services and agencies is especially important for older spousal caregivers. Some individuals may lack certain types of support due to fragmented family networks, lack of connection to one's community, and/or limited finances. Therefore, access to respite, day programs, home-support as well as new technologies must be ensured. These programs are necessary to support (though not replace) older caregivers and care recipients to maintain a certain quality of life while aging in place. For persons who lack access to financial resources, subsidized programs are required. In addition, persons in the caregivers' family network require information and guidance as to how best to support a parent or sibling in the spousal caregiving role. In particular, spousal caregivers may need emotional and instrumental support from family members as well as regular encouragement to maintain health behaviours. There are clear opportunities for technological innovations such as caregiver apps and web-based platforms to connect older caregivers with multifaceted supports and motivate engagement in health behaviours.

8.4.6. Tailored Interventions

Health promotion initiatives for older spousal caregivers must attend to differential outcomes according to personal attributes, marital history and quality, as well as caregiving length of time, intensity and care receiver illness. Tailored programs based on individual needs may be especially successful in helping older spouses maintain health behaviours throughout the course of the caregiving trajectory.

In particular, gender is a salient factor in the spousal caregiving experience. Both men and women experience challenges related to taking on their spouse's usual roles and responsibilities. Men appear to encounter difficulties related to cooking and housecleaning, while women may face challenges related to managing household finances and preparing meals. Spouses in the caregiving role must be encouraged to plan for the future and be provided with resources that help them to transition into new household roles and responsibilities. Caregiver apps and other technological innovations may be especially helpful for older persons to organize their days, keep track of ongoing responsibilities, and connect with informational resources. In addition, caregiver groups organized by a personal characteristic, such as gender, may be important for individuals to benefit from peer support and to offer guidance to others in similar situations.

To conclude, this work has demonstrated in which ways and why the health behaviours of older spousal caregivers differ in comparison to their non-caregiving counterparts, with special attention to differences between men and women. Although older spousal caregivers, especially women, may experience higher levels of physical activity compared to non-caregivers, it is clear that caregiving physical activity is physically and mentally demanding and qualitatively distinct from leisure-time physical activity. Due to the demands of caregiving, older spousal caregivers often have reduced engagement in health behaviours related to leisure activities and healthy eating. However, there are some instances of positive health effects from caregiving. Moreover, spousal caregivers must re-negotiate their household roles and responsibilities; this has gendered implications on the health behaviours of older persons. The multifaceted and paradoxical dimensions of spousal caregiving must be considered in examining health behaviours in relation to gender and the healthy caregiver effect.

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Appendix A.

Results from Bivariate Analyses

Independent variables by dependent variables

Physical activity score

Table A1.1 shows weak positive associations between physical activity score and spousal caregiver status (r = 0.17, p<0.001), caregiving frequency (tau-b = 0.16, p<0.001), and caregiving length of time (tau-b = 0.15, p<0.001). These bivariate associations support the hypothesis that spousal caregivers have increased levels of physical activity as compared to non-caregivers.

Caregiving physical activity item

Examination of Table A1.1 shows moderate positive associations between the caregiving activity item from the PASE and spousal caregiver status (r = 0.40, p<0.001), caregiving frequency (tau-c = 0.43, p<0.001), and caregiving length of time (tau-c = 0.42, p<0.001). Accordingly, the potential for a healthy caregiver effect among this sample is supported, especially among those who provide care on a more frequent basis.

Time spent engaging in leisure physical activities

In terms of time spent engaging in leisure physical activities, Table A1.1 shows very weak negative associations between engagement in light leisure physical activity and spousal caregiver status (r = -0.03, p<0.05), caregiving frequency (tau-c = -0.01, p<0.05), and caregiving length of time (tau-c = -0.01, p<0.05). Similarly, there are very weak negative associations between engagement in strenuous leisure physical activity and spousal caregiver status (r = -0.03, p<0.05), caregiving frequency (tau-c = -0.02, p<0.01), and caregiving length of time (tau-c = -0.02, p<0.01). While the majority of leisure physical activities examined show no significant differences between spousal caregivers and non-caregivers, findings suggest that spousal caregivers are less likely to spend 30 minutes or more engaging in light or strenuous leisure physical activity as compared to non-caregivers.

Nutritional risk score

Table A1.1 shows very weak negative associations between nutritional risk score and caregiving frequency (tau-b = -0.03, p<0.05) and caregiving length of time (tau-b = -0.03, p<0.05). Accordingly, the healthy caregiver effect may not apply to nutritional behaviours as spousal caregivers who provide care at a greater frequency and/or for an extended period of time are at an increased risk for poor nutrition (as indicated by a low nutritional risk score).

High nutritional risk

In terms of high nutritional risk, very weak positive associations emerge for spousal caregiver status (r = 0.03, p<0.05) and caregiving length of time (r = 0.04, p<0.01). This provides further support that the healthy caregiver effect may not apply to nutritional behaviours.

Frequency of skipping meals

Unexpectedly, none of the associations between frequency of skipping meals and the spousal caregiving variables are statistically significant (Table A1.1). Thus, spousal caregivers and non-caregivers do not appear to differ in their frequency of skipping meals among this sample.

Table A1.1. Bivariate analyses of independent variables by dependent variables

Dependent Variables	Independent Variables					
	Spousal caregiver status		Caregiving frequency		Caregiving length of time	
	Non-CG	Sp-CG	Low/Med	High	<1 year	1+ year
Physical activity score	χ^2 = 159.63*** r = 0.17***		tau-b = 0.16***		tau-b = 0.15***	
0 – 67	33.6%	14.4%	22.9%	10.5%	14.6%	14.3%
68 – 121	33.4%	34.6%	33.8%	35.0%	32.8%	35.6%
122 – 498	33.0%	51.0%	43.3%	54.5%	52.5%	50.1%
Caregiving physical activity item	χ^2 = 902.96*** r = 0.40***		χ^2 = 1035.01*** r = 0.43***		χ^2 = 945.31*** r = 0.42***	
No	84.0%	37.7%	62.2%	27.0%	50.0%	30.5%
Yes	16.0%	62.3%	37.8%	73.0%	50.0%	69.5%
Leisure physical activity: taking a walk	N/S		N/S		N/S	
<30 min/day	42.3%	41.0%	41.8%	40.7%	39.5%	41.8%
>30 min/day	57.7%	59.0%	58.2%	59.3%	60.5%	58.2%
Leisure physical activity: light	χ^2 = 4.54* r = -0.03*		tau-c = -0.01*		tau-c = -0.01*	
<30 min/day	87.2%	89.8%	90.2%	89.6%	90.1%	89.4%
>30 min/day	12.8%	10.2%	9.8%	10.4%	9.9%	10.6%
Leisure physical activity: moderate	N/S		N/S		N/S	
<30 min/day	91.9%	91.7%	90.9%	92.0%	90.7%	92.2%
>30 min/day	8.1%	8.3%	9.1%	8.0%	9.3%	7.8%
Leisure physical activity: strenuous	χ^2 = 6.45** r = -0.03*		tau-c = -0.02**		tau-c = -0.02**	
<30 min/day	88.3%	91.2%	92.0%	91.1%	91.9%	90.8%
>30 min/day	11.7%	8.8%	8.0%	8.9%	8.1%	9.2%

Dependent Variables	Independent Variables					
	Spousal caregiver status		**Caregiving frequency**		**Caregiving length of time**	
	Non-CG	Sp-CG	Low/Med	High	<1 year	1+ year
Leisure physical activity: strength training	N/S		N/S		N/S	
<30 min/day	93.3%	92.1%	92.0%	92.3%	91.0%	92.8%
>30 min/day	6.7%	7.9%	8.0%	7.7%	9.0%	7.2%
Nutritional risk score	N/S		tau-b = -0.03*		tau-b =-0.03*	
6 – 38	31.0%	35.0%	34.9%	35.1%	32.5%	36.5%
39 – 43	34.7%	33.4%	34.9%	32.7%	37.0%	31.2%
44 – 48	34.3%	31.6%	30.2%	30.2%	30.4%	32.3%
High nutritional risk	χ^2 = 4.54* r = 0.03*		N/S		χ^2 = 9.63** r = 0.04**	
Not at high NR	73.7%	70.3%	70.4%	70.2%	74.6%	67.7%
High NR	26.3%	29.7%	29.6%	29.8%	25.4%	32.3%
Frequency of skipping meals	N/S		N/S		N/S	
Never or sometimes	92.5%	91.7%	90.5%	92.2%	88.9%	93.3%
Often or daily	7.5%	8.3%	9.5%	7.8%	11.1%	6.7%

Significance levels: ***p<0.001, **p<0.01, *p<0.05

Independent variables by dependent variables, controlling for gender

Physical activity score

As shown in Table A1.2, the weak positive association between spousal caregiver status and physical activity score is slightly stronger among women (r = 0.20, p<0.001) than men (r = 0.16, p<0.001). This is also true for the weak positive association between physical activity score and caregiving frequency for women (tau-b = 0.19, p<0.001) and men (tau-b = 0.16, p<0.001; Table A1.3), as well as caregiving length of time for women (tau-b = 0.19, p<0.001) and men (tau-b = 0.15, p<0.001; Table A1.4). This suggests that older women who are spousal caregivers have higher levels of physical activity as compared to male spousal caregivers and non-caregiving older adults.

Caregiving physical activity item

Examination of Table A1.2 shows a weak to moderate positive association between the caregiving activity item of the PASE and spousal caregiver status among men (r = 0.38, p<0.001) and a moderate positive association among women (r = 0.42, p<0.001). Table A1.3 shows a moderate positive association between the caregiving activity item and caregiving frequency for both men (r = 0.42, p<0.001) and women (r = 0.43, p<0.001). As shown in Table A1.4, there is a weak positive association between the caregiving activity item and caregiving length of time for men (r = 0.39, p<0.001) and a moderate positive association was found for women (r = 0.42, p<0.001). These associations support the potential for gender differences in the healthy caregiver effect, with caregiving women having higher levels of physical activity as compared to caregiving men.

Time spent engaging in leisure physical activities

Among men only, there are weak positive associations between taking a walk and spousal caregiver status (r = 0.04, p<0.05; Table A1.2), caregiving frequency (tau-c = 0.03, p<0.05; Table A1.3), and caregiving length of time (tau-c = 0.03, p<0.05; Table A1.4). Among women only, there are weak negative associations for engagement in light physical activity and spousal caregiver status (r = -0.06, p<0.01; Table A1.2), caregiving frequency (tau-c = -0.03, p<0.01; Table A1.3), and caregiving length of time (tau-c = -0.03, p<0.01; Table A1.4). Weak/negligible negative associations also emerge among women for engagement in strenuous leisure physical activity and spousal caregiver status (r = -0.04, p<0.05; Table A1.2), caregiving frequency (tau-c = -0.02, p<0.05; Table A1.3), and caregiving length of time (tau-c = -0.02, p<0.05; Table A1.4). This suggests that spousal caregiving women have similar patterns of engagement in leisure physical activities as non-caregiving women, except for light and strenuous physical activity where spousal caregiving women are less likely to report engaging in 30 minutes or more per day. Male spousal caregivers appear to have similar patterns of engagement in leisure physical activities as non-caregiving men, except for taking a walk where spousal caregiving men are more likely to report engaging in 30 minutes or more per day.

Nutritional risk score

As shown in Table A1.4, there is a weak negative association between nutritional risk score and caregiving length of time for men only (tau-b = -0.03, p<0.05). This suggests that older men who are longer-term spousal caregivers are at greater risk for poor nutrition (as indicated by low nutritional risk scores) as compared to non-caregiving men.

High nutritional risk

As shown in Table A1.4, there is a very weak positive association between high nutritional risk and caregiving length of time for women only ($r = 0.04^*$). This suggests that older women who are longer-term spousal caregivers are more likely to be at high nutritional risk as compared non-caregiving women.

Frequency of skipping meals

With regard to frequency of skipping meals, Table A1.2 shows a very weak positive association among men for spousal caregiver status ($r = 0.04$, $p<0.05$). This finding provides modest support for the hypothesis that spousal caregiving men are at an increased likelihood for skipping meals frequently as compared to spousal caregiving women and non-caregivers. The associations do not reach statistical significance for frequency of skipping meals and caregiving frequency or caregiving length of time.

Table A1.2. Bivariate analyses of spousal caregiver status by dependent variables, controlling for gender

Dependent Variables by category	Independent Variable by category			
	Spousal caregiver status			
	Men		Women	
	Non-CG	Sp-CG	Non-CG	Sp-CG
Physical activity score	χ^2 = 84.95***		χ^2 = 99.03***	
	r = 0.16***		r = 0.20***	
0 – 67	28.6%	11.4%	40.4%	17.3%
68 – 121	31.4%	28.0%	36.2%	41.4%
122 – 498	40.0%	60.6%	23.4%	41.2%
Caregiving physical activity item	χ^2 = 467.33***		χ^2 =415.95***	
	r = 0.38***		r = 0.42***	
No	87.5%	45.0%	79.2%	30.2%
Yes	12.5%	55.0%	20.8%	69.8%
Leisure physical activity: taking a walk	χ^2 = 4.94*		N/S	
	r = 0.04*			
<30 min/day	40.4%	34.9%	44.8%	47.2%
>30 min/day	59.6%	65.1%	55.2%	52.8%
Leisure physical activity: light	N/S		χ^2 = 8.53**	
			r = -0.06**	
<30 min/day	86.5%	86.7%	88.2%	93.0%
>30 min/day	13.5%	13.3%	11.8%	7.0%
Leisure physical activity: moderate	N/S		N/S	
<30 min/day	90.3%	91.7%	94.0%	91.9%
>30 min/day	9.7%	8.3%	6.0%	8.1%
Leisure physical activity: strenuous	N/S		χ^2 = 4.64*	
			r = -0.04*	
<30 min/day	87.4%	89.7%	89.7%	93.0%
>30 min/day	12.6%	10.3%	10.3%	7.0%

Dependent Variables by category	**Independent Variable by category**			
	Spousal caregiver status			
	Men		Women	
	Non-CG	Sp-CG	Non-CG	Sp-CG
Leisure physical activity: strength training	N/S		N/S	
<30 min/day	92.7%	90.8%	94.1%	93.7%
>30 min/day	7.3%	9.2%	5.9%	6.3%
Nutritional risk score	N/S		N/S	
6 – 38	28.3%	31.2%	34.8%	38.9%
39 – 43	36.2%	38.0%	32.5%	28.8%
44 – 48	35.4%	30.8%	32.7%	32.4%
High nutritional risk	N/S		N/S	
Not at high NR	76.7%	74.0%	69.6%	66.4%
High NR	23.3%	26.0%	30.4%	33.6%
Frequency of skipping meals	χ^2 = 4.57* r = 0.03*		N/S	
Never or sometimes	92.6%	89.7%	92.4%	93.5%
Often or daily	7.4%	10.3%	7.6%	6.5%

Significance levels: ***p<0.001, **p<0.01, *p<0.05

Table A1.3. Bivariate analyses of caregiving frequency by dependent variables, controlling for gender

Dependent Variables by category	Independent Variable by category Caregiving frequency Men Non-CG	 Low/Med	 High	 Women Non-CG	 Low/Med	 High
Physical activity score		tau-b = 0.16***			tau-b = 0.19***	
0 - 67	28.6%	19.6%	7.0%	40.4%	27.4	13.8
68 - 121	31.4%	30.4%	26.9%	36.2%	38.5	42.5
122 - 498	40.0%	50.0%	66.1%	23.4%	34.2	43.7
Caregiving physical activity item		χ^2 = 558.41*** r = 0.42***			χ^2 = 454.35*** r = 0.43***	
No	87.5%	69.4%	32.3%	79.2%	52.5	22.1
Yes	12.5%	30.6%	67.7%	20.8%	47.5	77.9
Leisure physical activity: taking a walk		tau-c = 0.03*			N/S	
<30 min/day	40.4%	38.0%	33.3%	44.8%	46.6%	47.4%
>30 min/day	59.6%	62.0%	66.7%	55.2%	53.4%	52.6%
Leisure physical activity: light		N/S			tau-c = -0.03**	
<30 min/day	86.5%	85.4%	87.3%	88.2%	96.6%	91.7%
>30 min/day	13.5%	14.6%	12.7%	11.8%	3.4%	8.3%
Leisure physical activity: moderate		N/S			N/S	
<30 min/day	90.3%	90.5%	92.0%	94.0%	91.5%	92.0%
>30 min/day	9.7%	9.5%	8.0%	6.0%	8.5%	8.0%
Leisure physical activity: strenuous		N/S			tau-c = -0.02*	
<30 min/day	87.4%	88.6%	90.3%	89.7%	96.6%	91.7%
>30 min/day	12.6%	11.4%	9.7%	10.3%	3.4%	8.3%

Dependent Variables by category	Independent Variable by category					
	Caregiving frequency					
	Men			Women		
	Non-CG	Low/Med	High	Non-CG	Low/Med	High
Leisure physical activity: strength training		N/S			N/S	
<30 min/day	92.7%	90.4%	91.0%	94.1%	94.0%	93.6%
>30 min/day	7.3%	9.6%	9.0%	5.9%	6.0%	6.4%
Nutritional risk score		N/S			N/S	
6 – 38	28.3%	38.6%	27.6%	34.8%	29.9%	42.0%
39 – 43	36.2%	34.2%	39.9%	32.5%	35.9%	26.1%
44 – 48	35.4%	27.2%	32.6%	32.7%	34.2%	31.9%
High nutritional risk		N/S			N/S	
Not at high NR	76.7%	67.1%	77.7%	69.6%	74.6%	63.5%
High NR	23.3%	32.9%	22.3%	30.4%	25.4%	36.5%
Frequency of skipping meals		N/S			N/S	
Never or sometimes	92.6%	88.6%	90.3%	92.4%	93.2%	93.9%
Often or daily	7.4%	11.4%	9.7%	7.6%	6.8%	6.1%

Significance levels: ***p<0.001, **p<0.01, *p<0.05

Table A1.4. Bivariate analyses of caregiving length of time by dependent variables, controlling for gender

Dependent Variables by category	Independent Variable by category					
	Caregiving length of time					
	Men			Women		
	Non-CG	<1 year	1+ year	Non-CG	<1 year	1+ year
Physical activity score		tau-b = 0.15***			tau-b = 0.19***	
0 – 67	28.6%	12.2%	10.9%	40.5%	16.8%	17.9%
68 – 121	31.4%	25.6%	29.4%	36.1%	39.6%	42.3%
122 – 498	40.0%	62.2%	59.7%	23.4%	43.8%	39.8%
Caregiving physical activity item		χ^2 = 494.57*** r = 0.39***			χ^2 = 434.56*** r = 0.42***	
No	87.5%	57.6%	37.9%	79.2%	42.4%	22.6%
Yes	12.5%	42.4%	62.1%	20.8%	57.6%	77.4%
Leisure physical activity: taking a walk		tau-c = 0.03*			N/S	
<30 min/day	40.4%	29.9%	37.9%	44.8%	48.8%	46.0%
>30 min/day	59.6%	70.1%	62.1%	55.2%	51.2%	54.0%
Leisure physical activity: light		N/S			tau-c = -0.03**	
<30 min/day	90.3%	92.7%	90.8%	88.2%	92.4%	93.1%
>30 min/day	9.7%	7.3%	9.2%	11.8%	7.6%	6.9%
Leisure physical activity: moderate		N/S			N/S	
<30 min/day	30.2%	23.2%	26.6%	94.0%	88.8%	93.8%
>30 min/day	45.8%	53.0%	48.8%	6.0%	11.2%	6.2%
Leisure physical activity: strenuous		N/S			tau-c = -0.02*	
<30 min/day	87.4%	88.4%	90.4%	89.7%	95.9%	91.2%
>30 min/day	12.6%	11.6%	9.6%	10.3%	4.1%	8.8%
Leisure physical activity: strength training		N/S			N/S	
<30 min/day	92.7%	90.3%	90.8%	94.1%	91.8%	94.9%
>30 min/day	7.3%	9.7%	9.2%	5.9%	8.2%	5.1%

Dependent Variables by category	Independent Variable by category					
	Caregiving length of time					
		Men			Women	
	Non-CG	<1 year	1+ year	Non-CG	<1 year	1+ year
Nutritional risk score		tau-b = -0.03*			N/S	
6 – 38	28.3%	32.3%	31.0%	34.8%	33.1%	42.5%
39 – 43	36.2%	34.1%	39.8%	32.5%	39.6%	22.0%
44 – 48	35.4%	33.5%	29.3%	32.7%	27.2%	35.5%
High nutritional risk		N/S			χ^2 = 8.23*	
					r = 0.04*	
Not at high NR	76.7%	75.6%	73.0%	69.7%	73.5%	62.0%
High NR	23.3%	24.4%	27.0%	30.3%	26.5%	38.0%
Frequency of skipping meals		N/S			N/S	
Never or sometimes	92.6%	85.5%	92.2%	92.4%	91.8%	94.5%
Often or daily	7.4%	14.5%	7.8%	7.6%	8.2%	5.5%

Significance levels*:* ***p<0.001,**p<0.01,*p<0.05

Appendix B.

Study Recruitment Material

SFU
SIMON FRASER UNIVERSITY

Invitation to participate in research on

SPOUSE CAREGIVING

Are you an older adult (65+) who has experience looking after your spouse or partner due to their health? If so, I would like to hear your story.

I am graduate student in Gerontology at Simon Fraser University. I would like to know how the experience of taking care of a spouse/partner influences health behaviours such as **healthy eating**, **exercise** and **stress management.**

Your participation in this study would involve one session, which would be about 60 to 90 minutes long. In appreciation for your time, you will receive a $5 gift card to Tim Hortons.

For more information about this study, or to volunteer for this study, please contact:

Melissa Badger
Department of Gerontology, Simon Fraser University

Appendix C.

Participant Consent Form

Consent Form

Gender Differences in the Health Behaviours of
Older Spousal Caregivers: A Mixed Methods Study

Who is conducting the study?
Principal Investigator: Melissa Badger
Affiliation: Department of Gerontology, Simon Fraser University

This research is for a graduate degree in Gerontology and the results of this study will be reported in a graduate thesis (public document).

Why should you take part in this study?
We want to learn more about how to help older people who have experience caregiving for their spouse/partner. This study will help us learn more about the health behaviours (for example exercise, eating habits, and health monitoring) of spousal caregivers. You are invited to take part in this research study because you have experience as a family caregiver to a spouse/partner, live in Metro-Vancouver, and are aged 65 or older.

Your participation is voluntary
Your participation is voluntary. You have the right to refuse to participate in this study. If you decide to participate, you may still choose to withdraw from the study at any time without any negative consequences.

What happens if you say "Yes, I want to be in the study"?
If you say 'Yes', here is how we will do the study:

- We will ask you to participate in a single conversational interview, which will last between 60 to 90 minutes
- This interview will take place in a mutually agreed upon time and location between you and the interviewer (Melissa Badger)
- You will be asked about your personal experiences in caregiving for your spouse/partner and how these experiences have influenced your health behaviours
- The interview will be audio-recorded, as this is necessary in order to analyze this research

- After the research has been completed, you will have the option to be mailed a report on the study findings

Is there any way being in this study could be bad for you?
We do not think there is anything in this study that could harm you or be bad for you. Some of the questions we ask might seem sensitive or personal. You do not have to answer any question if you do not want to. Please let the study staff know if you have any concerns.

What are the benefits of participating?
There may or may not be direct benefits to you from taking part in this study. Personal benefits to you may include having the opportunity to share your experiences. The results from this study may be helpful for future research on older spousal caregivers, as well as for family caregiving policy and/or creating community programs. However, these hoped-for benefits may or may not occur as a result of this single research project.

Will you be paid for taking part in this research study?
You will receive a $5 gift card to Tim Hortons for your participation in this study.

How will your identity and privacy be protected?
Your confidentiality will be respected. Participants will not be identified by name in any reports of the completed study. If you give your consent to participate, you will have your identity disguised using an ID number. These ID numbers will be used in all study documents and linked to pseudonyms in the final study report. Any details that you share regarding your life situation that could be linked to your identity will be excluded from the report.

The audio recording of your interview will be destroyed after written transcripts have been made. Data records will be stored as locked computer files on the Principal Investigator's password protected computer. The file linking you to your ID number will be stored as a password-protected file on a password-protected USB stick kept in a locked filing cabinet in a locked office.

Study results
The main study findings will be reported in a graduate thesis. The results may also be published in an academic journal, presented at an academic

Who can you contact if you have questions about the study?
If you would like additional information or have any concerns about this study, please feel free to contact Melissa Badger.

Who can you contact if you have complaints or concerns about the study?
If you have any concerns about your rights as a research participant and/or your experiences while participating in this study, you may contact Dr. Jeffrey Toward, Director, Office of Research Ethics.

How will my personal information/research data be used in the future?
There are no plans for future use of this research data. The findings may be used to influence future avenues of research and for educational purposes (e.g. by caregiver support groups).

Participant Consent and Signature

Taking part in this study is entirely up to you. You have the right to refuse to participate in this study. If you decide to take part, you may choose to pull out of the study at any time without giving a reason and without any negative impact on your life.

- Your signature below indicates that you have received a copy of this consent form for your own records.
- Your signature indicates that you consent to participate in this study.

Participant Signature   Date (yyyy/mm/dd)

Printed Name of the Participant signing above

If you would like to receive a report on the study findings, please provide your mailing address here:

Appendix D.

Interview Guide and Background Questionnaire

Gender differences in the Health Behaviours of
Older Spousal Caregivers: A Mixed Methods Study

Interview Guide – DRAFT
*Numbers are main questions; letters are “probing questions” as required

Caregiving

1. For how long have you been looking after your spouse due to their health condition(s)?
    a. Does the type of support you provide fluctuate from day to day or week to week, or has it been rather constant over time?

2. How did you come to be in this role, looking after your spouse?
    a. Do you receive support or help from others?

3. What do you enjoy most about caring for your spouse?
    a. What is the hardest thing about looking after your spouse?

Physical Activity

4. Since you began caring for SPOUSE, have the things you do to be physically active changed?
    a. In what ways have you noticed change? OR Why has it not changed?
    b. What types of activities did you do for regular exercise before your spouse became ill/was diagnosed?
    c. What types of activities do you currently do, if any, for exercise? How often?

5. Do you find looking after your spouse to be physically tasking or physically demanding?
    a. In what ways? OR Why not?
    b. What types of caregiving activities do you regularly engage in?
    c. Would you say that being a caregiver is a physically active role?

6. Are you satisfied with your current levels of physical activity?
    a. Do you desire to be more or less physically active?
    b. What kinds of things prevent you from being more physically active?
    c. What kinds of things enable you or motivate you to be physically active?

Eating Habits

7. Since you began caring for SPOUSE, have your eating habits changed?
    a. In what ways have you noticed change? OR Why has it not changed?
    b. What were your nutritional habits like before your spouse became ill/was diagnosed?
    c. How have mealtimes changed since your spouse became ill/was diagnosed?

8. Are you satisfied with your current diet and mealtimes?
    a. In what ways? OR Why not?

    b. What kinds of things prevent you from eating healthy?
    c. What kinds of things enable or motivate you to eat healthy?

General Health

9. Since you began caring for SPOUSE, has your overall health changed?
    a. In what ways have you noticed change? OR Why has it not changed?
    b. Do you feel healthy?
    c. Do you feel like you need to improve your health? Why or why not?

10. Since you began caring for SPOUSE, have the things you do to take care of your own health changed?
    a. In what ways have you noticed change? OR Why has it not changed?
    b. What kinds of things did you do to take care of your own health (or for self-care) before your spouse became ill/was diagnosed?
    c. What kinds of things do you currently do to look after your own health (or for self-care)?
    d. What are the barriers for you to look after your own health?
    e. What kinds of things enable or motivate you to look after your own health?

That covers everything I wanted to ask, is there anything you care to add?

Background Questionnaire
Interview ID:

What is your gender?

In what year were you born?

Ethnic background:

Country of birth:

Year of immigration (if applicable):

What is your main activity/occupation (current or former):

What year did you and your spouse marry?

Gender of spouse:

In what year was your spouse born:

Spouse’s health condition/diagnosis:

Approximate year of diagnosis: