

Intimacy as a Mediator of the Relationship between Caregiver Burden and Marital
Satisfaction

By

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Abstract

As the baby boomer generation ages, the need for caregivers will increase. Research has demonstrated that the burden of providing care can have potentially negative effects on the physical and mental health of caregivers and on marital satisfaction. However, the role of intimacy has been overlooked. Given that spouses often take care of their husbands or wives, an understanding of how intimacy may influence the relationship between caregiving and marital satisfaction needs to be further investigated.

This dissertation investigated the relationship between caregiver burden, marital satisfaction, and intimacy. The study employed nationally representative data from the National Social Life, Health, and Aging Project (NSHAP) to test intimacy as a potential mediator of the relationship between caregiver burden and marital satisfaction. Type of chronic health condition, age, and gender were tested as moderators of these relationships.

The results indicated that caregivers who reported greater levels of satisfaction from physical and emotional intimacy experienced greater marital satisfaction. Older caregivers, however, experienced less marital satisfaction. The study also revealed different patterns of caregiving by male and female caregivers. Consistent with previous research, women reported spending more time on providing care than men. Frequency of intimate behaviors was significantly correlated with depressive symptoms among male but not female caregivers.

The SPSS macro PROCESS was employed to test the hypothesis about the mediating role of intimacy in the relationship between caregiver burden and marital

satisfaction. The frequency of intimate behaviors as well as satisfaction from intimacy were tested as mediators of the relationship between hours per week spent providing care and positive versus negative marital satisfaction. These mediator models were evaluated for the overall sample of 100 caregivers as well as separately for male versus female caregivers. Little support was found for intimacy as a mediator in the relationship between caregiving and marital satisfaction. Additional analyses used hierarchical regression to examine the moderating effects of age, gender, and type of chronic health condition on the relationships among caregiving, marital satisfaction, and intimacy. Neither age, gender, or type of chronic health condition was a significant moderator of these relationships.

Despite these null findings, this study has important implication for health care professionals. It is important to recognize the influence of intimacy on marital satisfaction. Appropriate interventions for older couples affected by chronic health conditions should be developed to restore intimacy, both the frequency of intimate behaviors and satisfaction from intimacy.

A primary limitation of this study was the lack of a measure of caregiver burden in the NSHAP database as well as the reliance on cross-sectional data. Future research should address these limitations by assessing both objective and subjective measures of caregiver burden as well as collecting dyadic data as well as data from multiple time points, reflecting changing patterns of caregiving, burden, intimacy, and marital satisfaction.

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Chapter 1: Literature Review

The population of adults aged 65 or above in the U.S. in 2010 was estimated to be 40 million, which represented 13% of the population (U.S. Census Bureau, 2011). Due to the aging Baby Boomer generation, it is projected that by 2030 the number of individuals aged 65 and above will be about 72.1 million and it will constitute 19% of the U.S. population (Administration on Aging, 2012). Longer life expectancy and a significant decline in number of acute diseases, due to early detection and advances in medical technology, have contributed to the rise in prevalence of chronic diseases (Fries, 1980). The increasing prevalence of chronic health conditions has also been associated with lifestyle factors, such as tobacco use, lack of physical activity, or poor diet (Willett, 2002). Recent estimates indicate that about 80% of older adults have one chronic health condition, and 50% have at least two (Centers for Disease Control and Prevention, 2011). Older adults are at risk for multiple, comorbid chronic health conditions because chronic health conditions become more common with age (Barile et al., 2012).

A chronic health condition is a non-communicable illness that requires a long period of treatment, does not resolve spontaneously, is seldom fully cured (Greene, 2009) and requires ongoing medical care (Anderson, 2004). Chronic health conditions such as cancer, dementia, cardiovascular disease (primarily stroke and heart disease), and diabetes are among the major causes of adult mortality and disability (Mackay & Mensah, 2004). These conditions may affect older adults' physical and mental health (Anderson, Freedland, Clouse, & Lustman, 2001; Miller et al., 2008) and may cause worse physical functioning (Boult, Kane, Louis, Boult, & McCaffrey, 1994). Because chronic health conditions are also likely to influence individuals' ability to perform

activities of daily living, ADLs (den Ouden, Schuurmans, Mueller-Schotte, Brand, van der Schouw, 2013; Johnson & Wolinsky, 1993), oftentimes older adults with a chronic health condition need to rely on spouses or family caregivers to provide assistance with tasks such as bathing and dressing. The majority of individuals with chronic health conditions are cared for at home by family members, in many cases by spouses (Huyck, 1996, National Alliance for Caregiving, 2009).

In the context of increasing numbers of older adults with chronic health conditions, the health of care-recipients and their caregivers has become an important issue. Some spouses may experience positive feelings as a result of caregiving such as companionship, fulfillment, enjoyment, and the satisfaction of meeting an obligation and providing improved quality of life to a loved one (Cohen, Colantonio, & Vernich, 2002; Haley, LaMonde, Han, Burton, & Schonwetter, 2003; Motenko, 1989). However, caregiving may also have serious negative consequences for the caregiver's health. The adverse impact of caregiving may also lead to caregiver burden, which in turn may alter marital satisfaction (Garand et al., 2007; Lewis, Woods, Hough, & Bensely, 1989).

Caregiver Burden

Caregiving refers to the “activities and experiences involved in providing care, help and assistance to relatives who are unable to provide for themselves” (Pearlin, Mullan, Semple, & Skaff, 1990). The physical and emotional demands associated with attending to the needs of an individual with a chronic health condition have been the subject of considerable research (e.g., Pinquart & Sörensen, 2003a, 2003b; Strang, 2001). Many studies have demonstrated that caring for a spouse with a chronic health condition can be a stressful experience associated with negative health outcomes such as anxiety, depression, and decreased immune function (e.g., Keating & Fast, 1999; Ostwald,

Hepburn, & Caron, 2009).

Grand and Sainsbury (1963) were the first to suggest that the chronic strain associated with providing care may lead to caregiver burden. Since then, the concept of burden has been adopted by other researchers investigating negative repercussions of providing care. Although caregiver burden is conceptualized differently in various studies, it often refers to the financial, physical, and emotional effects of caring for an adult with a disabling condition (Carretero, Garces, Rodenas, & Sanjose, 2009; George & Gwyther, 1986; Kim, Chang, Rose, & Kim, 2011). For example, Zarit, Reever, and Bach-Person (1980) conceptualized caregiver burden as a state resulting from the action of taking care of a dependent or elderly person, a state which threatens the physical and mental health of the caregiver. Caregiver burden has been differentiated into objective and subjective burden. Objective burden involves events and activities associated with negative caregiving experiences and the practical consequences of physical and behavioral changes of the care receiver, while subjective burden is associated with the emotional reactions of the caregiver burden, such as worry, anxiety, frustration, and fatigue (Montgomery, Gonyea, & Hooyman, 1985). Because of its objective and subjective nature, the caregiver burden is a multi-dimensional experience (Carretero et al., 2009).

The level of stress experienced by a caregiver varies with the type of chronic health condition experienced by the care recipient. Reese, Gross, Smalley, and Messer (1994) found that caregivers of persons with Alzheimer's disease were more distressed psychologically than caregivers of persons who have had strokes. In their study, they contrasted caregivers of persons with Alzheimer's disease, which has a gradual onset,

with caregivers of persons who are suffering from a previous stroke, with an abrupt onset. The objective duration of caregiving, which was indicated by years since diagnosis, was the same for both samples. The authors hypothesized that caregivers of persons with Alzheimer's disease, possibly unbeknownst to themselves, had been caregivers for years prior to the date that they identified as the point of onset of caregiving. In a review of studies of caregiving involving different types of chronic conditions, Biegel, Sales, and Schulz (1991) concluded that caregivers of persons whose chronic condition had a sudden onset, for example, a heart attack, a diagnosis of cancer, experience a peak of psychological distress after the initial diagnosis, followed by a reduction in distress as time passes. However, this pattern of peak caregiver stress following diagnosis was not observed in caregivers of persons whose chronic condition has a gradual onset, for instance, dementia. Caring for a person with dementia can have a greater impact on decline in marital satisfaction than caring for a person with other chronic health conditions. Research has shown that problems with communication, cognitive, emotional, and personality changes that accompany dementia can be detrimental to marital satisfaction (Gallagher-Thompson, Dal Canto, Jacob, & Thompson, 2001; Wright, 1998).

Caregiver burden is an appraisal of stress that varies with individual characteristics of the care providers, care recipients, and on cultural contexts (Lawton, Kleban, Moss, Rovine, & Glicksman, 1989). The elements contributing to the high levels of caregiver burden may be generally grouped into situational and psychological factors. The most common situational factors are financial burden, lack of social support, role overload, duration of caregiving, and the socio-cultural characteristics of the care recipients. The quality of the relationship between caregiver and care recipient prior to

and after the onset of the chronic health condition, as well as the caregiver's personality constitute the psychological aspects of the caregiver burden.

Consequences of caregiver burden. Caregiving contributes to a higher risk for the development of mental and physical health problems (Schulz, Visintainer, & Willimson, 1990; Vitaliano, Zhang, & Scanlan, 2003). Caregivers of individuals with chronic health conditions are at greater risk for cardiovascular diseases, depression, physical exhaustion, weakened immune system and mortality (Pinquart & Sörensen, 2003a; Vitaliano et al., 2003) than non-caregivers are. With respect to the nature of the problems, the effect of caregiver burden can be divided into two broader groups: mental health and physical health problems.

Mental health. A great deal of research has shown that caregivers have higher levels of mental complications when compared to non-caregivers (Pinquart & Sörensen, 2003a, 2003b). The most notable and detrimental outcome of caregiver burden is depression (Chang, Chiou, & Chen, 2010; Pinquart & Sörensen, 2003a). Depression is a very serious and alarming consequence of caregiver burden because depressed caregivers have been found to be more likely to have coexisting anxiety disorders, substance abuse or dependence issues, and may be at risk for a chronic health condition (Spector & Tampi, 2005).

Increased anxiety and depression, especially in the case of caregivers for those with dementia, may lead to placement of the care recipient in a long-term care institution. This fact is often reflected in research studies, because caregiver burden and mental health are strong predictors of institutionalization (Dunkin & Anderson-Hanely, 1998). However, depression and anxiety disorders can persist and even worsen after the

placement of the care recipient in a long term care facility. A significant number of caregivers report depressive symptoms and anxiety to be as high after institutionalization as they were when care recipient was in the home (Schulz et al., 2004).

As a result of increased stress due to the caregiving demands, caregivers report more anxiety symptoms, increased alcohol consumption, and the usage of psychotropic medications more often than non-caregivers (U.S. Department of Health and Human Services, 2010). Caregivers also express feeling frustrated, drained, guilty, even angry or helpless as the result of providing care (Center on Aging Society, 2005). Due to such a multifaceted nature of the burden, caregivers often feel a loss of self-identity, lower levels of self-esteem, constant worry, or uncertainty (Center on Aging Society, 2005). Moreover, caregivers report less self-acceptance, feel less effective, and less in control of their lives compared to non-caregivers (Marks, Lambert, & Choi, 2002; Pinqart & Sörensen, 2003a).

Physical health. Even though the physical consequences of caregiving have received less attention than psychological outcomes, there are findings from a myriad of studies indicating that caregiver burden has negative repercussions on physical health of the caregivers (Kim et al., 2011; Brodaty, Green, & Low, 2005; Schulz & Beach, 1999). Some studies revealed that one-half of caregivers suffer from at least one chronic health condition themselves (Schulz, O'Brien, Bookwala, & Fleissner, 1995; Collins & Swartz, 2011). The detrimental effects of caregiving on physical health stem from the primary stressors experienced by the caregivers, such as the duration and type of care provided, and the functional and cognitive disabilities of the care recipient. The care recipient's behavior problems, cognitive impairments, functional disabilities, vigilance demands, and

caregiver and patient coresidence are also often mentioned among factors related to the decline in the caregiver's physical health (Pinquart & Sörensen, 2003a, 2003b; Schulz et al., 1995; Vitaliano et al., 2005).

Caregivers have a diminished immune response, which leads to frequent infection and increased risk of cancers (Kiecolt-Glaser, Dura, Speicher, Trask, & Glaser, 1991). For example, caregivers have a 23% higher level of stress hormones and a 15% lower level of antibody responses (Vitaliano et al., 2003) than non-caregivers. Caregivers also suffer from slower wound healing (Center on Aging Society, 2005) compared to non-caregivers. These findings are very important because prolonged physiological reactions to heightened stress hormones can lead to increased risks of health problems such as diabetes, hypertension, and reduced resistance to viruses (Vitaliano et al., 2003).

Caregiving often includes physically demanding and exhausting tasks such as lifting a care recipient or assisting with basic needs (e.g., eating, bathing). This may be especially challenging for caregivers of advanced age because their physical strength deteriorates and they begin to experience their own age-related health problems, while still providing care. Caregivers can experience several physical complications, including back injuries, arthritis, hypertension, gastric ulcers, and headaches (Sawatzky & Fowler-Kerry, 2003). Even though it is still unclear whether or not caregiving actually causes these physical impairments, it is likely that performing caregiving procedures may exacerbate these health conditions. Caregivers neglect their own health needs or hide information about their health problems (Chang et al., 2010; Lee, Colditz, Berkman, & Kawachi, 2003). In addition, Grunfeld et al. (2004) found that caregivers are less likely to engage in preventative health behaviors than non-caregivers.

Although the negative effects of caregiving on physical health are less intensive than the psychological effects (Schulz & Sherwood, 2008), both of them are important because they are linked and their effects may be super-additive. Depression and sleep disturbance associated with providing care can create more physical health complications for the caregiver. The reverse is also true; mental health problems related to caregiver burden affect the physical health of a caregiver. For instance, poor psychological health may lead to insomnia which may quickly lead to physical exhaustion.

Caregiver burden and spousal caregivers. Due to increased life expectancy and increased prevalence of chronic health conditions, a growing number of older couples have to face the transition to a caregiving / care recipient relationship. Caring for a spouse or partner with a chronic health condition is often a role that is imposed without choice or notice (Winter, Bouldin, & Andresen, 2010). Some studies demonstrate that spouses of persons with chronic health conditions are at risk of stress and adjustment-related problems, including physical and psychological health impairments, disruptions in family dynamics, decreased relationship satisfaction, and decreased quality of life (Burton, Newsom, Schulz, Hirsch, & German, 1997; Chronister & Chan, 2006; De Frias, Tuokko, & Rosenberg, 2005).

Spousal caregivers are a unique group of family caregivers. Zarit, Davey, Edwards, Femia, and Jarrot (1996) found that spousal caregivers have been shown to be more susceptible to feelings of stress than other caregivers. Furthermore, spouses experience fewer caregiving rewards (Drummond et al., 2013) and they may have fewer resources (Seltzer & Li, 2000) than other caregivers. Compared to other caregivers, spouses spend more time in caregiving (Keating & Fast, 1999). Consequently, it may be

difficult for them to manage work while caring for a spouse. In addition, spousal caregivers may experience increased burden due to age-associated health problems because caregivers of older people are themselves growing older. Of those caring for someone aged 65 and older, the average age is 63 years old with one-third of these caregivers in fair to poor health (Administration on Aging, 2012). Connel and Gibson (1997) found that the caregiver's own health problems are often reported to interfere with the provision of care. It may be more difficult to provide care if a caregiver is also affected by age-related cognitive and physical changes and functional impairments.

Psychological stress experienced by spousal caregivers of individuals with chronic health conditions often results from performing the dual role of spouse and caregiver (Montgomery, Rowe, & Kosloski, 2007). Role strain theory offers a useful explanation of how over-demanding roles may cause stress. This theory posits that multiple roles may result in competition for an individual's time while draining psychological and physical resources (Goode, 1960). Schumacher et al. (2008) identified two levels of role strain in caregivers. At the task specific level, role strain is characterized by behaviors that impair caregiving and result in difficulty completing tasks. A more global level of role strain occurs when the spousal caregiver believes that the entire caregiving situation is stressful, what in turn may lead to higher levels of depression.

To sum up, spouse who are caregivers of individuals with chronic health conditions are at risk for stress due to role strain. As a result of providing care, their quality of life may decrease and they are also at risk for compromised health.

Marital Satisfaction

The subject of marital satisfaction has been of interest to both psychologists and sociologists. Marital satisfaction can be defined as “the relative degree of pleasure and displeasure associated with the relationship” (Haynes et al., 1992, p. 473). Although there are many definitions of marital satisfaction, it is generally defined as a person’s overall evaluation of his or her marriage (Clements, Cordova, Markman, & Laurenceau, 1997). A review of marital research reveals that marital satisfaction has been measured in a number of ways. Some of the assessments consist of only 3 items, for example, Kansas Marital Satisfaction Scale (Schumm, Nicols, Schectman, & Grigsby, 1983), whereas others consist of 280 items, for example, the Marital Satisfaction Inventory (Snyder, 1997). In addition, in order to measure marital satisfaction researchers use a number of terms, such as “satisfaction,” “quality,” “adjustment,” “success,” and “happiness.”

One of the earliest findings in the marital satisfaction literature is that partners’ satisfaction is likely to be high around the time of the wedding and then begins to decline (Burgess & Wallin, 1953). Marital satisfaction has also been described as curvilinear, declining following the birth of the first child but increasing once the children have left the parental home (Van Laningham, Johnson, & Amato, 2001). However, many of the studies of marital satisfaction relied on cross-sectional designs (e.g., Blood & Wolfe, 1960; Dentler & Pineo, 1960) and therefore provided limited information about how marital satisfaction unfolds over time. The U-shaped pattern of marital satisfaction may be an artifact of cross-sectional research. In addition, Glenn (1990) in his critical review argues that this conclusion is based on data that excluded marriages of poor quality which ended in divorce, leaving only marriages of higher quality among individuals of older ages. It may be a misconception that marital satisfaction improves in later life, because

many unhappy marriages are dissolved before then. Longitudinal evidence regarding trajectories of marital satisfaction suggests an overall decline rather than a U-shaped pattern (Umberson, Williams, Powers, Liu, & Needham, 2006). Van Laningham, Johnson, and Amato (2001), in their analysis of data from a national 17-year, 5-wave panel sample, found that the steepest decline in marital satisfaction occurs during the early (within the first seven years) and late (after forty) years of marriage.

Married men and women, compared to their single counterparts, have better physical and mental health (e.g., Robles, Slatcher, Trombello, & McGinn, 2014; Waite & Gallagher, 2000). However, the number of benefits associated with being married depends on marital satisfaction. Marital satisfaction is positively associated with both mental and physical health (Kiecolt-Glaser et al., 1987; Wickrama, Lorenz, Conger, Matthews, & Elder, 1997). For instance, individuals who were experiencing marital satisfaction reported higher levels of overall happiness (Waite & Gallagher, 2000), lower risk of depression (Coyne & DeLongis, 1986), lower rates of mental illness (Moss & Schwebel, 1993), and lower mortality rates (Johnson, Backlund, Sorlie, & Loveless, 2000) than unmarried individuals. Marital satisfaction may also lessen the consequences of poor health (Bookwala, 2005). Conversely, marital dissatisfaction predicts increases in depressive symptoms over time (Culp & Beach, 1998; Fincham, Beach, Harold, & Osborne, 1997) and is hypothesized to increase negative marital elements such as verbal and physical aggression (Proulx, Helms, & Buehler, 2007). Umberson et al. (2006) found that poor marital satisfaction may accelerate declines in self-rated health over time. The salience of the marital satisfaction increases with age (Choi & Marks, 2008; Umberson et al. 2006), therefore, the influence of marital satisfaction on well-being may be especially

important for married older adults who are simultaneously at greater risk for chronic health conditions.

Marital satisfaction in context of caregiving can be also understood from the social exchange theory that was developed by Molm and Cook (1995). Social exchange theory has been the basis of research into the impact of cancer, stroke, and dementia on couples (e.g., McPherson, Wilson, Chyurlia, & Leclerc, 2010; Wright & Aquilino, 1998). This theory assumes that individuals attempt to maximize rewards and minimize costs in their social interactions. As a consequence, individuals who receive more help or support than they provide will evaluate their interactions more positively and experience higher well-being than those who receive less than they give. The imbalance in an exchange relationship leads to dissatisfaction. Applied to caregiving situations, this suggests that when care recipients reciprocate the care and assistance provided to them, their caregivers will experience more satisfaction with the relationship. However, the ability of the care recipient to reciprocate the received support is related to his or her functional limitations.

The presence of a chronic health condition in one partner can significantly affect the marital satisfaction, as both members of the dyad have to adjust to their new roles. A sizable body of research exists on how couples cope with the stresses associated with managing a chronic health condition (Revenson, Kayser, & Bodenman, 2005) and how chronic health condition influences marital satisfaction (Burman & Margolin, 1992; Kiecolt-Glaser & Newton, 2001). The burden of providing care to a spouse with a chronic health condition poses a threat to marital satisfaction, mostly because of the behavioral and physical changes in people with chronic health conditions. For example,

de Vugt et al. (2003) examined the premorbid and current marital satisfaction among fifty-three spousal caregivers and found that the majority of them experienced a deterioration in marital satisfaction due to the care recipient's apathy and problems with communication. Booth and Johnson (1994) using a national sample of 1,298 married persons examined the effect of declining health on marital satisfaction. The researchers hypothesized that there are a few factors that cause a decline in marital satisfaction in couples where one spouse has a chronic health condition. First, physical impairment due to a chronic health condition oftentimes requires one to limit work, which in turn may result in decreased income. Declines in income may have an adverse effect on marital satisfaction. The next factor is the change in the division of the household. A healthy spouse has to perform more responsibilities and therefore, experience more stress. Third, due to reduced income or physical impairment, a couple has to reduce a number of activities that were previously performed together. Fourth, chronic health conditions are often associated with depression. As a result of depression, a spouse with a chronic health condition may reduce communication with a partner. The results of their study indicated that decrements in health negatively impact marital satisfaction. All the proposed factors accounted for the decline in marital satisfaction. The research found also that health decline has a stronger effect on marital satisfaction for a healthy spouse than for the spouse with declining health.

Previous studies investigating the influences of caregiver burden indicated that there is a negative association between higher subjective burden and poorer marital satisfaction (e.g., Fearon, Donaldson, & Burns, 1998; Wright, 1998). Chadiha, Rafferty, and Pickard (2003) in their study of 100 female caregivers found that high levels of

burden resulted in lower levels of marital satisfaction. Similar results were obtained by Fitzpatrick and Vacha-Haase (2010). Also objective burden was found to lead to a decline in marital satisfaction. For example, Lewis et al. (1989) found that individuals who reported a greater objective caregiver burden had more negative perceptions of overall marital satisfaction.

Marital satisfaction before the chronic health condition occurred has important implications for the overall mental and physical health of the caregiver. In case of a chronic health condition, high premorbid marital satisfaction often mediates the stress resulting from caring for someone with a chronic health condition (e.g., Bookwala, 2005; Rutledge, Matthews, Lui, Stone, & Cauley, 2003; Troxel, Matthews, Gallo, & Kuller, 2005). Lewis (1998) suggests that a poor pre-morbid relationship makes the experience of caregiving more stressful. Precaregiving marital satisfaction may also influence the caregiver's reaction to changes in the care recipient. Steadman, Tremont, and Duncan-Davis (2007) demonstrated that caregivers with high marital satisfaction reported less reactivity to care recipient's behavior problems, and more effective communication compared with the caregivers whose marital satisfaction was low.

Despite the increasing interest of researchers, little is known about the effects of caregiver burden on marital satisfaction. Caring for a dependent elderly spouse may negatively affect not only the physical and mental health of the caregiver, but also their marital satisfaction.

Intimacy

Intimacy is considered to be one of the most important contributors to marital satisfaction (Prager, 1995) along with the length of marriage, personality and

communication style (Laurenceau, Barrett, & Rovine, 2005). Prior to reviewing the importance of intimacy and its relationship to marital satisfaction and caregiver burden, it is useful to clarify the term intimacy. Intimacy is a very broad term and has been operationalized in variety of ways. Moss and Schwebel (1993) in their review of intimacy studies found 61 distinctive definitions of intimacy. Definitions ranged from unidimensional to multidimensional. Reis and Shaver (1988) defined intimacy as an experimental outcome of an interpersonal process. Waring, McElrath, Lefcoe, and Weisz (1981) defined intimacy as a multifaceted dimension composed of: affection, commitment, compatibility, expressiveness, identity, sexuality, conflict resolution, and autonomy. Most definitions of intimacy used in research consist of emotional and physical intimacy (Moss & Schwebel, 1993). Emotional intimacy involves a deep sense of caring, expressions of liking and loving, sharing of private thoughts, and the capacity to communicate about the relationship (Waring & Chelune, 1983), whereas physical intimacy pertains to sexual intercourse and other forms of sexual expression (Davis & Bibace, 1999).

Marriage is the most intimate relationship for most individuals (Levinger & Huston, 1990). The levels of intimacy that spouses experience have implications on their physical and mental health. For example, spouses with high levels of intimacy are more resistant to a number of diseases, have higher well-being (Vanfossen, 1986), and lower rates of mental illness (Moss & Schwebel, 1993). Lack of intimacy may contribute to greater vulnerability to depression (Waring, Patton, Neron, & Linker, 1986) and feelings of loneliness (Pager, 1995).

Intimacy and caregiving. Although in recent years there has been an increasing interest in caregivers, relatively little attention has been devoted to the role of emotional and physical intimacy among caregivers and their chronically ill partners (Hubley, Hemingway, & Michalaos, 2003). Caring for an individual with a chronic health condition and maintaining the same level of intimacy can be very difficult for a spousal caregiver. Chronic health conditions may cause physical and emotional changes in intimacy, ranging from loss of interests in sex to problems with communication (Korpelainen, Nieminen, & Myllyla, 1999; Simonelli, Tripodi, Rossi, & Fabrizi, 2008).

Caregiver burden may contribute to decline in intimacy. For example, Simonelli et al. (2008) reported that higher burden in spouses providing care to partners with dementia was negatively correlated with the frequency of sexual intercourse. The researchers also demonstrated that caregivers with the higher burden reported lesser emotional and physical satisfaction. In one recent study, Harris, Adams, Zubatsky, and White (2011) conducted structured interviews with open-ended questions to examine the effect that Alzheimer's disease and related disorders had on emotional and physical intimacy. The results showed the sexual relationship of the couple changed radically with the onset and progression of the disease. Some caregivers were unable to maintain intimacy with their partners because they feel overwhelmed, whereas other caregivers experienced greater closeness to their partners. Caregivers who reported an acceptance of losing physical intimacy were those for whom physical intimacy was poor. Self-reported high levels of intimacy pre-diagnosis were associated with high levels of intimacy post-diagnosis. The authors suggested that the harmful effects of caregiving are somewhat ameliorated by physical intimacy.

Many caregivers, despite the physical difficulties resulting from the chronic condition, try to maintain an intimate relationship with their partner (Zarit et al., 1996), which suggests its importance in the relationship. Caregivers find physical intimacy to be a source of support, reassurance, and a means of coping with their partner's health (Ballard et al., 1997; Davies, Zeiss, Shea, & Tinkelenberg, 1998). Adams (2001) suggested that the caregiving spouse may be invested in maintaining physical intimacy as a way to relate to and connect to their spouse.

Although the caregivers may continue to value intimacy, physical activity in people with chronic health conditions, especially dementia, is a controversial issue. In addition to physical changes that affect physical intimacy, patients and their spouses have to struggle with cultural taboos and personal beliefs about what is and what is not appropriate sexual behavior for people at their age and in their situation (Dourando, Finamore, Barroso, Santos, & Laks, 2010).

Intimacy and marital satisfaction. There is a significant positive association between intimacy and marital satisfaction (Lawrance & Byers, 1995; Young, Luquis, Denny, & Young, 1998) and an increase in marital intimacy has a positive effect on marital satisfaction over a period of time (Dandeneau & Johnson, 1994). However, a low level of intimacy in a marital relationship may not have an adverse effect on marital satisfaction if both spouses are satisfied. For example, Sternberg and Barnes (1985) found that the strongest predictor of relationship satisfaction was the discrepancy between the partners' desired and received levels of intimacy.

Although both the emotional and physical aspects of intimacy influence the marital satisfaction, their importance may differ. Some researchers suggested that a

couple's satisfaction with their physical relationship is one of the most significant dimensions of marital satisfaction (Butzer & Campbell, 2008; Litzinger & Gordon, 2005; Trudel, Turgeon, & Piché, 2000), whereas others emphasize the role of emotional intimacy. For example, in the study of 43 couples, Tolstedt and Stokes (1983) found that emotional intimacy was more predictive of marital satisfaction than physical intimacy. Similar results were obtained by Schaefer and Olson (1981). Talmadge & Dabbs (1990), however, found that different types of intimacy may have different functions for men and women. In their study men reported a tendency to attach greater value to physical intimacy than women. Karney & Bradbury (1995) in their meta-analysis found that sexual satisfaction was a strong predictor of marital satisfaction and that the effect was stronger for men. It appears that men use sexual interaction to increase emotional intimacy, whereas women need emotional intimacy to be sexually intimate (Prager, 1995).

Physical intimacy is an important aspect of the dyadic relationship and contributes to relationship durability and satisfaction (Laumann, Gangon, Michael, & Michaels, 1994; Sprecher, 2002). However, age-related declines in sexual functioning can affect the nature and frequency of older adults' sexual behavior. The most common changes that occur in the sexuality of older adults are erectile dysfunction for men and vaginal dryness for women, respectively (Lochlainn & Kenny, 2013). Due to physical changes frequency of sexual intercourse systematically decreases with age (Trudel et al., 2000). Longitudinal studies (e.g., James, 1981; Udry, Deven, & Coleman, 1982) and retrospective studies (e.g., Greenblat, 1983) have also documented a decline in sexual intercourse over even a few years of marriage. Brecher (1984) claims that the incidence and frequency of sex

declines with each additional decade of life. Greeley (1991) reported that the steepest decline in the incidence of marital sex occurs between the 5th and 6th decade of life. Although patients' functional ability declines, their sexual drive does not necessarily disappear. For instance, when a demented spouse is still living at home, 25–50% of couples continue to have intercourse (Ballard et al., 1997; Eloniemi-Sulkava, Notkola, Hamalainen, & Rahkonen, 2002).

When one partner's health is compromised, opportunities for affection and physical intimacy may decrease (Wright, 1998). In addition, in caregiving spousal dyads, caregivers are often old enough to experience age-related declines in health. Moreover, providing elder care has been shown to have detrimental effects on caregiver physical health. Thus, spousal caregivers of chronically ill or disabled elders may be especially vulnerable to decrements in satisfaction with physical intimacy not only because of their partners' declining physical and cognitive functioning, but also because their own health can be compromised.

Problem Statement

Due to increased life expectancy and prevalence of chronic health conditions, a growing number of older individuals face challenges of providing care to their spouses. Spousal caregiving can be a stressful experience associated with negative outcomes such as depression or decline in marital satisfaction. Many studies have established the consequences of providing care including depression, impaired health habits, and physical exhaustion (e.g. Pinqart & Sörensen, 2003; Vitaliano et al., 2003). However, understanding of the mechanisms through which caregiver burden has negative effects on marital satisfaction remains limited.

This study investigated the relationships between caregiver burden, marital

satisfaction, and intimacy. On the basis of the empirical and theoretical work reviewed previously, it was expected that caregiver burden would predict lower levels of marital satisfaction and lower levels of intimacy. Intimacy itself was expected to be related to marital satisfaction such that lower levels of intimacy are associated with reduced marital satisfaction. Further, given the importance of intimacy to the marital relationship, the current study examined the hypothesis that intimacy mediated the effects of caregiver burden on marital satisfaction.

This study tested intimacy as a potential mediator of the caregiver burden-marital satisfaction link as shown in Figure 1. The mediation analysis attempted to explain the underlying effect of caregiver burden on marital satisfaction. The mediator variable represents the mechanism through which the independent variable (caregiver burden) is able to influence the dependent variable (marital satisfaction) (Baron & Kenny, 1986). According to Baron and Kenny (1986) a variable is a mediator if it meets the following conditions: (a) variations in level of the independent variable significantly account for variations in the presumed mediator (Path B), (b) variations in the mediator significantly account for variations in the dependent variable (Path C), and (c) when Paths B and C are controlled, the previously significant relationship between the independent and dependent variables (Path A) is no longer significant, with the strongest demonstration of mediation occurring when Path A is zero (p. 1176).

Figure 1 assumes that the mediation variable (intimacy) is affected by caregiver burden, in turn affecting marital satisfaction. In Figure 1, Path A represents the direct impact of the independent variable, caregiver burden, on the dependent variable, marital satisfaction; Path B is the relationship of the independent variable, caregiver burden, to

the mediator, intimacy; and Path C represents the impact of the mediator on the dependent variable, marital satisfaction. Hence, the test of this mediation model involved 3 steps: (a) establishing that variation in the level of caregiver burden accounts for variation in the level of intimacy (Path B), (b) establishing that variation in the level of intimacy accounts for variation in the level of marital satisfaction (Path C), and (c) testing that when Paths B and C are controlled, the relationship between caregiver burden and marital satisfaction, Path A, is no longer significant.

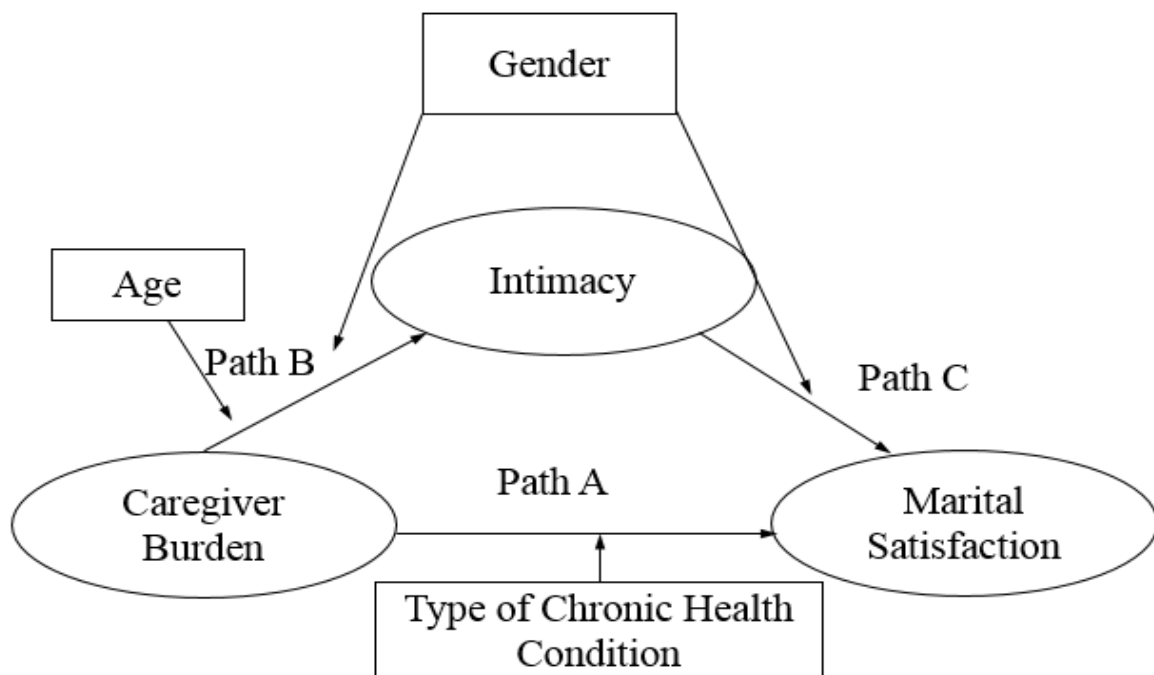


Figure 1. Hypothesized mediation model.

The study improved on prior studies of caregiver burden and marital satisfaction not only by including intimacy as a potential mediator of this relationship, but also by testing three additional issues. A moderator is a qualitative or quantitative variable that affects the direction or strength of the relationship between the independent and a

dependent variable (Baron & Kenny, 1986). This study investigated three possible moderators of the relationship between caregiver burden and marital satisfaction. First, the study contrasted caregivers of individuals with dementia and caregivers of individuals with other chronic health conditions. Research has demonstrated that caregiving for a spouse with dementia is related to higher levels of stress and depression than caring for someone who does not have dementia (Ory, Hoffman, Yee, Tennstedt, & Schulz, 1999). Characteristic symptoms of dementia such as problems with communication or changes in behavior and personality may deteriorate marital satisfaction (Gallagher-Thompson et al., 2001; Wright, 1991). It was hypothesized that spousal caregivers of individuals with dementia would experience more burden and a greater decline in marital satisfaction than caregivers of individuals with other chronic health conditions.

Second, the study examined whether age acts as a moderator of the relationship between intimacy, caregiver burden, and marital satisfaction. Studies conducted on a representative sample of adults in the United States demonstrated that age is highly associated with marital sexual frequency (Call, Sprecher, & Schwartz, 1995). The percentage of couples who have marital sex gradually declines with age. Given that both increasing age and burden are negatively associated with intimacy, it was hypothesized that age would moderate the relationship between caregiver burden and intimacy such that the relationship would be stronger for older caregivers than for younger caregivers.

Third, the study examined the gender differences among caregivers. The relationship between burden, marital satisfaction, and intimacy may be different for males caring for females versus females caring for males. Previous research suggested that there are significant gender differences in the experience of burden. Male caregivers

are healthier, more satisfied with life, and experience less physical strain than female caregivers. In addition, they adapt better than women to the caregiving role (Chang & White-Means, 1991; Gilhooly, Sweeting, Whittick, & McKee, 1994). Compared with female caregivers, male spousal caregivers reported significantly lower levels of subjective burden and higher levels of mental health (Thompson et al., 2004). It appears that detrimental effects of caregiver burden have lesser impact on male caregivers' intimacy as male caregivers of spouses with dementia had more sexual intercourse than female caregivers (Simonelli et al., 2008). Some researchers argue that stressful changes that had occurred in the relationship due to chronic health conditions result in losing interest in sex for female caregivers because they may believe that attending to their own sexual needs is inappropriate. Male caregivers, however, desire sex even if changes in sexual behaviors are perceived as stressful (Litz, Zeiss, Davies, 1990; Simonelli et al., 2008). Therefore, the gender of the spousal caregiver was expected to moderate the relationship between caregiver burden and intimacy such as male caregivers' intimacy would be less affected by caregiver burden than female caregivers'.

Gender may also act as a moderator of the relationship between intimacy and marital satisfaction because males attach greater value to sexual intimacy than females (Talmadge & Dabbs, 1990). Lawrence et al. (2008) in their longitudinal study found that for males, intimacy was the strongest predictor of change in marital satisfaction, whereas for women, only communication and conflict management predicted changes in marital satisfaction. Laumann et al., (2006) found that women are more likely than men to rate sex as an unimportant part of life. Therefore, gender was hypothesized to be a moderator

of the relationship between intimacy and marital satisfaction such that the relationship would be stronger for spousal male caregivers than for female caregivers.

In summary, the following hypotheses were proposed:

1. Caregiver burden will be negatively associated with marital satisfaction such that more caregiver burden results in less marital satisfaction (Path A).
2. Caregiver burden will also be negatively associated with intimacy such that more caregiver burden results in less intimacy (Path B).
3. Intimacy will be positively associated with marital satisfaction such that more intimacy results in greater marital satisfaction (Path C).
4. The negative relationship between caregiver burden and marital satisfaction will be partially or fully mediated by intimacy.
5. Different types of chronic health conditions will differentially impact the relationship of caregiver burden to marital satisfaction such that the caregivers of individuals with dementia will experience more decline in marital satisfaction than caregivers of individuals with other types of chronic health conditions (Path A).
6. Age will moderate the relationship between caregiver burden and intimacy such that the relationship will be stronger for older caregivers than for younger caregivers as older caregivers will experience greater decline in frequency of intimate behaviors (Path B).
7. Caregiver gender will moderate the relationship between caregiver burden and intimacy such that male caregivers' intimacy will be less affected by caregiver burden (Path B).

8. Caregiver gender will moderate the relationship between intimacy and marital satisfaction such that male caregivers who lose intimacy with spouses will experience greater decline in marital satisfaction (Path C).

Chapter 2: The National Social Life, Health, and Aging Project

Despite the importance of intimacy, research on intimacy among older adults is frequently based on convenience samples in which individuals are selected for inclusion based on availability. Although convenience sampling is easier and less expensive to carry out than random sampling, relying on available subjects can lead to bias. This method does not allow the researcher to control the characteristics of the sample (e.g., age, race, gender, education). Therefore, the sample may be unlikely to be representative of the population being studied and findings from the sample cannot be generalized to the population (Saumure & Given, 2008, p.124). A notable exception is the National Social Life, Health, and Aging Project (NSHAP) that is a nationally representative U.S. probability sample, developed as a result of the growing interest among researchers to explore the area of intimacy among older Americans.

Previous studies such as the National Health and Social Life Survey (NHSL; Laumann, Gagon, Miachel, & Michaels, 1994) and the Chicago Health and Social Life Survey (Laumann, Ellingson, Mahay, Paik, & Youm, 2004) found that there is an association between health and intimacy. This prompted researchers to expand their focus on intimacy to different domains of aging including cognitive functioning, physical, and mental health.

The NSHAP is a population-based survey conducted by the National Opinion Research Center (NORC) at the University of Chicago with more than 3,000 non-institutionalized men and women aged 57-85 (Suzman, 2009). To conduct the study, the NSHAP relied on a sample recruited by the Health and Retirement Study (HRS) in 2004. The HRS identified households for the NSHAP eligible population. From a sample of

4,400 people, NSHAP selected 92 % of the individuals recruited by the HRS. The study collected data from 1,550 women and 1,455 men. The NSHAP was conducted between July of 2005 and March of 2006 and included information on demographic characteristics, physical and mental health, sexual behaviors and attitudes with overall response rate of 75.5% (O’Muirheartaigh, Eckman, & Smith, 2009). The study was funded by the National Institutes of Health.

The overall goal of NSHAP longitudinal study was to understand the well-being of older adults by examining the interactions among physical health, medication use, cognitive and emotional health, health behaviors, illnesses, and social networks. The most noteworthy strength of the NSHAP is that it is a very rich data set on health, sexuality and social relationships and is one of the most comprehensive studies of the U.S. older population (Suzman, 2009). The guiding hypothesis of this study was that those individuals with high-quality intimate social and sexual relationships “will age better in terms of health and well-being than those with poor-quality relationships or those who lack social relationships” (Suzman, 2009, p. 5). In order to test this hypothesis, extensive data were collected on social networks, medication use, prevalence of chronic health conditions, and psychological attributes.

The data from NSHAP were collected by conducting face-to-face interviews, collecting biomarkers, and questionnaires left behind by the interviewers. The data were collected in both English and Spanish, by trained interviewers. Institutional review boards at the University of Chicago and the National Opinion Research Center (NORC) approved the data collection procedures (Laumann, Das, & Waite, 2008).

The in-person questionnaire and biomarker collection (e.g. weight, blood pressure, and saliva) were administered at the respondents' homes by NORC field interviewers. The in-person interview and biometrics collection lasted about 120 minutes. "Questionnaire topics included: 1) demographic characteristics; 2) social networks and social network change; 3) social and cultural activity; 4) physical and mental health including cognition; 5) well-being; 6) illness; 7) healthcare utilization and medications; and 8) history of sexual and intimate partnerships" (Smith et al., 2009, p. 20).

In order to minimize respondent burden, some questions were included in a supplemental paper-and-pencil questionnaire. At the end of the in-person interview, respondents were provided postage-paid envelopes and instructed to complete the questionnaire and return it via U.S. mail. This self-administered questionnaire took approximately 30 minutes to complete. There was approximately an 84% response rate for the supplemental questionnaire (Smith et al., 2009).

The NSHAP produced a significant number of findings on older adults' sexuality which were published in academic journals and also extensive media coverage.

Caregiving

Although assessing caregiver burden was not a primary focus of NSHAP, the extensive survey included an objective indicator of caregiving. Respondents were asked if they were currently assisting an adult who needs help with day-to-day activities and if they consider themselves to be the primary caregiver. If an individual reported engaging in providing care, a set of items queried "(1) what is this person's relationship to you? Is this person your spouse, your parent, your child, or other; (2) how old is this person; (3)

why does this person require care; and (4) are you the person who provides the most help or care for this person” (Waite et al., 2010). In addition, individuals providing care were also asked to indicate how many days and hours per week they were caring for this person.

Marital Satisfaction

The NSHAP revealed that the majority of older individuals interviewed were in long-term first marriages (69%) (Brown & Kawamura, 2010). Gender disparities increased with age: 78% of men and 40% of women ages 75 to 85 reported having a spouse or partner whereas 89% of the men and 74% of the women ages 57 to 64 reported having a spouse or partner. In each age group men were more likely to have a spouse or a partner than were women. This difference might be due to higher mortality rates among men (Waite, Laumann, Das, & Schumm, 2009). For most of the older women and men, the overall marital satisfaction was high (Waite & Das, 2010).

Although the NSHAP does not include a scale measuring marital satisfaction, the questionnaire included items that allowed researchers to draw conclusions about marital satisfaction. Respondents were asked about their current marital status as well as about their past relationships. If they reported being married, they were further asked about the overall quality of the relationship. Individuals were also asked about the extent to which they liked to spend time with their partners, if they could rely on him / her and whether they felt being criticized by their partners. The interview also obtained information about the self-rated emotional and physical satisfaction with the relationship (Waite et al. 2009).

In order to measure marital quality, Warner and Kelly-Moore (2012), conducted a

factor analysis based on items from the NSHAP survey. The chosen items asked about “the frequency with which respondents could ‘talk about . . . worries’ with their spouses, could ‘rely on [their spouses] if [they] have problems,’ whether their spouses made ‘too many demands,’ and whether their spouses ‘criticize[d]’ them” (p. 55). Another question asked “whether respondents and their spouses ‘spend free time doing things together, or doing things separately’ (p. 55). The scale also included a global measure of marital satisfaction where respondents were asked to rate their overall satisfaction with their marriage. Results from the exploratory factor analysis suggested a two-factor structure: factor one “positive marital quality” ($\alpha = .62$) and factor two, “negative marital quality” ($\alpha = .60$) with the interfactor correlation $-.54$.

The results from the NSHAP demonstrated that most married men and women reported being able to open up to their partners about worries and to rely on their partners. Few respondents rated their current or last relationship as unhappy (Waite & Das, 2010).

Intimacy

The NSHAP offers a variety of measures of intimacy (Waite et al., 2009). These measures include frequency of sexual behaviors, sexual problems, attitudes towards sex, and satisfaction with sex. In order to examine sexual behaviors, all respondents were asked whether they had had partnered sex in the preceding year, and their frequency of masturbation over that period. Individuals who reported having sex were later asked some questions about the frequency of sex with their partner; frequency of vaginal intercourse; frequency of condom use; and frequency of oral sex. In addition, the respondents were asked about the frequency of hugging, kissing, or other ways of sexual

touching during sex. The researchers borrowed the items from the 1992 NHSLs. Those respondents who reported a lack of sexual activity were asked about the reasons for not having sex.

The respondents were also asked about sexual problems or dysfunctions. If they indicated a problem, they were further asked to specify the problem from the following list: “(1) lack of interest in sex; (2) arousal problems—trouble maintaining or achieving an erection (men) and trouble lubricating (women); (3) climaxing too early; (4) inability to achieve an orgasm; (5) experiencing pain during sex; (6) not finding sex pleasurable; and (7) anxiety about performance” (Laumann et al., p. 2301). The questions were asked during the face-to-face interview those respondents who reported a sexual problem, either their own or their partner. Respondents reporting a problem were asked the extent to which they were bothered by it, following the recommendations of a consensus panel on women’s sexual dysfunction.

Drawing upon the NSHAP data, researchers have begun to investigate sexual behaviors and sexual problems of older adults. This data have revealed that although sexual activity decreases steadily with age, older adults continue to be sexually active after age 75. The youngest age group in NSHAP, represented individuals aged 57–64; among these 84% of men and 62% of women reported having sex with a partner in the year preceding the study. In the oldest group, individuals aged 75–85, 38% of men and 17% women reported having sex. This decline is assumed to be related to declines in health and functionality as people age. Partnered sex was less likely to include vaginal intercourse among individuals aged 75–85, with 75% of women and 84% of their male counterparts reporting engaging in this activity. Individuals in the oldest group, however,

reported engaging often in kissing, hugging, or other sexual touching, known as sexual “foreplay”. Masturbation in the preceding year was low among men aged 75-85 (28%) in comparison to men aged 57-64 (63%). On the other hand, 16% of the women in the oldest age group reported masturbating, compared to 32% in the youngest age group (Lindau et al., 2007).

Respondents were also asked about how physically and emotionally pleasurable their relationship is with response categories from extremely pleasurable to not at all pleasurable. Contrary to the common stereotype about asexual older adults, older adults were satisfied with their sexual relationship, both physically and emotionally. One third of the respondents reported that sex was a very important part of their lives. Among men and women, rating sex as not at all important increased with age (Waite et al., 2009).

The frequency of sexual behavior may diminish due to chronic health conditions. Individuals who indicated poor health reported having less sexual activity than those in good or very good health. Poor mental health was associated with both men’s and women’s reports of sexual problems. Many of the women’s sexual problems were associated with depression and fair or poor self-rated mental health. Similarly, among men, poor mental health had a strong positive correlation with sexual problems (Laumann et al., 2008).

Specific health conditions were found to be associated with declines in sexual function. A given chronic health condition may have a different effect on sexual function for men and women. For men, the impact of a chronic health condition was often more directly sexual than for women. Both men and women reported that men’s health limitations were the major obstacles to sexual activity. For example, diabetes,

cardiovascular problems, and a wide variety of medications might have impacted men's sexual problems and their lack of sexual interest. Women indicated low sexual desire as their most prevalent sexual problem (Waite et al., 2009).

While investigating the role of physical health on marital satisfaction, Galinsky and Waite (2013) developed a model of the relationship between physical health and marital satisfaction and hypothesized that couple's ongoing sexual activity mediates this relationship. The frequency of sex was measured by using two variables. First, respondents had to indicate if they had had sex with their partner in the preceding year. Then, respondents were asked about the frequency of their sexual activities. The possible responses were: once a month or less, two to three times a month, once or twice a week, three to six times a week, or once a day or more. In order to create a measure of sexual behavior, Galinsky and Waite (2013) combined the answers to these two questions and received a measure with four categories: (0) did not have sex with spouse in the past year, (1) had sex once a month or less, (2) had sex two or three times a month, and (3) had sex once a week or more. A test of mediation showed that the effect of physical health on positive and negative marital satisfaction was mediated by sexual engagement.

The findings from the NSHAP demonstrated the significant role of sexual satisfaction. Satisfaction was associated with fewer sexual problems in both men and women. It also lowered the likelihood of men's lack of sexual interest and women's inorgasmia. It appears that sexual problems among the elderly are not an inevitable consequence of aging, but they are rather responses to the presence of stressors in different life domains (Laumann et al., 2007).

Summary

The NSHAP provided a broad array of findings on caregiving, marital satisfaction, and intimacy among older adults. Despite the strengths of NSHAP, a limitation is that this data is cross-sectional, which makes it difficult to draw conclusions about causality among variables.

Nonetheless, the NSHAP dataset was well-suited to investigate the research questions proposed in Chapter 1 for several reasons. First, it includes data on social, psychological, and biological dimensions of aging (Williams, Pham-Kanter, & Leitsch, 2009). Second, the NSHAP contains detailed measures of intimacy as well as physical and emotional satisfaction with relationships. Third, the NSHAP includes data on caregiving as well as marital satisfaction although the sample of caregivers who also provided data on intimacy and marital satisfaction is small.

Chapter 3: Method

The present study is among the first to investigate intimacy as a mediator of the relationship between caregiving and marital satisfaction. High levels of caregiving were expected to be negatively associated with marital satisfaction. This relationship was expected to vary within given type of chronic health condition. For example, caregivers of individuals with dementia were expected to experience greater decline in marital satisfaction than would caregivers of individuals with other chronic health conditions. Caregiving was also expected to be negatively associated with intimacy. Individuals with high levels of caregiving are expected to experience less intimacy. It was expected that the negative relationship between caregiver burden and marital satisfaction would be partially or fully mediated by intimacy. Furthermore, the relationship between caregiving and intimacy was anticipated to be moderated by age such that older caregivers' intimacy would be more affected by caregiving. Gender was also expected to moderate the relationship between caregiver burden and intimacy such that male caregivers' intimacy would be less affected by caregiver burden. Decrease in intimacy was expected to result in decrease in marital satisfaction, and this relationship was expected to be moderated by caregivers' gender such that male caregivers who experienced greater loss of intimacy would experience greater decline in marital satisfaction compared with female caregivers.

The hypotheses were tested using secondary data from the National Social Life, Health, and Aging Project (NSHAP dataset). The NSHAP collected data from a nationally representative sample of 3,005 men and women ages 57-85. The data were collected by conducting face-to-face interviews, biomarkers, and leave-behind questionnaires.

The protocol for this study was reviewed and approved by the University of Kansas Institutional Review Board (see Appendix B). Consent to use the NSHAP data was obtained from Dr. James W. McNally, the director of National Archive of Computerized Data on Aging. See Appendix D for the request to access the NSHAP data and Appendix E for approval to access the data.

Participants' characteristics

Because this study investigated the effect of caregiving on marital satisfaction, the analysis was restricted to a subsample of individuals who were providing care to a spouse. First, the sample was limited to respondents who reported assisting an adult who needed help with day-to-day activities. Of the 3,005 respondents, 401 (13.3%) reported providing care to an adult. Second, the sample was limited to married respondents. Last, the sample was limited to married individuals who provided care for a spouse. Of 272 married caregivers, 100 (27.2%) provided care for a spouse. Participants' characteristics are shown in Table 1. Age was categorized into three groups: 57-64 years old, 65-74 years old, and 75-85 years old. Race and ethnicity was categorized as white, black, and other, including Hispanics. Education was categorized into three groups: no diploma, high school diploma or higher, and college graduate.

Table 1

Participants' Characteristics as a Percentage of the Sample

Variables and Categories	Spousal Caregivers (n=100) % (N)	NSHAP Sample (n=3005) % (N)
Respondent's Gender		
Male	43% (43)	48.4% (1,455)
Female	57% (57)	51.6% (1,550)
Respondent's Age		
57-64	18 % (18)	33.9% (1,020)
65-74	35% (35)	36.3% (1,092)
75-85	47% (47)	29.7% (893)
Respondent's Education		
No diploma	17% (17)	23.3% (699)
High school graduate or higher	65% (65)	54.9% (1,649)
College graduate	18% (18)	21.9% (657)
Respondent's race/ethnicity		
White	85% (85)	76.4% (2,295)
Black	11% (11)	16.9% (509)
Other	4% (4)	6.4% (193)

Measures

Caregiving. Caregiving was operationalized as the amount of caregiving measured in hours. This measure was derived from 2 items. First, respondents were asked to indicate the number of hours per day spent on caring for a spouse. Then, respondents were asked to indicate the number of days per week they spend on providing care. Table 2 presents the items from the NSHAP questionnaire. These questions were combined for the analysis and recoded to a continuous variable by multiplying number of hours per day by the number of of days spent on providing care. Categorical variables were transformed into continuous variables by recoding each range into a numerical score: responses of “less than 2 hours per day” were recoded as 1; responses of “more than 2

but less than 4” were recoded as 3; responses of “more than 4 but less than 8” were recoded as 6; responses of “more than 8” were recoded as 10; and responses of “all of the time” were recoded as 12 hours per day. For example, a participant who reported caregiving 5 days per week and “more than 4 but less than 8 hours per day” was giving a caregiving score of 30 hours per week while one who reported caregiving 7 days per week but only “more than 2 but less than 4” hours per day was giving a caregiving score of 21 hours per week.

Table 2

Items Measuring Amount of Caregiving

Item	Response Alternatives
1. How many days per week do you typically spend caring for this person?	1) Number of days ___
2. How many hours per day do you typically spend caring for this person?	1) Less than 2 hours 2) 2 hours or more, but less than 4 hours 3) 4 to 8 hours 4) More than 8 hours 5) All of the time

Marital satisfaction. To measure marital satisfaction, the author followed the methods that Warner and Kelly-Moore (2012) developed to calculate marital satisfaction scales using the NSHAP data. The measure of marital satisfaction was derived from six items. The items were recoded in order to obtain consistent response categories. First, respondents were asked whether they preferred to spend their free time doing things with their spouse or apart from them. Responses ranged from (1) together, (2) some together and some apart, to (3) different / separate things. This item was reverse coded so the higher score indicated more time spent together. The next four items asked respondents

about how often a respondent could (1) open up to the spouse if they needed to about their worries, (2) how often they could rely on the spouse for help if they had problems, (3) how often the spouse made too many demands on them, and (4) how often the spouse criticized them. Possible responses to each were coded (1) hardly ever (or never), (2) some of the time, and (3) often. The sixth item asked how happy their relationship with their spouse was. Responses ranged from (1) very unhappy to (7) very happy. The categories were collapsed and responses were recoded to 1= unhappy (1, 2, 3, 4); 2= happy (5, 6), and 3= very happy (7). In order to form a scale of marital satisfaction, Warner and Kelly-Moore (2012) conducted an exploratory factor analysis using principal components factor analysis (PCA). Their results suggested that these six items form two factors, which they referred to positive and negative marital satisfaction. Table 3 demonstrates Warner and Kelly-Moore's two-factor solution and Table 4 presents items from the NSHAP questionnaire chosen for the analysis.

A confirmatory factor analysis (CFA) was conducted to evaluate the two-factor solution proposed by Warner and Kelly-Moore (2012) and to assess how well the model matches the observed data. One of the biggest advantages of the CFA over PCA is that CFA produces many goodness-of-fit measures which can be used to evaluate the fit of the model.

To assess model fit, three fit indices were evaluated: the chi square (χ^2), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). The χ^2 is an absolute fit index that attempts to correct for bias that is introduced when the data is non-normal in distribution (Jackson, Pure-Stephenson, & Gillaspay, 2009). The CFI is an incremental fit index that compares the improvement of fit of an identified

model with a more restricted model (Weston & Gore, 2006). The RMSEA is used to evaluate the hypothesis of close fit (Browne & Cudeck, 1993). The confirmatory factor model was estimated by using Amos 7.0 (Arbuckle, 2005).

Table 3

Exploratory Factor Analysis of Marital Satisfaction among Married Older Adults: Items and Corresponding Factor Loadings from the Rotated Oblique Factor Pattern Matrix and Factor Structure Matrix for Two-Factor Solution (n = 1,500)

Factor Pattern ^a		Factor Structure ^b		Questionnaire Item
1	2	1	2	
.35*	-.05	.38*	-.24	1. "Some couples like to spend their free time doing things together, while others like to do different things in their free time. Do you [and partner] like to spend free time doing things together, or doing things separately?"
.60*	.07	.56*	-.25	2. "How often can you open up to [partner] if you need to talk about your worries? Would you say hardly ever, some of the time, or often?"
.55*	-.01	.56*	-.31	3. "How often can you rely on [partner] for help if you have a problem? Would you say hardly ever, some of the time, or often?"
-.04	.55*	-.34	.57*	4. "How often does [partner] make too many demands on you? Would you say hardly ever, some of the time, or often?"
.04	.57*	-.27	.55*	5. "How often does [partner] criticize you?"
.42*	-.24	.55*	-.47*	6. "Taking all things together, how would you describe your [marriage/relationship] with [partner] on a scale from very unhappy [to] very happy?"

Note. Adopted from "The Social Context of Disablement among Older Adults: Does Marital Quality Matter for Loneliness?," by D. F. Warner and J. Kelley-Moore, 2012, *Journal of Health and Social Behavior*, 53(1), p. 56. Copyright 2012 by the American Psychological Association.

^aFactor pattern loadings are standardized regression coefficients for the unique contribution of each latent factor to the observed indicator; loadings greater than .35 are designated with asterisks.

^bFactor structure correlations between the observed indicators and the latent factors; correlations greater than .35 are designated with asterisks.

Table 4. Items Measuring Marital Satisfaction

Items Measuring Marital Satisfaction

Item	Response Alternatives
1. "Some couples like to spend their free time doing things together, while others like to do different things in their free time. Do you [and partner] like to spend free time doing things together, or doing things separately?"	1) Together 2) Some together, some different 3) Different / separate things
2. "How often can you open up to [partner] if you need to talk about your worries? Would you say hardly ever, some of the time, or often?"	1) Hardly ever (or never) 2) Some of the time 3) Often
3. "How often can you rely on [partner] for help if you have a problem? Would you say hardly ever, some of the time, or often?"	1) Hardly ever (or never) 2) Some of the time 3) Often
4. "How often does [partner] make too many demands on you? Would you say hardly ever, some of the time, or often?"	1) Hardly ever (or never) 2) Some of the time 3) Often
5. "How often does [partner] criticize you?"	1) Hardly ever (or never) 2) Some of the time 3) Often
6. "Taking all things together, how would you describe your [marriage/relationship] with [partner] on a scale from very unhappy [to] very happy?"	1) Very unhappy 2) 2 3) 3 4) 4 5) 5 6) 6 7) Very happy

Intimacy. The measure of intimacy was composed of 4 items. First, respondents were asked if during the past 12 months they had sex. Those who answered that they had sex were further asked about their sexual frequency. The responses ranged from (1) once a month or less, (2) two to three times a month, (3) once or twice a week, (4) three to six times a week, to (5) once a day or more. Respondents were also asked how physically and emotionally pleasurable their relationship was. Responses ranged from (1) extremely

pleasurable, (2) very pleasurable, (3) moderately pleasurable, (4) slightly pleasurable, and (5) not at all pleasurable. Table 5 demonstrate items from the NSHAP questionnaire.

Table 5

Items Measuring Intimacy

Item	Alternative Responses
1. Did you have sex during the last 12 months?	0) Yes 1) No
2. During the past 12 months, would you say that you had sex:	0) Once a month or less 1) Two to three times a month 2) Once or twice a week, 3) Three to six times a week 4) Once a day or more
3. How physically pleasurable did/do you find your relationship with (PARTNER) to be: extremely pleasurable, very pleasurable, moderately pleasurable, slightly pleasurable, or not at all pleasurable?	0) Extremely 1) Very 2) Moderately 3) Slightly 4) Not at all
4. How emotionally satisfying did/do you find your relationship with (him/her) to be? Extremely satisfying, very satisfying, moderately satisfying, slightly satisfying, or not at all satisfying?	0) Extremely 1) Very 2) Moderately 3) Slightly 4) Not at all

In order to examine how engagement in sexual activity may explain the relationship between physical health and positive and negative marital satisfaction, Galinsky and Waite (2013) combined two items and created a measure of partnered sexual behavior. The respondents reported their engagement in the sexual frequency role among four categories: (0) did not have sex with spouse in the past year, (1) had sex once a month or less, (2) had sex two to three times a month, and (3) had sex once a week or

more. The researchers found that the indirect effect of the respondent's physical health on positive and negative marital satisfaction through sexual engagement was significant ($b = -0.15$, 95% $CI = -.26$ to $-.06$, $p < .01$ for positive marital satisfaction and $b = 0.14$, 95% $CI = 0.06$ to 0.28 , $p < .01$ for negative marital satisfaction).

The author followed Galinsky and Waite's (2013) procedure to obtain a measure of intimacy frequency. In addition, the two additional items measuring levels of satisfaction from intimacy were combined and their mean used as a measure of intimacy satisfaction.

Additional Measures. Potential moderators of the relationships between caregiving, marital satisfaction, and intimacy included age, gender, and type of chronic health condition. In addition, self-rated health and depressive symptoms were considered as possible additional covariates.

The NSHAP respondents were asked about chronic health conditions that were hypothesized to have an association with social life and sexuality (Williams, Pham-Kanter, & Leitsch, 2009). Type of chronic health condition was coded as 0 = Alzheimer's disease or dementia, 1 = other chronic health conditions (e.g., diabetes, arthritides, cardiovascular diseases).

The respondents also rated their own physical and mental health as (1) excellent, (2) very good, (3) good, (4) fair, or (5) poor. Then, they were asked to compare their own health to other people their age. Possible responses were: (1) much better, (2) somewhat better, (3) about the same, (4) somewhat worse, (5) much worse. Table 6 presents the items from the NSHAP questionnaire. While recoding the measures of self-rated physical and mental health, the author followed Galinsky and Waite's (2013) procedure and

combined the “poor” and “fair” categories. Similarly, for the question asking the respondents to compare their health to their peers, responses alternatives “somewhat worse” and “much worse” were combined.

Table 6

Items Measuring Self-rated Health

Item	Response Alternatives
1. Would you say your health is excellent, very good, good, fair, or poor?	0) Excellent 1) Very good 2) Good 3) Fair 4) Poor
2. What about your emotional or mental health? Is it excellent, very good, good, fair, or poor?	0) Excellent 1) Very good 2) Good 3) Fair 4) Poor
3. Compared with other people your age, would you say your health is much better, somewhat better, about the same, somewhat worse, or much worse?	0) Much better 1) Somewhat better 2) About the same 3) Somewhat worse 4) Much worse

In addition, the NSHAP included items measuring depressive symptoms taken from the Center for Epidemiologic Studies Depression Scale, CESD (Radloff, 1977). Respondents were asked, “On how many days during the past week did you: (a) feel like not eating, your appetite was poor, (b) feel depressed, (c) feel that everything you did was an effort, (d) sleep restlessly, (e) you are happy, (f) feel lonely, (g) feel that people were unfriendly, (h) enjoy life, (i) feel sad (j) feel that people dislike you, and (l) you could not get going.” The possible responses for each question were: 1) rarely or none of the time, 2) some of the time, 3) occasionally, 4) most of the time. Table 7 presents the items from

the NSHAP questionnaire. The items 'I was happy' and 'I enjoyed life' were reverse coded to match other depressive symptoms.

Table 7

Items Measuring Depressive Symptoms

Item	Response Alternatives
During the past week ...	
1. I did not feel like eating; my appetite was poor	1) Rarely or none of the time 2) Some of the time 3) Occasionally 4) Most of the time
2. I felt depressed	1) Rarely or none of the time 2) Some of the time 3) Occasionally 4) Most of the time
3. I felt that everything I did was an effort	1) Rarely or none of the time 2) Some of the time 3) Occasionally 4) Most of the time
4. My sleep was restless	1) Rarely or none of the time 2) Some of the time 3) Occasionally 4) Most of the time
5. I was happy	1) Rarely or none of the time 2) Some of the time 3) Occasionally 4) Most of the time
6. I felt lonely	1) Rarely or none of the time 2) Some of the time 3) Occasionally 4) Most of the time
7. People were unfriendly	1) Rarely or none of the time 2) Some of the time 3) Occasionally 4) Most of the time
8. I enjoyed life	1) Rarely or none of the time 2) Some of the time 3) Occasionally 4) Most of the time

Table 7 continued

9. I felt sad	1) Rarely or none of the time 2) Some of the time 3) Occasionally 4) Most of the time
10. I felt that people disliked me	1) Rarely or none of the time 2) Some of the time 3) Occasionally 4) Most of the time
11. I could not get "going"	1) Rarely or none of the time 2) Some of the time 3) Occasionally 4) Most of the time

A principal component factor analysis with varimax rotation was used to extract two factors. Only those items loading 0.40 or greater were retained in defining the factors. The 7 items loaded on two separate factors: 2 items asking about negative experiences with other people created a subscale called Disturbed Social Relationships and 5 items assessing instances of depressive symptoms created a subscale called Negative Affect. The results of the factor analysis are reported in Table 8. The Cronbach's alpha for the Negative Affect scale was estimated at .73, indicating good internal consistency, whereas the reliability for the Disturbed Social Relationships was estimated at .63.

Table 8

Results of the Principal Component Factor Analysis of the Depression Scale

	Negative Affect	Disturbed Social Relationships
% Variance accounted for	35.5	22.35
	Factor Loading	Factor Loading
1. I felt depressed	.63	
2. My sleep was restless	.74	
3. I was happy	-.60	
4. I felt lonely	.71	
5. People were unfriendly		.91
6. I felt sad	.76	
7. I felt that people disliked me		.74

Chapter 4: Results

The analysis consisted of four steps. First, descriptive statistics and between-group comparisons were obtained for the measures of caregiving, marital satisfaction, and intimacy as well as potential covariates and moderators including health and depression. Second, a confirmatory factor analysis was used to derive composite measures of marital satisfaction. Third, intercorrelations among these measures were examined for the total sample and then for male versus female caregivers. The final step was to test whether intimacy mediated the relationship between the predictor variable, caregiving, and the outcome variable, marital satisfaction and whether age, gender, and type of chronic health condition moderated the relationships among amount of caregiving, marital satisfaction, and intimacy. All the analyses were conducted using IBM SPSS.

Descriptive Statistics

Means and standard deviations were used to explore sample characteristics and were calculated for each study variable for both male and female spousal caregivers (see Table 9). Appendix F presents detailed distributional information and patterns of responding to the study variables. Participants' ages ranged from 57 to 85 years, with a mean of 72.42 years ($SD = 7.54$) for men and 72.79 years ($SD = 7.52$) for women. The majority of respondents were female (57%). On average, men reported providing care for 44.9 hours per week ($SD = 30.13$), whereas women reported providing care for 50.7 hours per week ($SD = 30.92$). As shown in Appendix F, 44% of the female caregivers reported spending more than 60 hours per week providing care whereas only 22% of the male caregivers provided more than 60 hours per week of care.

Scores on the Self-rated Health scale ranged from 0 to 9, with higher scores indicating worse mental and physical health. Men reported a mean of 2.36 ($SD = 0.73$), while women reported a slightly lower mean of 2.21 ($SD = 0.78$). Total Self-rated Health scores for male and female caregivers were calculated by multiplying the number of items by the mean of the three items to develop accurate scales, correcting for missing data.

Depression was measured by two subscales derived from the factor analysis: Negative Affect and Disturbed Social Relationships. Scores for Negative Affect ranged from 0 to 15, and for Disturbed Social Relationships from 0 to 6. High scores on the Negative Affect subscale indicated more depressive symptoms (e.g. restless sleep or sadness), while high scores on the Disturbed Social Relationships subscale reported more instances of feeling disliked by other people and that other people were unfriendly. On average, women reported slightly higher scores on Negative Affect with a mean of 1.59 ($SD = 0.45$), while men's mean score was 1.47 ($SD = 0.39$). Both subsamples' average score on the Disturbed Social Relationships scale was similar; .50 for men ($SD = 1.25$) and .51 for women ($SD = 1.24$).

Intimacy (Frequency) was scaled from 0 to 3, with 0 indicating lack of sexual activity and 3 indicating having sex once a week or more. On average, women reported less frequent engagement in sexual behavior than men. For men the mean was 0.44 ($SD = 0.78$) and for women the mean was 0.76 ($SD = 1.14$). In comparison with women mean = 1.38 ($SD = 0.80$), men reported higher satisfaction from physical and emotional intimacy, mean of 1.91 ($SD = 0.76$). Consistent with previous research (e.g. Bulanda, 2011; Galinsky, & Waite, 2013), men reported higher positive marital satisfaction, mean = 6.26

($SD = 1.34$) than women, mean = 5.55 ($SD = 1.44$). In both subsamples, mean scores on the Negative Marital Satisfaction Scale for men and women were similar; 3.03 ($SD = 1.33$) and 2.78 ($SD = 1.24$).

The preliminary results revealed that data were not normally distributed. Therefore, in order to determine whether or not male and female caregivers differed significantly on the key study variables, Mann-Whitney tests were calculated. No significant differences were found except for intimacy (Satisfaction) and Positive Marital Satisfaction. The Mann-Whitney tests indicated that men and women differed significantly on these variables. Intimacy (Satisfaction) and Positive Marital Satisfaction were greater for female than for male caregivers, $U(56) = 699$, $p = .002$ and $U(56) = 856$, $p = .029$, respectively.

Table 9

Means and Standard Deviations for Male and Female Caregivers

Variable	Males		Females		<i>U</i>	<i>p</i>
	<i>n</i> = 43		<i>n</i> = 57			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Age in years	72.42	7.54	72.79	7.52	1191	.810
Amount of Caregiving (hours per week)	44.9	30.13	50.7	30.92	857	.536
Self-rated Health	2.36	0.73	2.21	0.78	1082	.308
Negative Affect	1.47	0.39	1.59	0.45	1016	.139
Disturbed Social Relationships	0.22	0.65	0.22	0.63	1220	.956
Intimacy (Frequency)	0.76	1.14	0.44	0.78	848	.251
Intimacy (Satisfaction)	1.91	0.76	1.38	0.80	699	.002**
Positive Marital Satisfaction	6.26	1.34	5.55	1.44	856	.029*
Negative Marital Satisfaction ^g	2.78	1.24	3.03	1.33	1167	.944

Note. Self-rated Health is a measure of physical and emotional health. The scale ranged from 0 to 9 points. The higher the score, the poorer the health. Negative Affect is a measure of depressive symptoms, scores ranged from 0 to 15. Disturbed Social Relationships represents depressive symptoms, scores ranged from 0 to 6. The higher the score, the more depressive symptoms. Intimacy (Frequency) is a measure of the frequency of sexual behaviors. Scores ranged from 0 to 3. The higher the score, the more frequent sex. Intimacy (Satisfaction) represents the level of satisfaction from emotional and physical relationship. Scores ranged from 0 to 6. Scores on Positive Marital Satisfaction ranged from 4 to 12. Scores on Negative Marital Satisfaction ranged from 3 to 9.

* $p < 0.05$ level (2-tailed); ** $p < 0.01$ level (2-tailed).

Factor Analysis of Marital Satisfaction

Marital satisfaction was assessed by six items asking about satisfaction with respondents' marriages. A confirmatory factor analysis was used to assess the fit of a two-factor model obtained by Galinsky and Waite (2013). The model consisted of 6 observed variables and two latent factors. Following Galinsky & Waite's (2013) analysis, items 1, 2, 3, and 6 loaded on Positive Marital Satisfaction Scale, and items 4 and 5 on Negative Marital Satisfaction. CFI values range from 0 to 1 with values of .95 or greater are considered a good fit (Hu & Bentler, 1999). RMSEA values of .06 or less are thought to indicate a close fit, .08 a fair fit, and .10 a marginal fit (Browne & Cudeck, 1993; Hu & Bentler, 1999). The results demonstrated a marginal fit of the model: $\chi^2(8) = 23.28, p < 0.01$, RMSEA and its 90% confidence interval = 0.13 (.075-.21), and CFI=0.84. The factor loadings for each item are reported in Table 10. The CFA model is presented in Appendix G along with the distributions of participants' scores for Positive and Negative Marital Satisfaction.

Table 10

Results of the Confirmatory Factor Analysis of the Marital Satisfaction

	Positive Marital Satisfaction	Negative Marital Satisfaction
	Factor Loading	Factor Loading
1. "Some couples like to spend their free time doing things together, while others like to do different things in their free time. Do you [and partner] like to spend free time doing things together, or doing things separately?"	.47	
2. "How often can you open up to [partner] if you need to talk about your worries? Would you say hardly ever, some of the time, or often?"	.67	
3. "How often can you rely on [partner] for help if you have a problem? Would you say hardly ever, some of the time, or often?"	.73	
4. "How often does [partner] make too many demands on you? Would you say hardly ever, some of the time, or often?"		1.41
5. "How often does [partner] criticize you?"		.19
6. "Taking all things together, how would you describe your [marriage/relationship] with [partner] on a scale from very unhappy [to] very happy?"	.61	

Correlations between the study variables. Bivariate correlations reflecting associations between the study variables are shown in Table 11.

Age was negatively correlated with Disturbed Social Relationships and with Positive Marital Satisfaction ($r = -.203, p < .05$; $r = -.220, p < .05$). Older caregivers reported more depressive symptoms and less satisfaction from their marriage. Self-rated health was positively correlated with satisfaction from intimacy ($r = .226, p < .05$), but negatively correlated with Negative Affect ($r = -.203, p < .05$). Intimacy appears to lead

to better social relations as well as better marital relations: frequency of intimate behaviors was negatively correlated with Negative Affect ($r = -.244, p < .05$); and satisfaction from intimacy was positively correlated with Positive Marital Satisfaction ($r = .571, p < .01$) and negatively correlated with Negative Marital Satisfaction ($r = -.347, p < .01$). Not surprisingly, Negative Affect was positively correlated with Disturbed Social Relationships ($r = .304, p < .01$) and Positive Marital Satisfaction was negatively correlated with negative Marital Satisfaction ($r = -.289, p < .05$).

Female caregivers reported spending many more hours per week providing care than male caregivers (see Table 9 and Appendix F). Because of these different patterns of caregiving, separate correlation matrices were computed for female and male caregivers (see Table 12). Although these matrices stratified by gender revealed interesting contrasts between female and male caregivers, they should be treated with caution due to the limited sample size.

Female caregivers: Older female caregivers reported less satisfaction with their social and marital relationships. Age was negatively correlated with Disturbed Social Relationships ($r = -.299, p < .05$) in female caregivers and negatively correlated with Positive Marital Satisfaction ($r = -.283, p < .05$). Self-rated Health was negatively correlated with the Disturbed Social Relationships ($r = -.385, p < .05$) for female caregivers. Intimacy Satisfaction was positively correlated with the Positive Marital Satisfaction ($r = .570, p < .01$) and negatively correlated with Negative Marital Satisfaction ($r = -.303, p < .05$). Positive Marital Satisfaction was negatively correlated with Negative Marital Satisfaction ($r = -.414, p < .01$),

Male caregivers: A somewhat different picture emerged of the relationship among these measures for men. Negative Affect and Caregiving were positively correlated ($r = .489, p < .01$), whereas Negative Affect was negatively correlated with the frequency of intimate behaviors ($r = -.460, p < .01$). Similar to women, satisfaction from physical and emotional intimacy was positively correlated with Positive Marital Satisfaction ($r = .474, p < .01$) and negatively correlated with Negative Marital Satisfaction ($r = -.383, p < .05$).

Table 11

Intercorrelations among Variables for the Total Sample

	1.	2.	3.	4.	5.	6.	7.	8.
1. Age in years								
2. Amount of Caregiving in hours	.093							
3. Self-rated Health	-.140	-.063						
4. Intimacy (Frequency)	-.083	-.070	.147					
5. Intimacy (Satisfaction)	-.073	-.172	.226*	.164				
6. Negative Affect	.115	.141	-.203*	-.244*	-.033			
7. Disturbed Social Relationships	-.203*	.073	-.187	.157	.064	.304**		
8. Positive Marital Satisfaction	-.220*	-.189	.061	.184	.571**	-.094	.049	
9. Negative Marital Satisfaction	.102	-.053	.077	-.167	-.347**	.137	-.080	-.289*

* $p < 0.05$ level (2-tailed); ** $p < 0.01$ level (2-tailed).

Table 12

Intercorrelations among Variables Stratified by Gender.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Age in years		.037	-.240	-.200	-.232	.057	-.299*	-.283*	.112
2. Amount of Caregiving in hours	.168		.063	.176	-.261	-.059	.045	-.195	-.102
3. Self-rated Health	.003	-.289		.184	.240	-.220	-.385*	.049	.111
4. Intimacy (Frequency)	-.123	.053	.104		.166	-.037	.131	.261	-.151
5. Intimacy (Satisfaction)	.137	-.081	.148	.054		-.069	.016	.570**	-.303*
6. Negative Affect	.200	.489**	-.144	-.460**	.159		.717**	-.038	.025
7. Disturbed Social Relationships	-.079	.123	.086	.195	.144	.147		.109	-.076
8. Positive Marital Satisfaction	-.105	-.132	.007	.057	.474**	-.109	-.041		-.414**
9. Negative Marital Satisfaction	.083	.009	.118	-.154	-.383*	.296	-.105	.054	

* $p < 0.05$ level (2-tailed); ** $p < 0.01$ level (2-tailed).

Note. Correlations below the diagonal are for the male caregivers ($n = 43$). Correlations above the diagonal are for the female caregivers ($n = 57$).

Mediation Analyses

In order to test the hypothesis that intimacy mediates the relationship between caregiving and marital satisfaction, the author used the Precher and Hayes (2008a) SPSS macro called PROCESS. PROCESS is a computational tool for path analysis-based moderation and mediation analysis. PROCESS was used for estimation of the coefficients of the model and estimated the total and direct effect of amount of caregiving on marital satisfaction, as well as the indirect effect of amount of caregiving on marital satisfaction through intimacy (Haynes, 2013).

Taking into account the small sample size of the study, bootstrapping appeared to be the best method to test if the indirect effect was significant. The Sobel test (Sobel, 1982), which is one of the most common methods for testing a hypothesis about mediation, assumes normality in the distribution of the mediated effect. Since the sampling distribution of the mediated effect is normal only in large samples, a use of the Sobel test in this study could have led to an inaccurate estimate of the true p -value (Preacher & Hynes, 2008b). Similarly, the casual step strategy (Baron & Kenny; 1986) cannot be applied in small samples (Preacher & Hynes, 2008b). However, the bootstrapping method can be applied with confidence to smaller samples. Bootstrapping, which is a nonparametric resampling procedure does not impose the assumption of normality of the sampling distribution (Precher & Hynes, 2008b).

Two separate mediation models were tested to examine role of Intimacy (Frequency) and Intimacy (Satisfaction) for the total sample of 100 caregivers. Because of female and male patterns of caregiving differed, each models was conducted separately for male and female caregivers.

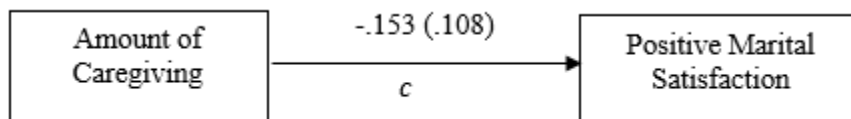
Positive Marital Satisfaction. In the first model predicting Positive Marital Satisfaction, the independent variable, the mediators, and the dependent variable were entered into a single simultaneous analysis. Figure 2 depicts this multiple mediation model; variables, Amount of Caregiving, Positive Marital Satisfaction, Intimacy Frequency, and Intimacy Satisfaction, are in rectangles and arrows represent relations among variables. Figure 2A represents the direct effect of Amount of Caregiving on Positive Marital Satisfaction without adjusting for the mediators (path c). Figure 2B shows the indirect effect of Amount of Caregiving on Positive Marital Satisfaction adjusted for Intimacy (Frequency) and Intimacy (Satisfaction). Further information about this model is presented in Table 13.

In Step 1, time spent on providing care was not a significant predictor of Positive Marital Satisfaction, ignoring the frequency of intimate behaviors and satisfaction from intimacy, $b = -.153$, $t(69) = -2.24$, $p = .160$. Step 2 showed that the amount of caregiving was not a significant predictor of the mediator, frequency of intimate behavior, $b = -.035$, $t(69) = -.081$, $p = .619$. Nor was the amount of caregiving a significant predictor of the other mediator, satisfaction from intimacy, $b = -.093$, $t(68) = -1.29$, $p = .149$. Step 3 of the mediation process showed that the mediator Intimacy (Frequency) was not a significant predictor of Positive Marital Satisfaction, $b = .095$, $t(67) = -1.73$, $p = .558$. However, the mediator Intimacy (Satisfaction) was a significant predictor of Positive Marital Satisfaction, $b = .915$, $t(68) = 3.104$, $p > .01$.

Results of this analysis using a bias corrected 95 % confidence interval for indirect relations indicated that the indirect link was not statistically significant (95% CI - .006 to .001). Although the path between the predictor (Amount of Caregiving) and the

outcome (Positive marital Satisfaction) was reduced when mediators were included in the equation, Intimacy did not significantly mediated the relationship between Amount of Caregiving and Positive Marital Satisfaction.

A. The direct effect of Amount of Caregiving on Positive Marital Satisfaction



B. The indirect effect of Amount of Caregiving on Positive Marital Satisfaction through Intimacy

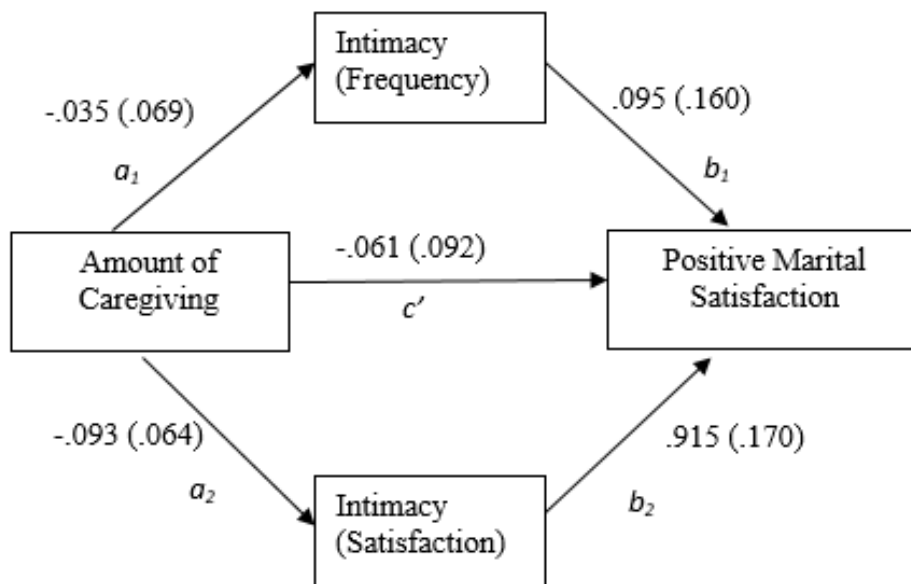


Figure 2. The direct and indirect effects of Amount of caregiving on Positive Marital Satisfaction. a , b , and c' are path coefficients. Values in parentheses are standard errors of those path coefficients. a = unstandardized regression coefficient for the association between independent variable and mediator, b = unstandardized regression coefficient for the association between the mediator and the dependent variable.

Table 13

Regression Coefficient, Standard Errors, and a Model Summary Information for the Positive Marital Satisfaction Multiple Media Model

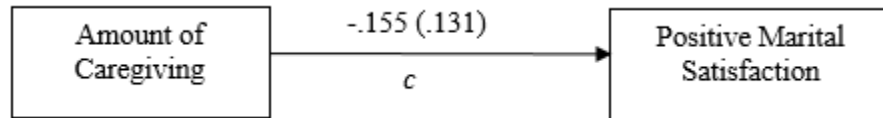
Predictor	Intimacy Frequency						Intimacy Satisfaction						Positive Marital Satisfaction					
	Coeff.	SE	p	Coeff.	SE	p	Coeff.	SE	p	Coeff.	SE	p	Coeff.	SE	p			
Amount of Caregiving	----	----	----	-----	----	----	-----	----	----	----	----	----	-----	.108	.16			
Amount of caregiving	a_1	.069	.619	a_2	-.093	.063	a_3	.149	a_4	-.061	.092	a_5	.51					
Intimacy Frequency	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	.160	.55				
Intimacy Satisfaction	---	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	.170	.00				
Constant	i_M	.713	.258	i_M	1.78	.240	i_y	.000	i_y	2.06	.155	i_y	.00	.00				
			$R^2 = .003$			$R^2 = .054$					$R^2 = .328$							
		$F(1, 71) = .249$	$p = .619$		$F(2, 70) = 2.03$	$p = .139$		$F(3, 69) = 10.94$										

Note. i_M = regression constant in the model regressing Intimacy (Frequency) on Amount of Caregiving. i_M = regression constant in model regressing Intimacy (Satisfaction) on Amount of Caregiving. i_y = regression constant in the model regressing Positive Marital Satisfaction on Amount of Caregiving.

The next mediation model included only female caregivers. Figure 3 depicts this multiple mediation model. Figure 3A represents the direct effect of Amount of Caregiving on Positive Marital Satisfaction without adjusting for mediators (path c). Figure 3B shows the indirect effect of Amount of Caregiving on Positive Marital Satisfaction adjusted for Intimacy (Frequency) and Intimacy (Satisfaction). Further information about this model is presented in Table 14.

In Step 1, time spent on providing care was not a significant predictor of Positive Marital Satisfaction, ignoring the frequency of intimate behaviors and satisfaction from intimacy, $b = -.155$, $t(48) = -2.24$, $p = .240$. Step 2 showed that the amount of caregiving was not a significant predictor of the mediator, frequency of intimate behavior, $b = -.083$, $t(48) = -.081$, $p = .315$. Nor was the amount of caregiving a significant predictor of the other mediator, satisfaction from intimacy, $b = -.083$, $t(48) = -1.29$, $p = .271$. Step 3 of the mediation process showed that the mediator Intimacy (Frequency) was not significant predictor of Positive Marital Satisfaction, $b = .327$, $t(48) = -1.73$, $p = .108$. However, the mediator Intimacy (Satisfaction) was a significant predictor of Positive Marital Satisfaction among female caregivers, $b = .865$, $t(48) = 3.104$, $p < .01$.

A. The direct effect of Amount of Caregiving on Positive Marital Satisfaction



B. The indirect effect of Amount of Caregiving on Positive Marital Satisfaction through Intimacy

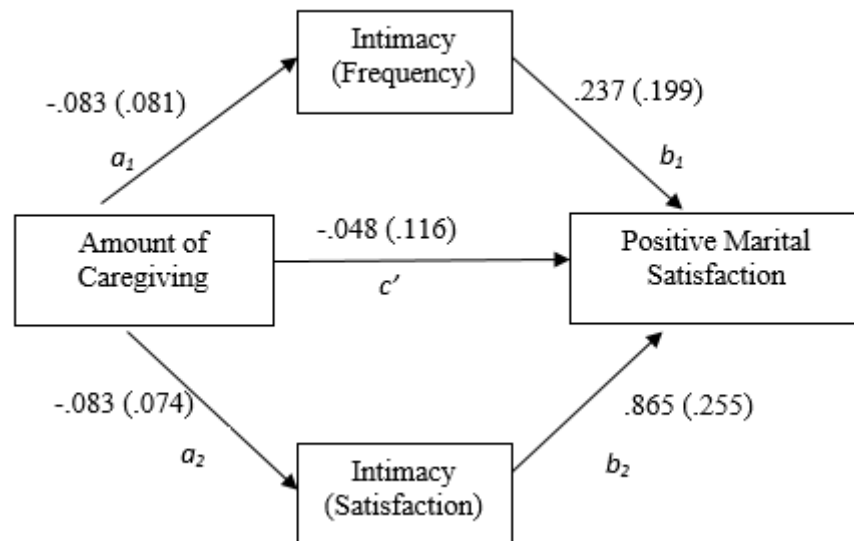


Figure 3. The direct and indirect effects of Amount of caregiving on Positive Marital Satisfaction. a , b , and c' are path coefficients. Values in parentheses are standard errors of those path coefficients. a = unstandardized regression coefficient for the association between independent variable and mediator, b = unstandardized regression coefficient for the association between the mediator and the dependent variable.

Table 14

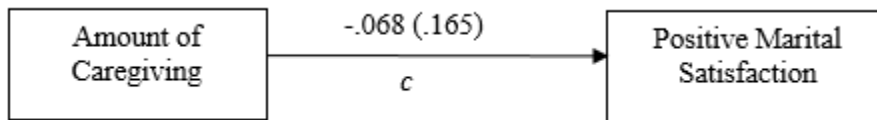
Regression Coefficient, Standard Errors, and a Model Summary Information for the Positive Marital Satisfaction Multiple Mediator Model for Female Caregivers

Predictor	Intimacy Frequency				Intimacy Satisfaction				Positive Marital Satisfaction			
	Coefficient	SE	p		Coefficient	SE	p		Coefficient	SE	p	
Amount of Caregiving	----	----	----	-----	-----	----	----	c	-.155	.131	.24	
Amount of caregiving	a_1	.081	.315	-.083	.074	.271	c'	-.048	.116	.68		
Intimacy Frequency	----	-----	-----	-----	-----	----	b_1	.327	.199	.10		
Intimacy Satisfaction	---	----	----	----	-----	----	b_2	.865	.255	.00		
constant	i_M	.730	.030	i_M	1.58	.000	i_y	4.29	.623	.00		
		$R^2 = .026$	$p = .315$		$R^2 = .049$	$F(2, 45) = .994$		$R^2 = .303$	$F(3, 44) = 5.58$			$p = .c$

Note. i_M = regression constant in the model regressing Intimacy (Frequency) on Amount of Caregiving. i_M = regression constant in the model regressing Intimacy (Satisfaction) on Amount of Caregiving. i_y = regression constant in the model regressing Positive Marital Satisfaction on Amount of Caregiving.

Figure 4 depicts this multiple mediation model for male caregivers. Further information about this model is presented in Table 15. Similar to the mediation model conducted for female caregivers, the mediator Intimacy (Satisfaction) was the only significant predictor of Positive Marital Satisfaction among male caregivers, $b = .840$, $t(25) = 3.104$ $p > .01$.

A. The direct effect of Amount of Caregiving on Positive Marital Satisfaction



B. The indirect effect of Amount of Caregiving on Positive Marital Satisfaction through Intimac

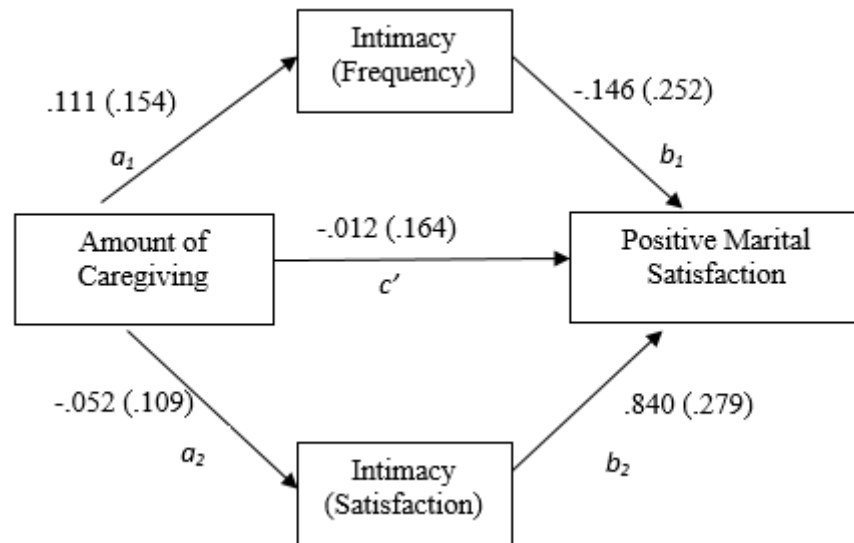


Figure 4. The direct and indirect effects of Amount of Caregiving on Positive Marital Satisfaction among male caregivers.. a , b , and c' are path coefficients. Values in parentheses are standard errors of those path coefficients.

a = unstandardized regression coefficient for the association between independent variable and mediator, b = unstandardized regression coefficient for the association between the mediator and the dependent variable.

Table 15

Regression Coefficient, Standard Errors, and a Model Summary Information for the Positive Marital Satisfaction Multiple Mediation Model for Male Caregivers

Predictor	Intimacy Frequency				Intimacy Satisfaction				Positive Marital Satisfaction			
	Coefficient	SE	p		Coefficient	SE	p		Coefficient	SE	p	
Amount of Caregiving	----	----	----	-----	-----	----	----	c	-.068	.165	.684	
Amount of caregiving	.111	.154	.478	a ₂	-.052	.109	.639	c'	-.012	.164	.944	
Intimacy Frequency	----	-----	-----	-----	-----	-----	----	b ₁	-.146	.252	.569	
Intimacy Satisfaction	---	----	----	-----	-----	-----	----	b ₂	.840	.279	.007	
constant	i _M	.551	.456	.239	i _M	2.08	.392	i _y	4.80	.961	.000	
		R ² = .019				R ² = .009				R ² = .314		
		F(1, 23) = .521		p = .478		F(2, 22) = .125		p = .883		F(3, 21) = 4.58		p = .01

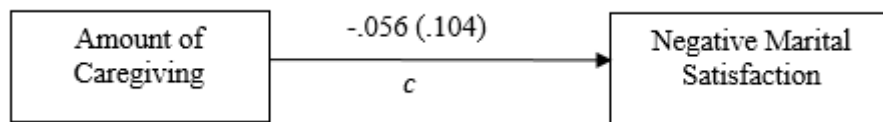
Note. i_M = regression constant in the model regressing Intimacy (Frequency) on Amount of Caregiving. i_M = regression constant in the model regressing Intimacy (Satisfaction) on Amount of Caregiving. i_y = regression constant in the model regressing Positive Marital Satisfaction on Amount of Caregiving.

Negative Marital Satisfaction. In the model predicting Negative Marital Satisfaction, the independent variable, the mediators, and the dependent variable were entered into a single simultaneous analysis. The multiple mediator model is shown in Figure 5 and the coefficients corresponding to Figure 5 are presented in Table 16.

In Step 1 of the mediation model, the regression of amount of caregiving spent on providing care, ignoring the frequency of intimate behaviors and satisfaction from intimacy, was not a significant predictor of Negative Marital Satisfaction, $b = -.112$, $t(70) = -.0834$, $p = .271$. Step 2 showed that the regression of amount of caregiving on the mediator, frequency of intimate behavior, was not significant, $b = -.043$, $t(68) = -.745$, $p = .534$. Amount of caregiving was not a significant predictor of the mediator, satisfaction from intimacy, $b = -.104$, $t(69) = .791$, $p = .113$. Step 3 of the mediation process showed that the mediator, Intimacy (Frequency) was not significant predictor of Negative Marital Satisfaction. However, Intimacy (Satisfaction) was a significant predictor of Negative Marital Satisfaction, $b = -.444$, $t(68) = -.745$, $p < .01$.

Results of this analysis using a bias corrected 95 % confidence interval for indirect relations indicated that the indirect link was not statistically significant. Because zero is contained in the interval, Intimacy does not mediate the relationship between Amount of Caregiving and Negative Marital Satisfaction.

A. The direct effect of Amount of Caregiving on Negative Marital Satisfaction



B. The indirect effect of Amount of Caregiving on Negative Marital Satisfaction through Intimacy

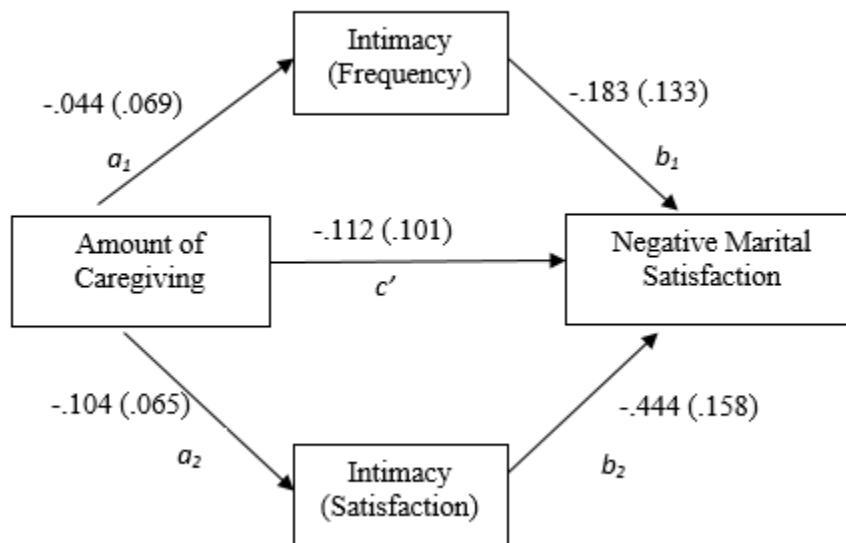


Figure 5. The direct and indirect effects of Amount of Caregiving on Negative Marital Satisfaction. a , b , and c' are path coefficients. Values in parentheses are standard errors of those path coefficients.

a = unstandardized regression coefficient for the association between independent variable and mediator, b = unstandardized regression coefficient for the association between the mediator and the dependent variable.

Table 16

Regression Coefficient, Standard Errors, and a Model Summary Information for the Negative Marital Satisfaction Multiple Mediat

Predictor	Intimacy Frequency						Intimacy Satisfaction						Negative Marital Satisfaction					
	Coefficient	SE	<i>p</i>	Coefficient	SE	<i>p</i>	Coefficient	SE	<i>p</i>	Coefficient	SE	<i>p</i>	Coefficient	SE	<i>p</i>			
Amount of Caregiving	----	----	----	-----	----	----	-----	----	----	----	----	----	----	.104	.593			
Amount of caregiving	a_1	.069	.534	a_2	-.104	.113	c'	.065	.113	c	.101	.271	b_1	.133	.175			
Intimacy Frequency	----	----	----	-----	----	----	-----	----	----	----	----	----	b_2	.158	.006			
Intimacy Satisfaction	----	----	----	-----	----	----	-----	----	----	----	----	----	i_y	.512	.000			
constant	i_M	.742	.069	i_M	1.83	.007	i_y	.245	.000	4.07	.512	.000						
			$R^2 = .005$				$R^2 = .057$						$R^2 = .342$					
		$F(1, 73) = .391$	$p = .534$		$F(2, 72) = 2.12$	$p = .128$		$F(3, 71) = 4.06$		$p = .010$								

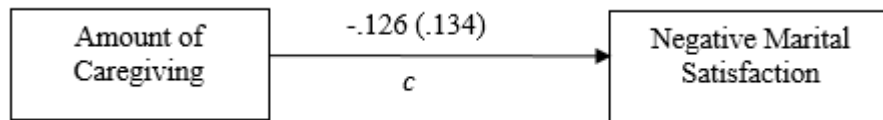
Note. i_M = regression constant in the model regressing Intimacy (Frequency) on Amount of Caregiving. i_M = regression constant in the model regressing Intimacy (Satisfaction) on Amount of Caregiving. i_y = regression constant in the model regressing Negative Marital Satisfaction on Amount of Caregiving.

The same mediation model predicting Negative Marital Satisfaction was tested for female caregivers. Figure 6 depicts this multiple mediation model; variables, Amount of Caregiving, Positive Marital Satisfaction, Intimacy Frequency, and Intimacy Satisfaction, are in rectangles and arrows represent relations among variables. Figure 6A represents the direct effect of Amount of Caregiving on Positive Marital Satisfaction without adjusting for the mediators (path c). Figure 6B shows the indirect effect of Amount of Caregiving on Negative Marital Satisfaction adjusted for Intimacy (Frequency) and Intimacy (Satisfaction). Further information about this model is presented in Table 17.

In Step 1, time spent on providing care was not a significant predictor of Negative Marital Satisfaction, ignoring the frequency of intimate behaviors and satisfaction from intimacy, $b = -.126$, $t(48) = -.946$, $p = .349$. Step 2 showed that the amount of caregiving was not a significant predictor of the mediator, frequency of intimate behavior, $b = -.079$, $t(48) = -.939$, $p = .353$. Nor was the amount of caregiving a significant predictor of the other mediator, satisfaction from intimacy, $b = -.111$, $t(48) = -4.44$, $p = .157$. Step 3 of the mediation process showed that the mediators Intimacy (Frequency) and Intimacy (Satisfaction) were not significant predictors of Negative Marital Satisfaction, $b = -.225$, $t(48) = -.863$, $p = .393$, and $b = -.456$, $t(48) = -1.92$, $p = .062$.

Results of this analysis using a bias corrected 95 % confidence interval for indirect relations indicated that the indirect link was not statistically significant (95% CI - .466 to .066).

A. The direct effect of Amount of Caregiving on Negative Marital Satisfaction



B. The indirect effect of Amount of Caregiving on Negative Marital Satisfaction through Intimacy

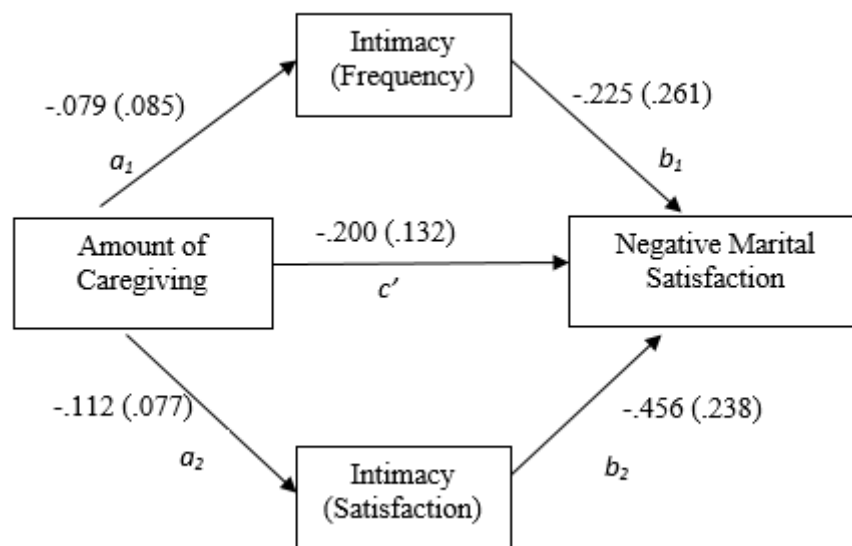


Figure 6. The direct and indirect effects of Amount of Caregiving on Negative Marital Satisfaction. a , b , and c' are path coefficients. Values in parentheses are standard errors of those path coefficients.

a = unstandardized regression coefficient for the association between independent variable and mediator, b = unstandardized regression coefficient for the association between the mediator and the dependent variable.

Table 17

Regression Coefficient, Standard Errors, and a Model Summary Information for the Negative Marital Satisfaction Multiple Mediator Model for Female Caregivers

Predictor	Outcome											
	Intimacy Frequency			Intimacy Satisfaction			Negative Marital Satisfaction					
	Coefficient	SE	p	Coefficient	SE	p	Coefficient	SE	p			
Amount of Caregiving	----	----	----	----	----	----	.050	.167	.768			
Amount of caregiving	a_1	-.079	.085	.353	a_2	.144	.099	.801	c'	.052	.179	.775
Intimacy Frequency	----	----	----	----	----	----	b_1	-.225	.261	.393		
Intimacy Satisfaction	---	----	----	----	----	----	b_2	-.456	.238	.062		
constant	i_M	.707	.349	.049	i_M	1.66	.296	.000	i_y	4.39	.679	.000
			$R^2 = .024$				$R^2 = .079$			$R^2 = .120$		
		$F(1, 46) = .811$	$p = .353$		$F(2, 45) = 1.45$	$p = .245$		$F(3, 44) = 2.04$		$p = .12$		

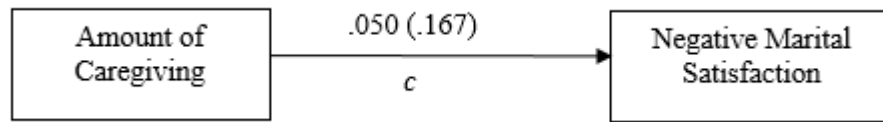
Note. i_M = regression constant in the model regressing Intimacy (Frequency) on Amount of Caregiving. i_M = regression constant in the model regressing Intimacy (Satisfaction) on Amount of Caregiving. i_y = regression constant in the model regressing Negative Marital Satisfaction on Amount of Caregiving.

The mediation model predicting Negative Marital Satisfaction for male caregivers was also tested. Figure 7 depicts this multiple mediation model; variables, Amount of Caregiving, Negative Marital Satisfaction, Intimacy Frequency, and Intimacy Satisfaction, are in rectangles and arrows represent relations among variables. Figure 7A represents the direct effect of Amount of Caregiving on Positive Marital Satisfaction without adjusting for the mediators (path c). Figure 7B shows the indirect effect of Amount of Caregiving on Negative Marital Satisfaction adjusted for Intimacy (Frequency) and Intimacy (Satisfaction). Further information about this model is presented in Table 18.

In Step 1, time spent on providing care was not a significant predictor of Negative Marital Satisfaction, ignoring the frequency of intimate behaviors and satisfaction from intimacy, $b = -.050$, $t(25) = .299$, $p = .768$. Step 2 showed that the amount of caregiving was not a significant predictor of the mediator, frequency of intimate behavior, $b = .072$, $t(25) = .497$, $p = .624$. Nor was the amount of caregiving a significant predictor of the other mediator, satisfaction from intimacy, $b = -.025$, $t(25) = -.255$, $p = .801$. Step 3 of the mediation process showed that the mediators Intimacy (Frequency) and Intimacy (Satisfaction) were not significant predictors of Negative Marital Satisfaction, $b = -.191$, $t(25) = -.100$, $p = .326$, and $b = -.456$, $t(25) = -1.88$, $p = .074$.

Results of this analysis using a bias corrected 95 % confidence interval for indirect relations indicated that the indirect link was not statistically significant (95% CI - .318 to .421).

A. The direct effect of Amount of Caregiving on Negative Marital Satisfaction



B. The indirect effect of Amount of Caregiving on Negative Marital Satisfaction through Intimacy

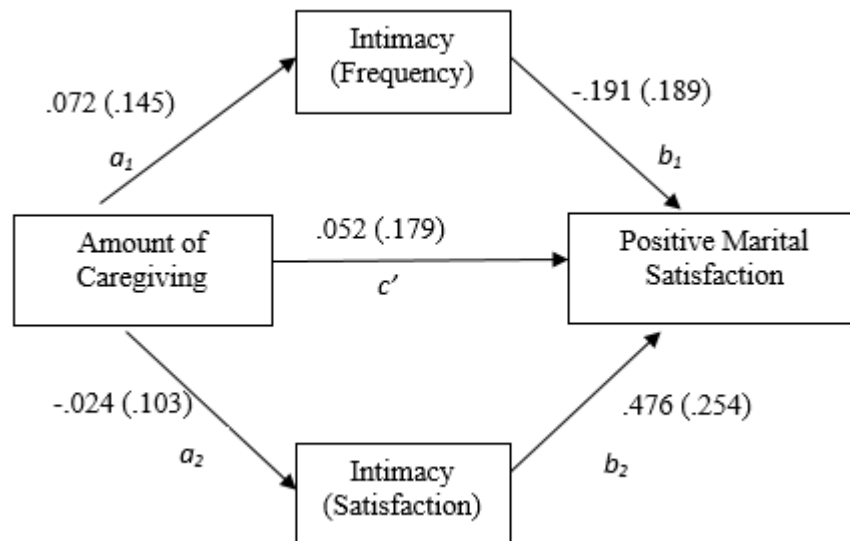


Figure 7. The direct and indirect effects of Amount of Caregiving on Negative Marital Satisfaction. a , b , and c' are path coefficients. Values in parentheses are standard errors of those path coefficients.

a = unstandardized regression coefficient for the association between independent variable and mediator, b = unstandardized regression coefficient for the association between the mediator and the dependent variable.

Table 18

Regression Coefficient, Standard Errors, and a Model Summary Information for the Negative Marital Satisfaction Multiple Mediator Model for Male Caregivers

Predictor	Outcome											
	Intimacy Frequency			Intimacy Satisfaction			Negative Marital Satisfaction					
	Coefficient	SE	<i>p</i>	Coefficient	SE	<i>p</i>	Coefficient	SE	<i>p</i>			
Amount of Caregiving	----	----	----	-----	----	----	<i>c</i>	.167	.768			
Amount of caregiving	<i>a</i> ₁	.072	.145	.624	<i>a</i> ₂	-.025	.099	.801	<i>c</i> '	.052	.179	.775
Intimacy Frequency	----	----	----	-----	-----	-----	<i>b</i> ₁	.189	.326			
Intimacy Satisfaction	---	----	----	-----	-----	-----	<i>b</i> ₂	.254	.074			
constant	<i>i</i> _M	.669	.455	.154	<i>i</i> _M	2.02	.364	.000	<i>i</i> _y	3.65	.834	.000
			<i>R</i> ² = .008				<i>R</i> ² = .002				<i>R</i> ² = .004	
			<i>F</i> (1, 25) = .247	<i>p</i> = .624		<i>F</i> (2, 25) = .065	<i>p</i> = .801		<i>F</i> (3, 25) = .089		<i>p</i> = .768	

Note. *i*_M = regression constant in the model regressing Intimacy (Frequency) on Amount of Caregiving. *i*_M = regression constant in the model regressing Intimacy (Satisfaction) on Amount of Caregiving. *i*_y = regression constant in the model regressing Negative Marital Satisfaction on Amount of Caregiving.

Moderator Analyses

The effect of independent variable on dependent variable is moderated by the moderator if its size or strength depends on or can be predicted by the moderator (Hayes, 2013). The hypotheses about the moderating effect of type of chronic health condition, age, and gender were tested by using hierarchical regression analyses. In the first step, the outcome variable was regressed on two predictors. If the model was significant, the interaction term between two predictors was entered to test if the addition of the interaction terms resulted in a significant increase in the fit of the model. If step 1 was not significant, step 2 was not conducted.

Hypothesis 5 postulated that type of chronic health condition would moderate the relationship between amount of caregiving and marital satisfaction. To test the hypothesis, two separate hierarchical regression analyses were conducted.

The moderator model is shown in Figure 8, where the variables Amount of Caregiving, Positive Marital Satisfaction, and type of chronic health condition (in rectangles) and the arrows represent relations among the variables. In the first step, two variables were included: Amount of Caregiving and type of chronic health condition. However, these variables did not account for a significant amount of variance in Positive Marital Satisfaction, $R^2=.067$, $F(2, 78) = 2.82$, $p = .066$. Hence, step 2 was not performed to test whether the addition of an interaction term would result in a significant increase in the fit of the model.

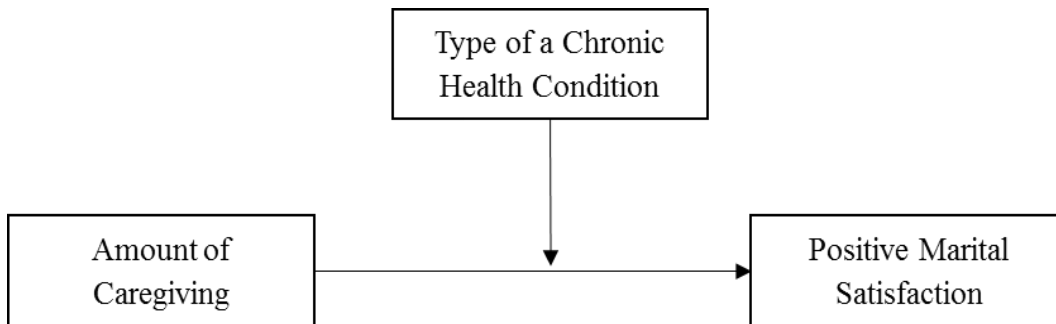


Figure 8. Type of Chronic Health Condition as a Moderator of the Relationship between Amount of Caregiving and Positive Marital Satisfaction.

A similar procedure was performed to test if type of chronic health condition moderated the relationship between Amount of Caregiving and Negative Marital Satisfaction. Amount of Caregiving and type of chronic health condition accounted for a significant amount of variance in Negative Marital Satisfaction, $R^2=.110$, $F(2, 80) = .496$, $p < .01$. Therefore, step 2 was performed to test whether the addition of an interaction term would result in a significant increase in the fit of the model. However, the interaction term did not result in a significant increase in the fit of the model, $R^2= .111$, $F(3, 79) = 3.27$, $p < .05$. The hypothesis that type of chronic health condition moderates the relationship between caregiving and marital satisfaction can be rejected.

Hypothesis 6 postulated that caregiver's age would moderated the relationship between Amount of Caregiving and Intimacy. Separate moderation analyses were conducted for Intimacy (Satisfaction) and Intimacy (Frequency). In the first step, two variables were included as predictors of intimacy: Amount of Caregiving and Age. In the second step, the interaction term was included. The interaction term was created by

converting Age and Amount of Caregiving to z-scores and using z-score variables to compute the interaction term.

The moderator model is shown in Figure 9 for Intimacy (Satisfaction). Age and Amount of Caregiving did not account for a significant amount of variance in Intimacy (Satisfaction), $R^2=.032$, $F(2, 80) = 1.31$, $p > .05$. Hence, step 2 was not conducted.

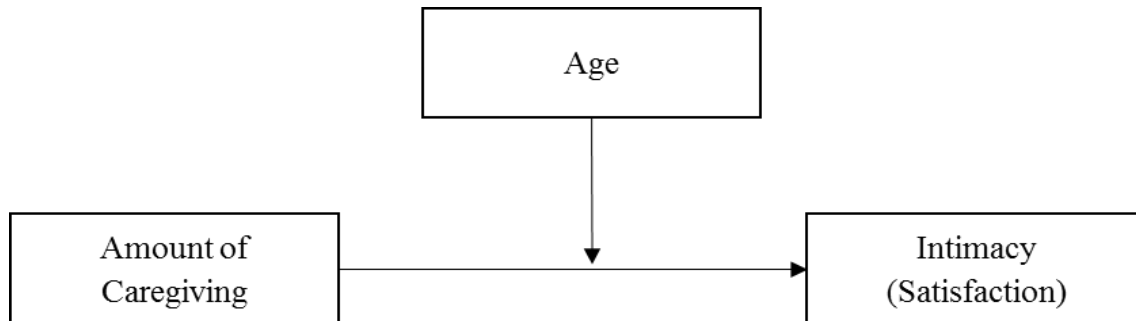


Figure 9. Age as a Moderator of the Relationship between Amount of Caregiving and Intimacy (Satisfaction).

A similar procedure was performed to test if age moderated the relationship between Amount of Caregiving and Intimacy (Frequency). The results of step 1 of the hierarchical regression analysis demonstrated that Amount of Caregiving and Age did not account for a significant amount of variance in Intimacy (Frequency), $R^2=.010$, $F(2,77) = .397$, $p = .674$. Hence, step 2 was not performed. The hypothesis that age moderates the relationship between caregiving and Intimacy (Frequency) can be rejected.

Hypothesis 7 examined to the extent to which gender moderated the relationship between Amount of Caregiving and Intimacy. The moderator model is shown in Figure 10 for Intimacy (Satisfaction). In the first step, two variables were included as predictors of intimacy: Amount of Caregiving and Gender. The results demonstrated that Gender and Amount of Caregiving did account for a significant amount of variance in Intimacy

(Satisfaction), $R^2=.131$, $F(2, 80) = 6.04$, $p < .01$. Therefore, step 2 was performed to test whether the addition of an interaction term would result in a significant increase in the fit of the model. However, the interaction term did not result in a significant increase in the fit of the model, $R^2= .150$, $F(3, 79) = 4.65$, $p > .05$. The hypothesis that gender moderates the relationship between caregiving and Intimacy (Satisfaction) can be rejected.

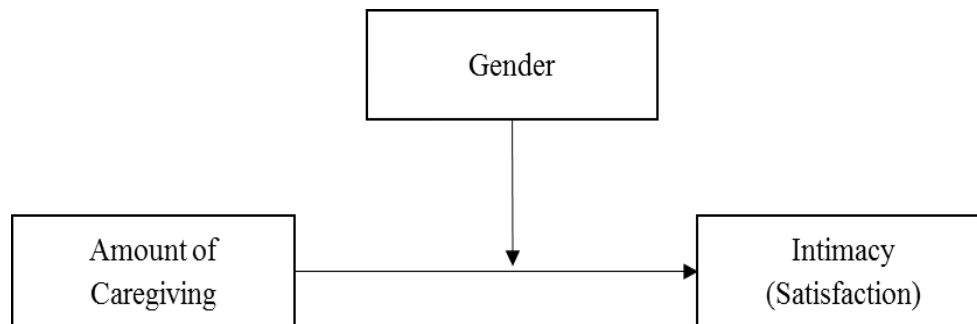


Figure 10. Gender as a Moderator of the Relationship between Amount of Caregiving and Intimacy (Satisfaction).

A similar procedure was performed to test if gender moderated the relationship between Amount of Caregiving and Intimacy (Frequency). The results of the hierarchical regression analysis in step 1 demonstrated that Amount of Caregiving and Gender did not account for a significant amount of variance in Intimacy (Frequency), $R^2=.045$, $F(2,77) = 1.47$, $p = .237$. Hence, step 2 was not conducted. It can be concluded that gender does not moderate the relationship between Caregiving and Intimacy.

Hypothesis 8 examined to the extent to which Gender moderated the relationship between Intimacy and Marital Satisfaction. The moderator model is shown in Figure 11 for Intimacy (Satisfaction). Gender and Intimacy (Satisfaction) accounted for a significant amount of variance in Positive Marital Satisfaction, $R^2=.333$, $F(2, 89) = 22.19$,

$p < .01$. The interaction term between gender and Intimacy (Satisfaction) was added to the regression model in step 2, but did not improve the fit of the model, R^2 change = .003, $p = .522$.

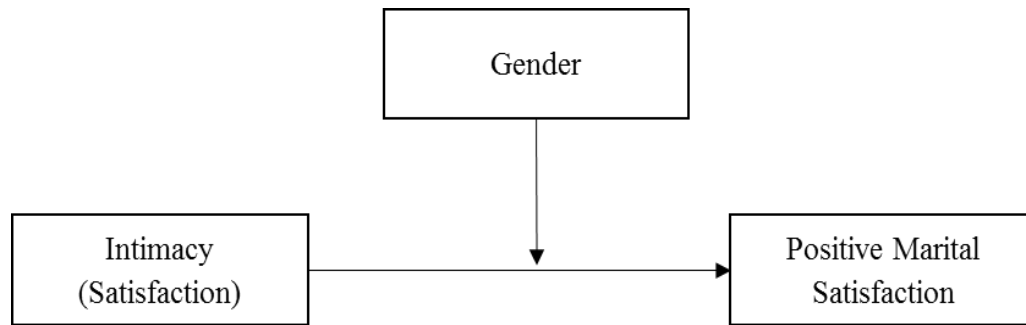


Figure 11. Gender as a Moderator of the Relationship between Intimacy (Satisfaction) and Positive Marital Satisfaction.

A similar procedure was performed to test if Gender moderated the relationship between Intimacy (Frequency) and Positive Marital Satisfaction. The results of the hierarchical regression analysis demonstrated that Intimacy (Frequency) and Gender did not account for a significant amount of variance in Positive Marital Satisfaction, $R^2=.059$, $F(2,83) = 2.83$, $p = .081$ in step 1. Hence, step 2 was not conducted.

Gender was also tested as a moderator the relationships between Intimacy (Satisfaction) and Negative Marital Satisfaction and between Intimacy (Frequency) and Negative Marital Satisfaction. The results demonstrated that Gender and Intimacy (Satisfaction) did account for a significant amount of variance in Negative Marital Satisfaction, $R^2=.121$, $F(2, 91) = 6.25$, $p < .01$. The interaction term between gender and

Intimacy (Satisfaction) was added to the regression model in step 2, but did not improve the fit of the model, R^2 change = .001, $p = .732$.

Gender and Intimacy (Frequency) did not account for a significant amount of variance in Negative Marital Satisfaction, $R^2=.017$, $F(2, 85) = .736$, $p = .482$. Hence, step 2 was not conducted. The hypothesis that gender moderates the relationship between intimacy and marital satisfaction can be rejected.

Chapter 5: Discussion

Caregiving has become an important issue in an aging society. Caring for a spouse may be a stressful experience (Pinquart & Sörensen, 2001; Schulz and Beach, 1999) that leads not only to negative health outcomes such as a worsening of the immune system, slow wound healing, and greater risk for cardiovascular reactivity, but also leads to decreased frequency of intimate behaviors between spouses (Simonelli et al., 2008).

A number of studies have demonstrated that positive marital satisfaction can mitigate the consequences of poor physical health and improve quality of life (Bookwala, 2011; Warner & Kelly-Moore, 2012). However, caregiver burden and the care recipient's declining health can threaten marital satisfaction as they are significant stressors in a caregiver's life (Bookwala & Franks, 2005). Previous research has found that caregivers of spouses with Alzheimer's disease reported decreased levels of marital satisfaction compared to their healthy counterparts (Wright, 1991). The mechanism through which providing care negatively influences marital satisfaction is unclear. However, some researchers have linked changes in the care recipient's personality and behavior due to the disease process as a reason of decreased marital satisfaction (Cohen & Eisdorfer, 2001). Other studies have indicated that providing care for a spouse can lead to deleterious changes in sexual functioning (Davies et al., 1998; Simonelli et al., 2008), which in turn could affect marital satisfaction.

The primary goal of this dissertation was to investigate intimacy as a mediator of the relationship between the amount of caregiving and marital satisfaction. Both the frequency of intimate behaviors and satisfaction from intimacy were considered as

potential mediators. Positive and negative aspects of marital satisfaction were also considered. The study also investigated the type of chronic health condition, age, and gender as moderators of the relationship among the amount of caregiving, intimacy, and marital satisfaction. Because chronic health conditions are mostly prevalent among the elderly, the study focused on married older individuals. The study utilized data from the first wave of the National Social Life, Health, and Aging Project, which surveyed 3,005 men and women aged 57-85. This survey yielded a sample of 100 caregivers (43 males and 57 females) who provided data on marital satisfaction and on intimacy.

Study variables included measures of caregiving (hours per week of providing care), marital satisfaction (positive and negative), intimacy (frequency and satisfaction), health, and depression outcomes (disturbed social relations and negative affect). The study variables showed different patterns of correlation for male versus female caregivers. Aging affected only female caregivers' social relationships and marital satisfaction. Older female caregivers were more likely to experience feelings of being disliked by other people and were less satisfied with their marriages. Also female caregiver's self-rated health was associated with experiencing feelings of being disliked by other people. These findings support previous research that found that caregiving wives report higher levels of depression (Gallagher-Thompson, Dal Canto, Jacob, & Thompson, 2001). In contrast, the relationship between age and other variables was not significant for male caregivers.

Weekly hours spent on providing care significantly impacted male but not female caregivers, although on average, women reported providing more care than men. For male caregivers, more hours spent on caring for a spouse was associated with more

depressive symptoms, both disturbed social relationships and negative affect. Depressive symptoms were associated with infrequent intimate behaviors among men, but not among women.

Positive Marital Satisfaction was positively associated with satisfaction from physical and emotional intimacy for both men and women. Positive Marital Satisfaction was also negatively associated with Negative Marital satisfaction but only for female caregivers.

Hypotheses Testing

Based on previous research investigating the negative effects of caregiver burden on marital satisfaction and intimacy, a model was developed that hypothesized that intimacy would mediate the relationship between caregiver burden and marital satisfaction. Caregivers with high levels of caregiver burden were hypothesized to report lower levels of marital satisfaction and less frequent intimate behaviors. It was also expected that caregivers, who experience high levels of intimacy, would report high levels of marital satisfaction. In order to examine these hypotheses, a series of mediation analyses were performed. The analysis tested the main hypothesis about the mediating role of intimacy in the relationship between caregiver burden and marital satisfaction, using the macro PROCESS. Two sets of models were tested to examine the mediation hypothesis for the total sample, one examining positive marital satisfaction, one examining negative marital satisfaction. For each outcome, both the frequency of intimacy and satisfaction from intimacy were considered as possible mediators. Because men and women reported different patterns of providing care, separate mediation

analyses were performed for men and women. In these analyses caregiving burden was assessed in terms of hours per week providing care.

The first hypothesis was that caregiving would result in decreased marital satisfaction. There was little evidence of a negative relationship between caregiving and marital satisfaction. The results also did not support the second hypothesis that caregiving would be negatively associated with the frequency of intimate behaviors and with satisfaction from intimacy. Hence, the second hypothesis was also rejected. The third hypothesis was accepted: satisfaction from intimacy was a significant predictor of positive marital satisfaction. Higher levels of satisfaction from intimacy result in higher levels of satisfaction from the marriage, for both male and female caregivers. The main hypothesis stated that the negative relationship between caregiver burden and marital satisfaction would be partially or fully mediated by intimacy. No evidence was found to support this hypothesis, either for the frequency of intimacy or satisfaction from intimacy; hence, hypothesis 4 was rejected.

The fifth through eight hypotheses considered how type of chronic health condition (dementia versus other chronic conditions), age, and gender might moderate relations among caregiving, marital satisfaction, and intimacy. Little support was found for these hypothesis.

Limitations of the Study

This study did not find that the frequency and satisfaction from intimacy mediates the effect of caregiving on marital satisfaction. The failure to support the mediation hypothesis may be due to a number of limitations of this study.

First, by using a secondary dataset, the study was limited to the available data. Further, single-item measures present many limitations, mainly due to difficulty establishing reliability and the tendency to correlate only moderately with scale measures (Nagy, 2002; Wanous & Hudy, 2001). The dataset did not include a measure of caregiver burden. Typically in research on caregiving, burden is assessed in terms of the caregiver's perception of the impact of caregiving on social supports, personal activities, or emotional states. Only a single measure of hours per week spent providing care was available as an indicator of caregiver burden. In more advanced stages of diseases like dementia, the types of caregiving tasks may change because the care recipient's functioning may become increasingly impaired and their impact on the caregiver may increase. Information about subjective as well as objective aspects of caregiving, including the duration of caregiving experience, would have been helpful in assessing caregiver burden and understanding how caregiving burden affects intimacy and marital satisfaction.

Similarly, the frequency of intimacy was measured by using only one question about intercourse. A more detailed inventory of the frequency of intimate behaviors is needed because older adults may consider different types of behavior other than intercourse. For example, the frequency of kissing, hugging, or touching might be more important indicators of intimacy than intercourse. Using only one item to measure the frequency of intimate behaviors may limit our understanding the complex ways in which individuals express their sexuality.

Another issue that arises from using secondary data is that the data were gathered using a self-report method. The main disadvantage of self-report is that there are a

number of potential validity problems, because self-report measures allow respondents to strategically modify their responses to suit particular self-presentation motives (Richter, 2001). A related limitation is that data were only collected from caregivers and not from their spouses. Evaluation of data from both members of the dyad could provide a broader picture of the relationships among studied variables, particularly with regards to marital satisfaction and intimacy. It would be important to understand how both partners are affected by care giving and care receiving. Further these data were assessed at only a single point in time; caregiving burden, intimacy and marital satisfaction may change over the time course of caregiving. Hence, assessing these measures at multiple time points may provide valuable insights into changing relationships among caregiving, intimacy, and marital satisfaction.

Another important limitation to this study was that the total number of participants was small. This study examined only caregivers providing care to spouses as opposed to all caregivers in general. In addition, the sample was not diverse racially. A more racially diverse sample would have strengthened the study.

General Conclusions and Future Directions

Spousal caregivers are essential for individuals with chronic health conditions. However, providing care often has significant consequences for health and marital satisfaction. With an increasing number of older adults and increasing prevalence of chronic health conditions, it becomes critical for health care professionals to understand the challenges arising from being a caregiver to an individual with chronic health conditions.

This study contributes to the literature on caregiving by demonstrating that age, depressive symptoms, and self-rated health play an important role in the frequency of intimate behaviors and satisfaction from intimacy, and positive marital satisfaction. The current study also provides insight into how caregivers' intimacy influences marital satisfaction.

Although this study did not find that intimacy mediates the relationship between caregiver burden and marital satisfaction, it provides useful information to guide future studies. Given the findings and limitations of the current study, a number of opportunities for future research emerge.

First, researchers could contribute to research on caregiving by expanding the sample to include a more diverse sample of caregivers. It would be also beneficial to use dyadic data that could offer more insights into how members of the same dyad perceive the loss of intimacy and how it affects marital satisfaction.

A second direction for future research is to examine the mediating role of intimacy among married older caregivers by using varied methods to measure caregiver burden, including its objective and subjective components. Perhaps subjective burden is more important in predicting marital satisfaction than objective burden, e.g., hours per week spent providing care. Another way to improve the current research is to include more potentially moderating variables. These variables might include measures of the personality of caregivers and duration of the marriage. Future studies could also incorporate physiological measures of health outcome (e.g., levels of cortisol, blood pressure) in addition to self-report measures of caregivers' health outcomes.

A longitudinal study over the course of caregiving is also recommended in order to extend the current line of research. A longitudinal study would allow researchers to draw inferences about causal relationship among the studied variables. Assessing caregiving, intimacy, and marital satisfaction at multiple time points would allow researchers to examine how their relationships change over time with the health of the care recipient and with changing nature of caregiving. Further attention should also be given to the duration of caregiving. Caregiving over many years may have more detrimental effects on marital satisfaction and intimacy than a short interval of caregiving.

Future research could also focus on combining quantitative and qualitative approaches. For example, an interviewer could use a semi-structured format to inquire about the experience of caregiving. The open-ended questions would allow participants to answer the questions using their own words, rather than choosing from one of the pre-formulated responses. Letting the participants answer in their own words might also bring to light some unique and unexpected responses, which could lead to new insights about how older adults define marital satisfaction, intimacy, and caregiver burden.

Despite its limitations, this study has several very important implications. The identification of factors that influence intimacy and marital satisfaction is beneficial to detecting caregivers who might be vulnerable to “burn-out”. The findings provide insights into the importance of intimacy for couples coping with dementia and other chronic health conditions. It also provides valuable insights for individuals who work with older adults as to the importance of intimacy in maintain caregiving and marital bonds.

Knowing and understanding the importance of intimacy for marital satisfaction is important for the maintenance of satisfaction from marriage. However, it is important not only to emphasize the benefits of intimacy, but it is also necessary to identify barriers that limit intimacy among spousal caregivers. Due to age-related problems and symptoms of chronic health conditions, many older couples may face problems with sexual expression. This may be an important topic that health care professionals should address with caregivers and their spouses, particularly those with chronic or progressive health conditions. For example, in case of dementia there is usually a gradual decline that occurs over an extended period of time. Caregivers should be prepared for this progression and learn how to anticipate gradual changes to intimacy. Therefore, addressing these concerns early in the process of caregiving may have long-term benefits for both caregivers and care recipients. In addition, it may help both spouses adapt more effectively to the caregiving situation.

This study provided further evidence that depressive symptoms are key to the frequency of intimate behaviors among spousal caregivers (e.g., Baldwin, 2001). In addition, the study revealed that self-rated health plays an important role in satisfaction from intimacy. Therefore, this study may assist in the development of appropriate interventions for couples affected by chronic health conditions. Health care professionals should be aware of the high rates of depressive symptoms among caregivers. Early evaluation and treatment of depressive symptoms may help in maintaining high levels of marital satisfaction and intimacy, which in turn may help to build or improve caregiver's resiliency (Braun et al., 2009).

Furthermore, increased awareness of how negative affect and health influence

intimacy may help health care professionals better understand and support caregivers. In other words, a better understanding of the caregiver experience and how it impacts intimacy could be beneficial to health care professionals and caregiving spouses. Health care professionals must address these issues by providing information and options for maintain high levels of satisfaction from intimacy as couples age.

Previously, studies have ignored the role of intimacy among caregivers of individuals with chronic health conditions. This study has extended the line of thinking of prior studies by examining the mediating role of intimacy. However, future research that would employ dyadic data collected at multiple time points is needed to advance our understanding of the relationships between caregiving burden, intimacy, and marital satisfaction. Overall, this study could be used as a stepping stone for other studies investigating the relationship between caregiver burden, intimacy, and marital satisfaction.

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Appendix A

Institutional Review Board Application

1. * Title of study:

The relationship between marital satisfaction and caregiver burden in spouse caregivers of individuals with chronic illnesses.

2. * Short title:

The relationship between marital satisfaction and caregiver burden.

3. * Brief description:

The study aims to examine the impact of chronic illness on a spousal caregiver. This study will analyze data from the National Social Life, Health and Aging Project (NSHAP). The NSHAP is a population-based survey conducted on more than 3,000 men and women aged 57-85. In this study, I will explore the role of intimacy as the potential moderator variable between marital satisfaction and the experience of caregiver burden.

4. * Principal investigator:

Magdalena Leszko

5. * Does the investigator have a financial interest related to this research?

Yes No

6. * Which IRB should oversee this study?

- KU Lawrence
 KUMC
 KUSM-W

7. * Will an external IRB act as the IRB of record for this study?

Yes No

8. * Attach the protocol: (include the investigator protocol and full sponsor protocol)



Human Subjects Committee - Lawrence

Submission for Initial Review **For Use with eCompliance Only**

Project Title:	The relationship between marital satisfaction and caregiver burden in spouse caregivers of individuals with chronic illnesses.
Investigator Name:	Magdalena Leszko
Faculty Supervisor:	Susan Kemper, PhD

This form must be used when submitting an application through the eCompliance system.
No other methods of submission will be accepted.

You may access the system here: <http://research.ku.edu/eCompliance>

Students and faculty supervisors: Please note an ancillary review process will be required to obtain faculty supervisor approval within the system. Please see the [IRB Study Submission Guide](#) for more information.

For faster processing, ensure all study staff have completed all required training through https://rgs.drupal.ku.edu/human_subjects_compliance_training

Contact hscl@ku.edu with questions!

rev 6/7/13

The relationship between marital satisfaction and caregiver burden in spouses	Magdalena Leszko
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1. Subject Information**1.1 Number of Subjects:** 3,005**1.2 Subject Age (Check all that Apply)**

- 0-7
 8-17
 18-65
 65+

1.3 Special Populations (Check all that apply)

- Minors
 Non-English speaking
 Mentally or developmentally disabled individuals
 Pregnant women
 Prisoners
 Individuals with diminished capacity for consent
 Individuals with a Legally Authorized Representative
 Other vulnerable population (describe below)

1.4 Describe any specific populations targeted for inclusion or exclusion:

Because of our interest in the marital satisfaction, intimacy and caregiver burden, our analysis will be restricted to only married men and women between the ages of 57-85 years who at the time of the study, spousal caregivers. All the participants who will be studied under this protocol have previously participated in the National Social Life, Health and Aging Project (IRB# 00005565 and 00000142).

1.5 Describe target demographics of proposed subjects; explain how you will ensure that selection is equitable and that all relevant ethnic groups, genders, and populations have access to the study.

This study will analyze data from the National Social Life, Health and Aging Project (NSHAP). This nationally representative survey of 3,005 U.S. adults aged 57-85 years collected information on physical and cognitive health, intimate social relationships, and sexuality. The NSHAP survey was conducted during 2005 and 2006.

2. Recruitment**2.1 Describe the recruitment process for the study. Explain how you will gain access to and recruit the subjects for participation in this project.**

This is a secondary-data analyses with publicly available non-identifiable data. The data come from the 2005-2006 National Social Life, Health and Aging Project (NSHAP). The NSHAP respondents are drawn from a nationally representative sample of the U.S. population. The project uses human derived material in the form of survey responses in the NSHAP.

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University of Kansas
Human Subjects Committee - Lawrence**2.2 Identify any cooperating institutions by name.**

2.3 Where will the research activities take place? List all off campus locations.

2.4 Identify all applicable recruitment methods. (Please provide copies of materials)

- | | | |
|---|--|--|
| <input type="checkbox"/> Flyers | <input type="checkbox"/> Internet | <input type="checkbox"/> Purchased Sample List |
| <input type="checkbox"/> Letter | <input type="checkbox"/> E-mail | <input type="checkbox"/> Personal or Professional Contacts |
| <input type="checkbox"/> Telephone | <input type="checkbox"/> Amazon MTurk | <input checked="" type="checkbox"/> Other |
| <input type="checkbox"/> Newspaper | <input type="checkbox"/> Social Media | |
| <input type="checkbox"/> Poster | <input type="checkbox"/> SONA | |
| <input type="checkbox"/> Departmental Communication | <input type="checkbox"/> Third Party (Professional or Charitable Organization) | |

2.5 Are you recruiting students from a class you teach or for which you have responsibility?

No

2.6 Are you recruiting employees who directly or indirectly report to you?

No **2.7 If yes to 2.5 or 2.6, please explain why this population is necessary and describe what precautions have been taken to minimize potential undue influence or coercion.**

3. Compensation*Drawings and raffles may not be permitted for payment or recruiting; see HSCL website for detailed guidance.*

- Participants will not receive compensation**
- Students will receive extra credit or course credit**
- Subjects will receive monetary compensation**

Describe the compensation or credit, including amount, scheduling and method. Explain what will happen if participants withdraw from the study.

The relationship between marital satisfaction and caregiver burden in spouse Magdalena Leszko

4. Project Information

4.1 Expected Study period from: To:

4.2 Describe the purpose of the research. Include purpose, aims, and objectives. State the hypothesis to be tested.

The purpose of this study is to examine the impact of chronic illness on a spousal caregiver. In this study, we explore the role of intimacy as the potential moderator variable between marital satisfaction and the experience of caregiver burden.

Research aims: we attempt to assess the current quality of the marital relationship, level of intimacy and level of caregiver burden among spousal caregivers of individual with chronic illnesses. We also explore whether intimacy can moderate the influence of marital satisfaction on caregiver burden. The next aim is to explore the association between levels of present intimacy and the degree of depressive symptoms.

Hypothesis:

Caregivers who are dissatisfied with their marital relationship will experience higher levels of perceived strain and depression.

Caregivers who experience low levels of marital intimacy will have higher levels of perceived strain and depression.

The moderating effect of intimacy on marital satisfaction and caregiver burden will be significantly larger for men than for women.

4.3 Background; describe prior relevant experience and gaps in current knowledge. Provide a brief scientific or scholarly background.**5. Risks & Benefits**

5.1 Does this study involve any of the following? (Check all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Deception | <input checked="" type="checkbox"/> Information relating to sexual attitudes, orientation or practice |
| <input type="checkbox"/> Omission | <input type="checkbox"/> Private identifiable information |
| <input type="checkbox"/> Misleading information/False feedback | <input type="checkbox"/> Personal or sensitive information |
| <input type="checkbox"/> Physical or mental stress | <input type="checkbox"/> Private records (academic or medical) |
| <input type="checkbox"/> Collection of fluids or tissue | <input type="checkbox"/> Social or economic burden to participants |
| <input type="checkbox"/> Genetic information | <input type="checkbox"/> Exposure to hazardous materials |
| <input type="checkbox"/> Substances taken internally or applied externally | <input type="checkbox"/> Information that if released could damage an individual's financial standing, employability, reputation; or cause social stigmatization or discrimination |
| <input type="checkbox"/> Mechanical or electrical device applied to subjects | <input type="checkbox"/> Other |
| <input type="checkbox"/> Information pertaining to illegal activity | <input type="checkbox"/> None of these |
| <input type="checkbox"/> Information pertaining to substance use | |

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5.2 Describe the nature and degree of the risk or harm checked above. If using deception, include a justification for the deception.

Even though the collected data includes sexual attitudes and behaviors, there is a very small risk that individuals may be identified. The risk is minimized even further by our focus on statistical relationships rather than individual characteristics.

5.3 What steps will be taken to minimize the risks or harm and to protect the subject's welfare (when risk is greater than minimal)?

If any individuals are identified through this research, the Inter-University Consortium for Political and Social Research (ICPSR) (who release the data) and the Institutional Review Boards at the University of Kansas, will be notified.

5.4 Describe the anticipated benefits of the research for individual subjects.

This study will use pre-existing Review data, therefore, there will be no direct benefits to individual subjects.

5.5 Describe the anticipated benefits of the research for society or science, and explain how the benefits outweigh the risks.

The knowledge derived from this research will benefit the population at large by providing researchers with information about sexuality in older population and its association with marital satisfaction and caregiver burden. The findings from this research may guide intervention strategies among spousal caregivers.

6. Data Collection & Security**6.1 Data collection methods** (*Check all that apply*)

- | | |
|---|--|
| <input type="checkbox"/> Observation | <input type="checkbox"/> Blood draw, saliva swab, or other biological sampling |
| <input type="checkbox"/> Interviews | <input type="checkbox"/> Tissue biopsies |
| <input type="checkbox"/> Focus groups | <input type="checkbox"/> Audio recording |
| <input type="checkbox"/> Surveys/Questionnaires | <input type="checkbox"/> Video recording |
| <input type="checkbox"/> Psychological tests | <input type="checkbox"/> Previously collected data (no individual identifiers) |
| <input type="checkbox"/> Educational tests | <input type="checkbox"/> Previously collected data (with individual identifiers) |
| <input type="checkbox"/> Internet based methods | <input checked="" type="checkbox"/> Other |

6.2 Procedures (*Describe the setting and tasks subjects will be asked to perform. Describe the frequency and duration of procedures, tests, and experiments. Include a time line or step by step listing.*)

This study will analyze data from the National Social Life, Health and Aging Project (NSHAP). The NSHAP survey was conducted during 2005 and 2006. The data collection included biomeasures, in-home interviews, and leave-behind respondent-administered questionnaires. All questionnaires and survey materials were developed in English and translated into Spanish. A more detailed explanation of the NSHAP questionnaires and procedures can be found at <http://www.norc.org/Research/Projects/Pages/national-social-life-health-and-aging-project.aspx>

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6.3 Sharing results with Subjects (Indicate if results like tests or incidental findings will be shared with the subject or others and if so, indicate how it will be shared.)

The results of this study will not be shared with the subjects.

6.4 Withdrawal of Subjects (Describe the procedures to be followed when subjects withdraw from research or under what circumstances subjects may be withdrawn without their consent.)

There will be no withdrawal of subjects as only the data will undergo secondary analysis.

6.5 Protected data to be collected (Check all that apply)

- Protected health information
- Unique ID number (e.g. employee id, driver's license number)
- Academic records
- Social security number
- Other personally identifiable information

6.6 Describe the steps that will be taken to secure the data during storage, use, and transmission. How and where will the data be stored, for how long will it be kept, what safeguards are in place for data with identifying information. Include a description of physical and electronic security.

The data will be kept at the principal investigator's office (Room 3091), which is located in the Gerontology Center at the University of Kansas campus. This is a locked office, which always is locked unless used by the principal investigator or faculty staff. No copies of the data will be made (including no backup copies, copies on the local computer etc.). After completion of the analysis, the medium containing the NSHAP data will be put back into the cabinet and locked. When the data are not being used, the medium containing the data will be stored in this locked cabinet.

6.7 Identify any direct identifiers like name, unique identifier, address, e-mail, etc. that will kept with the records. Explain why it is necessary to record the identifiers and describe the coding system to be used.

6.8 If retaining a link between study code numbers and direct identifiers after data collection is complete, please explain why this is necessary, how long the link will be kept, and how it will be stored.

6.9 If using audio and video recording, describe how the recordings will be used, how confidentiality will be maintained, and how and when the recordings will be destroyed.

The relationship between marital satisfaction and caregiver burden in spouse

Magdalena Leszko

6.10 As part of the study will you:

1. Collect protected health information (PHI) from subjects in the course of providing experimental care, or
2. Have access to PHI in the subject's records?

If yes, please describe how you will satisfy the HIPAA requirements for authorization to use PHI in research below.
(Submit the Statement on Use of Protected Health Information (PHI) form)

7. Informed Consent

7.1 Specify the type of informed consent you will use with this research project.

 Signed Consent

Consent forms included with this submission:

- | | |
|--|---|
| <input type="checkbox"/> Adult | <input type="checkbox"/> Assent Script/Procedures |
| <input type="checkbox"/> Parent/Guardian | <input type="checkbox"/> Foreign Language version |

 Oral Consent (Waiver of documentation of consent, include script with application)

- A signed consent form would be the only record linking the subject to the research, and the principal risk of signing a consent form would be potential harm resulting from a breach of confidentiality.
- The research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside the research context.

 Information Statement
 Debriefing Statement

7.2 Describe any potential concerns with obtaining informed consent (Foreign language, minimizing possibility of coercion, etc.)

7.3 Describe the process you will follow to obtain consent and/or assent. Include names of individuals on the research team who will obtain consent, where and when the process will take place and how you will ensure the subject's understanding.

The informed consent was obtained before the interviews were conducted. All the participants who will be studied under this protocol have previously participated in the National Social Life, Health and Aging Project (IRB# 00005565 and 00000142).

The relationship between marital satisfaction and caregiver burden in spouses

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Appendix B

Approval of Protocol

**APPROVAL OF PROTOCOL**

February 6, 2014

Magdalena Leszko mleszko@ku.edu

Dear Magdalena Leszko:

On 2/6/2014, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	The relationship between caregiver burden and marital satisfaction in spouse caregivers of individuals with chronic illnesses.
Investigator:	Magdalena Leszko
IRB ID:	STUDY00000781
Funding:	None
Grant ID:	None

The IRB approved the study on 2/6/2014.

1. Any significant change to the protocol requires a modification approval prior to altering the project.
2. Notify HSCL about any new investigators not named in original application. Note that new investigators must take the online tutorial at https://rgs.drupal.ku.edu/human_subjects_compliance_training.
3. Any injury to a subject because of the research procedure must be reported immediately.
4. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity.

Please note university data security and handling requirements for your project:
<https://documents.ku.edu/policies/IT/DataClassificationandHandlingProceduresGuide.htm>

You must use the final, watermarked version of the consent form, available under the “Documents” tab in eCompliance.

Sincerely,

Stephanie Dyson Elms, MPA
IRB Administrator, KU Lawrence Campus

Human Subjects Committee Lawrence

Youngberg Hall | 2385 Irving Hill Road | Lawrence, KS 66045 | (785) 864-7429 |
HSCL@ku.edu | research.ku.edu

Appendix C

The National Social Life, Health, and Aging Project (NSHAP) Data Protection Plan

Title of Research Project: The relationship between marital satisfaction and caregiver burden in spouse caregivers of individuals with chronic illnesses.

Principal Investigator: Magdalena Leszko

Dole Human Development Center

1000 Sunnyside Ave. Room 3091

Lawrence, KS 66045-7555

Phone: (785) 304 9063

E-mail: mleszko@ku.edu

Locations where copies of the data will be kept:

Dole Human Development Center

1000 Sunnyside Ave. Room 3091

Lawrence, KS 66045-7555

The data will be kept in Dole Human Developmental Center (Room 3091), on the University of Kansas campus. This is a locked office, access is restricted to the principal investigator or authorized Gerontology Center staff.

The Computing Environment and Data Storage:

The office is equipped with one Windows desktop computer including the software packages required for the data analysis. Once the medium (CD, DVD, memory card etc.) containing the NSHAP data is received by the PI, it will be securely stored in a

key locked cabinet located in the PI's office. Only the PI will have access to this locked cabinet. No copies of the data will be made and it will not be saved to the university network nor to the personal computers or workstations. The workstation computer is connected to the University of Kansas Internet Network and features the firewall protection provided by the University of Kansas Information Technology Office.

In order to analyze the data, the original medium containing the dataset will be removed from the cabinet and transferred into the workstation. This workstation computer is password protected, located in a locked office and will never be left unlocked and unattended. The data will not be copied to or stored on the workstation. The data will be opened with the software (SPSS or MPlus) and used for statistical analysis. Once the analysis is completed, the output of the statistical analysis will be generated and saved in electronic form. All identifying information will be removed from the output. The object of the research will be statistical relationships rather than individual characteristics. The original data will never be copied or transmitted.

After completion of the analysis, the medium containing the NSHAP data will be put back into the cabinet and locked. When the data are not being used, the medium containing the data will be stored in this locked cabinet.

The electronic output will be stored on the abovementioned workstation. The paper printout of computer output will be stored in a locked cabinet in the principal investigator's office or securely destroyed using a paper shredding machine.

Appendix D

Letter to Request the National Social Life, Health and Aging Project Data

February 7th, 2014

Magdalena Leszko

Dole Human Development Center

1000 Sunnyside Ave. Room 3091

Lawrence, KS 66045-7555

Phone: (785) 304 9063

E-mail: mleszko@ku.edu

Dear Dr. James W. McNally,

My name is Magdalena Leszko and I am a PhD student at the University of Kansas.

I am interested in using the data from the National Social Life, Health, and Aging Project (NSHAP) for my dissertation. Therefore, I would like to request an access to the data.

Please find attached the data protection plan, the University of Kansas Institutional Review Board letter of approval, and the signed data use agreement.

Please let me know if you have any questions.

Sincerely,

Magdalena Leszko

Appendix E

Approval of Request for Access the National Social Life, Health, and Aging Project Data

From: Arun Mathur [arun@umich.edu]

Sent: Thursday, February 13, 2014 9:45 AM

To: Leszko, Magdalena; Martha Sayre

Subject: ICPSR\NACDA restricted data

Dear Magdalena,

Your request for access to restricted data from the National Social Life, Health, and Aging Project (NSHAP) has been approved. I will momentarily be sending you a temporary URL from which you can download the files. Once you have done so please move them to wherever specified in your Data Protection Plan prior to emailing me back for the decryption password.

Best regards,

--

Arun Mathur

Data Services Specialist

ICPSR

734-647-2200

Appendix F

Distributional information and patterns of responding to the study variables

Table 1

Items measuring Caregiving

Question	Response Alternative
1. How many <u>days per week</u> do you typically spend caring for this person?	Write # of days ____ <ul style="list-style-type: none"> ▪ 7 days (80) ▪ 6 days (2) ▪ 5 days (3) ▪ 3 days (2) ▪ 2 days (1) ▪ 0 days (1) ▪ No answer (11)
2. How many <u>hours per day</u> do you typically spend caring for this person?	<ul style="list-style-type: none"> 6) Less than 2 hours (13) 7) 2 hours or more, but less than 4 hours (24) 8) 4 to 8 hours (16) 9) More than 8 hours (8) 10) All of the time (33) 11) No answer (6)

Note: Number in parenthesis indicates number of respondents choosing each alternative.

Table 2

Items measuring Positive Marital Satisfaction

Question	Response Alternative
1. Some couples like to spend their free time doing things together, while others like to do different things in their free time. What about you and (NAME)? Do you like to spend free time doing things together, or doing things separately?	<ul style="list-style-type: none"> ▪ Together (43) ▪ Some together, some different (37) ▪ Different/Separate things (19)
2. How often can you open up to [partner] if you need to talk about your worries? Would you say hardly ever, some of the time, or often?	<ul style="list-style-type: none"> ▪ Hardly ever (or never) (21) ▪ Some of the time (17) ▪ Often (61)
3. How often can you rely on (NAME) for help if you have a problem? Would you say hardly ever, some of the time, or often?	<ul style="list-style-type: none"> ▪ Hardly ever (or never) (20) ▪ Some of the time (19) ▪ Often (60)
4. Taking all things together, how would you describe your (marriage/relationship) with (Partner) on a scale from 1 to 7 with 1 being very unhappy and 7 being very happy?	<ul style="list-style-type: none"> ▪ 1 Very unhappy (3) ▪ 2 (1) ▪ 3 (5) ▪ 4 (15) ▪ 5 (9) ▪ 6 (1) ▪ 7 Very happy (48)

Note: Number in parenthesis indicates number of respondents choosing each alternative.

Table 3

Items Measuring Negative Marital Satisfaction

Question	Response Alternative
1. How often does (NAME) make too many demands on you? Would you say hardly ever, some of the time, or often?	<ul style="list-style-type: none"> ▪ Hardly ever (or never) (48) ▪ Some of the time (20) ▪ Often (32)
2. How often does (NAME) criticize you? Would you say hardly ever, some of the time, or often?	<ul style="list-style-type: none"> ▪ Hardly ever (or never) (49) ▪ Some of the time (36) ▪ Often (14)

Note: Number in parenthesis indicates number of respondents choosing each alternative.

Table 4

Items Measuring Intimacy (Frequency)

Question	Response Alternative
1. Did you have sex during the last 12 months?	<ul style="list-style-type: none"> ▪ No (60) ▪ Yes (34) ▪ No answer (6)
2. During the past 12 months, would you say that you had sex:	<ul style="list-style-type: none"> ▪ Once a month or less (10) ▪ Two to three times a month ▪ Once or twice a week ▪ Three or six times a week ▪ Once a day or more

Note: Number in parenthesis indicates number of respondents choosing each alternative.

Table 5

Items Measuring Intimacy (Satisfaction)

Question	Response Alternative
1. How physically pleasurable did/do you find your relationship with (PARTNER) to be: extremely pleasurable, very pleasurable, moderately pleasurable, slightly pleasurable, or not at all pleasurable?	<ul style="list-style-type: none"> ▪ Extremely (19) ▪ Very (37) ▪ Moderately (7) ▪ Slightly (9)
2. How emotionally satisfying did/do you find your relationship with (him/her) to be? Extremely satisfying, very satisfying, moderately satisfying, slightly satisfying, or not at all satisfying?	<ul style="list-style-type: none"> ▪ Extremely (14) ▪ Very (42) ▪ Moderately (31) ▪ Slightly (5) ▪ Not at all (6)

Note: Number in parenthesis indicates number of respondents choosing each alternative.

Table 6

Items Measuring Self-rated Health

Question	Response Alternative
1. Would you say your health is excellent, very good, good, fair, or poor?	<ul style="list-style-type: none"> ▪ Excellent (6) ▪ Very good (40) ▪ Good, fair (31) ▪ Poor (2)
2. What about your emotional or mental health? Is it excellent, very good, good, fair, or poor?	<ul style="list-style-type: none"> ▪ Excellent (11) ▪ Very good (44) ▪ Good, fair (30) ▪ Poor (1)
3. Compared with other people your age, would you say your health is much better, somewhat better, about the same, somewhat worse, or much worse?	<ul style="list-style-type: none"> ▪ Much better (23) ▪ Somewhat better (34) ▪ About the same (30) ▪ Somewhat worse (8) ▪ Much worse (1)

Note: Number in parenthesis indicates number of respondents choosing each alternative.

Table 7

Items Measuring Depressive Symptoms

During the past week ...

- a) I felt depressed^a (60/20/14/6/0)
 - b) My sleep was restless (38/24/24/13)
 - c) I was happy (3/17/5/75/0)
 - d) I felt lonely (75/7/11/5/2)
 - e) People were unfriendly (86/3/4/4/1)
 - f) I felt sad (47/26/22/4/1)
 - g) I felt that people disliked me (84/5/8/2/0)
-

Note: Number in parenthesis indicates number of respondents choosing each alternative.

^aNumber in parenthesis indicates number of respondents choosing each alternative: rarely or none of the time /some of the time/ occasionally/ most of the time / refused.

Distributions of the Study Variables

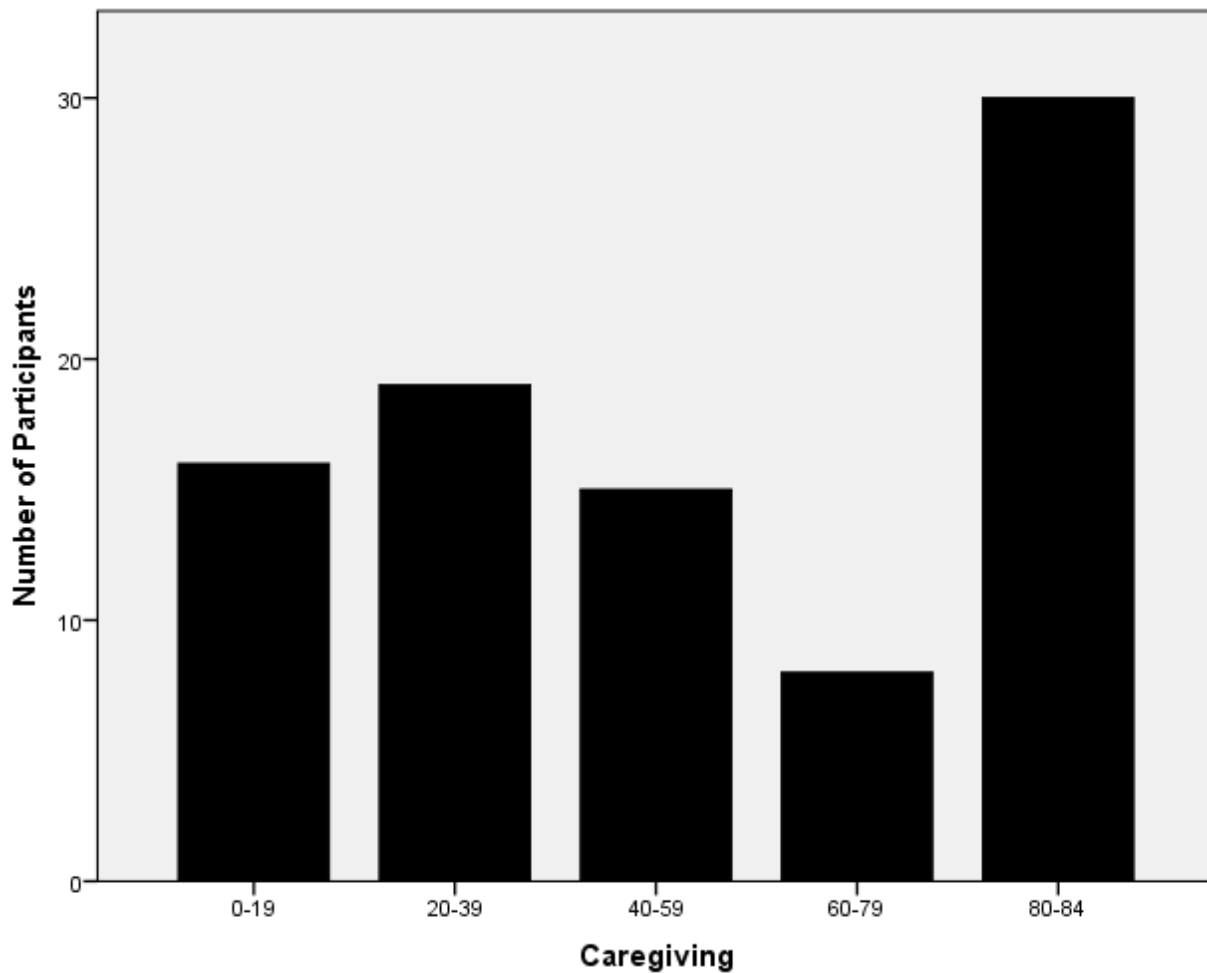


Figure 1. A distribution of Amount of Caregiving with skewness of $-.064$ ($SE = .257$) and kurtosis of -1.52 ($SE = .508$).

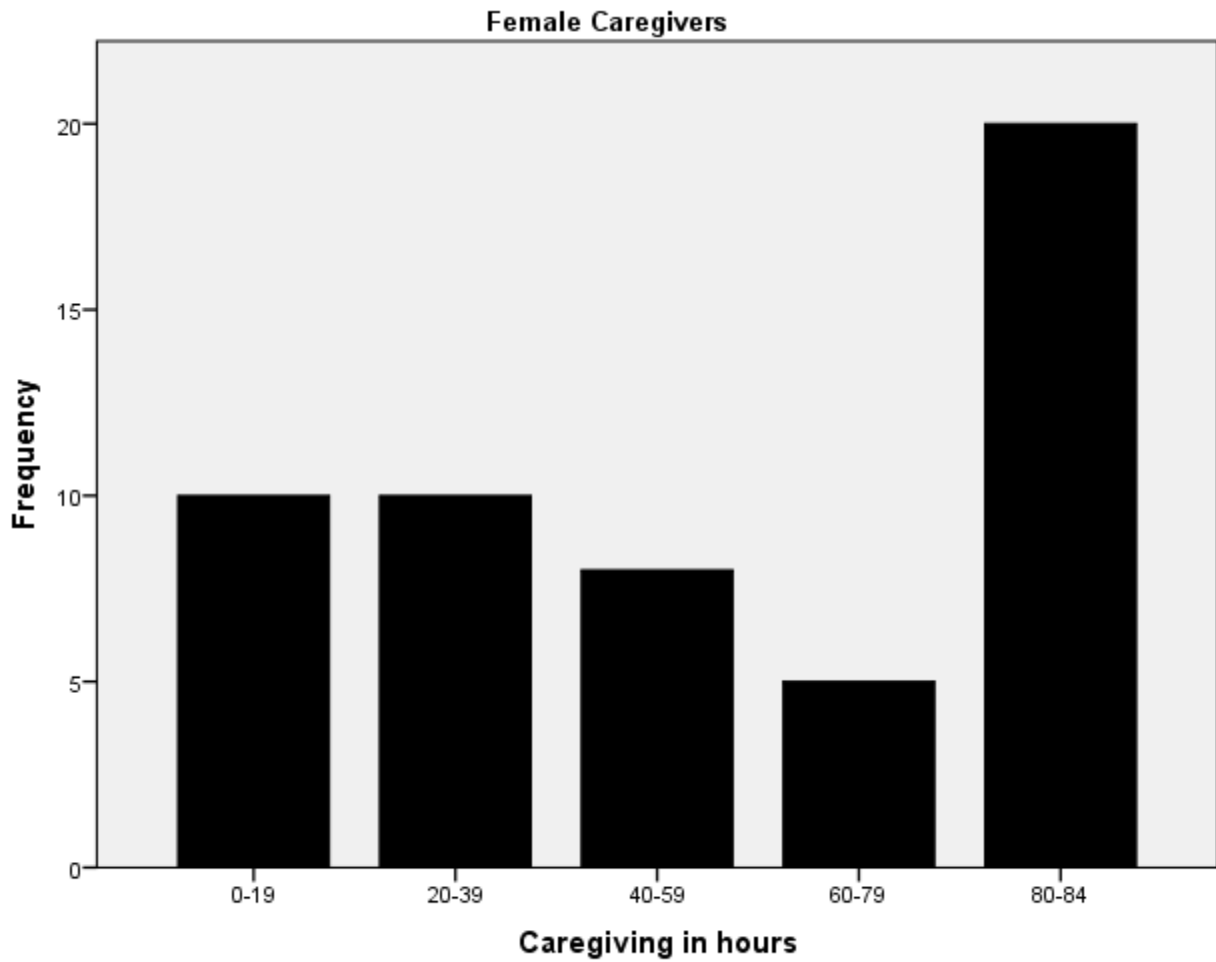


Figure 2. A distribution of Amount of Caregiving for female caregivers with skewness of $-.187$ ($SE = .327$) and kurtosis of -1.56 ($SE = .644$).

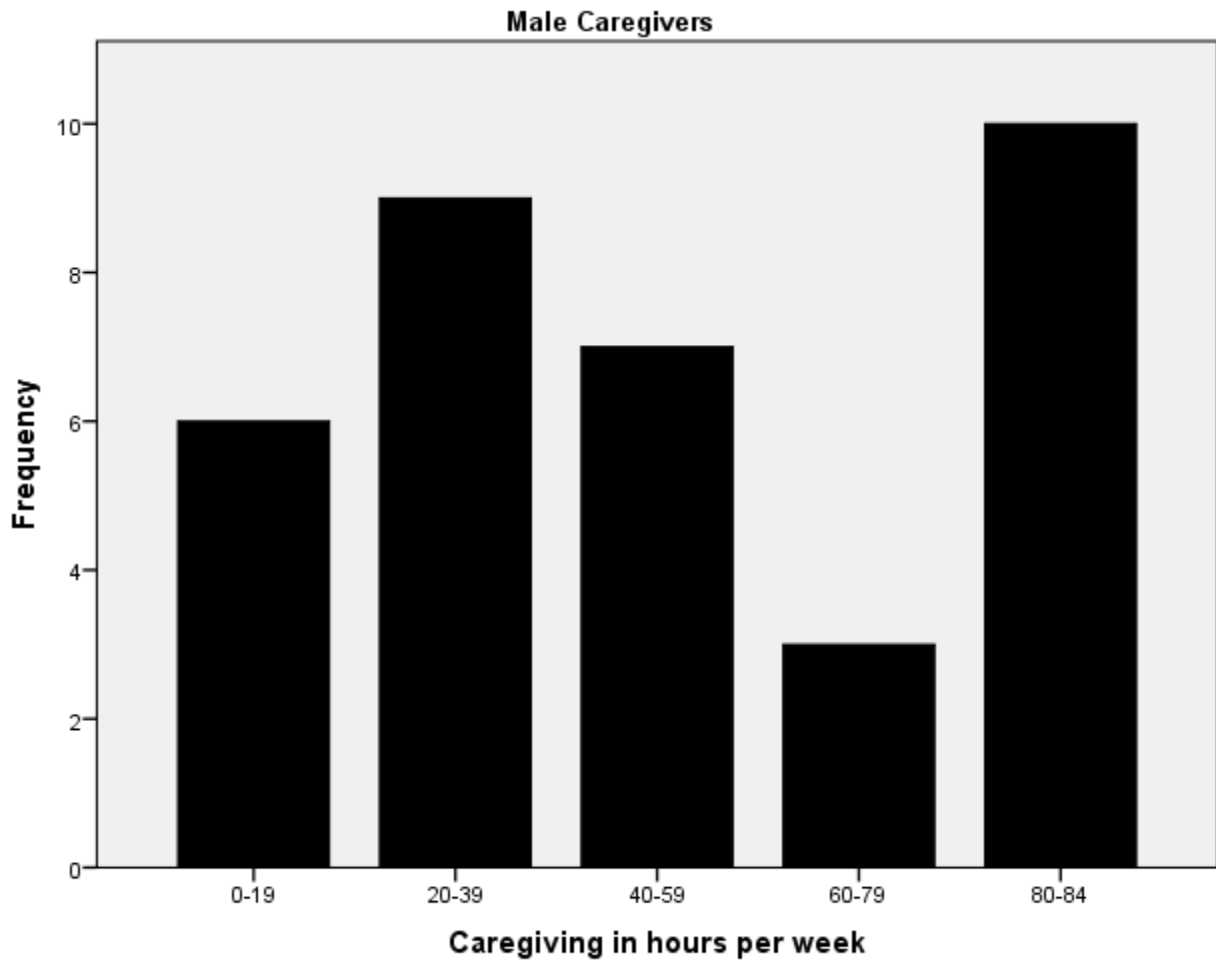


Figure 3. A distribution of Amount of Caregiving for male caregivers with skewness of .121 ($SE = .398$) and kurtosis of -1.43 ($SE = .778$).

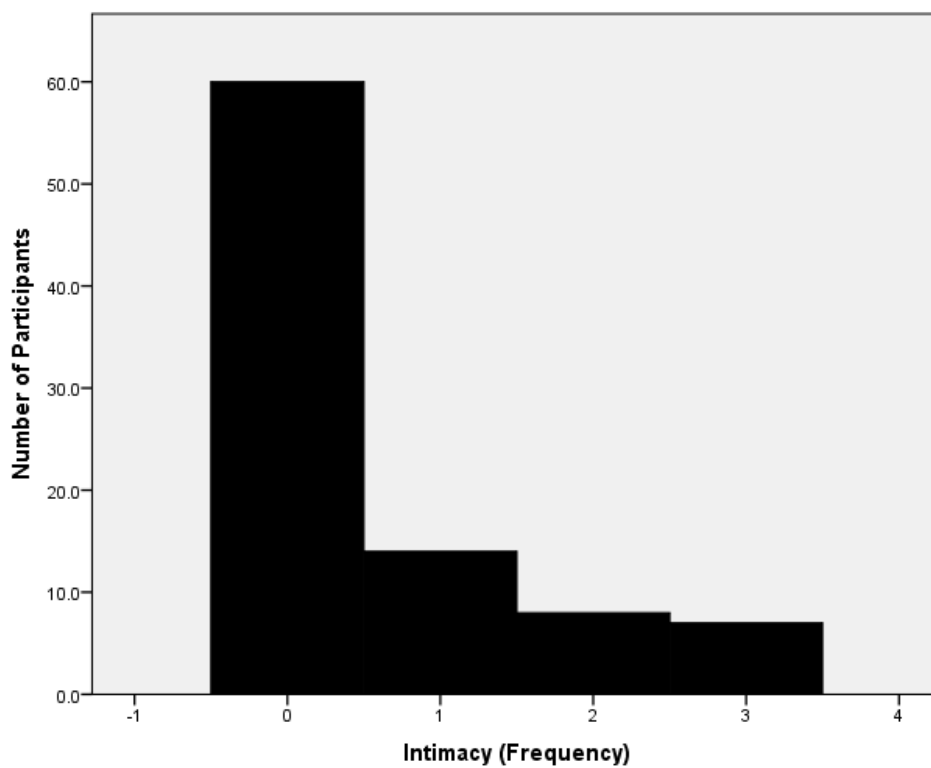


Figure 4. A distribution of Intimacy (Frequency) with skewness of 1.52 ($SE = .255$) and kurtosis of 1.08 ($SE = .506$).

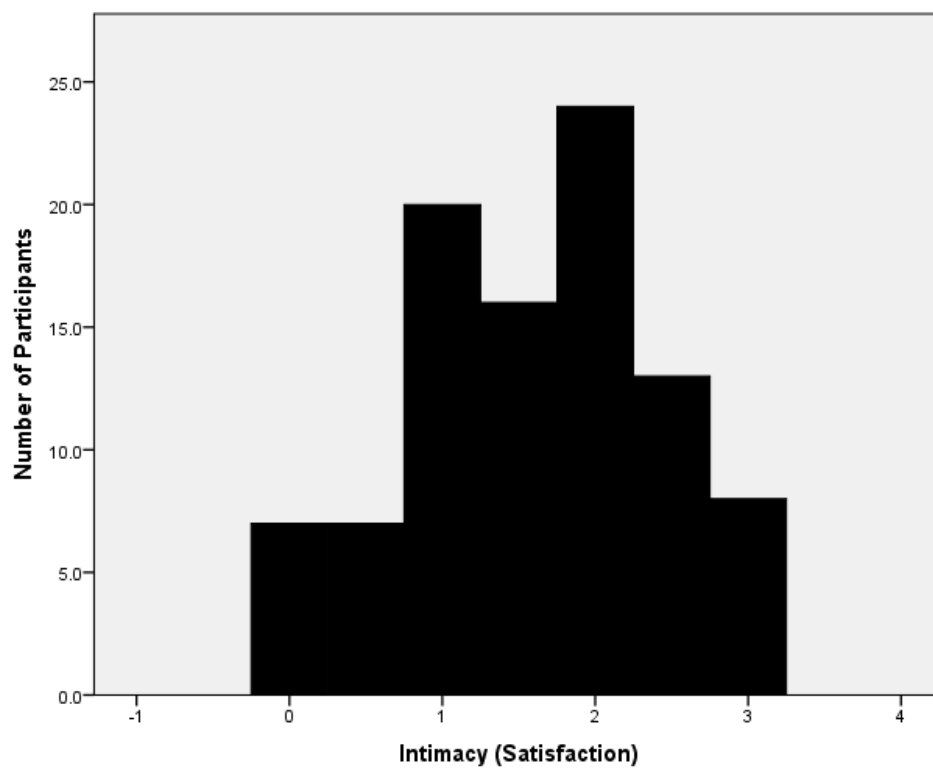


Figure 5. A distribution of Intimacy (Satisfaction) scale with skewness of $-.182$ ($SE = .247$) and kurtosis of $-.671$ ($SE = .490$).

Appendix F

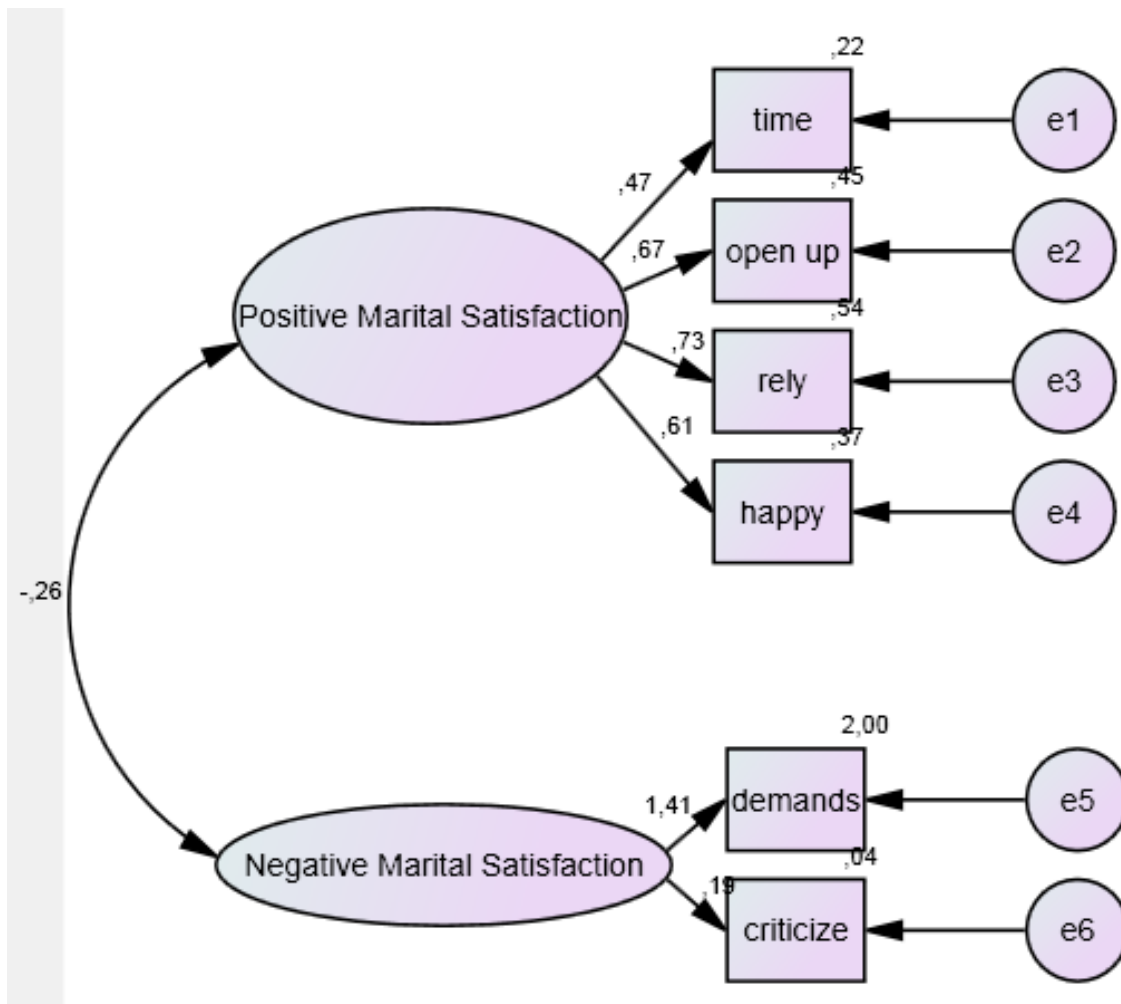
Confirmatory Factor Analysis Path Diagram, Positive and Negative Marital Scale
Distributions

Figure 1. Confirmatory Factor Analysis 2 Factor Solution Path Diagram

Chi2 =23.28; $p < 0.01$, RMSEA=0.13 (90% CI, .075 -.21); CFI=0.84

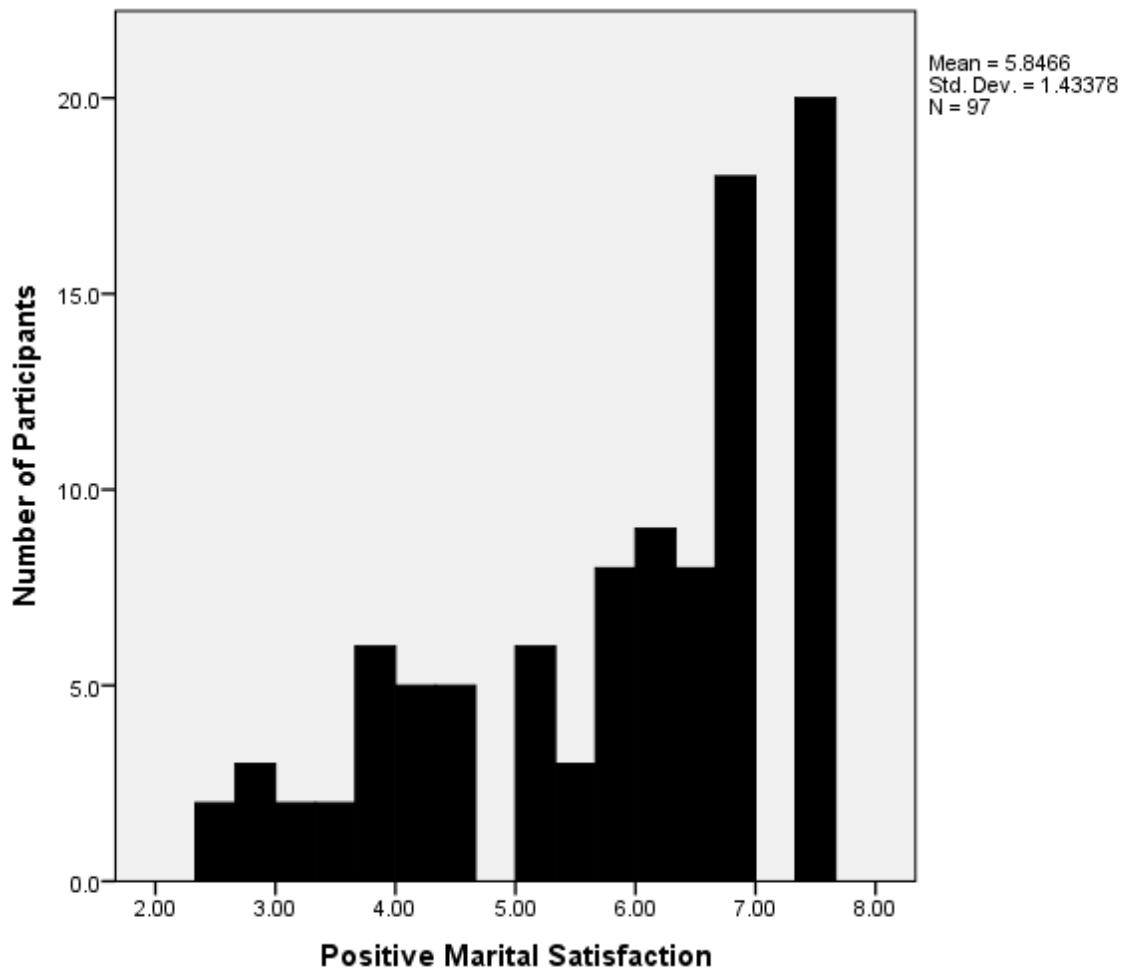


Figure 2. A distribution of Positive Marital Scale with skewness of $-.692$ ($SE = .245$) and kurtosis of $-.652$ ($SE = .485$).

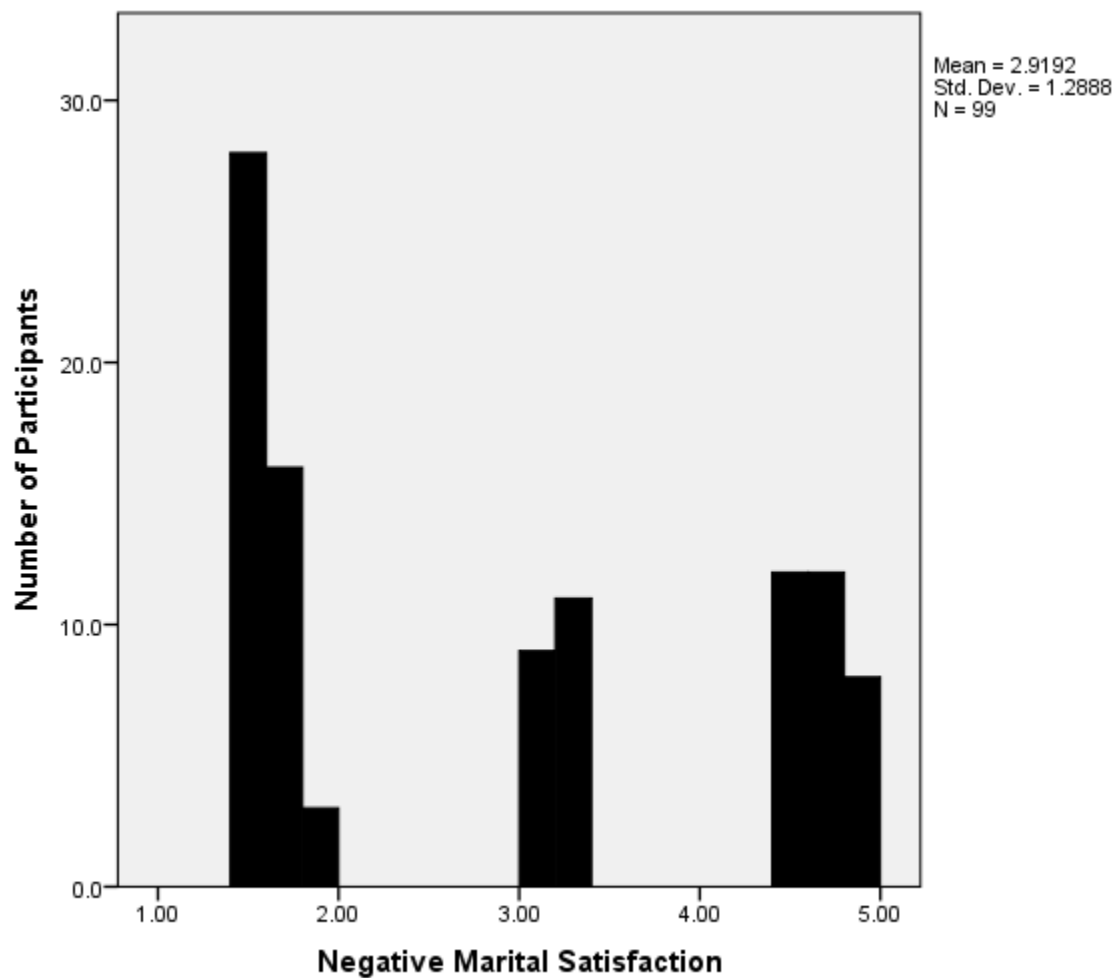


Figure 3. A distribution of Negative Marital Scale with skewness of .304 ($SE = .243$) and kurtosis of -1.630 ($SE = .481$).