

**The Association of Caregiver Unmet Needs with the Psychological Well-being  
of Cancer Survivors: An Application of Interdependence Theory**

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A thesis  
presented to the University of Waterloo  
in fulfillment of the  
thesis requirement for the degree of  
Master of Science  
in  
Health Studies and Gerontology  
Waterloo, Ontario, Canada, 2012

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## **AUTHOR'S DECLARATION**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

## ABSTRACT

**Introduction:** Cancer survivors continue to experience psychological distress and challenges in their daily lives long after the completion of treatment. Caregivers play a pivotal role in the lives of cancer survivors by providing support in various domains of their lives. The cancer experience between support persons and cancer survivors is intertwined. The interdependence theory will serve as a theoretical framework to guide the purposes of this study.

**Objective:** The purpose of this research was to gain a better understanding of unmet needs of caregivers supporting long-term cancer survivors and explore how fulfilling the needs of caregivers influenced the psychological well-being of cancer survivors. Specifically, an emphasis was placed on exploring the level of dependence present in marital relationships, and how this impacted the relationship between caregiver unmet needs and the psychological outcomes of cancer survivors.

**Method:** Data was drawn from *The Cancer Support Persons' Unmet Needs Survey* (SPUNS) (Campbell et al., 2009) and *The Cancer Survivors' Unmet Needs Survey* (SUNS) (Campbell et al., 2009). Regression models tested for significant interactions between caregiver unmet needs and factors influencing survivor dependence with psychological distress in cancer survivors.

**Results:** Findings revealed main effects between caregivers' depression, anxiety, and stress with the respective psychological outcomes in cancer survivors. Caregivers' concerns about the future predicted elevated depression in cancer survivors. Caregivers with needs pertaining to information or emotions predicted higher anxiety in cancer survivors. Information needs, future concerns, and health care access and continuity needs of caregivers predicted higher survivor stress. Conversely, work and financial needs of caregivers predicted lower depression, anxiety and stress in cancer survivors. Significant interactions were found for caregivers' concerns about

the future by recurrence of diagnosis with decreased survivor anxiety, health care needs of support persons by recurrence of illness with increased survivor anxiety, caregivers' personal needs by severity of illness with higher survivor anxiety, support persons' emotional needs by severity of illness with lower survivor anxiety, caregivers' emotional needs by severity of illness and decreased survivor stress, and finally, support persons' health care needs by severity of illness with higher survivor stress.

**Conclusion:** Findings did not fully support the hypotheses of this present study. Nonetheless, the significant results revealed in the findings would be useful to generate alternative hypotheses in future studies regarding interdependence, unmet needs and psychological well-being. The findings for the present study will also provide direction towards improvement in treating caregivers and cancer patients as a conglomerate, and inform programs, services and policies in cancer care.

## ACKNOWLEDGEMENTS

I would like to sincerely thank my supervisor Dr. Steven Mock for all his time, advice, and support throughout this entire process towards completing my thesis. Steve, without you, this would not have been possible. I would also like to thank my committee members Dr. Richard Eibach and Dr. Paul Stolee for their valuable feedback.

I would like to acknowledge The Propel Center for Population Health Impact for providing the data for *The Cancer Support Person's Unmet Needs Survey* and *The Cancer Survivor's Unmet Needs Survey* that facilitated my research. In addition, I would like to thank Sharon Campbell for providing guidance and feedback in the earlier stages of this study.

Finally, I would like to thank my family and friends for their continual love, encouragement and support. Rex, thank you for *everything*. To all my friends from Mississauga, Toronto, Hamilton, Waterloo, and Ottawa, your continual encouragement and prayers mean the world to me.

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## **1.0 INTRODUCTION**

The incidence and prevalence rates of cancer are rising along with the survival rates of individuals living with cancer (Stats Can, 2011). The increasing proportion of those who currently have the illness combined with individuals previously diagnosed is a result of advancements in diagnostic procedures with more precise cancer detection (Stats Can, 2011; Hagedoorn et al., 2008). As treatments continue to advance, the cancer care trajectory is lengthened from what was once days and weeks to months and years (Given et al., 2001). Previous evidence revealed that both cancer survivors and their respective caregivers continue to experience stress long after treatment is finished (e.g. Campbell et al., 2009). Caregivers who provide support for an extended period of time have been shown to experience distress and anxiety associated with the heavy demands of caregiving duties and having fewer needs met (Ferrell et al., 1991; Molassiotis et al., 2010; Kim et al., 2010). Meanwhile, the limitations placed on both physical and psychological functioning by cancer may result in elevated levels of depression, anxiety, and stress in long-term survivors (Grant et al., 1998 as cited in Hodges et al., 2005; Campbell, 2009; Bedini & Guinin, 1996a). Within the cancer experience, caregivers play a crucial role in the lives of cancer survivors. Research has shown patients who are well supported by their caregivers achieved greater stability in emotional well-being (Arora et al., 2007). However, caregivers who reported having more needs unmet provided poorer quality of care to the patient (Park et al., 2010 as cited in Fridriksdottir et al., 2011). With data from a national population-based cancer registry, this study examined the association between unmet needs of caregivers and the impact on cancer survivors' psychological well-being. Drawing on the interdependence theory (Thibaut & Kelly, 1959), the extent to which a survivor is dependent on

their caregiver may enhance or minimize the relationship between caregivers' unmet needs and survivors' psychological outcomes. Factors such as recurrence of illness, age of survivor, and severity of illness in the survivor are factors that influence levels of dependency. To analyze this theoretical framework directly, these factors influencing survivor dependence will be examined to test how dependence can modify the association between caregivers' unmet needs and the psychological outcomes of cancer survivors.

Traditionally, cancer had been considered a terminal illness, but increasingly has become a chronic condition (Campbell, 2009). Changes in the health care system have led to shortened length of hospital stays resulting in diagnosed individuals who receive care and treatment at home (Given & Given, 1994; McCorkle et al., 1993; Lobchuk & Kristjanson, 1997; Ferrell et al., 1991; Arno et al., 1999 as cited in Given et al., 2001). These institutional changes have led to an intensifying role for caregivers to take on the heavy responsibility of caring for the cancer survivor during times of treatment as well as adapt to long-term effects of the illness (Grant et al., 1998 as cited in Hodges et al., 2005).

Although a significant number of studies have explored the experiences of caregivers and cancer patients while still in treatment (e.g Nijboer et al., 2001; Sharpe et al., 2005), limited research has studied the needs of caregivers and cancer survivors after treatment. Research conducted by Campbell et al. (2009) revealed that both survivors and caregivers continued to experience stress after treatment was complete.

The experiences of cancer are overwhelming and significantly stressful for both the survivor and caregiver. With cancer survivors living longer and caregivers providing support for a considerably longer period of time, it is important to consider the quality of life for each member of the carer-survivor pair. Long-term survivors are likely to experience physical limitations and poor psychological well-being such as depression, anxiety and stress (Grant et al., 1998 as cited in Hodges et al., 2005; Campbell, 2009; Bedini & Guinin, 1996a). Meanwhile, elevated levels of psychological distress in caregivers may compromise their caring capabilities, which in turn, affect the level of emotional support that is provided (Park et al., 2010 as cited in Fridriksdottir et al., 2011). Moreover, research on unmet needs in cancer care revealed that caregivers with more needs unfulfilled demonstrated poorer quality of care provided to the patient (Park et al., 2010 as cited in Fridriksdottir et al., 2011).

In addition to the existing challenges endured by carer-survivor dyads, the repercussions of cancer combined with normative life occurrences impact the extent that cancer survivors depend on their primary caregivers for support. The recurrence of illness (e.g. Ashing-Giwa et al., 2004; Matthews, 2004; Mullens et al., 2004; Ferrell et al., 1998), age of survivor (e.g. Hewitt et al., 2003; Deimling et al., 2005; Baker et al., 2005) and the severity of illness (e.g. Canadian Cancer Society, 2011) experienced by cancer survivors have been identified as some of the prominent factors that impact the cancer experience for both the caregiver and cancer survivor. This present study assumes that these factors influence the level of dependence that survivors have on their caregivers with existing unmet needs, which in turn, would affect survivors' psychological well-being.

It is noteworthy to consider that although the cancer experience for survivors has been shown to vary with age (e.g. Mor et al., 1994), it is important to acknowledge the hazards associated with testing age as a factor that influences survivor dependence. It may be argued that age reflects diverse life stages rather than dependency. However, previous studies have shown that the experiences of cancer are substantially different between an older and younger person (e.g. Schulz et al., 1996; Mor et al., 1994). Mor et al. (1996) found that the social roles that often correspond with age presented varying demands, expectations and futures for younger and older individuals enduring a chronic illness, and consequently shaped how they coped with cancer as a major life stressor. For instance, those in advanced age may experience fewer competing demands in later life, and they and their respective partners may not (or need to) be engaged in full-time employment (Schulz et al., 1994). In contrast, younger individuals are likely to face challenges with balancing the demands of work and dependent family members (Baker et al., 2005). Hence, the different economic and social circumstances of younger and older cancer survivors may call for varying degrees of support to help them adjust to both the current and consequential effects of cancer.

As the lives of caregivers and cancer survivors become increasingly intertwined with longer survival rates, analyzing the dynamics of a carer-survivor dyad would provide a better understanding on how relational mechanisms impact the support, health and quality of life for both people. This study drew on the interdependence theory as a means for a better understanding of satisfaction, dependence and commitment in close relationships (Rusbult & Buunk, 1993). Central to this theory is a focus on dependence, which guided the purposes of this research. There are four dimensions of dependence outlined in the framework, but only *degree of*

*dependence* has been used to test the second hypothesis of this study. The premise of this dimension focuses on the extent to which the outcomes of one partner (cancer survivor) would be influenced by the actions of their respective partner (caregivers) (Rusbult & Van Lange, 1996). Within this context, the assumption was that the magnitude of dependence in marital relationships would moderate the association between caregivers' unmet needs and the psychological well-being of cancer survivors.

Ultimately, caregivers play an integral role for the overall well-being of survivors. When one is faced with an adverse life event such as a cancer diagnosis, having social support serves as a coping mechanism in these circumstances (Thoits, 1995). With respect to mental health, support persons positively impact the care recipient's psychological well-being by providing coping assistance, offer reassurance to bolster self-esteem, and help the survivor maintain a sense of competence through continual encouragement (Thoits, 1995). However, the experiences of the caregiver also need to be acknowledged. A study on caregivers conducted by Aneshensel et al. (1992) found that persons who provided prolonged and extensive support are at risk of physical and emotional burn-out, which in turn, may eradicate or even outweigh beneficial outcomes to promote self-esteem or competence in the care recipient (as cited in Thoits, 1995). Thus, it is imperative to identify the needs of caregivers and determine predictors for psychological well-being in cancer survivors to enhance quality of life for both partners in this dyad.

## **1.1 Study Rationale**

A significant amount of research has shown the experiences of cancer are intertwined between two people in marital relationships. Studies of married and co-residing couples demonstrated emotional patterns reciprocating between those who live together (Gaelick et al., 1985 as cited in Bookwala & Schulz, 1996). Gurtman et al (1990) found similar psychological well-being between partners when one person is exposed to another's mood of depression and anxiety (as cited in Bookwala & Schulz, 1996). These studies shed light on the interconnected nature of marriage, and imply benefits that may be derived from treating couples as a unit of study, rather than solely focusing on the cancer survivor.

It is important to consider how marital relationships are uniquely abounded in closeness, emotions, and intimacy that differ from other types of relationships (e.g. parent-child), especially in the context of cancer care. Nearly two thirds of cancer survivors and their spouses, who are likely to be their primary support person as well, are over the age of 65 (Institute of Medicine, 2007), and face challenges such as having co-morbidities and functional limitations (Yancik, 1997). Previous research demonstrates how dyadic relationships impact the well-being of partners who each assume the position of a caregiver and patient, suggesting bidirectional effects of one partner's (i.e. caregiver) well-being on the other's (i.e. survivor). While there has been much research on how intimate relationships impact health and well-being, more evidence is needed to measure how relational mechanisms such as dependence would moderate the association between caregiver's unmet needs and cancer survivor's psychological well-being.

With the rate of cancer, as well as survivorship on the rise, my research contributes to gaining a better understanding of how to address the needs of this population and enhance their quality of life. Further, studying the couple as a unit will help cancer control decision-makers to provide more comprehensive care to both the caregiver and survivor, and results from this study will be beneficial to the planning and evaluation purposes of survivor-focused programs, services and policies.

## **1.2 Purpose Statement**

The purpose of this research study is to gain a better understanding of unmet needs of caregivers supporting long-term cancer survivors and explore how fulfilling the needs of caregivers influences the psychological well-being of cancer survivors. Specifically, I focused on exploring the level of dependence present in a marital relationship using the recurrence of illness in survivor, the age of survivor, and severity of illness in survivor.



## **1.3 Definitions**

### **1.3.1 Caregivers**

A caregiver is defined as a person whom another individual depends on for support and assistance in essential activities for everyday living (Walker et al., 1994). Caregivers who are identified as the primary support person are responsible for providing care through physical and emotional support, and are typically spouses, adult children, relatives and friends (Campbell, 2009). Only spousal caregivers are examined in this present study.

### **1.3.2 Cancer Survivor**

Although there is no standard definition for the term ‘cancer survivor’, a person is generally classified as a cancer survivor when he/she is “living with the challenges that may occur as a result of cancer diagnosis and cancer treatment” (National Coalition for Cancer Survivorship, 2010; Institute of Medicine, 2010; National Cancer Institute, 2010 as cited in Gage et al., 2011).

### **1.3.3 Unmet Needs**

Campbell (2009) has defined unmet needs as a problem in which a person is unable to obtain the means to rectify an issue, and is “the requirement for some desirable, necessary or useful action to be taken or some resource to be provided, in order for the person to attain optimal well-being”.

#### 1.3.4 Psychological Well-Being

For the purpose of this paper, psychological well-being refers to depression, anxiety and stress measured in the support person and cancer survivor.

#### 1.3.5 Marital Relationships

This study explored relationship processes between partners in the context of cancer care.

Marital relationships refer to those who are legally married. Within this relational context, the terms ‘spouse’ and ‘partner’ were used interchangeably throughout this paper.

#### 1.3.6 The Propel Center

This study utilized psychometric instruments developed by the Propel Center for Population Health Impact (partnered with Canadian Cancer Society and the University of Waterloo) to measure the unmet needs of caregivers (i.e. support person). The results have been analyzed using the Cancer Support Person’s Unmet Needs Survey (SPUNS) (Campbell et al., 2009) and the Cancer Survivor’s Unmet Needs Survey (SUNS) (Campbell et al., 2011) to address the research questions.

## 1.4 Research Hypotheses

The aim of this research is to explore the interdependent processes that exist in marital relationships in the context of cancer care. The research hypotheses are as follows:

1. Caregivers' unmet needs have an impact on the psychological well-being of cancer survivors. Results were expected to reveal a positive linear association, where fulfilling the needs of caregivers would demonstrate better psychological outcomes (e.g. lower levels of depression, anxiety, and stress) in cancer survivors.
2. The association between caregivers' unmet needs and survivors' psychological well-being would be moderated by the degree of survivor dependence (as measured by recurrence of diagnosis, age of survivor, severity of cancer in survivor). I expected that a high level of dependency in the relationship (e.g. recurrence of diagnosis), meant that caregivers' unmet needs would have an even greater impact on the survivors' psychological well-being. On the contrary, low levels of dependence (e.g. no recurrence of diagnosis) meant the unmet needs of caregivers would have less of an impact on the psychological outcomes of survivors.

## **2.0 LITERATURE REVIEW**

This section provides an overview of relevant research that has been synthesized to inform the scope of this study. In order to gain a better understanding of how cancer affects caregivers and long-term survivors both independently and interdependently, various aspects have been explored and discussed below. The unmet needs of caregivers as part of their caregiving experience, factors influencing level of dependence, and psychological well-being (e.g. depression, anxiety, and stress) are embedded in the cancer experience. Additionally, a focus on marital relationships illustrates the social and relational dynamics within carer-survivor dyads that can help explain how interdependent processes promote (or diminish) the health of caregivers and survivors independently and as a couple.

### **2.1 Caregiving Experience**

The environment for which cancer survivors receive care is changing. Shortened length of hospital stays have resulted in an increasing role of caregiving for families with cancer patients receiving care and treatment at home (Given & Given, 1994; McCorkle et al., 1993; Lobchuk & Kristjanson, 1997; Ferrell et al., 1991; Arno et al., 1999 as cited in Given et al., 2001). This shift to home care places a substantial responsibility on caregivers as they carry out 50 to 55 percent of total care in the home (Nijboer et al., 1998). Caregivers immediately presume tasks and roles that they may be ill-prepared for, such as meeting the survivor's needs in the physical, psychological, social, spiritual, and financial dimensions (Giarelli et al., 2003; Schumacher et al., 2000).

Caregivers occupy a role that is both demanding and overwhelming. The experience of caring for another person has implications on the caregiver's physical and psychological health (Glajchen, 2004). Kim et al. (2007) explained that caregivers find managing their partner's emotional stress along with managing their own distress as the most difficult task of caring. Prolonged caregiving duties have also been shown to lead to financial issues (Clipp & George, 1993). Glajchen (2004) explained that as the time spent on performing tasks for the patient increases, caregivers experience disruptions to their sleeping schedule and emotional well-being. Distress results from the caregiving role itself and witnessing the patient's sufferings (Ferrell et al., 1991), and has been found to be highest during the second to fifth year post-diagnosis (Fridriksdottir et al., 2011). Studies have also shown that higher anxiety is connected with having fewer caregiver needs met (Molassiotis et al., 2010; Kim et al., 2010).

However, it is noteworthy to consider that the experiences of caregiving are unique to each person. A sense of purpose and satisfaction can be derived from performing caring duties to better the health of a loved one (Strawbridge et al., 1997). Hence, caregiving can be a positive experience, and not all caregivers will necessarily endure negative impacts to their physical and psychological health.

## **2.2 Caregivers' Unmet Needs**

It is challenging for caregivers to balance the demands and needs of caring for themselves while providing long-term support to their loved one. Due to the overwhelming demands of caregiving duties on the caregiver, his or her own physical and emotional needs often go unnoticed (e.g. juggling time, jobs, money, energy and roles) (Sanson-Fisher et al., 2009). Osse et al., (2000)

defined a *need* as “a wish to receive support with regard to an experienced problem” (as cited in Hwang et al., 2003). Often, caregivers who are caring for someone previously diagnosed with cancer put their own needs aside. Meanwhile, caregivers’ needs and concerns may not be adequately addressed or even acknowledged by the health care system. It is important to determine areas of need with which caregivers and survivors require the most assistance. Doing so provides a starting point to enhance the QOL of those enduring the experiences of having cancer (Kim et al, 2010).

There has been much research looking at unmet needs and the impacts of cancer on caregivers and support persons, however, the focus has predominantly surrounded experiences during active treatment rather than the survivorship period (Campbell, 2009). The need for support has been found to still be necessary even after the patient’s treatment was complete (Hodgkinson et al., 2006). It is very plausible for support persons of survivors to have greater needs as a result of long-term issues threatening physical, cognitive and psychosocial well-being (Campbell, 2009).

Previous research on unmet needs have shown consistent findings on major areas as reported by caregivers (e.g. Campbell et al., 2009a, Campbell et al., 2009b; Al-Jauissy, 2010; Fridriksdottir et al., 2011; Girgis et al., 2011; Gray et al., 1998; Hodgkinson, 2007; Kim et al., 2010; Mangan et al., 2003; Molassiotis et al., 2011; Sanson-Fisher et al., 2009; Soothill et al., 2001). Seeking information and practical support has been reported by caregivers as prominent needs requiring help (Hodgkinson et al., 2006; Bishop et al., 2007). Information needs are unique to caregivers and have not been a highlighted need for patients (Molassiotis et al., 2011). Having access to and receiving information has been shown to help those with a passive role (i.e. caregivers) in

making informed treatment decision-making (Sutherland et al., 1989 as cited in Gray et al., 1998), while assistance with practical tasks such as respite care, home care, child care, and transportation (Hodgkinson et al., 2006; Bishop et al., 2007) help to alleviate caregiver burden and open up time for other tasks, responsibilities, or leisure activities. Often, the social and emotional needs of caregivers are unrecognized or considered secondary to patients' needs (Barbara et al., 2001; Grimm et al., 2000). Caregivers may also be concerned about legal and financial issues due to the demands of providing adequate care that require them to quit work or take long leaves of absences (Canadian Cancer Society, 2003).

Although support persons play both an integral and active role in the survivors' adjustment to cancer and quality of life, there still remains much that is unknown about caregivers' lives. It is important to consider that caregivers who have a greater number of needs unfulfilled will likely lead to poor provision of care to the patient, which in turn, elevates distress and anxiety in both partners. Having a better understanding of caregiver's needs, especially during the survivorship period contributes towards implications in health care and services to provide better support to both the caregiver and cancer survivor.

### **2.3 Psychological Well-being and Cancer Survivors**

Cancer parallels attributes of traumatic life events such as loss, crisis, and the fear and anxiety of having a major threat to health and life (Filipp, 1992; Weisman, 1979 as cited in Deimling et al., 2002). Ample research has provided documentation of the cancer experience causing psychosocial disruption in the lives of patients and their families (Kurtz et al. 1995). Within cancer research, cancer survivors have been shown to experience persisting health problems,

psychological distress and social life disruption for decades after diagnosis and treatments are complete (Bloom, 2002). Much of these continual emotional and psychologic issues of cancer survivors are derived from the anxiety and depression that occurs from the fear of recurrence of disease and uncertainties for the future (Baker et al., 2005).

A study by Thomas et al., (1997) assessed the psychological distress of cancer survivors and found that there is no significant difference in anxiety rates between long-term survivors and patients with an active disease. Further, Grassi and Rosti's (1996) study on long-term survivors found that depression persisted in 13 percent of their participants after six years of diagnosis. Survivors who experience depression as a result of continued cancer sequelae are prone to negative impacts on their mental and physical health, such as impaired concentration or sleep disturbance and insomnia (Deimling et al., 2002). These findings suggest that poor psychological well-being reduces QOL in cancer survivors. Hence, patients that are physically cured do not equate to being psychologically fit, and these survivors still endure challenges in their lives, potentially increasing dependence on their caregiver.

#### **2.4 Impact of Caregivers on the Cancer Survivors**

The care provided by caregivers is crucial to how cancer survivors cope with the long-term sequelae from diagnosis and treatment, and influence their overall well-being. Specifically, caregiving entails the provision of social support that is instrumental to the physical and psychological functioning of cancer survivors. Thoits (1986) describes social support as a multi-faceted concept comprised of three dimensions: emotional (empathy, reassurance, love, care), informational (“assistance with both seeking and understanding medical information”), and



instrumental support (tangible aid and problem solving tasks such as medical decision-making).

A patient who is well supported by their caregiver has been shown to better seek and process cancer-related information, achieved greater stability in emotions, and is better at making informed medical decisions (Arora et al., 2007). For marital relationships, significant others who provide encouragement and support strengthen the patient's feelings of personal control and actively assist with maintaining mental health (Krause et al., 1989).

Moreover, much research on social support has revealed how this can curtail the detrimental effects of the cancer experience. For instance, Lin et al (1986) demonstrated that those who received instrumental and emotional support from a trusted person had reduced levels of depression after experiencing a negative life event (e.g. cancer) (as cited in Koopman et al., 1998). In contrast, patients who lacked adequate support, particularly during the time of diagnosis, are at higher risk for elevated levels of anxiety, depression and mortality (Knobf, 2007).

## **2.5 Marriage, Health, and Illness**

Marriage is an intimate bond that is distinct from other forms of kin relationships because a marital relationship arises out of choice or deep affection between two people (Lewis et al., 2006). Marriage buffers against the detrimental effects of illness and has shown to increase the probability of survival rates because it serves as a mechanism for each partner to acknowledge value and care for one another (Burman & Margolin, 1992 as cited in Cannon & Cavanaugh, 1998). Within cancer care, married individuals survived cancer better than single people (Goodwin et al., 1987 as cited in Kim et al., 2008). Hence, the unique characteristics of marriage

in providing a persevering source of social support, intimacy and sense of identity is uniquely connected with how chronic illness such as cancer, is experienced in this relationship (Cannon & Cavanaugh, 1998).

When one person is sick, extra demands are placed on their partner, in addition to usual roles and responsibilities. Well spouses often neglect their own well-being and needs when taking on the role of a caregiver, which might likely lead to exhaustion from bearing additional household duties or possibly supplemental employment to alleviate financial strains (Cannon & Cavanaugh, 1998). Moreover, the repercussions of a demanding caregiving role are associated with decreased psychological wellbeing with elevated feelings of “anxiety, guilt, ignorance, apprehension, depression, fatigue, frustration, and anger” (Diethorn, 1985, p. 66 as cited in Cannon & Cavanaugh, 1998). These consequences arise as the caregiver’s own well-being and needs become secondary to the cancer survivor. Meanwhile, the cancer survivor may still be dependent on their caregiver for support, despite the caregiver’s overwhelming experience.

Interactions that occur in dyadic relationships containing one ill partner and one who is well form the basis for how illness is experienced and dealt with by the couple (Cannon & Cavanaugh, 1998). In other words, the perception and management of the illness is a product of how the couple interacts with one another. The couple’s ability to successfully adapt to the presence of cancer depends more on how well the illness is incorporated into their interpersonal lives, than on the circumstances of the illness itself (Manne & Badr, 2008).

### 2.5.1 Reciprocal Effects of Psychological Well-being on Partners

The interpersonal properties of marriage result in partners feeling similar, yet distinct, challenges to their personal well-being, and threats to the tenacity of the relationship. Illness manifests itself to a single host upon transmission, but the impact and consequences from the illness extends to those closely connected with the ill person. As a result, the partner who is well may be influenced by how the illness is experienced and perceived by the ill person, which subsequently impose changes to the relationship (Slaikou, 1990 as cited in Cannon & Cavanaugh, 1998).

Studies of married and co-residing individuals have demonstrated emotional patterns reciprocating between those living together (Gaelick et al., 1985 as cited in Bookwala & Schulz, 1996). Gurtman et al. (1990) found when one person is exposed to another person's moods of depression and anxiety, specific mood similarity is exhibited by both individuals (e.g. being exposed to anxiety elicited anxiety). Bookwala & Schulz (1996) conducted a study to examine the extent to which one spouse's subjective well-being predicts that of the partner. The results from this study found that even after controlling for sociodemographic variables, functioning (i.e. ADLs and IADLs) and health status, and shared life events, one partner's well-being of the marital pair was significantly predicted by the other spouse's well-being.

Psychological distress appears to be in agreement between carer-survivor pairs across all points in the cancer phase, except for the durations nearing time of diagnosis and end of treatment. Kim et al.'s (2008) findings from their study on dyadic effects of psychological distress support previous evidence that married couples experience congruent rates of psychological distress beyond the early periods of illness trajectory, approximately 2 years post-diagnosis. The

similarities of psychological distress found between partners suggest mutuality in response where if one partner becomes distressed, the other partner is likely to feel this way as well (Manne, 1998). The mechanisms to explain reasons for the transference of distress have not been fully investigated (Hodges et al., 2005). It is unclear why this reciprocity of distress occurs within carer-survivor pairs. This study attempted to provide insight to explain these occurrences by using the interdependence theory. As mentioned, the hypotheses of this study emphasize dependence as a key relational dynamic to account for how a cancer survivor's psychological outcomes are influenced by the experiences of their primary support person. Factors influencing dependence are discussed in a later section of this paper.

## **2.6 Interdependence Theory**

Numerous theories such as cognitive-social processing theory, stress-buffering theory, and equity theory made fair attempts to explain how relationships serve as resources or support during the detrimental experiences of being diagnosed with cancer. However, these resource theories merely adopt an individual-level conceptualization with a focus on one person in the relationship, and do not perceive marital relationships as a haven in which partners can invest and draw from. Alternatively, dyadic level theories do treat couples as a unit of study by examining couples' continual investments in the relationship as a way to maintain or enhance the quality of the relationship, while enduring the cancer experience together. However, a gap still exists since these theories do not completely capture key relational elements such as interactional processes within couples, and how this impacts health. Thus, the interdependence theory was selected to inform the research for this study.

The interdependence theory is a robust model for examining dyadic relationships that offers a comprehensive approach to better understanding satisfaction, dependence and commitment in close relationships (Kelly & Thibaut, 1978; Thibaut & Kelley, 1959 as cited in Rusbult & Buunk, 1993). This theoretical framework is primarily concerned with understanding the interaction between *two* people and how these interactions influence each partner's outcomes. As interaction prolongs, outcomes may submerge between both partners, which subsequently results in positive or negative consequences (or outcomes) such as pleasure, gratification, distress, pain or embarrassment (Rusbult & Buunk, 1993). In the case of caregivers and survivors, their interaction may be defined by how dependent they are on one another, and this dependence would yield positive or negative impacts to their health.

As a comprehensive analytical framework, the interdependence theory uses a taxonomical system that considers all plausible forms of interdependent situations based on four key dimensions. First, the *degree of dependence* refers to how likely an individual 'needs' their interaction partner in the relationship, or depends on the partner to fulfill certain needs (Rusbult & Van Lange, 1996). Second, the *mutuality of dependence* describes whether both individuals are mutually dependent on each other, rather than unilaterally dependency to achieve good outcomes (Rusbult & Van Lange, 1996). Third, *correspondence of outcomes* refers to corresponding actions that may be taken between partners to determine whether each person is eliciting certain behaviours to achieve the same goals. Finally, *the basis for dependence* describes the extent to which each partner's dependence on the other is based on *fate control* (each partner's outcomes are influenced by the actions of each other) versus *behaviour control* (the joint actions of each partner influence the outcomes of each partner).

Although each dimension is purposeful for better understanding dependence and interactions in dyadic relationships, this thesis only be focused on the first dimension, degree of dependence, to guide my research. It was hypothesized that if factors of dependence (e.g. recurring cancer, older survivor, high severity of illness) are present in the dyad, this would result in a cancer survivor being more dependent on their caregiver. The assumption was that greater dependence would impact the association between caregivers' unmet needs on cancer survivors' psychological well-being. In other words, if the caregiver had needs that were unfulfilled, this burden would further be exasperated by a survivor's dependence on him or her, hence, compromising the support provided. This in turn, was predicted to elevate the survivor's psychological distress.

## **2.7 Factors Influencing Levels of Dependence**

Within the body of cancer research, prominent factors have been shown to enhance or minimize the survivor's dependence on their caregiver. The recurrence of cancer, age of the survivor, and the severity of illness in the survivor, can impact the level of dependency between the pair.

Presumably, how dependent one person is on another would modify the association between caregivers' unmet needs and survivors' psychological outcomes.

### **2.7.1 Fears of Recurrence of Cancer**

Cancer survivors report that the fear of cancer returning is one of their biggest worries (Ashing-Giwa et al., 2004; Matthews, 2004; Mullens et al., 2004; Ferrell et al., 1998). Fear of recurrence is connected with negative psychological adjustment, elevated emotional distress, and reduced quality of life for survivors (Stanton et al., 2002; Vickberg, 2003). Baker et al.'s (2005) study on adult cancer survivors revealed that after 1 year past diagnosis, more than two-thirds of cancer survivors worried about their illness returning, approximately 60 percent had concerns about

disease recurrence, and nearly 58 percent were fearful about uncertainties of their future.

Mullens et al. (2004), Ganz et al., (1996) and Northouse (1981) reported that fear of recurrence is persistent in long-term cancer survivors even after exiting the acute phase of illness. In other words, long-term survivors perceive a continual threat looming over them, with the potential return of cancer (Muzzin et al., 1994).

Family resources have been found to influence appraisal and fear of recurrence (Mellon et al., 2007). Having higher social support from family is linked with finding more positive meaning in the illness (Fife, 1995), diminished concerns (Stefanek et al., 1989), and reduced fear of recurrence among cancer survivors (Northouse, 1981). Therefore, long-term survivors who are able to depend on their spouse for support may alleviate the fear of the illness potentially returning.

### 2.7.2 Age of Cancer Survivor

Traditionally, cancer has higher incidence and morbidity among the older population, and the challenges associated with cancer, superimposed on normal degenerations of aging, compounds significant burden for caregivers and long-term survivors. According to the American Cancer Society (2002), more than half of all cancers occur in those aged 65 years or older, and incidence rates are tripled among those in the 60 to 79 year age group compared to people in between 40 to 59 years of age. The physical and psychological problems associated with age differ between young and older age groups. Thus, the challenges among different age groups would also vary.

The experiences of cancer increase older survivors' vulnerability to other existing chronic health conditions. Hewitt et al. (2003) found that survivors in advanced age experience functional difficulties with activities of daily living (ADL) and instrumental activities of daily living (IADL). Increased age also highlights the importance of symptom monitoring as part of cancer survivorship (Deimling et al., 2005). Moreover, health worries may arise with symptoms of age-related comorbidities. When symptoms are ambiguous, this is worrisome for the survivor, especially if these symptoms are similar to previously experienced symptoms of cancer (Easterling & Leventhal, 1989). In terms of psychosocial issues, Baker et al., (2005) found that younger cancer patients (ages 18 to 54 years) experienced an average of three more problems than their older counterparts (ages 55 years and older). In contrast to younger survivors, Mor et al. (1994) propose that older survivors exhibit fewer psychosocial problems due to less demand on time and resources. Younger people with cancer are likely to face challenges with balancing the demands of work and dependent family members which are elements in earlier life stages (Baker et al., 2005). Age also implies a temporal element where increasing age is associated with declining health on one hand, but also signifies a passage of time away from time of diagnosis which reduces the initial traumatic impact of discovering the diagnosis.

### 2.7.3 Severity of Illness in the Survivor

Disease severity can be estimated using population-based survival measures. The Canadian Cancer Society (2011) uses the Relative Survival Ratio (RSR) for assessing the probability that an average person diagnosed with cancer will live up to their five-year anniversary following the diagnosis. The RSR is defined as “the ratio of the observed survival for a group of persons diagnosed with cancer to the survival expected for people in the same general population”



(Canadian Cancer Society, 2011, p. 60). Different RSRs are associated with cancer types. For example, RSRs are lowest for pancreatic, esophageal, and lung cancers compared to thyroid, prostate and testicular cancers with high RSRs (Canadian Cancer Society, 2011). A full listing of five-year RSR by cancer type and sex are presented below in Table 1.

Table 1. *Estimated Five-Year Relative Survivor Ratios and 95% Confidence Intervals (CI) for Selected Cancers by Sex, Canada (Excluding Quebec), 2004-2006*

	Relative Survival Ratio (5) (95% CI)		
	Both Sexes	Males	Females
All Cancers	62 (62-62)	62 (61-62)	63 (63-63)
Thyroid	98 (97-98)	94 (93-96)	99 (98-99)
Prostate	--	96 (96-97)	--
Testis	--	95 (94-96)	--
Melanoma	90 (89-90)	86 (85-88)	93 (92-94)
Breast	88 (87-88)	79 (73-85)	88 (87-88)
Hodgkin Lymphoma	85 (83-87)	83 (81-86)	87 (84-89)
Body of Uterus	--	--	85 (85-86)
Bladder	75 (74-77)	76 (74-78)	73 (71-76)
Cervix	--	--	75 (73-76)
Kidney	67 (66-68)	67 (65-68)	67 (66-69)
Larynx	64 (62-66)	65 (62-67)	61 (56-66)
Oral	63 (61-64)	61 (59-62)	66 (64-68)
Colorectal	63 (63-64)	63 (62-63)	64 (63-65)
Non-Hodgkin Lymphoma	63 (62-64)	61 (60-62)	65 (63-66)
Leukemia	55 (54-56)	55 (54-57)	54 (53-56)
Ovary	--	--	42 (41-44)
Multiple Myeloma	37 (35-38)	37 (35-39)	36 (34-38)
Stomach	24 (23-25)	24 (22-25)	25 (23-27)
Brain	23 (21-24)	21 (20-23)	25 (23-27)
Liver	18 (16-19)	18 (16-20)	17 (14-20)
Lung	16 (15-16)	13 (13-14)	19 (18-19)
Esophagus	13 (12-15)	13 (11-14)	15 (13-18)
Pancreas	6 (6-7)	6 (5-7)	7 (6-8)

-- Not applicable.

Note. Adapted from Canadian Cancer Society: Canadian Cancer Statistics 2011 (p.63)

Although there has been recent improvements made to cancer survival rates, attention must be given to how RSR can impact the QOL and prognosis of cancer survivors. Those at greatest risk for mortality, such as lung cancer survivors with low RSR, who also have an array of problems managing daily tasks, are most susceptible to higher rates of poor psychological outcomes (Baker et al., 2005; Deimling et al., 2006). Although cancer survivors with a high RSR (Canadian Cancer Society, 2011) are living longer, Bloom (2002) indicates that health problems, psychological distress, and disruptions to social life persist for decades after the completion of diagnosis and treatment. Findings from Deimling et al's (2006) longitudinal study on older adult, long-term cancer survivors revealed that cancer-related worries persisted beyond the 5-year anniversary (a period considered by many as 'cured'), suggesting that the cancer experience has a long temporal duration. In addition, the continual testing and monitoring of cancer is associated with distress that persists for years into the chronic survivorship phase (Burish & Tope., 1992; Glanz & Lerman, 1992; Deimling et al., 2006).

## **3.0 METHODS**

### **3.1 Data Collection**

Data were drawn from *The Cancer Support Person's Unmet Needs Survey* (SPUNS) (Campbell et al., 2009) and *The Cancer Survivors' Unmet Needs Survey* (SUNS) (Campbell et al., 2009) collected by the Canadian Cancer Society. The sampling frame is from a cross-sectional, stratified random sample of 1600 cancer survivors from the Manitoba Cancer registry. From this sample, 1128 survivors were eligible to participate in the study. A total of 789 support persons completed the 78-item survey for SPUNS and 789 cancer survivors completed the 78-item survey for SUNS.

Each survey was divided into three sections: unmet needs; health and well-being and; demographic information and medical history. In the first section pertaining to unmet needs, six domains of needs (Information and Relationship, Emotional, Personal, Work and Financial, Health Care Access and Continuity, and Worries About Future) were measured in the SPUNS, and five domains (Emotional, Health Care Access and Continuity, Relationship, Work and Financial, and Information) were used in SUNS. Both support persons (SPUNS) and cancer survivors (SUNS) rated their level of unmet need in the past month for each item on a 5-point Likert scale that ranged from 0 to 4 (0 = no unmet need, 4 = very high unmet need). The option of "no unmet need" was included in this survey to allow respondents to identify areas where assistance was not necessary. Scores in each domain could then be calculated to give an overall score of unmet needs.

In the second section, questions regarding health and well-being asked the caregivers (SPUNS) and cancer survivors (SUNS) about how they felt in the past week could be rated using a 4-point Likert-type scale ranging from 0-3 (0 = Did not apply to me at all, 3 = Applied to me very much/most of the time). Questions in this section were drawn from the SF-12 (Ware et al., 1996) and DASS-21 (Antony et al., 1998; Henry & Crawford, 2005) surveys measuring functional health and psychological well-being, respectfully. In the final section of each survey, support persons and cancer survivors were asked to provide their demographic information and medical history.

Both surveys are instruments demonstrating strong psychometric properties. After rigorous psychometric testing, the SPUNS demonstrates high acceptability with over 85 percent of support persons finding the survey clear and easy to understand, strong item test-retest reliability comprising .70 of the 95% confidence interval, internal consistency (Chronbach = .990 for the overall scale), and face, content, and construct validity. The survey uses 78 items to measure six domains of unmet needs accounting for 73.5 percent of total variance (Campbell et al., 2009). The SUNS has high acceptability with over 85 percent of survivors agreeing that the survey was clear and easy to understand, item test-retest reliability containing .70 of the 95% confidence interval, and internal consistency (Chronbach's alpha = .990), face, content and construct validity. 89 items in this survey accounted for 64.4 percent of total variance across all five domains (Campbell et al., 2011).

## 3.2 Data Analysis

Data analyses were conducted on the PASW (SPSS) software to determine the impact caregivers' unmet needs have on the psychological well-being of cancer survivors. Analyses were restricted to participants who identified as legally married by applying a filter on the dataset. These selection criteria yielded a sample size of  $n = 599$  each for caregivers and cancer survivors. In order to measure predictor, moderator, outcome, and control variables, data was extracted from specific sections of each survey for analytic purposes. A full listing of the selected questions drawn from each survey is presented in Appendix A, Table 12.

### 3.2.1 Fulfillment of Caregiver Needs

For the predictor variable, *Fulfillment of Caregiver Needs*, data from the unmet needs section of the SPUNS was used to measure unmet needs of support persons. Participants were asked to rate the extent of needs requiring assistance in six different domains. Means and reliability alphas for each domain of unmet needs were calculated. In regards to means of each unmet need, higher values represented a greater area of need that required assistance, versus lower values depicting needs that are less prominent in the lives of support persons. The reliability alphas for each domain of unmet needs for support persons were calculated: Information Needs  $\alpha = 0.94$ , Personal Needs  $\alpha = 0.97$ , Future Needs  $\alpha = 0.96$ , Emotional Needs  $\alpha = 0.97$ , Work and Financial Needs  $\alpha = 0.90$ , and Healthcare Needs  $\alpha = 0.94$ .

### 3.2.2 Factors Influencing Survivor Dependence

Factors Influencing Survivor Dependence acted as the moderating variable. To measure level of survivor dependency, the following proxy variables were created using data from the third

section of SUNS pertaining to demographic information and medical history: Recurrence of Diagnosis; Age of Survivor and; Severity of Illness in Survivor. *Recurrence of Diagnosis in Survivor* was calculated by summing existing dataset variables identifying relapse of illness (1 = yes, 2 = no) and new cancer diagnosis (1 = yes, 2 = no). This variable was then recoded (0 = 0, 1 thru 2 = 1) to better endorse this construct where 0 represented no recurrence of diagnosis and 1 indicated a return of disease. The *Age of Survivor* variable was constructed by recoding the original age variable which used categorical ranges (i.e. 20-29, 30-39) to a continuous variable using the mid-point in each age category (i.e. 20-29 recoded to 25, 30-39 recoded to 35). To measure *Severity of Illness in Survivor*, this variable was constructed by using data pertaining to cancer that a participant was “first diagnosed with” and applying the relative survival ratio (RSR) from the 2011 Canadian Cancer Society Statistics to the diagnosis. As previously indicated, a listing of RSR by cancer type can be found on Table 1. For instance, if a participant identified breast cancer as their first diagnosis, she would have an 88 percent probability of surviving (RSR for breast cancer = 0.88) to the 5 year anniversary since diagnosis. Because illness severity is perceived as a threat to one’s health and presumably increases survivor dependency on their caregiver, this construct was reversely coded to reflect probability of dying before reaching the 5 year anniversary. Within this context, a patient diagnosed with breast cancer would have a 12 percent (1 – 0.88) probability of dying before reaching 5 year anniversary post-diagnosis.

### 3.2.3 Psychological Well-Being of Cancer Survivors

The psychological well-being of cancer survivors served as the outcome variable. To measure the psychological well-being of cancer survivors, select data was drawn from the second section of the SUNS regarding health and well-being. To measure *Depression*, *Anxiety* and *Stress* for

support persons and cancer survivors, the sums for each of these subscales within the SPUNS (support persons) and SUNS (cancer survivors) were calculated and then multiplied by two. The scores were doubled to reflect the scoring properties from the original DASS-42 survey (Antony et al., 1998) from which the DASS-21 was derived. Reliability alphas for the above mentioned measures of psychological well-being were also calculated: Support Person: depression  $\alpha = .90$ , anxiety  $\alpha = .83$ , stress  $\alpha = .92$ ; Cancer Survivor: depression  $\alpha = .92$ , anxiety  $\alpha = 0.79$ , stress  $\alpha = .90$ .

### 3.2.4 Demographics and Controls

Demographic information for support persons and cancer survivors were drawn from the third sections of SPUNS and SUNS. Age, gender, employment status, university education and the psychological well-being of both the support person and cancer survivor served as control variables.

*Age* signified chronological years of a person's life. Age was coded as a continuous variable for support persons and cancer survivors. Gender was coded so that *female* = 1 and male = 0.

*University Education* analyzed those who had obtained a university education versus those who had not. Detailed information from both the SPUNS and SUNS was recoded so university education = 1, and education below university level = 0. *Employed* signified participants who were working for pay (yes = 1) versus those who were not (no = 0). In the second section of the SPUNS and SUNS, three sets of subscales drew questions from the DASS-21 scale to investigate the psychological health of support persons and cancer survivors. Participants self-rated their depression, anxiety, and stress on a 4-point Likert scale (0 = did not apply to me at all, 3 =

Applied to me very much, or most of the time). Responses were then summed to determine the *Depression, Anxiety, and Stress* for support persons and cancer survivors. In the present analyses, these variables were controlled for since previous studies have shown spill-over effects of psychological states between partners (e.g. Manne, 1998). Reliability alphas were also calculated for support persons' depression  $\alpha = 0.90$ , anxiety  $\alpha = 0.83$ , and stress  $\alpha = 0.92$ , as well as cancer survivor's depression  $\alpha = 0.92$ , anxiety  $\alpha = 0.79$ , and stress  $\alpha = 0.90$ .

### **3.3 Regression Models**

Three sets of regression models, totaling nine models altogether, were used to examine the association of caregivers' unmet needs and factors influencing survivor dependence (Recurrence of Diagnosis, Age of Survivor, and Illness Severity in Survivor) with Depression, Anxiety, and Stress in cancer survivors. Each set of analyses were associated with an outcome variable (depression, anxiety, stress) and contained three steps to analyze main effects and interaction effects between the predictor variable (caregiver unmet needs) and moderator (factors of survivor dependence) on the outcome variable (depression, anxiety, and stress).

#### **3.3.1 Depression**

##### **3.3.1.1 Recurrence of Diagnosis in Survivor**

The first step in this regression model contained demographic variables, control variables and the outcome variable depression. In the second step, caregiver unmet needs and recurrence of diagnosis in survivor were added. Any significant findings revealed at this stage would suggest the residual effect that the mentioned predictor variables have on the outcome, after controlling for variables in the previous step. In the third step, interaction was tested by adding unmet needs



by recurrence of diagnosis. Significant interactions were probed by using PROCESS, a computational command in SPSS to determine the simple slopes for the relationship between the predictor variable (caregiver unmet needs) with the potential outcome variable (i.e. depression) at high ( $M + 1$  SD) or low ( $M - 1$  SD) levels of the moderator (survivor dependence) (Hayes, 2012). Any significant interactions revealed in this step describe how the effect of unfulfilled needs of caregivers on survivor depression changes when the level of survivor dependency is influenced by the presence or absence of a recurring cancer diagnosis.

### 3.3.1.2 Age of Survivor

Within this regression model, the first step involved demographic variables, control variables and the outcome variable depression. Unmet needs of caregivers and the age of survivors were added to the second step. Any significant findings revealed at this stage would suggest the residual effect that the above mentioned predictor variables have on the outcome, after controlling for variables in the previous step. In the third step, unmet needs by age of survivor were added in to test interaction. Significant interactions were probed by using PROCESS, a computational command in SPSS to determine the simple slopes for the relationship between the predictor variable (caregiver unmet needs) with the potential outcome variable (i.e. depression) at high ( $M + 1$  SD) or low ( $M - 1$  SD) levels of the moderator (survivor dependence) (Hayes, 2012). Any significant interactions revealed in this step describe how high versus low levels of survivor dependency are influenced by the age of the survivor, and thus modify the impact that caregiver needs have on survivor depression.

### 3.3.1.3 Severity of Illness in Survivor

The first step in the third set of regression models consisted of demographic variables, control variables and depression as the outcome variable. The second step involved the addition of caregiver unmet needs and recurrence of diagnosis in survivor. Any significant finding found at this point suggests the residual effect of a predictor variable after variables were controlled for in the preceding step. In the third step, interaction was tested by adding unmet needs by severity of illness in survivor. Significant interactions were probed by using PROCESS, a computational command in SPSS to determine the simple slopes for the relationship between the predictor variable (caregiver unmet needs) with the potential outcome variable (i.e. depression) at high ( $M + 1$  SD) or low ( $M - 1$  SD) levels of the moderator (survivor dependence) (Hayes, 2012). Any significant interactions revealed in this step describe how high versus low levels of survivor dependency are influenced by the severity of illness in the survivor, and thus modify the impact that caregiver needs have on survivor depression.

### 3.3.2 Anxiety

#### 3.3.2.1 Recurrence of Diagnosis in Survivor

The first step in this regression model contained demographic variables, control variables and the outcome variable anxiety. In the second step, caregiver unmet needs and recurrence of diagnosis in survivor were added. Any significant findings revealed at this stage would suggest the residual effect that the mentioned predictor variables have on the outcome, after controlling for variables in the previous step. In the third step, interaction was tested by adding unmet needs by recurrence of diagnosis. Significant interactions were probed by using PROCESS, a computational command in SPSS to determine the simple slopes for the relationship between the

predictor variable (caregiver unmet needs) with the potential outcome variable (i.e. anxiety) at high ( $M + 1$  SD) or low ( $M - 1$  SD) level of the moderator (survivor dependence) (Hayes, 2012). Any significant interactions revealed in this step describe how the effect of unfulfilled needs of caregivers on survivor anxiety changes when the level of survivor dependency is influenced by the presence or absence of a recurring cancer diagnosis.

### 3.3.2.2 Age of Survivor

Within this regression model, the first step included demographic variables, control variables and the outcome variable anxiety. Unmet needs of caregivers and the age of survivors were added to the second step. Any significant findings revealed at this stage would suggest the residual effect that the mentioned predictor variables have on the outcome, after controlling for variables in the previous step. In the third step, unmet needs by age of survivor were added in to test interaction. Significant interactions were probed by using PROCESS, a computational command in SPSS to determine the simple slopes for the relationship between the predictor variable (caregiver unmet needs) with the potential outcome variable (i.e. anxiety) at high ( $M + 1$  SD) or low ( $M - 1$  SD) levels of the moderator (survivor dependence) (Hayes, 2012). Any significant interactions revealed in this step describe how high versus low levels of survivor dependency are influenced by the age of the survivor, and thus modify the impact that caregiver needs have on survivor anxiety.

### 3.3.2.3 Severity of Illness in Survivor

The first step in this regression model consisted of demographic variables, control variables and anxiety as the outcome variable. The second step involved the addition of caregiver unmet needs and severity of illness in survivor. Any significant finding found at this point suggests the residual effect of a predictor variable after variables were controlled for in the preceding step. In the third step, interaction was tested by adding unmet needs by severity of illness in survivor. Significant interactions were probed by using PROCESS, a computational command in SPSS to determine the simple slopes for the relationship between the predictor variable (caregiver unmet needs) with the potential outcome variable (i.e. anxiety) at high ( $M + 1$  SD) or low ( $M - 1$  SD) levels of the moderator (survivor dependence) (Hayes, 2012). Any significant interactions revealed in this step describe how high versus low levels of survivor dependency are influenced by the severity of illness in the survivor, and thus modify the impact that caregiver needs have on survivor anxiety.

### 3.3.3 Stress

#### 3.3.3.1 Recurrence of Diagnosis in Survivor

The first step in this regression model contained demographic variables, control variables and the outcome variable stress. In the second step, caregiver unmet needs and recurrence of diagnosis in survivor were added. Any significant findings revealed at this stage would suggest the residual effect that the mentioned predictor variables have on the outcome, after controlling for variables in the previous step. In the third step, interaction was tested by adding unmet needs by recurrence of diagnosis. Significant interactions were probed by using PROCESS, a

computational command in SPSS to determine the simple slopes for the relationship between the predictor variable (caregiver unmet needs) with the potential outcome variable (i.e. stress) at high ( $M + 1$  SD) or low ( $M - 1$  SD) level of the moderator (survivor dependence) (Hayes, 2012). Any significant interactions revealed in this step describe how the effect of unfulfilled needs of caregivers on survivor stress changes when the level of survivor dependency is influenced by the presence or absence of a recurring cancer diagnosis.

#### 3.3.3.2 Age of Survivor

Within this regression model, the first step involved demographic variables, control variables and the outcome variable stress. Unmet needs of caregivers and the age of survivors were added to the second step. Any significant findings revealed at this stage would suggest the residual effect that the mentioned predictor variables have on the outcome, after controlling for variables in the previous step. In the third step, unmet needs by age of survivor were added in to test interaction. Significant interactions were probed by using PROCESS, a computational command in SPSS to determine the simple slopes for the relationship between the predictor variable (caregiver unmet needs) with the potential outcome variable (i.e. stress) at high ( $M + 1$  SD) or low ( $M - 1$  SD) levels of the moderator (survivor dependence) (Hayes, 2012). Any significant interactions revealed in this step describe how high versus low levels of survivor dependency are influenced by the age of the survivor, and thus modify the impact that caregiver needs have on survivor stress.

### 3.3.3.3 Severity of Illness in Survivor

The first step of this regression model consisted of demographic variables, control variables and stress as the outcome variable. The second step involved the addition of caregiver unmet needs and severity of illness in survivor. Any significant finding found at this point suggests the residual effect of a predictor variable after variables were controlled for in the preceding step. In the third step, interaction was tested by adding unmet needs by severity of illness in survivor. Significant interactions were probed by using PROCESS, a computational command in SPSS to determine the simple slopes for the relationship between the predictor variable (caregiver unmet needs) with the potential outcome variable (i.e. stress) at high ( $M + 1 SD$ ) or low ( $M - 1 SD$ ) levels of the moderator (survivor dependence) (Hayes, 2012). Any significant interactions revealed in this step describe how high versus low levels of survivor dependency are influenced by the severity of illness in the survivor, and thus modify the impact that caregiver needs have on survivor stress.

## 4.0 RESULTS

Descriptive statistics for variables used in this study can be seen in Table 2. The means and frequencies for sociodemographic information, factors influencing survivor dependence, and the psychological well-being of support persons and cancer survivors are presented below.

Sociodemographics included the age, gender, employment status (employed versus unemployed), and education (university level or higher). Factors influencing survivor dependence consisted of survivors' recurrence of diagnosis, age, and severity of illness.

Psychological well-being described average rates of depression, anxiety and stress in support persons and cancer survivors.

Table 2. Means and Frequencies for Demographics, Factors Influencing Dependence, and Psychological Well-being Variables.

Variables	Support Persons		Cancer Survivors	
	<i>M/Percent</i>	<i>SD</i>	<i>M/Percent</i>	<i>SD</i>
<b>Sociodemographics</b>				
Age	62.12	10.92	61.20	11.10
Female	60.37	--	39.63	--
Employed	43.72	--	--	--
University Education	21.81	--	--	--
<b>Factors Influencing Dependence</b>				
Recurrence of Diagnosis	--	--	18.86	--
Age of Survivor			61.20	11.10
Probability of Dying in 5 years	--	--	22.90	20.90
<b>Psychological Well-being</b>				
Depression	4.14	7.00	4.11	7.00
Anxiety	3.08	5.61	3.28	5.15
Stress	6.18	8.53	5.53	7.62

Support Persons  $n = 599$

Cancer Survivors  $n = 599$

## 4.1 Depression

With regards to the first three sets of regression analyses, Model 1 showed positive associations between caregiver depression and cancer survivor depression (Table 3, Table 4, Table 5). In Model 2, future concerns (Table 3, Table 4, Table 5) of the support person predicted depression in cancer survivors across all three sets of analyses (Table 3, Table 4, Table 5). This relationship suggests that the more caregivers had unmet needs related to future concerns, the greater the survivors' depressive symptoms were. However, as the work and financial needs of support persons increased, survivor depression decreased (Table 5). No significant interactions were found in any of the analyses on caregiver unmet needs by recurrence of diagnosis and survivor depression (Table 3), caregiver unmet needs by age of survivor (Table 4) and survivor depression, or caregiver unmet needs by severity of illness in survivor and survivor depression (Table 5).

Within each regression model, the  $R^2$  values demonstrated an increased strength in correlation between predictor variables and outcomes from Model 1 to Model 2 and Model 3. In Table 3, Model 1 revealed an  $R^2$  of .08, Model 2 indicated an  $R^2$  of .13, and the  $R^2$  is .13 in Model 3. In Table 4, the  $R^2$  values were .08, .12, and .12 for Models 1, 2, and 3 respectively. For Table 5, the  $R^2$  was .05 in Model 1,  $R^2$  was .11 in Model 2, and Model 3 revealed an  $R^2$  of .11. In general, the residual variability explained by the predictor variables in each model decreased with the addition of predictor variables after Model 1, but little to no change in residual variability was seen between Models 2 and Models 3 across each regression model (Table 3, Table 4, Table 5). In other words, the findings suggest that Models 2 and Models 3 were better at predicting survivor depression than Model 1.



Table 3. *Unstandardized Coefficients for Regression Models Predicting Cancer Survivors' Depression from Support Persons' Demographics and Depression, Support Persons' Unmet Needs, Cancer Survivors' Recurrence of Diagnosis, and Support Persons' Unmet Needs by Cancer Survivors' Recurrence of Diagnosis.*

Variables	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Constant	7.17**	2.36	5.35*	2.36	4.87*	2.38
Age	-.06	.03	-.05	.03	-.04	.03
Female	-.96	.63	-1.00	.62	-1.03	.63
Employed	-.60	.74	-.74	.72	-.65	.73
University Education	.61	.74	.80	.72	.78	.73
Support Person Depression	.28***	.04	.18**	.04	.18**	.07
Information Needs	--		.77	.55	.80	.63
Personal Needs	--		-.24	.78	-.06	.92
Future Concerns	--		1.24**	.38	1.35**	.43
Emotional Needs	--		-.06	.90	-.34	.98
Work and Financial Needs	--		-.69	.64	-.44	.73
Healthcare Needs	--		.44	.57	-.04	.62
Recurrence of Diagnosis	--		1.48	.75	1.48	.75
Information X Recurrence	--		--		-.58	1.45
Personal X Recurrence	--		--		-1.46	1.85
Future X Recurrence	--		--		-.62	.90
Emotional X Recurrence	--		--		1.57	2.17
Work X Recurrence	--		--		-2.12	1.70
Healthcare X Recurrence	--		--		3.24	1.69
Adjusted R <sup>2</sup>	.08		.13		.13	

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 4. *Unstandardized Coefficients for Regression Models Predicting Cancer Survivors' Depression from Support Persons' Demographic and Depression, Support Persons' Unmet Needs, Age of Cancer Survivors, and Support Persons' Unmet Needs by Age of Cancer Survivors.*

Variables	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Constant	7.14**	2.36	5.53*	2.36	2.63	2.87
Age	-.05	.03	-.01	.06	-.01	.06
Female	-.97	.63	-.84	.69	-.81	.70
Employed	-.63	.73	-.73	.72	-.70	.73
University Education	.66	.73	.84	.72	.83	.73
Support Person Depression	.28***	.04	.19**	.06	.20**	.06
Information Needs	--		.72	.56	2.97	3.08
Personal Needs	--		-.18	.78	-.04	3.99
Future Concerns	--		1.27**	.38	3.00	2.17
Emotional Needs	--		-.08	.90	-.24	3.96
Work and Financial Needs	--		-.74	.64	-2.54	3.56
Healthcare Needs	--		.39	.58	.91	3.11
Age of Cancer Survivor	--		-.04	.06	-.04	.06
Information X Age	--		--		-.04	.05
Personal X Age	--		--		.00	.07
Future X Age	--		--		-.03	.04
Emotional X Age	--		--		-.00	.07
Work X Age	--		--		.03	.06
Healthcare X Age	--		--		-.01	.05
Adjusted R <sup>2</sup>	.08		.12		.12	

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 5. *Unstandardized Coefficients for Regression Models Predicting Cancer Survivors' Depression from Support Persons' Demographics and Depression, Support Persons' Unmet Needs, Severity of Illness in Cancer Survivors, and Support Persons' Unmet Needs By Severity of Illness in Cancer Survivors.*

Variables	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Constant	7.40**	2.41	5.67*	2.45	5.55*	2.46
Age	-.06	.03	-.05	.03	-.05	.03
Female	-.82	.63	-.90	.62	-.85	.63
Employed	-.55	.74	-.56	.72	-.51	.73
University Education	.40	.74	.46	.72	.23	.73
Support Person Depression	.23***	.05	.19**	.06	.17*	.07
Information Needs	--		.72	.55	1.56	.82
Personal Needs	--		-.37	.80	-2.01	1.31
Future Concerns	--		1.18**	.39	.92**	.59
Emotional Needs	--		-.26	.91	1.69	1.44
Work and Financial Needs	--		-1.82**	.67	-1.71	1.07
Healthcare Needs	--		.93	.59	.32	.86
Severity of Illness	--		1.40	1.44	1.00	2.08
Information X Severity	--		--		-3.68	2.58
Personal X Severity	--		--		6.57	3.78
Future X Severity	--		--		1.10	1.83
Emotional X Severity	--		--		-7.62	4.01
Work X Severity	--		--		-.69	3.00
Healthcare X Severity	--		--		3.67	2.90
Adjusted R <sup>2</sup>	.05		.11		.11	

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

## 4.2 Anxiety

In the next three sets of analyses, Model 1 revealed that gender was significantly associated with survivor anxiety (Table 6, Table 7, Table 8). Model 2 revealed that as caregivers' informational needs (Table 6, Table 7, Table 8) and emotional needs (Table 6, Table 7) became more substantial, greater anxiety was exhibited in cancer survivors. In contrast, the more caregivers had unmet needs related to work and finances, the less anxiety was shown in survivors (Table 8).

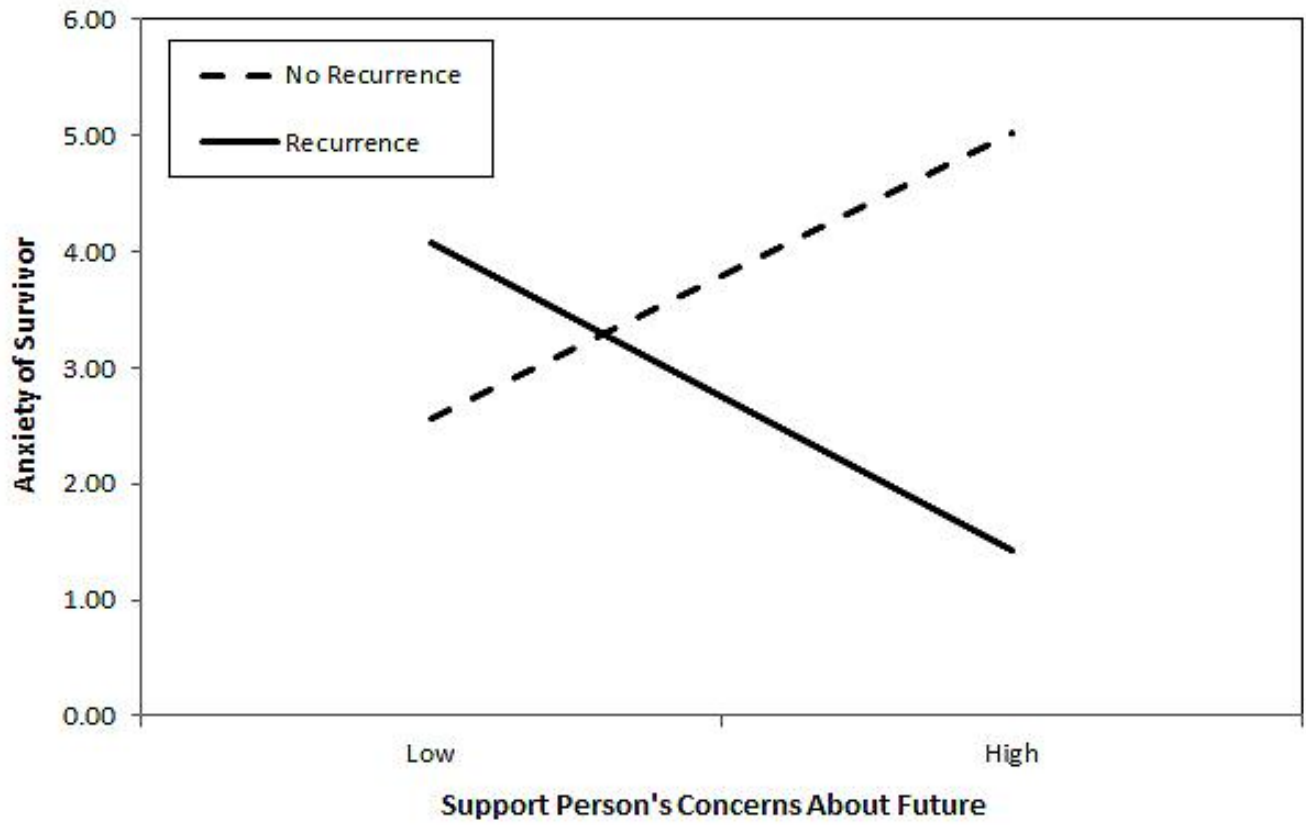
In Model 3, various significant interactions showed the impact that factors of dependence have on the association between caregiver unmet needs and survivor anxiety. When interaction occurred between caregivers' future concerns with recurrence of diagnosis in survivors (Table 6), results illustrated that at higher levels of survivor dependency (i.e. cancer recurs), there was no significant association of caregivers' future concerns with survivor anxiety ( $b = -0.89$ ,  $se = 0.58$ ;  $p = n.s.$ ). However, at low levels of survivor dependence (i.e. no recurrence of diagnosis), as caregivers increasingly became worried about the future, survivors' anxiety increased ( $b = 0.82$ ,  $se = 0.31$ ;  $p < 0.01$ .) (Figure 1). A significant association was found between the caregivers' needs regarding health care access and continuity by recurrence of diagnosis interaction with survivor anxiety. The significant interaction indicates that the relationship between caregivers' healthcare needs and survivor anxiety is not significant when survivor dependency is low (i.e. no recurrence of diagnosis) ( $b = -0.35$ ,  $se = 0.45$ ;  $p = n.s.$ ), but at higher levels of survivor dependency (i.e. cancer returns), the more unfulfilled caregivers' healthcare needs are, the greater the survivor anxiety ( $b = 4.34$ ,  $se = 1.14$ ;  $p < .001$ ) (Figure 2).

Within each regression model, the  $R^2$  values demonstrated an increased strength in correlation between predictor variables and outcomes from Model 1 to Model 2 and Model 3. In Table 6, Model 1 revealed an  $R^2$  of .03, Model 2 indicated an  $R^2$  of .11, and the  $R^2$  was .13 in Model 3. In Table 7, the  $R^2$  values were .03, .11, and .11 for Models 1, 2, and 3 respectively. For Table 8, the  $R^2$  was .03 in Model 1,  $R^2$  was .10 in Model 2, and Model 3 revealed an  $R^2$  of .11. In general, the residual variability explained by the predictor variables in each model decreased with the addition of predictor variables after Model 1, but little to no change in residual variability was seen between Models 2 and Models 3 across each regression model (Table 6, Table 7, Table 8). In other words, the findings suggest that Models 2 and Models 3 were better at predicting survivor anxiety than Model 1.

Table 6. *Unstandardized Coefficients for Regression Models Predicting Cancer Survivors' Anxiety from Support Persons' Demographics and Anxiety, Support Persons' Unmet Needs, Cancer Survivors' Recurrence of Diagnosis, and Support Persons' Unmet Needs By Cancer Survivors' Recurrence of Diagnosis.*

Variables	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Constant	5.85 **	1.76	3.65 *	1.74	3.35	1.73
Age	-.04	.03	-.02	.02	-.02	.02
Female	-.97 *	.48	-.98 *	.46	-1.02 *	.45
Employed	-.06	.55	-.23	.53	-.24	.53
University Education	-.59	.55	-.44	.53	-.42	.53
Support Person Anxiety	.14	.04	-.03	.05	-.03	.05
Information Needs	--		1.12 **	.41	1.35 **	.45
Personal Needs	--		-.32	.59	-.32	.68
Future Concerns	--		.43	.28	.82	.31
Emotional Needs	--		1.22 *	.60	.94	.67
Work and Financial Needs	--		-.48	.48	-.29	.53
Healthcare Needs	--		.30	.42	-.35	.45
Recurrence of Diagnosis	--		.73	.55	1.52	.77
Information X Recurrence	--		--		-1.79	1.05
Personal X Recurrence	--		--		-.03	1.34
Future X Recurrence	--		--		-1.71 **	.66
Emotional X Recurrence	--		--		.55	1.56
Work X Recurrence	--		--		-1.38	1.23
Healthcare X Recurrence	--		--		4.69 ***	1.22
Adjusted R <sup>2</sup>	.03		.11		.13	

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$



*Figure 1.* Support Person's future concerns predicting survivor anxiety moderated by recurrence of illness.

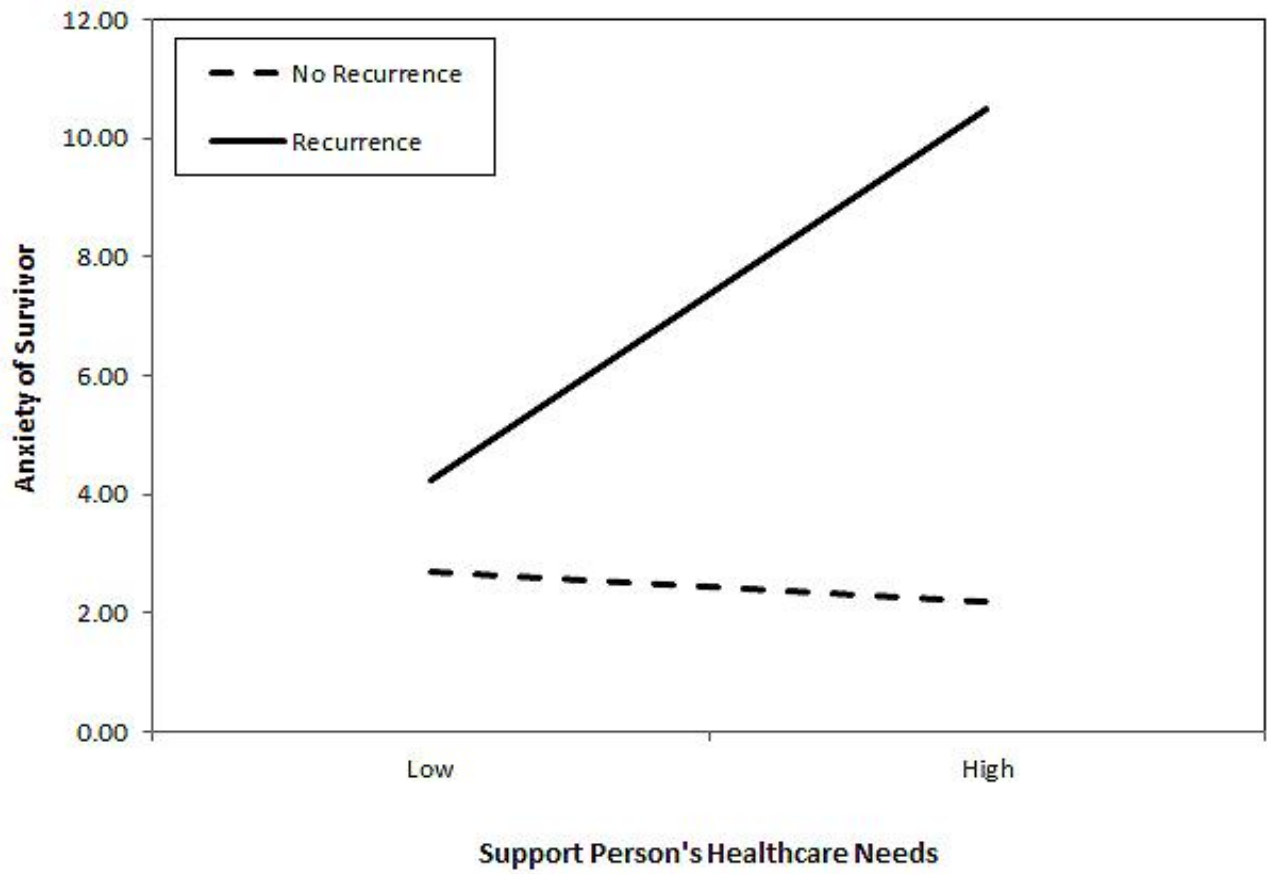


Figure 2. *Support Person's healthcare needs predicting survivor anxiety moderated by recurrence of illness.*



Table 7. *Unstandardized Coefficients for Regression Models Predicting Cancer Survivors' Anxiety from Support Persons' Demographics and Anxiety, Support Persons' Unmet Needs, Age of Cancer Survivors, and Support Persons' Unmet Needs By Age of Cancer Survivors.*

Variables	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Constant	5.79 **	1.76	3.87 *	1.75	1.12 **	2.11
Age	-.04	.03	.04	.05	.03	.05
Female	-1.04 *	.48	-.74	.51	-.74	.51
Employed	-.04	.55	-.19	.53	-.15	.54
University Education	-.55	.55	-.38	.53	-.38	.53
Support Person Anxiety	.14 **	.04	-.03	.05	-.01	.05
Information Needs	--		1.08 **	.41	2.20	2.25
Personal Needs	--		-.29	.59	3.05	2.93
Future Concerns	--		.44	.28	2.25	1.63
Emotional Needs	--		1.25 *	.60	-2.45	2.91
Work and Financial Needs	--		-.50	.48	.06	2.61
Healthcare Needs	--		.24	.42	.21	2.30
Age of Cancer Survivor	--		-.06	.04	-.01	.05
Information X Age	--		--		-.02	.04
Personal X Age	--		--		-.06	.05
Future X Age	--		--		-.03	.03
Emotional X Age	--		--		.06	.50
Work X Age	--		--		-.01	.04
Healthcare X Age	--		--		.00	.04
Adjusted R <sup>2</sup>	.03		.11		.11	

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

The caregivers' personal needs by severity of illness in survivor interaction predicting survivor anxiety was statistically significant (Table 8). At lower levels of survivor dependency (i.e. low severity of illness), there was no significant association between caregivers' personal needs and survivor anxiety ( $b = 0.89$ ,  $se = 0.79$ ;  $p = n.s.$ ), but at higher levels of survivor dependency (i.e. high severity of cancer), the more unmet personal needs that caregivers had, the greater was the level of anxiety shown in survivors ( $b = -1.47$ ,  $se = 0.88$ ;  $p < 0.05$ ) (Figure 3). A significant association was seen between caregivers' emotional needs and severity of illness in survivors (Table 8). When survivor dependency was high (i.e. high severity of illness), no significant relationship exists between caregivers' emotional needs and survivor anxiety ( $b = -0.36$ ,  $se = 0.82$ ;  $p = n.s.$ ), but at lower levels of survivor dependency (i.e. lower severity of cancer), unmet emotional needs of caregivers predicted higher survivor anxiety ( $b = 2.28$ ,  $se = 0.91$ ;  $p < .05$ ) (Figure 4). These results highlight how recurrence of diagnosis and cancer severity increased or decreased the extent that the survivor depends on their caregiver for support, and thus impacted anxiety in survivors.

Table 8. *Unstandardized Coefficients for Regression Models Predicting Cancer Survivors' Anxiety from Support Persons' Demographics and Anxiety, Support Persons' Unmet Needs, Severity of Illness in Cancer Survivors, and Support Persons' Unmet Needs By Severity of Illness in Cancer Survivors.*

Variables	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Constant	5.50 **	1.77	3.53	1.79	3.20	1.80
Age	-.03	.03	-.02	.03	-.01	.03
Female	-1.04 *	.47	-1.06 *	.45	-.97 *	.46
Employed	-.10	.55	-.20	.53	-.27	.79
University Education	-.58	.55	-.51	.53	-.66	.53
Support Person Anxiety	.15 **	.04	.00	.06	-.01	.06
Information Needs	--		1.00 *	.40	1.52 *	.60
Personal Needs	--		-.27	.60	-1.70	.96
Future Concerns	--		.42	.28	.35	.43
Emotional Needs	--		.95	.61	2.53 *	1.00
Work and Financial Needs	--		-1.21 *	.49	-.57 *	.78
Healthcare Needs	--		.65	.43	.04	.63
Severity of Illness	--		1.00	1.05	1.24	1.51
Information X Severity	--		--		-2.33	1.86
Personal X Severity	--		--		5.73 *	2.75
Future X Severity	--		--		.31	1.34
Emotional X Severity	--		--		-6.42 *	2.92
Work X Severity	--		--		-2.55	2.19
Healthcare X Severity	--		--		3.59	2.12
Adjusted R <sup>2</sup>	.03		.10		.11	

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

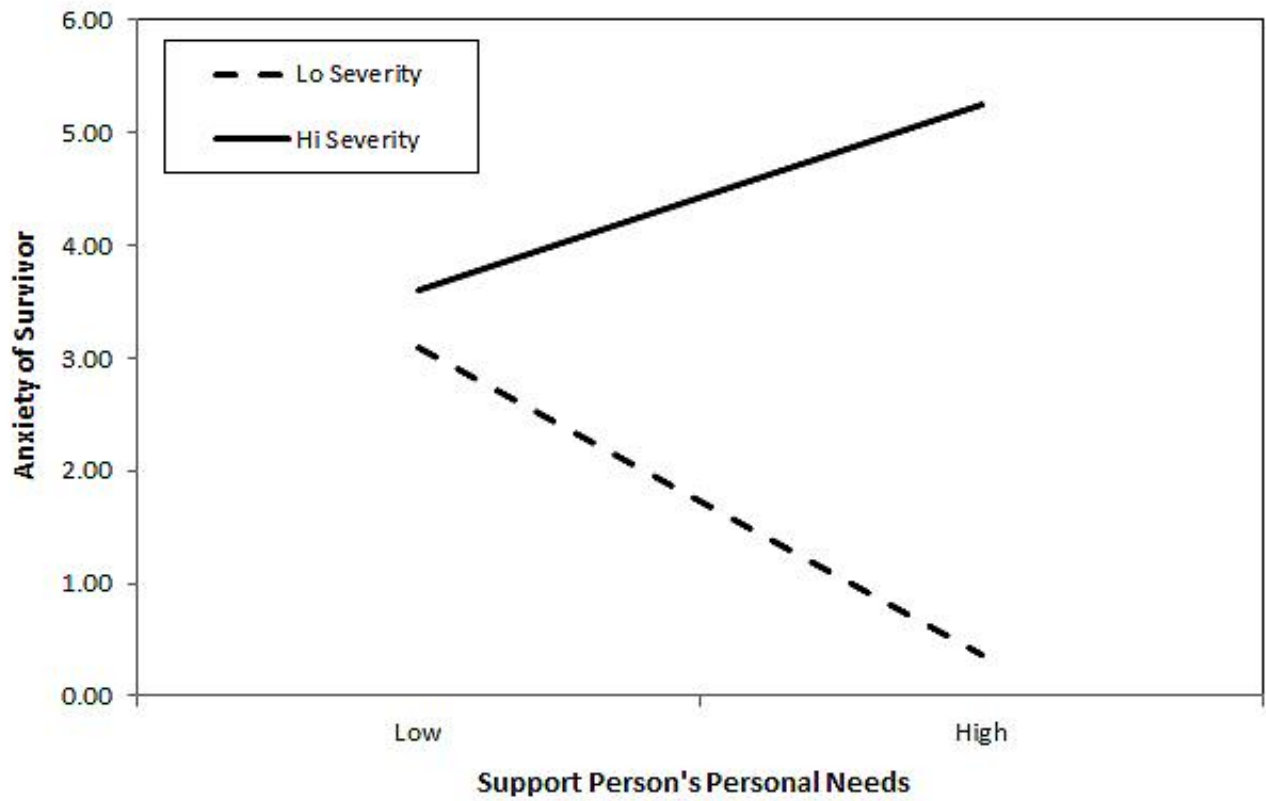
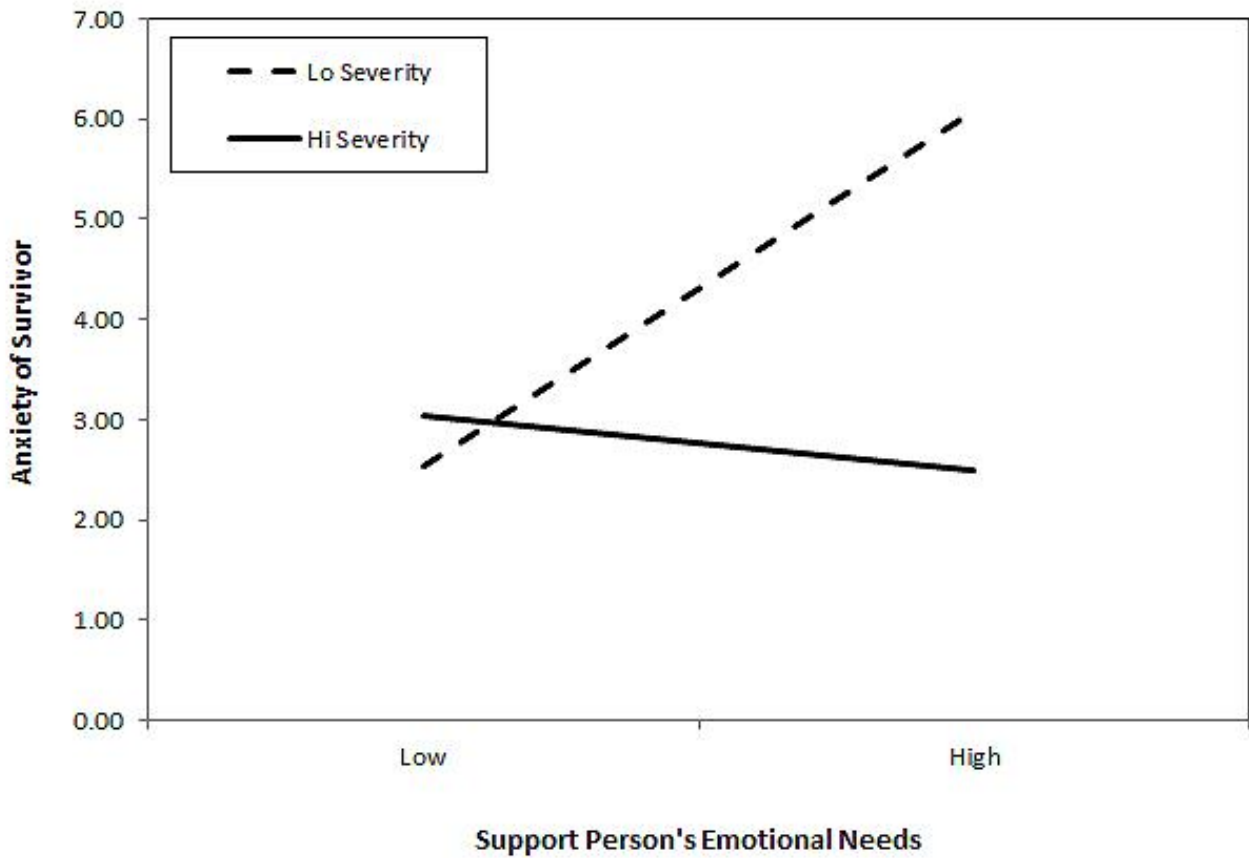


Figure 3. *Support person's personal needs predicting survivor anxiety moderated by severity of illness.*



*Figure 4. Support Person's emotional needs predicting survivor anxiety moderated by severity of illness.*

### 4.3 Stress

Model 1 in the last set of regression models showed that increased stress in support persons is associated with greater stress in survivors (Table 9, Table 11), whereas the age of the caregiver is linked with lower survivor stress (Table 9, Table 10, Table 11). In Model 2, analyses revealed that when caregivers had more unmet needs related to information (Table 9, Table 10) and future concerns (Table 9, Table 10, Table 11), greater stress was shown in survivors. As caregivers had a greater number of work and financial needs unfulfilled, cancer survivors exhibited reduced levels of stress (Table 11).

Within each regression model, the  $R^2$  values demonstrated an increased strength in correlation between predictor variables and outcomes from Model 1 to Model 2 and Model 3. In Table 9, Model 1 revealed an  $R^2$  of .14, Model 2 indicated an  $R^2$  of .21, and the  $R^2$  was .21 in Model 3. In Table 10, the  $R^2$  values were .14, .21, and .22 for Models 1, 2, and 3 respectively. For Table 11, the  $R^2$  was .15 in Model 1,  $R^2$  was .22 in Model 2, and Model 3 revealed an  $R^2$  of .23. In general, the residual variability explained by the predictor variables in each model decreased with the addition of predictor variables after Model 1, but little to no change in residual variability was seen between Models 2 and Models 3 across each regression model (Table 9, Table 10, Table 11). In other words, the findings suggest that Models 2 and Models 3 were better at predicting survivor stress than Model 1.

Table 9. *Unstandardized Coefficients for Regression Models Predicting Cancer Survivors' Stress from Support Persons' Demographics and Stress, Support Persons' Unmet Needs, Cancer Survivors' Recurrence of Diagnosis, and Support Persons' Unmet Needs By Cancer Survivors' Recurrence of Diagnosis.*

Variables	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Constant	11.81 ***	2.46	10.41 ***	2.41	10.01 ***	2.43
Age	-.12 **	.03	-.11 **	.03	-.12 **	.03
Female	-1.64 *	.66	-1.67 **	.63	-1.72 **	.64
Employed	-.19	.76	-.32	.73	-.27	.74
University Education	1.07	.76	1.24	.74	1.21	.74
Support Person Stress	.28 ***	.04	.21 ***	.06	.19 **	.06
Information Needs	--		1.51 **	.57	1.75 **	.64
Personal Needs	--		.03	.84	.70	.98
Future Concerns	--		1.33 **	.38	1.51 **	.44
Emotional Needs	--		-1.15	.85	-1.74	.95
Work and Financial Needs	--		-.92	.67	-.99	.75
Healthcare Needs	--		.94	.59	.47	.64
Recurrence of Diagnosis	--		.32	.77	.95	1.08
Information X Recurrence	--		--		-1.52	1.47
Personal X Recurrence	--		--		-2.49	1.89
Future X Recurrence	--		--		-.81	.92
Emotional X Recurrence	--		--		2.78	2.21
Work X Recurrence	--		--		-1.01	1.74
Healthcare X Recurrence	--		--		3.06	1.73
Adjusted R <sup>2</sup>	.14		.21		.21	

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 10. *Unstandardized Coefficients for Regression Models Predicting Cancer Survivors' Stress from Support Persons' Demographics and Stress, Support Persons' Unmet Needs, Age of Cancer Survivors, and Support Persons' Unmet Needs By Age of Cancer Survivors.*

Variables	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Constant	11.79 ***	2.46	10.35 ***	2.49	4.72	2.89
Age	-.11 ***	.03	-.13 *	.06	-.13 *	.06
Female	-1.67 *	.65	-1.83 *	.70	-1.67 *	.70
Employed	-.18	.76	-.30	.73	-.08	.73
University Education	1.09	.76	1.23	.74	1.14	.73
Support Person Stress	.28	.04	.21 ***	.06	.21 ***	.06
Information Needs	--		1.52 **	.57	4.85 **	3.10
Personal Needs	--		.01	.84	6.21	4.05
Future Concerns	--		1.31 **	.38	1.52	2.19
Emotional Needs	--		-1.15	.85	-2.72	3.98
Work and Financial Needs	--		-.92	.67	-7.98 *	3.60
Healthcare Needs	--		.95	.59	4.66	3.13
Age of Cancer Survivor	--		.02	.06	.11	.07
Information X Age	--		--		-.06	.05
Personal X Age	--		--		-.10	.07
Future X Age	--		--		-.00	.04
Emotional X Age	--		--		.02	.07
Work X Age	--		--		.11	.06
Healthcare X Age	--		--		-.06	.05
Adjusted R <sup>2</sup>	.14		.21		.22	

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$



Finally, Model 3 reveals significant interactions where factors influencing survivor dependence modified the association between caregiver unmet needs and survivor stress. The caregivers' emotional needs by severity of illness interaction predicting survivor stress was statistically significant (Table 11). These results illustrated that at lower levels of survivor dependency (i.e. lower severity of illness), there was no significant association between caregivers' unmet emotional needs and stress in cancer survivors ( $b = -.10, se = 1.28; p = n.s.$ ). However, at higher levels of survivor dependency (i.e. greater severity of cancer), the greater the extent of caregivers' emotional needs, and the lower was stress in survivors ( $b = -3.79, se = 1.14; p < .01$ ) (Figure 5). The caregivers' health care needs by severity of illness in survivors predicting survivor stress was also significant (Table 11). Results indicated that this relationship is not significant when survivor dependency is low (i.e. no recurrence of diagnosis) ( $b = 0.06, se = 0.80; p = n.s.$ ), but at higher levels of survivor dependency (i.e. cancer returns), the greater the extent of caregiver health care needs, the higher the level of stress in survivors ( $b = 3.66, se = 0.92; p < .001$ ) (Figure 6). These results suggest the moderating effects that cancer severity has on the level of survivor dependency, and thus influence the impact that caregiver unmet needs have on stress in cancer survivors.

Table 11. *Unstandardized Coefficients for Regression Models Predicting Cancer Survivors' Stress from Support Persons' Demographics and Stress, Support Persons' Unmet Needs, Severity of Illness in Cancer Survivors, and Support Persons' Unmet Needs By Severity of Illness in Cancer Survivors.*

Variables	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Constant	12.59***	2.50	11.11***	2.49	10.74***	2.49
Age	-.13***	.04	-.13***	.04	-.13***	.04
Female	-1.55*	.65	-1.55*	.63	-1.39*	.63
Employed	-.19	.76	-.29	.74	-.19	.73
University Education	1.08	.76	1.21	.74	1.01	.74
Support Person Stress	.28***	.04	.26***	.06	.24***	.06
Information Needs	--		1.43*	.56	2.13*	.83
Personal Needs	--		-.09	.86	-1.25	1.33
Future Concerns	--		1.18**	.40	1.22*	.60
Emotional Needs	--		-1.66	.86	0.26	1.41
Work and Financial Needs	--		-1.60*	.69	-1.12	1.09
Healthcare Needs	--		1.40*	.60	-.29*	.88
Probability of Dying in 5 Years	--		1.65	1.47	2.09	2.10
Information X Severity	--		--		-2.99	2.60
Personal X Severity	--		--		5.85	3.84
Future X Severity	--		--		-.18	1.85
Emotional X Severity	--		--		-9.01*	4.06
Work X Severity	--		--		-2.55	3.04
Healthcare X Severity	--		--		8.78**	2.93
Adjusted R <sup>2</sup>	.15		.22		.23	

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

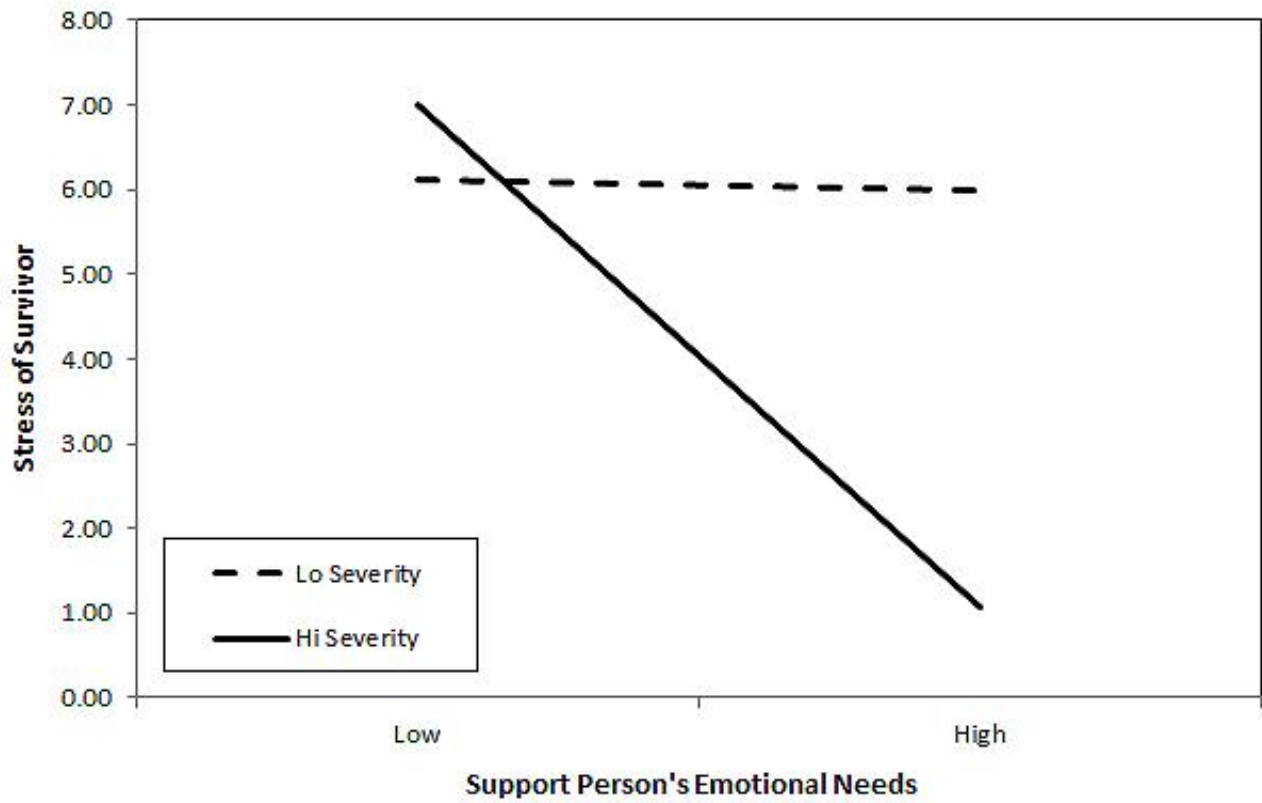


Figure 5. *Support Person's emotional needs predicting survivor stress moderated by severity of illness.*

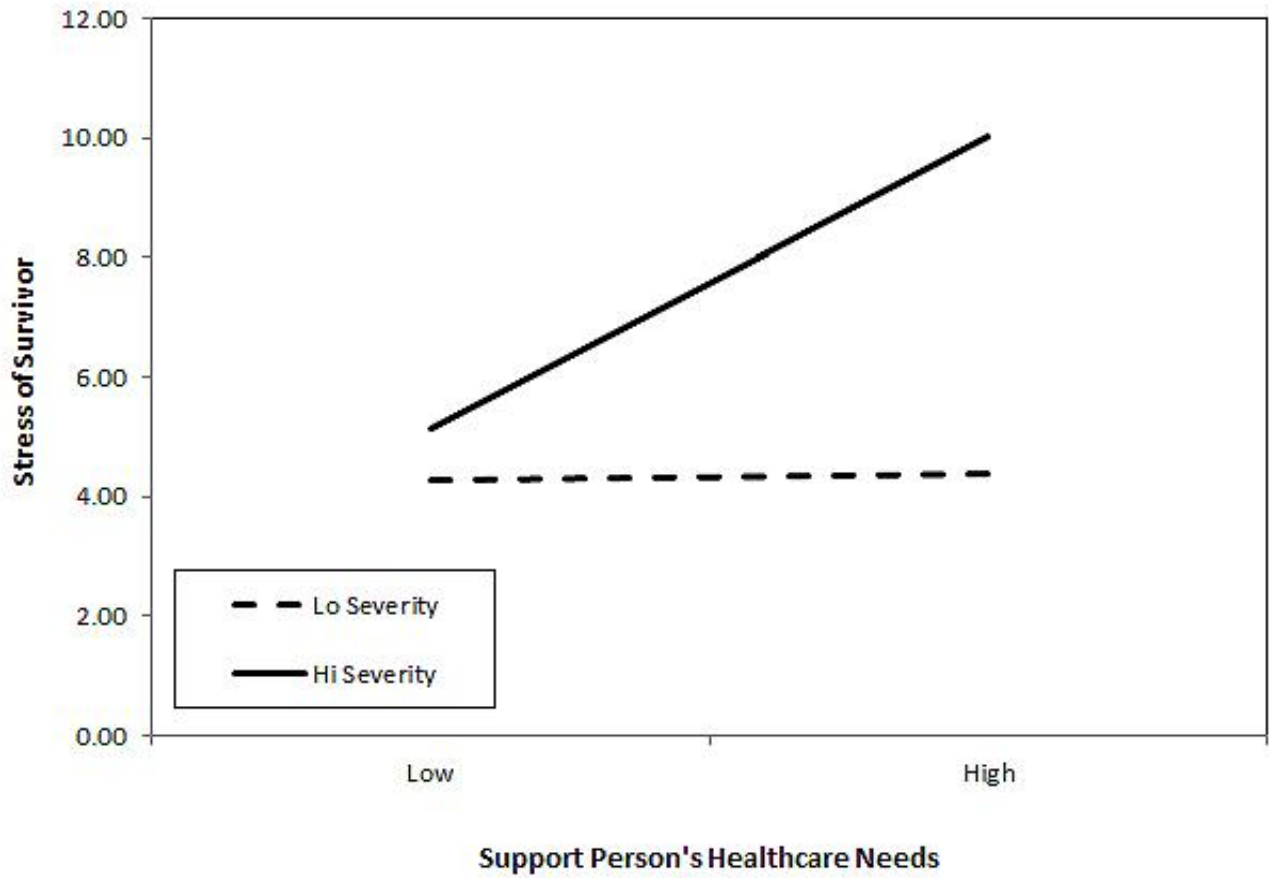


Figure 6. *Support Person's healthcare needs predicting survivor stress moderated by severity of illness.*

## **5.0 DISCUSSION**

In the first section of the discussion the main results are summarized and compared with past studies. The second section relates the main results to this study's hypotheses. In the third section, the Interdependence Theory is drawn upon to interpret the main findings. The fourth section provides the strengths and limitations of this study. Finally, the last section presents implications of this study and direction for future research.

### **5.1 Summary of Results and Previous Research**

The findings in this study that revealed congruent psychological distress between cancer survivors and their spousal caregivers have been reported in past studies (Bookwala & Schulz, 1996; Kim et al., 2008a; Kim et al., 2008b; Gurtman et al., 1990). Specifically, the findings from Model 1 across the three sets of regression models indicated that caregivers' depression predicted higher levels of survivor depression, that support persons' anxiety predicted increased anxiety in cancer survivors, and caregiver stress predicted cancer survivors' elevated stress. These results suggest that the support person's psychological well-being was a strong predictor for that of cancer survivors. However, the mechanisms to explain the transference of distress were unknown at this stage of the analyses. Campbell (2009) found that a greater number of caregiver unmet needs has been shown to have a negative impact on the well-being of cancer survivors. This kind of association reinforces the notion put forth by this study that carer-survivor dyads should be examined as a unit of study.

The cancer experience is shared between cancer survivors and their primary support person. When caregivers have a greater number of unfulfilled needs, they are likely to provide poorer

provision of care to their partner, which in turn, elevates distress to both people in the relationship. Findings from Model 2 across the regression models revealed main effects between support person's future concerns and unmet information needs with elevated depression (Tables 3 to 5), anxiety (Tables 6 to 8) and stress (Tables 9 to 11) in cancer survivors; these findings were consistent with previous research (Kim et al., 2008b, Molassiotis et al., 2011). Interestingly, the more caregivers had unmet needs related to work and finances, the lower were rates of survivor depression (Table 5), anxiety (Table 8) and stress (Table 11).

The significant interactions between some of the unmet needs with recurring illness and cancer severity having an impact on the psychological well-being of cancer survivors were consistent with previous research (e.g. Kim et al., 2008b; Baider et al., 2003). Caregivers who provide support to survivors with cancer that has relapsed or taking care of those in terminal stages experience poorer quality of life (Kim et al., 2008a). Kim et al. (2008b) proposes that caregivers who experience a heightened level of psychological distress may lead them to become less resourceful, hence delivering suboptimal support to survivors. Survivors who are not well supported are shown to have greater difficulty with processing cancer-related information, and achieving emotional stability (Arora et al., 2007). In marital relationships, spouses who provided adequate emotional support reinforced the patient's sense of personal control and facilitated maintaining mental health (Krause et al., 1989).

The significant interactions found in this study suggest how factors influencing survivor dependency may change the effect that caregivers' unmet needs has on the psychological well-being of cancer survivors. Caregiver's concerns about the future only had a significant impact on

survivor anxiety if the cancer returned (Figure 1). Recurring cancer also influenced the effect that caregivers' health care needs had on survivor anxiety (Figure 2). Furthermore, the severity of illness in the survivor had a moderating effect on the relationship between caregivers' personal needs (Figure 3) and emotional needs (Figure 4) with survivor anxiety that was statistically significant. In regards to stress, caregivers' emotional needs (Figure 5) and needs related to health care access and continuity (Figure 6) were significantly associated with survivor stress when the illness endured by the survivor was more severe.

## **5.2 Results Related to the Hypotheses of this Study**

The first research hypothesis assumed that caregiver unmet needs would predict the psychological well-being of cancer survivors. This relationship was explored because previous research on health and well-being in marital relationships (Bookwala & Schulz; Gurtman et al., 1990) have shed light on how cancer should be considered as a shared experience between partners, and treated as a unit of study. Specifically, a closer examination was taken to see how independent experiences of each person are interconnected within the couple. In the present study, six domains of unmet needs were analysed as predictors of cancer survivors' depression, anxiety, and stress. Although statistically significant associations were found between some unmet needs and psychological well-being, not all categories of unmet needs yielded significant results. Caregivers' needs regarding future concerns were associated with higher depressive symptoms in cancer survivors, whereas greater unmet work and financial needs indicated lower depression. Caregiver information needs predicted elevated levels of survivor anxiety, while work and financial needs were linked to lower levels. Results analyzing associations between unmet needs and survivor stress indicated caregivers' information needs and future concerns as

positively significant, while work and financial needs were negatively significant. Based on these results, there was partial support for the first hypothesis that assumed caregivers' unmet needs would have an impact on the psychological outcomes of cancer survivors.

The second hypothesis proposed that the degree of survivor dependence, measured by recurrence of diagnosis in survivor, age of survivor, and severity of illness in survivor, would impact the association between caregiver unmet needs and the psychological well-being of cancer survivors. The assumption is that at high levels of dependency (e.g. recurrence of diagnosis), caregivers' unmet needs would have an even greater impact on the survivors' psychological well-being. Alternatively, low levels of dependency (e.g. no recurrence of diagnosis) means caregiver unmet needs would have less of an impact on the psychological outcomes of cancer survivors. Little research on linkages between intimate relationships and well-being has explored specific relational mechanisms to explain how one partner impacts the other. A major objective of this study was to find more evidence to explain these associations by exploring the interconnected nature of dyadic relationships.

Findings did not fully support the second hypothesis. No significant interactions were revealed between unmet needs and factors influencing dependence that predicted survivor depression. Significant interactions for health care needs by recurrence of diagnosis (Figure 2), and personal needs by severity of illness (Figure 3) predicted higher survivor anxiety. Future concerns by recurrence of diagnosis (Figure 1), and emotional needs by severity of illness (Figure 4) predicted lower survivor anxiety. Lastly, significant interactions for health care needs by severity of illness were associated with higher stress in survivors (Figure 6), whereas emotional needs by



severity of illness were related to decreased levels of stress in survivors (Figure 5). These mixed results suggest that recurrence of diagnosis and severity of illness interact with specific unmet needs to produce different states of psychological well-being in cancer survivors.

Although the findings of this study did not support the second hypothesis entirely, some results were interesting and unexpected. Caregivers' needs related to health care access and continuity as well as personal needs were significantly associated with anxiety (Figure 2, Figure 3) and stress in survivors (Figure 6). These findings were consistent with the expectations described in the second hypothesis of this study. However, support persons with greater concerns about the future and more emotional needs were associated with decreased survivor anxiety (Figure 1, Figure 4) and stress (Figure 5). It is unclear why these specific unmet needs would predict such outcomes. Perhaps the reason why caregivers' health care and personal needs are related to increased psychological distress in survivors, but not their future concerns or work and financial needs, is due to a matter of visibility. Health care and personal needs (i.e. finding time to see family and friends) are more apparent and less demure than emotional needs and concerns about the future. The latter categories of needs are more psychological compared to the former, which can be objectified. For these reasons, a possible explanation for why these types of unmet needs predict different psychological outcomes in survivors could be due to how the survivor conceptualizes the caregivers' experience. A survivor who perceives their caregiver as being more burdened or needing additional assistance might experience heightened psychological distress. However, if a caregiver's needs are concealed or less visible, this perhaps, would have less of an impact on a survivor's psychological state.

### **5.3 Main Findings and the Interdependence Theory**

The interdependence theory is a comprehensive theoretical framework that examines relational dynamics in intimate dyadic relationships and provides a better understanding on satisfaction, dependence, and commitment (Kelly & Thibaut, 1978; Thibaut & Kelley, 1959 as cited in Rusbult & Buunk, 1993). The first of four dimensions in this theory, *degree of dependence*, was used to form the basis of this study's second hypothesis. This dimension describes the extent to which an individual depends on their relational partner to fulfill certain needs (Rusbult & Van Lange, 1996). In other words, the outcomes of partner B (cancer survivor) would be influenced by the actions of partner A (caregiver). Within this context, there was an assumption that not only would the caregivers' unmet needs effect the psychological outcomes of the cancer survivor (first hypothesis), but the level of dependence, as measured by various factors (i.e. recurrence of diagnosis, age of survivor, severity of illness) would change this relationship (second hypothesis). Presumably, the more a survivor needed their caregiver for support, the more this dependence would heighten the unmet needs of caregivers, and thus impact the psychological outcomes of cancer survivors. The findings revealed in this study indicated main effects between some unmet needs and psychological well-being in survivors that are presented in Tables 3 to 5 for survivor depression, Tables 6 to 8 for survivor anxiety, and Tables 9 to 11 for survivor stress. Results for significant interactions are illustrated on Figures 1 to 6. The findings indicated mixed results that do not fully support the premise of the first dimension in the Interdependence Theory. It was assumed that high levels of dependence would produce poorer rates of depression, anxiety and stress in survivors. However, the results do not consistently demonstrate this.

Despite the mixed results, the findings offer insight to consider other elements from the Interdependence Theory. The second dimension from the framework, *mutuality of dependence*, might account for significant interactions that were not explained by the first dimension, *degree of dependence*. Mutuality of dependence concerns dyadic relationships where partners are mutually dependent on one another for attaining specific outcomes (versus unilateral dependence described in the first dimension, where the actions of one partner influence the outcomes of the other) (Rusbult & Van Lange, 1996).

The results illustrated in Figure 1, 2, and 6 were not consistent with the expectations of the second hypothesis of this study, but may support *mutuality of dependence*. It is interesting to note that when cancer recurred, caregivers' future concerns were not significantly associated with anxiety in survivors (Figure 1). Additionally, when there was a greater severity of illness in the survivor, caregiver's emotional needs did not have a significant influence on the anxiety (Figure 2) or stress (Figure 6) in cancer survivors either. As previously discussed, the type of unmet need and its visibility might impact how the survivor conceptualizes their caregiver's experience. Within this context, unmet needs such as future concerns and emotional needs are more subjective and psychological in nature, compared to other types of unmet needs (i.e. work and financial needs), and made less apparent to the cancer survivor. The caregiver may be masking their needs from the survivor to avoid causing further distress to their partner who is experiencing a recurrence of illness or enduring a more severe form of cancer. These findings (Figure 1, 2, 6) also indicated that when there was no recurrence of cancer and lower severity of illness in survivors, the anxiety and stress of survivors heightened with the increasing unmet needs of caregivers related to future concerns and emotions. In these circumstances, caregivers'

unmet needs might be made known to their ill partners. Caregivers may rely on their partners as confidants to alleviate some of their worries and emotional distress while enduring the overwhelming role to provide support. Couples in long committed relationship are likely to depend on one another to endure daily challenges and help each other achieve or maintain independence and functionality (Harden et al., 2006). These findings suggest that dependence might be bi-directional, and offer support for the second dimension in the Interdependence Theory. However, exploring these assumptions in detail is beyond the scope of this study, but may be examined in future research.

## **5.4 Strengths and Limitations of the Study**

### **5.4.1 Strengths**

A major strength of this present study was using data from the SPUNS and SUNS each consisting of a large sample of support persons and cancer survivors residing in Canada contributing to greater statistical power. The datasets also contained a low proportion of missing data. Each survey identified specific domains of unmet needs for support persons and cancer survivors that were consistent with findings in literature, as well as examined their physical and psychological well-being, and demographics. Both surveys also demonstrated strong psychometric properties with high acceptability, item test-retest reliability, internal consistency (Chronbach's alpha = .990, and face, content, and construct validity (Campbell et al. 2009; Campbell et al., 2011).

Moreover, the present study employed a quantitative research design using knowledge attained from the above surveys to provide results in numeric form. The use of secondary data analysis in

this study demonstrated numerous strengths. Doing so allowed for a deeper exploration of an existing dataset as well as offered additional insight to the initial inquiry of the phenomenon as a whole and its main findings (Dale et al., 1988, p.3). As a result, connections were identified between unmet needs, psychological well-being, and sociodemographic characteristics. Secondary data analysis is also useful for decomposing data previously analysed and facilitated a better understanding of an independent topic arising from the initial focus of the survey. The purposes of this study concentrated on the unmet needs of caregivers in association with the psychological well-being of cancer survivors, which differed from the focus of the original study with the intent of developing a psychometric tool to measure unmet needs of caregivers.

#### 5.4.2 Limitations

However, the present study also contained several limitations. The SUNS data did not contain a variable providing the exact age of the survivor. In order to measure age of the survivor, a variable had to be constructed from the only available information on age by recoding the existing variable from age categories (i.e. 20-29, 30-39) to the mid-point of each age range (i.e. 20-29 recoded to 25, 30-39 recoded to 35). Hence, the actual age of survivors was not exact, and may influence the interpretation and accuracy of statistical results.

Although quantitative research does have many benefits, the nature of the research methods may be constricting at times. Participants were asked to rate their unmet needs, functional and psychological well-being, and provide demographic information and medical history by providing responses using Likert scales in the survey. Such methods facilitate the obtainment of vast amounts of data that is more convenient and time efficient, compared to qualitative research

methods. However, the responses given by participants on these surveys may not depict their experiences as richly as they would like to convey.

Additionally, the reliance on self-reported responses might be problematic. Although there are many advantages to using self-reports, major disadvantages include various biases that may affect the results. For instance, recall bias may occur where participants report inaccuracies or incomplete responses based on their memory of past events or experiences. Inherently, self-reports are biased by how a person feels at the time they are completing a survey or questionnaire. Someone who is enduring difficult circumstances at the moment is likely to provide answers that are more negative. Alternatively, a person who is feeling upbeat is likely to give more positive responses at the time of completing the survey.

Finally, the cross-sectional nature of the data used in the current study does not allow for determination of temporal or causal relationships between caregiver unmet needs, cancer survivors' psychological well-being and moderating variables. Nonetheless, this study made attempts to draw connections between unmet needs, psychological well-being and dependence among and within cancer survivors and their caregivers using validated psychometric measures and a robust theoretical framework on interdependence in close relationships.

## **5.5 Implications and Future Research**

This findings from this study, along with past research has shown a positive association of one partner's psychological distress with the other's (Cannon & Cavanaugh, 1998; Bookwala & Schulz, 1996; Kim et al., 2008a; Kim et al., 2008b, Manne, 1998). Although survivor

dependence was not shown to be a strong intervening variable between caregiving unmet needs and psychological outcomes of survivors in this current study, it would be interesting to examine whether other relational mechanisms would be stronger moderators. The interdependence theory also examines other relational elements such as satisfaction and commitment. Future studies may wish to explore these mechanisms as alternative moderating variables when examining the association between caregiver unmet needs and psychological outcomes in cancer survivors.

Additionally, although the focus of this study was not on older adults, the characteristics of the participants indicated an average age of 62.12 for support persons and 61.20 for cancer survivors. Older survivors have been shown to exhibit fewer psychosocial problems due to less demand on time and resources, compared to their younger counterparts (Mor et al., 1994). Perhaps a study focusing on younger participants using the same predictor, moderator, and outcomes variables in this current one would yield different results. Those who are younger are likely to face challenges with balancing the demands of work and dependent family members which are elements in earlier life stages (Baker et al., 2005). Thus, accounting for age or lifestage might demonstrate stronger associations between unmet needs and psychological well-being.

Finally, the majority of research on marriage and health has examined heterosexual relationships. Future studies may wish to explore whether the impact of dependence seen in same-sex couples would produce a similar impact on unmet needs and psychological outcomes seen in the current study.

## 6.0 CONCLUSION

The data in this present study was drawn from *The Cancer Support Person's Unmet Needs Survey* (SPUNS) (Campbell et al., 2009) and *The Cancer Survivors' Unmet Needs Survey* (SUNS) (Campbell et al., 2011). The mixed results from these analyses of this study did not fully support the hypotheses outlined in this paper or the interdependence theory.

Despite the limitations identified in this study, the significant results revealed in the findings would be useful to generate alternate hypotheses in future studies regarding interdependence, unmet needs, and psychological well-being. The findings for the present study will also provide direction towards improvements in treating caregivers and cancer patients as a conglomerate, and inform programs, services and policies in cancer care.



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## APPENDIX A

Table 12. *Variables Selected from The Cancer Support Persons Unmet Needs Survey and The Cancer Survivors Unmet Needs Survey*

Variable	Variable Label	Question as found in the survey	Response Options
<b>Dependent Variable (SUNS)</b>			
<b>Psychological Well-Being</b>	HWBPOS03	I couldn't seem to experience any positive feeling at all	0 = Did not apply to me at all 1 = Applied to me to some degree, or some of the time 2 = Applied to me to a considerable degree, or a good part of the time 3 = Applied to me very much, or most of the time
	HWBFWD10	I felt that I had nothing to look forward to	0 = Did not apply to me at all 1 = Applied to me to some degree, or some of the time 2 = Applied to me to a considerable degree, or a good part of the time 3 = Applied to me very much, or most of the time
	HWBBLU13	I felt down-hearted and blue	0 = Did not apply to me at all 1 = Applied to me to some degree, or some of the time 2 = Applied to me to a considerable degree, or a good part of the time 3 = Applied to me very much, or most of the time

	HWBENT16	I was unable to become enthusiastic about anything	0 = Did not apply to me at all 1 = Applied to me to some degree, or some of the time 2 = Applied to me to a considerable degree, or a good part of the time 3 = Applied to me very much, or most of the time
	HWBWOR17	I felt I wasn't worth much as a person	0 = Did not apply to me at all 1 = Applied to me to some degree, or some of the time 2 = Applied to me to a considerable degree, or a good part of the time 3 = Applied to me very much, or most of the time
	HWBMEA21	I felt life was meaningless	0 = Did not apply to me at all 1 = Applied to me to some degree, or some of the time 2 = Applied to me to a considerable degree, or a good part of the time 3 = Applied to me very much, or most of the time
<b>Independent Variable (SPUNS)</b>			
<b>Information Needs</b>	NQP1002	Understanding all the information the person with cancer and I were given	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1008	Finding information about how to manage the illness at home	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need

	NQP1010	Finding information about the kind of help available to me and the person I support	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1019	Finding information about who I should contact if I have a problem or concern	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1024	Knowing how to make the most of my time with the person I support	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
<b>Worries About Future</b>	NQP1028	Dealing with worry about the cancer coming back	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1030	Dealing with not knowing what lies in the future	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1031	Dealing with worrying about the future of the person I support	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
<b>Work and Financial Needs</b>	NQP1033	Being able to keep working	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1034	Getting time off work when I need it	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1039	Finding and getting financial aid	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need

<b>Access and Continuity of Health Care Needs</b>	NQP1040	Having access to a variety of health care services and providers (dietitians, physiotherapists, occupational therapists)	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1041	Getting appointments with health care providers quickly enough	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1045	Making sure the person I support could see the same cancer specialists at each follow-up visit	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
<b>Personal Needs</b>	NQP1053	Knowing how to relax	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1059	Finding time to do the things that make me happy	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
<b>Emotional Needs</b>	NQP1065	Dealing with feeling helpless	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1069	Dealing with no being able to 'get away from it all'	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1072	Dealing with feeling frustrated about my situation	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need
	NQP1075	Finding meaning in this experience	0 = No unmet need 1 = Low unmet need 2 = Moderate unmet need 3 = High unmet need 4 = Very high unmet need

<b>Moderators (SUNS)</b>			
<b>Severity of Cancer</b>	NQS209  NQS209OTH	What type of cancer were you <u>FIRST</u> diagnosed with?	1 = Breast 2 = Prostate 3 = Colon 4 = Lung 5 = Lymphoma 6 = Other ( <i>please specify</i> )
<b>Age of Survivor</b>	age_group_at_dx	Survivor's age group at diagnosis according to the registry	"20-29" "30-39" "40-49" "50-59" "60-69" "70-79" "80+"
<b>Recurrence of Cancer</b>	NQS210	Has the cancer returned or spread to other parts of your body?	1 = Yes 2 = No 3 = I am not sure
<b>Control Variables (SUNS)</b>			
<b>Gender</b>	NQP201	I am...	1 = Male, 2 = Female
<b>Own Health</b>	DEMYDI29	Have <u>YOU</u> ever been diagnosed with cancer?	1 = No, 2 = Yes
<b>Marital Status</b>	DEMMAR05	Presently, you are:	2 = Legally married (and not separated)
<b>Relationship to survivor</b>	DEMSUR01	Who gave you this survey? ( <i>Please check the <b>ONE person</b> that most closely describes this person</i> )	1 = Wife, husband, or partner
<b>Living situation</b>	DEMLIV02	Do you live with the person who gave you this survey?	1 = No 2 = Yes

<b>Family Structure</b>	nqp206f nqp206a DEMLI10C nqp206c nqp206d DEMLI10F  DEMLI10G DEMLI10H nqp206g nqp206Unc nqp206none  NQP206OTH	<b><u>With whom do you currently live most of the time?</u></b>  <i>(Please check all that apply)</i>  a) On my own b) Wife, husband, or partner c) Child(ren) / Grandchild(ren) d) Parent(s) e) Brother(s) or Sister(s) f) Other relatives (e.g., aunt, uncle, grandparent, in-law) g) Friend(s) h) Housemate i) Other <i>(please specify)</i> j) Uncodeable k) Missing Text Variable: Other <i>(please specify)</i>	           1 = Yes  0 = Not selected
<b>Employment Status</b>	EMPL	Respondent's Employment Status (derived variable)	1 = Does paid work 2 = Does not do paid work
<b>Education</b>	EDUC	Respondent's Highest Level of Education (derived variable)	1 = Secondary school or less 2 = Trades, vocational, college or other 3 = University or higher
<b>Time Since Diagnosis</b>	sur_months	Months Since Survivor's Diagnosis (derived variable)	12 : 60