PREDICTORS OF QUALITY OF LIFE IN CAREGIVERS
AT ONE AND SIX MONTHS POST STROKE

BY

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL OF
THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY
UNIVERSITY OF FLORIDA

2004
ACKNOWLEDGEMENTS

This has been a very interesting few years. Pursuing a doctoral degree has led me down several growth-inducing paths, which I had not expected as I began this journey. I found a home in the Rehabilitation Science Program and the Rehabilitation Counseling Department, and met peers and faculty who have enhanced this journey.

I would like to thank Dr. Maude Rittman from the Rehabilitation Outcomes Research Center (RORC) at the Malcom Randall VAMC for her unending support of my research interests, and for sharing her data with me. For that, I am very grateful. Dr. Mary Ellen Young, my committee chair, was committed to this research project and to my development as a researcher and writer. I appreciate Dr. Young’s time, effort and unending encouragement during this journey. Dr. Beth Swett was always willing to provide assistance and support during my doctoral career. Drs. Neale Chumbler and Jim Stansbury, committee members, provided challenging questions and helped to ensure rigor in my work. Also, the methodology core at the RORC (Haijing Qin, Kimberly Reid, Dr. Bruce Vogel, and Kristen Wing) provided quantitative and technical support which was greatly appreciated.

My friend Arlini, thanks for the unending willingness to listen, bring me food, and unending support. She is the strangest person I have ever known.

Charles, thanks for enriching my life and helping me through these final months with your unending love, encouragement and support.
My family, thanks so much for the unending and unconditional support you provided me during this time. I am so blessed by your love.
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This study used path analyses to test a theoretical model of influences on the quality of life for stroke caregivers at one and six months post stroke. The purpose of this study was to identify predictors of quality of life in stroke caregivers at one and six months post stroke. This study also examined ethnic differences in the caregiving trajectory and the influence of the time spent with the care recipient on the quality of life outcomes for stroke caregivers.

Patient and caregiver characteristics had some influence directly on the quality of life outcomes for stroke caregivers. However, the most influential factor on each quality of life dimension was the sense of coherence. Sense of coherence is the ability of caregivers to mobilize their coping resources during periods of distress. Caregivers who were able to do this effectively experienced less burden in four dimensions and less depression.
Ethnic differences were present in quality of life outcomes for stroke caregivers. Hispanic caregivers were more likely to spend time in the caregiving role, and experience more negative consequences in their lives as a result of providing care. African-American caregivers appear to experience more burden and depression initially, but this diminished by six months. Interestingly but not significantly, Caucasians and Hispanics were most similar in their quality of life outcomes, whereas African Americans appeared to experience different patterns over time in their quality of life.
CHAPTER 1
INTRODUCTION

Stroke is the foremost cause of disability in the United States (Han & Haley, 1995). Stroke caregiving presents challenges that are different from caregiving for other disabilities or diseases. A stroke causes sudden, often times severe, changes in functional limitations for the stroke survivor. Due to the swiftness of the onset of limitations, the caregiver does not have time to prepare emotionally or physically for the changes in his or her role. Often times the caregiver is the spouse or adult daughter and fulfills the role of caregiver out of obligation or the expectation of others. Informal caregiving by family or friends is very prevalent in the United States with greater than 60% of stroke patients being discharged home to continue recovery (Stineman, Ross, Hamilton, Maislin, Bates, Granger, & Asch, 2001).

Due to the predominance of stroke in our aging veterans, it is important to understand the lasting impact of stroke caregiving on the caregiver. It has been reported that caregivers who experience a great deal of distress may actually negatively impact the stroke survivor and this distress may determine if the care recipient will be able to remain at home during the course of recovery from stroke (Anderson, Linto, & Stewart-Wynne, 1995; Han & Haley, 1999). In fact, the presence of a caregiver is a significant factor in supporting rehabilitation and recovery after discharge home. This understanding has important implications for rehabilitation and policy (Anderson, Linto, & Stewart-Wynne, 1995; Bakas & Burgener, 2002; Evans, 1986; Evans, Hendricks, Haselkorn, Bishop, &
Most stroke caregiving studies thus far have been cross-sectional, examining caregiving issues at only one point in time. Numerous studies have identified the need for longitudinal stroke caregiving studies (Bakas, Austin, Okonkwo, Lewis, & Chadwick, 2002; Dennis, O’Rourke, Lewis, Sharpe, & Warlow, 1998; Han & Haley, 1999; Scholte op Reimer et al., 1998). The stroke caregiving experience is likely to be impacted by time as the functional status of the stroke survivor is likely to change and the caregiver may adapt to the role over time (Han & Haley, 1999; Teel, Duncan, & Lai, 2001).

Thus, the purpose of this study was to identify predictors of quality of life in stroke caregivers longitudinally, that is, at one and six months after discharge home following acute stroke. This study provides information about the predictors of the quality of life outcomes for stroke caregivers. Findings from this study will provide information to managers and clinicians about the education, counseling and therapeutic interventions needed to prepare the caregivers prior to the care recipients’ discharge. It also provides information about the support needs of caregivers at one month and six months after discharge. Finally, this study also explores ethnic variations in quality of life outcomes in stroke caregiving for Caucasian, African-American and Puerto Rican Hispanic caregivers, providing preliminary data for further research on ethnicity’s impact on stroke caregiving.

**Theoretical Framework**

The theoretical framework that this study is utilizing is based on a synthesis of literature on the stroke caregiving experience. The model (see Figure 1.1) indicates first
in the individual characteristic section the patient and caregiver characteristics which
have been shown to influence quality of life (QOL) outcomes for the caregiver. The
patient characteristics include: functional status, income, gender, compliance with the
medical regime, existing comorbidities, and age. The caregiver characteristics shown to
influences the quality of life for the caregiver include: gender, type of relationship,
etnicity, the amount of time the caregiver spends in the caregiving role, and employment
status.

The second part of the model, characteristics of the caregiving experience,
indicates that the strength of the relationship between the caregiver and stroke survivor
has an impact on coping and quality of life for the caregiver. Further, there are many
influences on the coping ability of the caregiver which also impact the quality of life for
the caregiver. These coping influences may also impact the dyad dynamics, and have
been identified as sense of coherence (SOC), social support, leisure, knowledge, and
sleep.

Finally, in the outcomes section, the quality of life for caregivers can be described
by examining physical health, mental health, and satisfaction with the experience of the
stroke caregiver. It is plausible that the outcomes for the caregiver also impact the dyad
dynamics and vice versa.
Figure 1.1 Theoretical Model of Caregiving Experience

**Research Questions**

The following research questions are derived from relationships depicted in the Figure 1.1 and will be the guiding focus of this study.

1. Do quality of life outcomes of caregivers change from one month to six months after discharge home following stroke?

2. Do patient characteristics influence quality of life outcomes of caregivers?

3. Do caregiver characteristics influence quality of life outcomes of caregivers?

4. Does caregiver coping and time spent in caregiving influence quality of life outcomes of caregivers?
CHAPTER 2
REVIEW OF THE LITERATURE

In Chinese culture, it is traditional for the eldest son and his wife to be the caregiver for the elderly or ill parents (Chiu, Shyu, Liu, Wang, & Chang, 2001). If the son is perceived to be focused on something other than his parents’ illness, or seen as having fun while his parent is ill, he is likely to be criticized as being immoral and not fulfilling his familial obligations (Chiu et al., 2001). Women in Western cultures were expected to adopt caregiving roles for a variety of family members who were sick or infirm after the Civil War (Hoffmann & Mitchell, 1998). Today in Western cultures, it is quite common for the wife, daughter, or daughter-in-law, to still provide the primary care for an ailing parent (Brody, 1985; Dewey, Thrift, Mihalopoulos, Carter, Macdonell, McNeil, & Donnan, 2002).

The caregiving literature in all disability/illness groups have primarily focused on the “burden” or negative aspects of caregiving. There has been an implied assumption in the caregiving literature that receiving care at home is the best outcome for the care recipient. In fact, there has only been one study that addresses that this may not be true for care recipients (but not specifically stroke survivors) (Newsom & Schulz, 1998). In addition, there is a paucity of literature on the benefits of caregiving for the stroke survivor.

Stroke caregiving presents unique obstacles for the caregiver. Due to the unexpected nature of a stroke, the stroke survivor and caregiver have no time to plan and
adapt to the potential loss of functioning and affective changes which may occur in both
the caregiver and patient. Quality of life for stroke caregivers is a multidimensional
concept which may be influenced by many factors. In the following sections, the
literature review begins with a brief introduction to stroke, and then is structured around
the large theoretical model introduced previously (Figure 1.1).

**Stroke**

A cerebrovascular accident (CVA) or stroke has been defined as “an acute onset
of neurological dysfunction due to an abnormality in cerebral circulation with resultant
signs and symptoms that correspond to involvement of focal areas of the brain”
(O’Sullivan, 2001, p. 521). Focal deficits must continue for 24 hours to be considered a
stroke, if they continue for less, they are classified as a transient ischemic attack (TIA)
(O’Sullivan, 2001). A stroke may result in a variety of residual deficits ranging from mild
to severe. The most common deficits resulting from a stroke include motor, sensory,
cognitive, language, affective and perceptual deficits. Motor deficits typically involve
hemiplegia, a weakness or paralysis affecting the side of the body opposite from the
lesion site in the brain. Sensory deficits include a potential loss of vision or other sense.
Cognitive deficits may include decrease in processing time or delayed brain activity.
Language deficits may include a variety of aphasia-related disorders, including trouble
with word finding and expression. Affective deficits are changes related to the emotional
make-up of the individual. Affective deficits in stroke typically manifest as change in
temper and emotional liability. Finally, perceptual deficits may involve a decrease in
depth perception or other visual-motor functions.
In the general population, stroke is the third leading cause of death, affecting approximately 600,000 individuals per year (AHCPR, 1995; O'Sullivan, 2001). Stroke is primarily a disease of older individuals, as the occurrence of stroke increases considerably with age. The occurrence doubles every decade after 55 years of age (O’Sullivan, 2001). Only approximately 30% of strokes occur in individuals under age 65, and strokes are more prevalent in males and in African-American and Hispanic populations (O’Sullivan, 2001; Wein, Smith, & Morgenstern, 1999). In 2001, 9016 veterans served by the Veterans Administration Medical Care system (VAMC) experienced a stroke (VAMC, 2003), which consumed approximately five percent of the VAMC health care resources. Of veterans who had experienced a stroke; approximately 60-72% were discharged to the community (Stineman et al., 2001; VAMC, 2003).

**Individual Characteristics**

The burgeoning literature in caregiving presents much conflicting information in regards to how and if patient and caregiver characteristics influence the caregiving experience. For example, some researchers have found that patient characteristics have an effect on the caregivers’ health (e.g., Gallagher, Wagenfeld, Baro, & Haepers, 1994; Hughes, Giobbie-Hurder, Weaver, Kubal, & Henderson, 1999) while others have found no effect (e.g., Bugge, Alexander, & Hagen, 1999; Morimoto, Schreiner, & Asano, 2003). Further still, an increasing area of focus in the literature is the negative impact of caregiving on the care recipient (Martire, Stephens, Druley, & Wojno, 2002; Newsom & Schulz, 1998). In this section, empirical evidence on patient and caregiver characteristics will be examined.
Patient Characteristics

Individuals who have experienced a stroke are often referred to in a negative sense, as a “burden” to others, or as a “victim,” implying passivity and worthy of pity (Pound, Gompertz, & Ebrahim, 1998). This typology of stroke survivors may influence how willing the care recipient is to accept help, and how he/she feels about the recovery process. The literature appears to assume that it is better for the stroke survivor to be taken care of at home, instead of at an institution. This may be true; however, there is very little empirical evidence of such. In a rare study on the subject, Clarke and colleagues (1999) found that at three months poststroke, individuals who were receiving care at home experienced less physical impairment than those who were living in an institution. This finding, however, should be evaluated with caution as it may simply be an artifact of the scale utilized (Clarke, Black, Badley, Lawrence, & Williams, 1999).

Patient functional status. Gallagher and colleagues (1994) studied 126 Belgian primary caregivers of individuals with dementia and non-dementia chronic illness. They found that the patient’s functional status was positively associated with role overload for caregivers of nondemented patients (Gallagher et al., 1994). These findings were supported by a study which examined 1570 veterans and their caregivers, which found that functional status was the only predictor which impacted caregiver burden (Hughes et al., 1999). In contrast, several studies have found that caregiver burden was independent of the functional status of the stroke survivor (Bugge et al., 1999, Morimoto et al., 2003; Scholte op Reimer, de Haan, Rijnders, Limburg, & van den Bos, 1998).

Income. Income may also be an important variable in influencing the caregiving relationship (Schulz, Tompkins, & Rau, 1988). Hughes and colleagues (1999) found that low income was significantly correlated with diminished physical functioning of the care
recipient, emotional role and social dysfunction of the caregiver, and decreased mental health and physical health. Bakas and Burgener (2002) studied 104 family caregivers of stroke patients in a cross sectional study, and found that poor health of the caregiver was predicted by low income. The impact of low income on so many variables indicates the need to include income in caregiving studies. Just as the care recipient’s income may have an impact on the caregiving experience, so may the caregiver’s income. These concepts are often hard to separate, as most caregivers are spouses, or income is rated as combined household income.

**Gender and compliance.** Married men reported less physical impairment following a stroke than unmarried men (Nagurney, Reich, & Newsom, in review), whereas married women reported more physical impairment after stroke than unmarried women (Clarke, Black, Badley, Lawrence, & Williams, 1999). The care recipients’ non-compliance with medical recommendations (e.g., diet change, smoking, exercise) also may cause significant distress for the caregiver (Hartke & King, 2003). For example, one caregiver in Hartke and King’s study (2003) explained their frustration about his noncompliance this way:

> For one thing, his unwillingness to do what the doctor tells him to do as far as diet and exercise. He refuses to eat according to plan. It’s frustrating for me to provide what he needs and he goes out and buys what he wants. That’s what got him into this in the first place. (p. 23)

As will be shown below in the caregiving characteristics, age and comorbidities are important factors in the caregiving experience. Previous research has focused on the patient’s physical functioning and has not included the patient’s age or comorbidities as covariates in analyzing the impact of caregiving.
Caregiver Characteristics

**Gender and type of relationship.** Most studies on caregiving identify that their samples are a majority of women and spouses (e.g., Hodgson, Wood, & Langton-Hewer, 1996; Hughes et al., 1999; e.g., Morimoto et al., 2003). In a study of 100 Japanese stroke caregivers, wives had significantly more burden than other caregivers (Morimoto et al., 2003). Spousal caregivers are more likely (than other family members) to maintain the caregiving role for longer periods of time, provide more comprehensive care, and are more likely to suffer negative emotional effects (Cohen, Colantonio, & Vernich, 2002).

There are inconsistent findings in the literature in regards to gender and caregiving. King and colleagues (2001) found that female caregivers were more likely to be depressed during the transition to home, but that at six months post stroke, an increased amount of men were depressed. Other studies have found that women were more likely than men to find caregiving tasks difficult (Hartke et al., 2002; van den Heuvel, de Witte, Schure, Sanderman, & Meyboom-de Jong, 2001), that female caregivers are more likely than male caregivers to have high levels of anxiety, and this anxiety was not impacted by the level of physical functioning of the care recipient (Dennis, O'Rourke, Lewis, Sharpe, & Warlow, 1998; Hartke et al., 2002). However, in a study which analyzed gender differences in bivariate analyses, gender differences were present. However, when these data were included in multivariate analysis these associations disappeared (Chumbler, Grimm, Cody, & Beck, 2003). Therefore, associations in relatively simple analyses may be simply unidimensional and not reflective of the multidimensionality of the caregiving experience. On the other hand, it has been reported that men are more emotionally distant from the caregiving experience, more stoic and less likely to mobilize social support networks (Kaye & Applegate, 1990).
A 2000 review of literature which examined the gender differences on psychiatric morbidities among family caregivers reports that most studies find that women have higher levels of depression and anxiety. These women also experience more psychiatric symptoms and less life satisfaction than male caregivers (Yee, 1997). Yee and Schulz (2000) also report that women tend to maintain the caregiving role longer than men and are less likely than men to request additional informal support and also less likely to participate in health prevention/promotion activities.

**Ethnicity.** There is a paucity of research on the relationship between ethnicity and caregiving, particularly for stroke caregivers. Hartke and King (2003) examined ethnic differences by dividing their sample of stroke caregivers into Caucasian and non-Caucasian caregivers. They found that non-Caucasian caregivers found caregiving tasks to be more difficult than the Caucasian caregivers, but the Caucasian caregivers identified that their care-receivers had more problems. Areas of specific concern for the non-Caucasian caregivers included financial problems and problems with their personal health. Areas for Caucasian caregivers which caused more difficulty included greater persistent worry and less social involvement (Hartke & King, 2003).

In a study which compared the health of spousal caregivers of Alzheimer’s disease (AD) and stroke patients, some interesting race findings emerged (Wright, Hickey, Buckwalter, Hendrix, & Kelechi, 1999). Stroke and AD caregivers had higher levels of depression at baseline than their control counterparts. In the stroke caregivers, the Caucasian caregivers’ depression increased over time while the African-American caregivers’ depression decreased (Wright et al., 1999).
To elucidate the lack of information provided on ethnic differences in stroke caregiving, a study had equal numbers of African-Americans and Caucasians caregivers (n=20 in each group) and performed many statistical analyses which provided rich information on the caregiving experience (Grant, Elliott, Giger, & Bartolucci, 2001). However, the researchers omitted all mention of ethnic differences or similarities in the caregiving experience, failing to contribute to this needed area of research.

Research on caregiving in AD has shown that outcomes vary by ethnicity; there may be similar differences in stroke caregiving (Connell & Gibson, 1997; Haley, West, Wadley, Ford, White, Barrett, Harrell, & Roth, 1995; Hughes et al., 1999). For example, Haley and colleagues (1995) compared psychological, social, and health variables in 175 black and Caucasian family caregivers and 175 black and Caucasian noncaregivers. The Caucasian caregivers had much higher levels of depression than the black caregivers. Similarly, in a large study (N=1594) of caregivers of individuals with a variety of illnesses, Hughes and colleagues (1999) found that African-American caregivers reported the least objective and subjective burden. Objective burden in this study included the caregivers’ personal time, income, vacation time, social support, health, privacy and freedom. Subjective burden in this study was defined as feelings and attitudes about the caregiving experience. These findings were supported by Connell and Gibson (1997) who, in their literature review of empirical studies which examined ethnic/racial differences in dementia caregiving, identified that black caregivers consistently had lower levels of caregivers stress, burden and depression.

**Time spent in the caregiving role.** Numerous studies have found that time spent in the caregiving role impacts the ability of the caregiver to manage the caregiving
experience (Bethoux, Calmels, Gautheron, & Minaire, 1996; Bugge et al., 1999; Scholte op Reimer et al., 1998). Bugge and colleagues (1999) examined 110 stroke patients and their caregivers in Scotland. They reported the mean hours per day over time that caregivers spent helping their stroke patient. In the first month post stroke, the average amount of time spent helping was 13.5 hours per day. At three and six months post-stroke, this number increased to greater than 16 hours per day (Bugge et al., 1999). They found that the greater the time spent in caregiving activities, the more difficult the caregiving appears to be, which has been supported by other studies (Bethoux et al., 1996; Bugge et al., 1999; Scholte op Reimer et al., 1998). Further, stroke caregivers experience considerable strain across time, and the predictors of strain include the amount of time that the caregiver spent helping the care recipient and the amount of time spent per day with the care recipient (Bugge et al., 1999).

**Employment.** Very few studies have examined the impact of employment on the caregiving experience. Immediately following stroke, King and colleagues (2001) found that caregivers who were employed were somewhat more likely to be depressed, but that at six months post stroke, employment acted as a mediator of depression. Covinsky and colleagues (2001) examined 2806 patients and their 4592 “potentially working” caregivers in a cross-sectional study. Twenty-two percent of the patients (n=264) had at least one of their caregivers who reduced their employment, or left work altogether to care for the care recipient. The caregivers most likely to reduce or leave work were more likely to be women or minorities (African-American or Hispanic), had care recipients with impaired physical function, a diagnosis of dementia or behavioral disturbance (Covinsky, Eng, Lui, Sands, Sehgal, Walter, Wieland, Eleazer, & Yaffe, 2001).
Characteristics of the Caregiving Experience

Dyad Dynamics

**Strength of family relationship.** King and colleagues (2001) examined the period of transition home after a stroke, and its impact on the caregiver. They used baseline and data from 6-10 weeks after discharge home on 136 caregivers, and found that caregiver depression is more likely in relationships which are strained. They further found that family functioning in strained relationships decreased over time, in part due to unhealthy interactions. However, two studies have reported that effective interactions between the caregiver and care recipient, particularly in the areas of problem solving, communication, and emotional interactions, appeared to increase treatment adherence and family functioning and resulted in less depression and less role restrictions (Evans, Bishop, & Haselkorn, 1991; Grant, Elliott, Weaver, Bartolucci, & Giger, 2002). Also, the caregiving relationship appears to be more satisfying if the care recipient is able to reciprocate with their caregiver(s) in some manner, be it financial or emotional support (Caruth, Tate, Moffett, & Hill, 1997; Kinney, Stephens, Franks, & Norris, 1995; Lee, 2001; Snyder, 2000; Stoller & Pugliesi, 1989). In addition, a strong sense of family and a high amount of shared enjoyable activities appears to increase the strength of the relationship and increases satisfaction with the caregiving-care-recipient relationship (Caruth et al., 1997; Snyder, 2000).

**Reaction to care.** Research in the experimental social psychology literature has examined the arena of negative reactions to care and has several conceptual models to explain this phenomenon. The primary model, the threat to self esteem model, identifies that the caregiving experience may be negative if the characteristics of the assistance provided does not fit with the care recipient’s needs (Fisher, Nadler, & Whitcher-Alagna,
Newsom and Schulz (1998) purport that negative reactions occur when the perceptions of the care recipient do not match with the assistance received. Several predictors of negative reactions to care have been shown to empirically exist. These include needing help with basic activities of daily living, lower perceived control, over or under help from the caregiver and lower self esteem (Newsom & Schulz, 1998). In their study of 91 older couples in the Caregiver Health Effects Study, Martire and colleagues (2003) found that higher depression rates for the care recipients were correlated with perceptions of poorer quality spousal care. Similarly, Nagurney, Reich and Newsom (in review) studied 118 adults with disabilities who received care from their spouse. Men who felt a strong need for independence reacted negatively to a high level of support from their wives. These men reported higher depression levels and lower self-esteem than men with less need for independence (Nagurney et al., 2003). Interestingly, they also found that the outcomes for women were not affected by their need for independence.

Coping

Coping has been delineated as the appraisal of demands which may exceed the person’s means or which are identified as challenging (Lazarus & Folkman, 1984). If stress is prolonged, or insufficiently managed, it may result in a physical illness or disability. Physical consequences of stress are identified as having a *Pathogenic Orientation*. Traditional theories of stress tend to follow this orientation. However, a more recent change in perspective has occurred in stress literature. A *Salutogenic Orientation* examines the social factors which mediate the health effects of stress. One such theory which utilizes the Salutogenic orientation is the Sense of Coherence (SOC).
The SOC has been defined as

“a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that (1) the stimuli deriving from one’s internal and external environments in the course of living are structured, predictable and explicable; (2) the resources are available to meet the demands posed by these stimuli, and (3) these demands are challenges, worthy of investment and engagement.” (Antonovsky, 1987, p. 19)

The SOC concept really is “a global orientation” of coping. (Antonovsky, 1987). So, the SOC is not a specific coping strategy, but rather the mobilization of coping and adaptive resources which decrease the deleterious effects of stress. It is essentially how individuals appraise the stressful situation and chose to handle it. The SOC has three main components. These are: comprehensibility (that the course of the stressor is structured, predictable and explicable), manageability (the individual has the necessary resources are available to meet the demands) and meaningfulness (these demands are worthy of investment and engagement) (Antonovsky, 1987).

When applied to caregivers, this concept can be utilized as an appraisal of the caregivers’ ability to mobilize resources to deal with their care recipient’s illness. Thus, individuals with higher SOC have a greater ability to avoid breakdown in times of stress. In fact, caregivers who have lower SOC have been found to be at higher risk of caregiving burnout and had increased difficulty coping with the caregiving situation (Nilsson, Axelsson, Gustafson, Lundman, & Norberg, 2001). Farran and colleagues (2004) found that caregivers who were able to manage competing stressors and expectation were able to cope more effectively. These caregivers accepted these roles as comprehensible, and viewed the caregiving experience as manageable and meaningful.

Caregivers who have higher SOC levels are: 1) less likely to perceive role overload, 2) more likely to redefine a stressful situation to make the meaning of the
experience acceptable, and 3) less likely to adopt dysfunctional coping mechanisms (Gallagher et al., 1994). To elucidate this point, Gallagher and colleagues (1994) found that Belgian caregivers with high levels of SOC were less likely to utilize chemicals to cope (e.g., alcohol, tobacco, medication). They further found that when the care recipient has a dementia-related disorder, managing the meaning of the caregiving experience is crucial in reducing role overload. Further, with individuals without dementing disorders, the need to direct patient behaviors increases the burden for the caregiver (Gallagher et al, 1994).

**Social support.** Social support is one area in which a plethora of research has been conducted with individuals who have experienced a stroke. Friedland and McColl (1992) defined social support as “the experience or information that one is loved and cared for, valued and esteemed, and able to count on others should the need arise” (573-574). Studies have found that stroke survivors who utilized their social support network recovered more quickly and thoroughly than those who did not utilize social support (Glass, Matchar, Belyea, & Feussner, 1993). Thus it appears interactions with family and friends are very important.

Social support has been found to be a dynamic construct for the stroke survivor. Clarke and colleagues (2002) performed secondary data analysis on over 5000 Canadians, of which 339 had experienced a stroke. They compared the stroke survivors with community-dwelling elderly who had not had a stroke and found that stroke survivors are likely to feel their social support networks are inadequate, but that utilization of social resources are associated with feelings of increased well-being. They further found that the utilization of social resources mediated some of the physical
disability effects which typically decrease well-being. In addition, the individuals who
felt their social supports were inadequate were more likely to report decreased feelings of
control, and greater disability in activities of daily living (Clark, 2002).

Social support shown to be moderator of depression in caregivers for stroke
survivors, particularly when the caregiver was satisfied with the amount and type of
support he/she has received (King, Carlson, Shade-Zeldow, Bares, Roth, & Heinemann,
2001). In a study of 40 patients with an admitting diagnosis of brain infarction with
moderate residual disability, Grant and colleagues (2001) found that the mobilization of
the social support network appears to be a great comfort for the caregiver of a stroke
survivor and the caregivers’ life satisfaction was best predicted by the presence and
utilization of social support.

Social interaction with others appears to decrease in the stroke caregiving
trajectory (Anderson et al., 1995; Silliman, Fletcher, Earp, & Wagner, 1986;
Thommessen et al., 2002; van den Heuvel et al., 2001) and this appears to be associated
with increased levels of depression (Carnwath & Johnson, 1987; Scholte op Reimer et al.,
couples dealing with mild dementia, 58 couples dealing with Parkinson’s disease and 36
couples who had experienced a stroke. They found that restrictions on the social life of
the caregiver was prevalent in each disability group, as were decrease in leisure travel
and disorganization of household routines. Several studies have found that stroke
caregivers relate their loss of social interaction to feeling confined to the house (Hartke &
King, 2003; Williams, 1994). This loss of social interaction has been associated with
increased feelings of loneliness, and with increased difficulty surrounding caregiving issues (Hartke & King, 2003).

Knowledge. The term “black hole” is used in Dutch culture to describe the time when a stroke survivor returns home with his/her family. This term is used to indicate the lack of education/preparation that the survivor and his/her family feel that they have about the return home (Proot, Crebolder, Abu-Saad, Macor, & Ter Meulen, 2000). Kerr and Smith (2002) engaged Scottish participants in a qualitative study one year post stroke to learn about the stroke experience. They found that the time surrounding discharge from the hospital is particularly distressing to caregivers of stroke survivors as a stroke causes a very abrupt loss of ability, as opposed to the graduated loss which may occur in a progressive illness (Kerr & Smith, 2001).

Caregivers for individuals who have experienced a stroke have expressed interest about the psychological sequelae and prognosis of stroke (Hanger, Walker, Paterson, McBride, & Sainsbury, 1998) and reported feeling inadequately informed about stroke, its sequelae and support at discharge from the hospital or rehabilitation unit (Rodgers, Bond, & Curless, 2001; Wiles, Pain, Buckland, & McLellan, 1998). Caregivers further expressed a desire to acquire general assistance skills, such as the ability to assist in daily care, mobility, toileting, as well as medical necessities such as taking blood pressure and glucometer checks (Hartke & King, 2003; Kerr & Smith, 2001; Wiles et al., 1998).

Leisure. For caregivers of stroke survivors, it has been shown that emotional difficulties arise when not able to go on vacation (Thommessen, Wyller, Bautz-Holter, & Laake, 2001; Thommessen et al., 2002), and with the loss of recreation pursuits (Anderson et al., 1995). Stroke caregivers have reported greatly diminished or completely
absent leisure participation (Bethoux, Calmels, Gautheron, & Minaire, 1996) and feelings of “being homebound” (Hartke et al., 2002). In a large scale clinical trial, the primary caregivers of stroke patients registered in the North East Melbourne Stroke Incidence Study (NEMESIS) were interviewed at 3, 6, and 12 months after stroke to determine the impact and cost of stroke (Dewey et al., 2002). They found that women tend to replace their leisure and family time with time spent caring for the stroke survivor.

**Sleep.** Sleep is not an issue that has received much attention in the stroke caregiving literature as a variable which impacts the quality of life for the caregiver. It has received increasing attention in caregiving literature in dementia and hospice populations as a need for service and intervention (Bramwell, MacKenzie, Laschinger, & Cameron, 1995; McCurry, Logsdon, Vitiello, & Teri, 1998; McCurry & Teri, 1995; Wilcox & King, 1999). McCurry and Teri (1995) and Bramwell and colleagues (1995) found that sleep disturbances in cancer caregivers were contributing factors in levels of caregiver depression. Rochettes and Desrosiers (2002) also found that cancer caregivers experience severe sleep problems but were hesitant to use prescribed sleeping medication. Sleep appears to impact the coping ability and depression levels of caregivers, thus impacting the quality of life outcomes for the caregiver.

**Quality of Life Outcomes for the Caregiver**

Quality of life (QOL) has emerged as a prevalent topic in social science research. Often caregiver quality of life definitions include measures of satisfaction, burden and depression (e.g., Hughes et al., 1999). Several studies have examined general or health-related QOL in caregivers. Hodgson and colleagues (1996) found in their sample of 50 caregivers, greater than 50% of the caregivers general well being scores decreased in the
twelve months following their care recipient’s stroke. They further found that the greatest predictors of well-being scores were the physical health of the caregiver, the caregiver’s appraisal of the stress from the caregiving experience and the caregivers satisfaction with services provision. George and Gwyther (1986) wrote a seminal paper about caregiving burden, and they argued that quality of life for caregivers are multidimensional. They recommend when examining the quality of life of caregivers, the components of physical health and mental health must be taken into account, as well as financial resources and social participation (George, 1994). In the following sections, empirical evidence on the impact of physical and mental health conditions on the caregiving experience (and vice versa) will be explored.

**Physical Health Conditions**

Surprisingly, there have not been many studies which have examined the physical health of stroke caregivers. For many caregivers, their new role as caregiver is a 24 hour a day/7 day a week job which causes great emotional and physical distress (Kerr & Smith, 2001). One study which examined 136 stroke caregivers at one and six months post stroke found a 16% increase in new health conditions at six months (King et al., 2001). These new health conditions included musculoskeletal, skin, cardiovascular, infection and gastrointestinal conditions (King et al., 2001). Additional physical problems reported by stroke caregivers included fatigue and difficulty sleeping (Hartke & King, 2003; Thommessen, Aarsland, Braekhus, Oksengård, Engedal, & Laake, 2002; Williams, 1994).

**Emotional Health Conditions**

**Depression.** Literature which has examined caregiving for stroke survivors has consistently reported higher rates of depression in the caregivers compared with non-
caregiving control groups (Han & Haley, 1999). Depression rates in stroke caregivers has been reported to be as high as between 40-52%, particularly among spousal caregivers (Anderson et al., 1995; Silliman, Fletcher, Earp, & Wagner, 1986; Stein, Gordon, Hibbard, & Sliwinski, 1992; Tompkins et al., 1988) and tends to persist longitudinally, and be more pervasive with female caregivers (King et al., 2001; King, Shade-Zeldow, Carlson, Feldman, & Philip, 2002). Hartke and King (2002) found that caregivers who were depressed were more likely to have difficulty with caregiving, report more problems with the care recipient, experience financial concerns, and report a decrease in social involvement. Researchers have also found that stroke caregivers were more likely to be depressed, and this depression appeared to increase with the severity of the stroke the care recipient experienced (Carnwath & Johnson, 1987; Dennis et al., 1998). Further they found that depressed spousal caregivers were more likely to be taking tranquilizers than non-caregivers, but not more likely to be taking antidepressants. In addition, they reported that spouses who were depressed were less likely to benefit from social interactions (Carnwath & Johnson, 1987; Dennis et al., 1998). In a Japanese study of 100 stroke caregivers, 52% scored as being depressed, which was double the rate (23%) of community dwelling, non-caregiving Japanese sample (Morimoto et al., 2003). The severity of depression in the stroke survivor has also been positively related with the magnitude of depression in the caregiver (Kotila, Numminen, Waltimo, & Kaste, 1998). Grant and colleagues (2001) studied family caregivers of stroke patients, and found that social support and personal control mediated depression in the caregivers.

**Stress/distress.** Caregiving for an elderly individual with disability has been found to be extremely burdensome and stressful to the caregiver. Schulz and Beach
(1999) utilized a prospective population-based cohort study of 392 caregivers and 427 noncaregivers for five years. They found that after adjusting for sociodemographic factors and significant comorbidities, caregivers who were experiencing caregiver strain had mortality risks that were 63% higher than noncaregiving controls. This suggests that caregiver strain increases the mortality of caregivers (Schulz & Beach, 1999). Caregivers tend to experience greater levels of distress when their care recipient has major physical difficulties (Bethoux et al., 1996; Hartke & King, 2003; van den Heuvel, de Witte, Schure, Sanderman, & Meyboom-de Jong, 2001). Caregivers who reported feeling less distress also had higher levels of self esteem (Bakas et al., 2002), thus caregivers experiencing greater distress are likely to experience lower self esteem (Blake & Lincoln, 2000).

**Persistent worry.** Persistent worry about the welfare of the care recipient appears to be more prevalent with caregivers of stroke survivors than caregivers of individuals with dementia or Parkinson’s disease (Thommessen et al., 2002) and is fairly consistent across the literature (Anderson et al., 1995; Scholte op Reimer et al., 1998; Secrest, 2000; Snyder, 2000; Thommessen, Wyller, Bautz-Holter, & Laake, 2001). Other areas which appear to cause the caregiver worry included fear of a future stroke and fear of physical deterioration of the care recipient (Kerr & Smith, 2001). Hartke and King (2002) studied 123 spousal stroke caregivers in a mixed methods study. They refer to this persistent worry as “anxious vigilance”, which they describe as “a problem of worry, patience, and guilt about performance as a caregiver and spouse” (p. 29).

**Strain/burden.** Caregiving burden is caused by feelings of large responsibility, uncertainty about the care needs of the stroke survivor, decreased social interaction, and
being the sole provider of care (Scholte op Reimer et al., 1998). Bugge and colleagues (1999) studied caregivers at 1, 3, and 6 months after the patient’s stroke. They found that the most influential factors of caregiver strain are the amount of time spent helping a patient, the amount of time spent with the patient, and the caregiver’s health. Caregivers who feel a higher degree of burden in their caregiving role report greater difficulty coping with stress and greater worry about their care recipient as well as less social involvement and more caregiving demands (Hartke & King, 2002). Caregivers who participate in greater dependent care (e.g., toileting, bathing) experienced greater emotional distress and greater caregiver burden (Bakas & Burgener, 2002; van den Huevel et al., 2001). It has also been indicated that stroke caregivers experienced considerable strain longitudinally, and the predictors of strain include the amount of time that the caregiver spent helping the care recipient and the amount of time spent per day with the care recipient (Bugge et al., 1999). Morimoto and colleagues (2003) found that the strongest predictor of declining quality of life for stroke caregivers was a high level of caregiver burden.

**Role disruption and loss.** Two studies interviewed caregivers of individuals who have experienced a stroke and found that major lifestyle changes and feelings of confinement were distressing to the caregivers (Periard & Ames, 1993; Williams, 1994). This confinement was either literal, feeling that they can not leave the care recipient, or less concrete, manifesting as a lack of time to pursue enjoyable, self-sustaining activities such as self-care, leisure, recreation and community activities (Fraser, 1999; Hartke & King, 2003).
Role disruption has been shown to negatively impact the physical and emotional well-being of the caregiver (Anderson, 1988; Fraser, 1999; Hartke & King, 2003; Holicky, 1996). This disruption may cause a significant lifestyle change which impacts the roles he/she has traditionally, thus causing increased distress (Kerr & Smith, 2001; Robinson & Smith, 1995; Secrest, 2000; Thommessen et al., 2002).

**Satisfaction With Role: Benefits of Caregiving**

Although this area has not been widely explored, there is some evidence that caregiving for a family member can be a positive and rewarding experience (Forsberg-Warleby, Moller, & Blomstrand, 2001; Kinney et al., 1995; Silliman et al., 1986). Benefits of caregiving may include feeling a sense of accomplishment, companionship, a sense of fulfillment, enjoyment and satisfying a role obligation (Cohen et al., 2002; Hartke & King, 2003). Additional benefits reported from the caregiver experience include a sense of optimism and increased self-esteem (Silliman et al., 1986) and increased sense of hope and meaningfulness (Thompson, Bundek, & Sobolew-Shubin, 1990).

Caregivers who were able to identify more positive aspects of caregiving were less likely to report feelings of depression, caregiver strain or poor health (Cohen et al., 2002). This corresponds with other research, since there are numerous reports that depression and strain from caregiving increase mortality (Schulz & Beach, 1999), increase exacerbations of health conditions and decreases quality of life for the caregiver (c.f. Bethoux et al., 1996; Hughes et al., 1999). In non-stroke related caregiving literature, participating in activities together (Walker, 1991), and a meaningful relationship with the care recipient (Walker, 1991) were identified as benefits of caregiving. Other predictors
of caregiver well-being included good physical health and satisfaction with services (Hodgson et al., 1996).

In a Swedish study, 83 caregivers of first ever stroke patients participated in a study which examined various aspects of caregiver satisfaction (Forsberg-Warleby, Moller, & Blomstrand, 2001). They found that younger participants were more satisfied with their sex life than older participants, and women were more satisfied with the ability for their own self-care than men (Forsberg-Warleby et al., 2001). Interestingly, there were no significant correlations found with life satisfaction pre-stroke or in the caregiver’s view of the future (Forsberg-Warleby et al., 2001).

Summary of Literature Review

This literature review demonstrates that the stroke caregiving experience is multidimensional, and sustains influence from many directions. Existing research indicates that patient and caregiver characteristics impact the strength of the relationship, and a care recipient’s reaction to care. Caregivers utilize different means to cope with the caregiving experience, including social support, leisure, knowledge, and feeling as though the caregiving experience is manageable. Inadequate use of coping mechanisms may also negatively influence the dyad dynamics. The QOL for the caregiver has been shown to impact the physical and mental health of the caregiver, as well as the satisfaction derived from the experience. Just as there is research to support all of these directional statements, there is research which did not find the same relationship. This study has examined salient relationships in the caregiving experience, and was designed to overcome methodological flaws which exist in current literature.
CHAPTER 3
DESIGN AND METHOD

Data for this study have been collected as part of a larger study. The larger study, funded by the Veterans Administration Health Service Research & Development (VA HSR&D), is entitled “Culturally Sensitive Models of Stroke Recovery and Caregiving After Discharge Home,” Dr. Maude Rittman, Principal Investigator. This larger study is a prospective, cohort multi-site study with sites located at the following: the North Florida/South Georgia Veterans Health System in Gainesville and Lake City, James Haley VA Hospital in Tampa, Miami VAMC, and San Juan VAMC in Puerto Rico. The purpose of this study was to identify the predictors of quality of life outcomes for caregivers and one and six months post stroke.

Due to the use of existing data, the large theoretical model introduced previously was reduced in order to be able to sufficiently test significant pathways. In addition, a model that is so large is not practical to test statistically. This is because the number of covariates needed to be included in the model could decrease the significance of important relationships. For these reasons, a reduced model was tested in this study (see Figure 3.1).

Sample

For this study on caregivers, data from a convenience sample of Puerto Rican Hispanic, African-American and Caucasian veterans and their informal caregivers was available (N=127 dyads). The inclusion criteria for the larger study for Veterans
included: (1) being a member of one of the three ethnic groups, (2) discharged directly home from an acute care unit following a stroke (ICD-9 Codes 430-438 except ICD-9 Code 435), (3) scoring 18 or higher on the Mini Mental State Exam (MMSE) and being able to verbally communicate at discharge, (4) having a caregiver willing to participate, and (5) signing a consent form or having the consent form signed by a proxy. The inclusion criteria for informal caregivers included: (1) being a spouse, significant other, family member, or involved friend whom the stroke survivor identifies as a primary caregiver, (2) being able to communicate verbally, and (3) be willing to participate and sign a consent form. Exclusion criteria for veterans and caregivers include: inability to communicate or unwillingness to participate.

**Power Analysis**

To determine a priori the appropriate sample size to test the primary hypothesis of differences in quality of life outcomes at one and six months, Power and Precision Software (1997) was utilized. For the given effect size (population mean difference of 4.0 on the Sense of Competence Questionnaire, SD of change=10, sample size [90 pairs] and a [.05, 2-tailed]), the power to test this hypothesis is .96. This was calculated using the SD for each rating as 10 (as published in the literature), and with the correlation between time one and time six of .50. This means that close to 96% of tests would be expected to yield a significant effect, rejecting the null hypothesis that the population mean difference is 0.00.

**Research Hypotheses**

1. Patient characteristics influence the coping experience of the caregiver.
2. Caregiver characteristics influence the coping experience of the caregiver.
3. The coping ability of the caregiver will influence the quality of life outcomes for caregivers.

4. Patient characteristics directly influence the quality of life for caregivers.

5. Caregiver characteristics directly influence the quality of life for caregivers.

6. Patient characteristics will influence the time spent in the caregiving role.

7. Caregiver characteristics will influence the time spent in the caregiving role.

8. The time spent helping the care recipient will influence quality of life outcomes for caregivers.

9. Caregiver outcomes change over time.

10. There are statistically significant differences in caregiver outcomes by ethnicity.

**Instrumentation**

All of the instruments have been previously utilized with stroke patients and are recommended in the AHCPR Post-Stroke Rehabilitation Guidelines (1995) as reliable and valid assessment instruments that are appropriate to evaluate stroke outcomes at different stages in the recovery process.

**Patient and caregiver characteristics.** Income level was the demographic data collected on the stroke survivor. Income level is obtained by choosing one of the following categories: <$15,000; $15,000-$25,000; $25,001-$35,000; $35,001-$45,000; or >$45,000. For the caregiver, ethnicity, gender, relation to the patient, time spent in the caregiving role per week, and employment status were collected. Gender elicited a response of male or female, and relation to patient elicited a response of spouse, daughter, son, daughter in law, son in law, friend, or other. Ethnicity required a response of Caucasian, Puerto Rican Hispanic, or African-American or other. If other was chosen, 18 spaces are provided to write in the ethnicity of the caregiver. To determine time spent in the caregiving role, the question was asked: On average, how many hours do you
spend helping (or staying with) the stroke patient? Two spaces were available next to the
daily category, and three next to the weekly category. Employment status for the
caregiver was asked by choosing yes or no to “employed outside the home.” The
caregiver was asked to choose if they work part or full time.

**Patient functional status.** The Functional Independence Measure (FIM) is the
most widely used method of assessing functional ability in persons with a disability
(ACHPR, 1995). The FIM motor subscale was used to measure functional status of the
patient over time. The FIM motor consists of 13-items and responses use a 7-level ordinal
scale (Granger, Cotter, Hamilton, & Fiedler, 1993; Hamilton, Laughlin, Fiedler, &
Granger, 1994). Possible scores range from 26-91, with higher numbers indicating higher
functional ability. The reliability and validity of the FIM are well established (Granger et
al., 1993; Hamilton et al., 1994; Ottenbacher, Hsu, Granger, & Fiedler, 1996). In fact, in
a meta-analysis by Ottenbacher and colleagues (1996), the median interrater reliability
for the total FIM was 0.95 and median test-retest and equivalence reliability values were
0.95 and 0.92, respectively.

**Caregiver coping.** The Sense of Coherence (SOC) questionnaire is a global
measure of the ability to mobilize adaptive coping resources. The SOC is a 13-item, self-
report scale which has been utilized in over 20 countries (Antonovsky, 1987; Coe, 1997;
Gallagher et al., 1994). The items on the scale are on a Likert-type scale, and possible
scores on the SOC range from 13-91, with higher scores indicating better ability to cope.
This scale has demonstrated strong internal validity, reliability, and test-retest
 correlations (Antonovsky, 1987; Gallagher et al., 1994). Specifically, Cronbach’s alpha
internal consistency) has ranged from 0.74 to 0.91 and the test-retest correlations for 12-month follow-ups ranged between 0.54 and 0.78 (Antonovsky, 1993).

**Caregiver depression.** Caregiver depression was assessed using the Geriatric Depression Scale (GDS) (Yesavage, Brink, Rose, Lum, Huang, Adey, & Leirer, 1983). The GDS is a 30-item scale that uses a dichotomous variable (yes/no) format. The range of scores on the GDS is 0-29, with higher numbers indicating greater number of depressive symptoms. A score of 0-9 indicates normal mood, 10-19 indicates mild depression, and a score of 20-29 indicates severe depression (New York University, 2003). For all 30 items, internal consistency has been found to be 0.91, and one-month test-retest reliability was $r=0.85$, $p<.001$. Concurrent validity ($r=0.82$ to 0.79; $p<.001$) has been established with the Beck Depression Inventory, Hamilton Depression Scale, and the Zung Depression Scale (Dunn & Sacco, 1989; Olin, Schneider, Eaton, Zemansky, & Pollock, 1992; Parmalee, Lawton, & Katz, 1989). The AHCPR Guidelines (1995) state that the GDS is easier to use by elderly and cognitively impaired than other measures of depression.

**Caregiver burden.** Caregiver burden was assessed with the Sense of Competence Questionnaire (SCQ) (Vernooij-Dassen, Persoon, & Felling, 1996). The SCQ was derived from the family crisis model (Bengston & Kuypers, 1985) and the Burden Interview (Zarit, Reever, & Bach-Peterson, 1980). It appears to be able to assess the caregiver’s perceived burden from a wide range of possible problems related to caregiving. The SCQ consists of 27 items in three subscales: satisfaction with the care recipient (7 items), satisfaction with one’s own performance as a caregiver (12 items), and consequences of involvement in care for the personal life of the caregiver (8 items).
The responses use a four-point Likert-type scale, and the burden score is determined by summing the three scales. Possible scores for the composite score range from 27-108, with higher scores indicating higher levels of burden. Possible scores for the first subscale, the satisfaction with the care recipient, range from 7-28, with higher scores indicating less satisfaction with the care recipient. Possible scores for the second subscale, Satisfaction with One’s Own Performance as a Caregiver range from 12-48, with higher scores indicating less satisfaction with their own performance in the caregiving role. Possible scores for the third subscale, Consequences of Involvement in Care for the Personal Life of the Caregiver range from 8-32, with higher scores indicating more negative consequences for the caregiver as a result of providing care. The composite burden scale and the three individual subscales have demonstrated strong validity and reliability. Internal consistency for the composite score was 0.83 and ranged between 0.68 and 0.77 for the subscales (Scholte op Reimer, de Haan, Pijnenborg, Limburg, & van den Bos, 1998). The intraclass correlations were 0.93 for the total score and between 0.92 and 0.84 for the subscales (Scholte op Reimer, de Haan, Pijnenborg, Limburg, & van den Bos, 1998b).

**Data Analyses**

The data were analyzed using PC SAS version 8.0 (SAS Institute). SAS is a powerful computer program commonly used to perform simple and complex data analyses (SAS, 2003).

To analyze the demographic variables of the stroke survivors and caregivers, descriptive statistics were performed. To test Hypotheses 1.0, 2.0, 3.0, 4.0, and 5.0, the influence of patient and caregiver characteristics on the quality of life outcomes for the
caregiver and the coping ability of the caregiver, path analyses were performed. Path analysis is a multivariate statistical technique that utilizes a series of multiple and simple linear regression models to test the strength of causal relationships among variables (Agresti & Finlay, 1997). Path analysis can test all relationships displayed in the theoretical model (see Figure 3.1) through a variety of regression analyses (Agresti & Finlay, 1997). Path analysis examines specified relationships not simply if the concepts in a model are related (like the type of information provided by correlations provide). Path analysis provides visual depictions of the relationships being tested and is also referred to as a causal modeling technique (Norris, 2001). Path models indicate strictly ordered relationships, that is, directional, theoretical relationships among variables (Norris, 2001). Finally, it has been said that path analysis provides richer data than regression analysis alone, because we are able to understand more multidimensional concepts as a result (Asher, 1983; Norris, 2001).

This study is following the psychological model of path analysis, utilize path coefficients known as standardized betas, or beta weights (β). The use of standardized betas makes comparison across variables and other studies possible (Carey, 1998; Norris, 2001; William, 2003). Further, standardized betas allow determination of which independent variables have the most influence on the dependent variables (Norris, 2001).

Path analysis uses some specific terminology not typically utilized in statistics in the social sciences. Path analysis is the analysis of a recursive model, indicating that causation in the model only occurs in one direction (Norris, 2001). Exogenous variables are the independent variables (William, 2003), and are defined by Pedazhur (1982) as variables “whose variability is assumed to be determined by causes outside the model
under consideration. Stated differently, no attempt is made to explain the variability of an exogenous variable or its relations with other exogenous variables” (p.178). Further, *endogenous variables* are defined as those “whose variation is to be explained by exogenous and other endogenous variables in the model” (Pedazhur, 1982, p. 178). Endogenous variables can be either independent or dependent variables (William, 2003).

Path analyses are composed of direct, indirect and total effects. A *direct effect* tells you how an independent variable will impact a dependent variable, controlling for all other independent variables (William, 2003). It also indicates that a one standard deviation change in the independent variable will affect the specified dependent variable. This does not supply the entire picture of what is occurring (just as it does not with correlations) as there may be other mediating variables intervening. An *indirect effect* is one that operates through an intervening variable (Agresti & Finlay, 1997). To calculate the composite indirect effect, the direct effect of the independent variable on the mediating variable is multiplied by the direct effect of the mediating variable on the dependent variable. Using Figure 3.2 as an example, to determine the composite indirect effect of patient functional status on caregiver burden through the mediating variable of coping, we would multiple the standardized coefficients of $\beta_1 \times \beta_3$. So, to understand the *total effects* (direct + indirect = total effects) we must consider the direct and indirect effects of the independent variables on the dependent variable (William, 2003). Figure 3.2 displays these terms in relation to the theoretical model.

Prior to running the path analyses, the data were tested formally for collinearity problems using the collinearity diagnostics in SAS. No data had a condition index of
greater than 30, therefore suggesting that multicollinearity is not a problem in this data set.

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<td>Gender</td>
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<td></td>
</tr>
</tbody>
</table>

Figure 3.1 Theoretical Model Of Influences of QOL Outcomes

To test Hypotheses 6.0 and 7.0, the influence of patient and caregiver characteristics on time spent in the caregiving role, multiple linear regressions were calculated for the data at one and six months. These analyses were originally intended to be included in the path analyses, but were run separately due to missing data (n=90 at one month and n=86 at six months).
Figure 3.2 Application of Path Analysis Terminology to Theoretical Model
To test Hypothesis 8.0, the influence of time spent with care recipient on the QOL outcomes for the caregivers, a series of simple linear regressions were calculated on each outcome measure at one and six months. These analyses were also originally intended to be included in the path analyses, but were run separately due to missing data (n=64 at one month and n=57 at six months).

To determine if caregiver outcomes changed over time (Hypothesis 9.0), paired sample t-tests were run first to determine if the mean one and six month scores on each dependent variable differed significantly from each other. To determine if the beta weights differed significantly, the data were pooled to see the time interaction of the coefficients. To do this, a two way fixed effects model (also known as a two-way repeated measures ANOVA) was calculated using time interactively and additively in the model.

To test Hypothesis 10.0, there are statistically significant differences in caregiving outcomes by ethnicity, ANOVAs were run on the mean scores for each ethnicity to determine if the scores differ significantly by ethnicity. Then paired-sample t-tests were run separately by ethnicity for each outcome measure, comparing mean scores at one and six months.

**Methodological Strengths**

This study was been designed to provide information that is not available in other studies. First, many studies on the caregiving experience are cross-sectional, thus lacking the ability to examine the dynamic multidimensionality of the caregiving experience. By employing a longitudinal design, examining data at one and six months post-stroke, this study captured the multidimensionality of the stroke caregiving experience. Using
multivariate statistics has been recommended by several studies (e.g., Han & Haley, 1999; Hodgson et al., 1996) and were employed in this study. In an extensive review of the stroke caregiving literature (greater than 50 articles), not one study has identified their prospective power analysis, a finding confirmed by a previous review of the stroke caregiving literature (Han & Haley, 1999). Without knowing the power of the design, other studies may not have reported valid results. The power for this study is very strong, which indicates that the results will be strong indicators of the caregiving experience. Finally, longitudinal designs in stroke caregiving research have been recommended by a variety of research studies (e.g., Dennis et al., 1998; Han & Haley, 1999; Hughes et al., 1999; Teel et al., 2001), and this study examines the stroke caregiving experience at one month and six months post stroke, in addition to examining change over time.
CHAPTER 4
RESULTS

Descriptive Analyses

Participants

One hundred and twenty seven dyads of stroke patients and their caregivers were eligible for inclusion in this study. Of these, four pairs were excluded due to a change in caregiver from one month to six months, 29 pairs were excluded due to missing data, and two pairs were excluded due to the caregiver not being one of the three ethnic groups under study (Caucasian, African-American, or Puerto Rican Hispanic). Thus, 92 stroke survivors and their caregivers were included in this study. Stroke survivor and caregiver demographics are summarized in Tables 4.1 and 4.2 respectively.

The stroke survivors experienced a variety of stroke types, which were categorized using ICD-9-CM codes (Medicode, 1996). Fifty-three stroke survivors were classified as having an occlusion of cerebral arteries (ischemic stroke 57.58%), 35 stroke survivors was classified as cerebrovascular disease (38.04%), and four were classified as having an intracerebral hemorrhage (4.35%). Residual paresis was on the left side of the body for 38 stroke survivors (41.3%), on the right side of the body for 44 stroke survivors (47.83%), bilaterally for 3 stroke survivors (3.26%), and 7 stroke survivors experienced no paresis (7.61%). At one-month post stroke, the mean FIM motor score for the stroke survivors was 79.73 (sd=15.03), and at six months it was 82.22 (sd=12.55). The annual income for the stroke survivors in this study ranged from under $15,000 (n=43, 46.7%),
$15,001-$25,000 (n=23, 25%), $25,001-$35,000 (n=15, 16.3%), $35,001-$45,000 (n=8, 8.7%), to greater than $45,000 (n=3, 3.3%).

Table 4.1 Stroke Survivor Characteristics (N=92)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>% or Mean (sd)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
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<td>67.16 (10.20)</td>
<td>46-83</td>
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<tr>
<td>Marital Status</td>
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<tr>
<td>Married</td>
<td>65</td>
<td>70.7%</td>
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</tr>
<tr>
<td>Divorced</td>
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<tr>
<td>Never Married</td>
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<td>3.3%</td>
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</tr>
<tr>
<td>Widowed</td>
<td>5</td>
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</tr>
<tr>
<td>Separated</td>
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<td>2%</td>
<td></td>
</tr>
<tr>
<td>Income (per annum)</td>
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<td></td>
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<tr>
<td>&lt;$15,000</td>
<td>43</td>
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</tr>
<tr>
<td>$15,001-$25,000</td>
<td>23</td>
<td>25%</td>
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<td>$25,001-$35,000</td>
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<td>16.3%</td>
<td></td>
</tr>
<tr>
<td>$35,001-$45,000</td>
<td>8</td>
<td>8.7%</td>
<td></td>
</tr>
<tr>
<td>&gt;$45,000</td>
<td>3</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>Type of Stroke</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ischemic</td>
<td>53</td>
<td>57.58%</td>
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</tr>
<tr>
<td>Cerebrovascular Disease</td>
<td>35</td>
<td>38.04%</td>
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</tr>
<tr>
<td>Hemorrhagic</td>
<td>4</td>
<td>4.35%</td>
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<tr>
<td>Impairment from Stroke</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Right side</td>
<td>44</td>
<td>47.83%</td>
<td></td>
</tr>
<tr>
<td>Left side</td>
<td>38</td>
<td>41.3%</td>
<td></td>
</tr>
<tr>
<td>Bilateral</td>
<td>3</td>
<td>3.26%</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>7</td>
<td>7.61%</td>
<td></td>
</tr>
<tr>
<td>FIM Motor Score at 1 month post stroke</td>
<td>92</td>
<td>79.73 (15.03)</td>
<td>26-91</td>
</tr>
<tr>
<td>FIM Motor Score at 6 months post stroke</td>
<td>92</td>
<td>82.22 (12.55)</td>
<td>26-91</td>
</tr>
</tbody>
</table>

The marital status for the caregivers in this study included 65 married participants (70.7%), three who had never married (3.3%), five who were widowed (5.4%), two who were separated (22%), and 17 who were divorced (18.5%). The caregivers in this study classified themselves as spouses (n=63, 68.5%), daughters (n=6, 6.5%), sons (n=2, 2.2%), friends (n=9, 9.8%) and the remaining were classified as others (n=12, 13%). Interestingly, there were no daughter-in-law or son-in-law caregivers in this study. The ages of the caregivers ranged from 23-86 years old, with a mean, median, and mode of 60
years old (sd=12.6). This sample included 42 Puerto-Rican Hispanics caregivers (45.7%),
35 Caucasians caregivers (38%), and 15 African-Americans caregivers (16.3%). At one-
month post stroke, 63 caregivers were not employed outside of the home (68.5%),
whereas 22 of the remaining 29 were employed full-time (23.9%), and 7 were employed
part-time (7.6%). At six-months post stroke, 62 caregivers were not working (67.4%),
and 20 of those working did so full-time (21.7%), and 10 had part-time employment
(10.9%). The change in employment occurred in three individuals, 2 moving from full
time work at one month to part time work at six months, and one moving from not
working to working part time. The caregivers in this sample stayed with the stroke
survivor a mean of 8.1 hours per day, with the range of time from 0-24 hours per day.
The mode amount of time spent with the care recipient was two hours per day (n=12).
Finally, four caregivers (4.3%) attended a support group after discharge home.

The caregivers were asked what provided the most pleasure and the most worry
for them about the caregiving experience. In providing answers about what provides the
most pleasure, the answers grouped around several categories. Many caregivers reported
that doing things for and providing care for the stroke survivor provided pleasure for
them (n=39). Other caregivers identified that helping the stroke survivor be more
independent, do better overall, and be happier was a source of pleasure (n=16). Receiving
positive feedback from the stroke survivor provided pleasure for 10 caregivers, and 8
caregivers identified that the entire caregiving experience provided pleasure for them.
However, for 9 caregivers, they were unable or unwilling to identify positive aspects of
the caregiving experience.
Table 4.2 Caregiver Characteristics (N=92)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>% or Mean (SD)</th>
<th>Range</th>
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</thead>
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<td><strong>Relationship to Patient</strong></td>
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<td>Spouse</td>
<td>63</td>
<td>68.5%</td>
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<tr>
<td>Other</td>
<td>12</td>
<td>13%</td>
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</tr>
<tr>
<td>Friend</td>
<td>9</td>
<td>9.8%</td>
<td></td>
</tr>
<tr>
<td>Daughter</td>
<td>6</td>
<td>6.5%</td>
<td></td>
</tr>
<tr>
<td>Son</td>
<td>2</td>
<td>2.2%</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>92</td>
<td>60.1 (12.6)</td>
<td>23-86</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>82</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puerto Rican Hispanic</td>
<td>42</td>
<td>45.7%</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>35</td>
<td>38%</td>
<td></td>
</tr>
<tr>
<td>African-American</td>
<td>15</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td><strong>Employment Status - 1mo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>22</td>
<td>23.9%</td>
<td></td>
</tr>
<tr>
<td>Part-time</td>
<td>7</td>
<td>7.6%</td>
<td></td>
</tr>
<tr>
<td>Not outside of home</td>
<td>63</td>
<td>68.5%</td>
<td></td>
</tr>
<tr>
<td><strong>Employment Status - 6mo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>20</td>
<td>21.7%</td>
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</tr>
<tr>
<td>Part-time</td>
<td>10</td>
<td>10.9%</td>
<td></td>
</tr>
<tr>
<td>Not outside of home</td>
<td>62</td>
<td>67.4%</td>
<td></td>
</tr>
</tbody>
</table>

The caregivers’ responses to what worried them about providing care were also able to be grouped into several categories. A majority of caregivers worried about the care recipient’s physical health decreasing (n=26), and specifically worried about the occurrence of another stroke (n=21). Six caregivers worried about the decreasing cognition or emotional health of the care recipient, and 11 caregivers were worried about the care recipient experiencing a negative event while alone. Seven caregivers worried about the care recipient falling and further, seven caregivers reported not being worried. The remaining caregivers reported being worried about the care recipient’s non-compliance (n=4), their recovery (n=4), money (n=2), and driving (n=1).
Bivariate Analyses

The mean scores for the caregivers on the outcome measures at one and six months are located in Tables 4.3 and 4.4. The following analyses are results of comparing mean scores for the independent variables at one and six months on the dependent variables. The comparison of means over time are related to Hypothesis 9.0, and are found beginning on page 86. The results of ethnicity on the dependent variables are related to Hypothesis 10.0, and thus the bivariate results for ethnicity are found beginning on page 94.

**Depression.** A series of independent samples t-tests were calculated to compare the mean scores of the independent variables on the Geriatric Depression Scale (GDS). The GDS has a possible range of 0-29, with a score of greater than or equal to 10 indicating a clinical level of depressive symptoms.

No significant difference was found for spouses and nonspouses (t(90) = -.46, p = .65) on the GDS at one month. The mean score on the GDS for spouses (m=6.71, sd=5.70) did not differ significantly from the mean of nonspouses at one month (m=6.10, sd=6.34). These mean scores appear to indicate that the caregivers in this study have a low number of depressive symptoms, and relation to patient does not impact the level of depression at one month.

For males and females, no significant difference was found at one month (t(90) = -.47, p = .64). The mean score on the GDS for men (m=5.7, sd=4.19) did not differ significantly from the mean score of women at one month (m=6.62, sd=6.07). Also, there was no significant difference at six months for males and females on the GDS (t(90) = -.34, p = .74). The mean score on the GDS for men (m=5.7, sd=5.29) did not differ
significantly from the mean of women at one month (m=6.35, sd=5.81). These scores indicate that men and women do not differ significantly on depressive symptoms at one or six months post stroke.

Two separate one-way ANOVA’s were conducted to determine if the mean scores on the GDS differed significantly by income level at one and six months. No significant difference was found at one month (F(2, 89) = 0.00, p=.999). Mean scores on the GDS do not differ by incomes of less than $15,000 (m=6.49, sd=6.31), incomes of $15-25,000 (m=6.61, sd=4.31), or incomes of greater than $25,000 (m=6.50, sd=6.53). No significant difference was found at six months (F(2,89) = .07, p=.94). Mean scores on the GDS do not differ by incomes of less than $15,000 (m=6.28, sd=6.07), incomes of $15-25,000 (m=6.61, sd=4.34), or incomes of greater than $25,000 (m=6.0, sd=6.35). These scores indicate that patient’s income does not significantly influence the depression of the caregiver.

**Coping.** A series of independent samples t-tests were calculated to compare the mean scores of the independent variables on the Sense of Coherence Questionnaire (SOC). Higher scores indicate a stronger sense of coherence, or ability to cope.

No significant difference was found for spouses and nonspouses (t(90) =-.11, p=.91). The mean score on the SOC for spouses (m=71.03, sd=15.90) did not differ significantly from the mean of nonspouses at one month (m=70.65, sd=14.6). These scores indicate that spouses and nonspouses do not differ on coping ability at one or six months.

No significant difference was found for males and females at one month (t(90) =1.16, p=.25). The mean score on the SOC for males (m=65.6, sd=15.52) did not differ
significantly from the mean of females at one month (m=70.67, sd=13.83). Mean scores also did not differ at six months for males and females (t(90) =.53, p=.60). The mean score on the SOC for males (m=73.1, sd=11.99) did not differ significantly from the mean of females at one month (m=70.67, sd=13.83. These scores indicate that males and females do not differ at one or six months in terms of coping ability.

Two separate one-way ANOVA’s were conducted to determine if the mean scores on the SOC differed significantly by income level. No significant difference was found at one month (F(2, 89) = 0.41, p=.999). Mean scores on the SOC do not differ by incomes of less than $15,000 (m=72.26, sd=15.20), incomes of $15-25,000 (m=69.87, sd=11.49), or incomes of greater than $25,000 (m=69.11, sd=17.31). No significant difference was found at six months (F(2,89) =.02, p=.98). Mean scores on the SOC do not differ by incomes of less than $15,000 (m=70.70, sd=8.99), incomes of $15-25,000 (m=71.48, sd=11.50), or incomes of greater than $25,000 (m=70.85, sd=14.86). These scores indicate that the caregivers ability to cope does not differ by patient’s income level.

The SOC has a range of possible scores from 13-91, so mean scores of approximately 71 indicate that the caregivers in this study cope well. As a marker, recent studies using the SOC found that stroke caregivers had a mean score of 71.3 (Chumbler, Rittman, Van Puymbroeck, Vogel, & Qin, 2003b), and that caregivers of individuals with mild memory impairments had a mean score of 68.7 (Chumbler, Grimm, Cody, & Beck, 2003a).

**Burden.** A series of independent samples t-tests were calculated to compare the mean scores of the independent variables on the Sense of Competence (SCQ). Higher
scores indicate a higher level of burden, and possible scores on the SCQ range from 29-108.

No significant difference was found between spouses and nonspouses at one month ($t(90) = -1.81, p = .07$). The mean score on the SCQ for spouses ($m=48.20, sd=12.57$) did not differ significantly from the mean of nonspouses at one month ($m=52.73, sd=10.47$). These scores indicate that spouses and nonspouses do not experience different levels of burden at one and six months.

No significant difference was found between males and females at one month ($t(90) = .95, p = .37$). The mean score on the SCQ for males ($m=54.5, sd=14.92$) did not differ significantly from the mean of females at one month ($m=50.92, sd=10.83$). At six months, there was no significant difference in the mean scores ($t(90) = 1.09, p = .28$). The mean score on the SCQ for males ($m=56.3, sd=14.65$) did not differ significantly from the mean score of females at one month ($m=52.01, sd=11.42$). These scores indicate that men and women do not differ significantly in terms of overall burden at one and six months.

Two separate one-way ANOVA’s were conducted to determine if the mean scores on the SCQ differed significantly by income level at one and six months. No significant difference was found at one month ($F(2, 89) = 0.31, p = .74$). Mean scores on the SCQ do not differ by incomes of less than $15,000 (m=50.33, sd=11.73), incomes of $15-25,000 (m=51.96, sd=11.91), or incomes of greater than $25,000 (m=52.35, sd=10.30). No significant difference was found at six months ($F(2,89) = .25, p = .78$). Mean scores on the SCQ do not differ by incomes of less than $15,000 (m=50.33, sd=11.73), incomes of
$15-25,000 (m=51.96, sd=11.91), or incomes of greater than $25,000 (m=52.35, sd=10.30). These scores indicate that burden level does not differ by patient income level.

By simply examining the means with in and across the groups, these caregivers appear to have low to moderate levels of burden. However, a previous study of stroke caregivers found the mean burden score at six months was 43.5 (Scholte op Reimer et al., 1998). Thus, comparatively, the caregivers in this study, while not significantly burdened may be experiencing more burden on average than other stroke caregivers.

**Satisfaction with the care recipient.** A series of independent samples t-tests were calculated to compare the mean scores of the independent variables on the satisfaction with the care recipient subscale (SCQ-1) at one and six months. Possible scores for the SCQ 1, range from 7-28, with higher scores indicating less satisfaction with the care recipient.

No significant difference was found for spouses and nonspouses (t(90) =-1.01, \( p=.31 \)). The mean score on the SCQ-1 for nonspouses (m=12.14, sd=4.46) did not differ significantly from the mean of spouses at one month (m=13.04, sd=3.79). These means indicate that spouses and nonspouses do not differ significantly in terms of satisfaction with the care recipient at one and six months.

No significant difference was found for males and females at one month (t(9.97) =-1.12, \( p=.29 \)). The mean score on the SCQ-1 for males (m=14.6, sd=5.7) did not differ significantly from the mean of spouses at one month (m=12.54, sd=3.74). At six months, there was no significant difference (t(90) =-1.12, \( p=.29 \)). The mean score on the SCQ-1 for males (m=14.3, sd=4.40) did not differ significantly from the mean of females at one
month (m=13.02, sd=4.16). Spouses and nonspouses do not differ in terms of satisfaction with the care recipient at one and six months.

Two separate one-way ANOVA’s were conducted to determine if the mean scores on the SCQ-1 differed significantly by income level at one and six months. No significant difference was found at one month (F(2, 89) = 0.38, p=.68). Mean scores on the SCQ-1 do not differ by incomes of less than $15,000 (m=12.90, sd=4.10), incomes of $15-25,000 (m=13.13, sd=4.54), or incomes of greater than $25,000 (m=12.19, sd=3.41). No significant difference was found at six months (F(2,89) =1.37, p=.26). Mean scores on the SCQ-1 do not differ by incomes of less than $15,000 (m=13.33, sd=4.02), incomes of $15-25,000 (m=14.04, sd=4.53), or incomes of greater than $25,000 (m=12.12, sd=4.07). These means indicate that satisfaction with the care recipient does not differ by income level. Further, mean scores for this sample of approximately 13 indicate that this group have fairly low to moderate levels of dissatisfaction with the care recipient.

**Satisfaction with one’s own performance as a caregiver.** A series of independent samples t-tests were calculated to compare the mean scores of the independent variables on the Satisfaction with One’s Own Performance as a Caregiver (SCQ 2). Possible scores range from 12-48, with higher scores indicating less satisfaction with their own performance in the caregiving role.

No significant difference was found between spouses and nonspouses on the mean scores of the SCQ-2 (t(90) =-1.01, p=.31). The mean score on the SCQ 2 for spouses (m=19.41, sd=5.75) did not differ significantly from the mean of nonspouses at one month (m=21.20, sd=5.36). Spouses and nonspouses do not differ at one or six months in terms of satisfaction with their performance as a caregiver.
No significant difference was found between males and females on the mean scores of the SCQ-2 at one month ($t(90) = 1.13, p = .26$). The mean score on the SCQ 2 for men ($m=22.5$, $sd=5.84$) did not differ significantly from the mean of females at one month ($m=20.42$, $sd=5.47$). At six months, there was no significant differences between males and females ($t(90) = 1.19, p = .24$). The mean score on the SCQ 2 for men ($m=23.2$, $sd=5.75$) did not differ significantly from the mean of females at one month ($m=21.06$, $sd=5.37$). Men and women do not experience different levels of satisfaction with their performance as a caregiver at one or six months.

Two separate one-way ANOVA’s were conducted to determine if the mean scores on the SCQ-2 differed significantly by income level. No significant difference was found at one month ($F(2, 89) = 2.86, p = .06$). Mean scores on the SCQ-2 do not differ by incomes of less than $15,000$ ($m=19.37$, $sd=4.95$), incomes of $15-25,000$ ($m=20.82$, $sd=5.91$), or incomes of greater than $25,000$ ($m=22.58$, $sd=5.67$). No significant difference was found at six months ($F(2,89) = .68, p = .51$). Mean scores on the SCQ-2 do not differ by incomes of less than $15,000$ ($m=20.77$, $sd=5.35$), incomes of $15-25,000$ ($m=21.13$, $sd=5.36$), or incomes of greater than $25,000$ ($m=22.31$, $sd=5.43$). Mean scores of approximately 21 indicate that most caregivers are fairly satisfied with their performance as a caregiver. These scores indicate that satisfaction with performance as a caregiver is not differentiated by patient income level.

**Consequences of involvement in care for the personal life of the caregiver.** A series of independent samples t-tests were calculated to compare the mean scores of the independent variables on the Consequences of Involvement in Care for the Personal Life of the Caregiver (SCQ-3). Possible scores for the SCQ-3 range from 8-32, with higher
scores indicating more negative consequences for the caregiver as a result of providing care.

No significant difference was found between spouses and nonspouses on the mean scores of the SCQ-3 at one month ($t(90) = -1.84, p = .07$). The mean score on the SCQ-3 for spouses ($m=16.65, sd=6.52$) did not differ significantly from the mean of nonspouses at one month ($m=18.48, sd=5.11$). Spouses and nonspouses do not differ significantly in terms of consequences in their personal life as a result of providing care.

No significant difference was found between males and females on the mean scores of the SCQ-3 at one month ($t(90) = -3.7, p = .71$). The mean score on the SCQ-3 for males ($m=17.4, sd=5.85$) did not differ significantly from the mean of females at one month ($m=17.97, sd=4.32$). At six months, there was no difference between men and women’s scores on the SCQ-3 ($t(90) = .55, p = .58$). The mean score on the SCQ-3 for males ($m=18.8, sd=6.36$) did not differ significantly from the mean of females at six months ($m=17.92, sd=4.50$). Men and women do not differ significantly in terms of consequences in their personal life as a result of providing care.

Two separate one-way ANOVA’s were conducted to determine if the mean scores on the SCQ-3 differed significantly by income level at one and six months. No significant difference was found at one month ($F(2, 89) = 0.09, p = .91$). Mean scores on the SCQ-3 do not differ by incomes of less than $15,000 ($m=18.04, sd=5.12$), incomes of $15-25,000 ($m=18.00, sd=4.23$) or incomes of greater than $25,000 ($m=17.58, sd=3.58$). No significant difference was found at six months ($F(2, 89) = 1.86, p = .16$). Mean scores on the SCQ-3 do not differ by incomes of less than $15,000 ($m=18.89, sd=4.94$), incomes of $15-25,000 ($m=17.96, sd=4.09$), or incomes of greater than $25,000 ($m=16.65, sd=4.64$).
Mean scores of approximately 18 indicate that the caregivers in this study indicate that they experience a moderate amount of negative consequences in their lives as a result of providing care.

Table 4.3 Caregiver Scores on Outcome Measures at One Month

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>n</th>
<th>Mean (sd)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC</td>
<td>92</td>
<td>70.77 (14.93)</td>
<td>26-90</td>
</tr>
<tr>
<td>SCQ</td>
<td>92</td>
<td>51.3 (11.30)</td>
<td>29-77</td>
</tr>
<tr>
<td>SCQ-1</td>
<td>92</td>
<td>12.76 (4.0)</td>
<td>7-23</td>
</tr>
<tr>
<td>SCQ-2</td>
<td>92</td>
<td>20.6 (5.52)</td>
<td>12-35</td>
</tr>
<tr>
<td>SCQ-3</td>
<td>92</td>
<td>17.90 (17.90)</td>
<td>8-31</td>
</tr>
<tr>
<td>GDS-1</td>
<td>92</td>
<td>6.52 (5.88)</td>
<td>0-26</td>
</tr>
</tbody>
</table>

Table 4.4 Caregiver Data on Outcome Measures at Six Months

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>n</th>
<th>Mean (sd)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC</td>
<td>92</td>
<td>70.93 (13.6)</td>
<td>39-91</td>
</tr>
<tr>
<td>SCQ</td>
<td>92</td>
<td>52.48 (11.8)</td>
<td>27-79</td>
</tr>
<tr>
<td>SCQ-1</td>
<td>92</td>
<td>13.16 (4.18)</td>
<td>7-22</td>
</tr>
<tr>
<td>SCQ-2</td>
<td>92</td>
<td>21.29 (5.35)</td>
<td>12-33</td>
</tr>
<tr>
<td>SCQ-3</td>
<td>92</td>
<td>18.02 (4.70)</td>
<td>8-28</td>
</tr>
<tr>
<td>GDS</td>
<td>92</td>
<td>6.28 (5.73)</td>
<td>0-25</td>
</tr>
</tbody>
</table>

Path Analyses

The multivariate results will provide answers to Hypotheses 1.0 - 6.0, and will test the pathways in the reduced theoretical model (Figure 3.1). The first analyses will examine the direct effects of patient and caregiver characteristics on coping, and coping on outcomes so that the composite indirect effects can be calculated. The next analyses will be the direct effects of patient and caregiver characteristics directly on the quality of life outcome measures. These direct effects will be added to the indirect effects to determine the total effects. All direct and indirect effects are reported using the standardized beta coefficient (β) so that comparisons of the strength the influence can be compared among variables.
To determine direct paths, multiple linear regression models are calculated. In multiple regression, categorical data uses a reference group, which is typically the group that is expected to do the worst. For income, the reference group was income group 1 (less than $15,000 annually). Further, income groups 3, 4, and 5 were collapsed into one group to have equitable numbers in each group for comparative purposes (income 1 n=43, income 2 n= 23, and incomes 3, 4, 5 n= 26). The reference group for the categorical data, relationship to patient, is spouses. Therefore, the other relationship types were collapsed into non-spouses. To examine ethnicity, Caucasian caregivers are the reference group and the reference group for gender is females.

**Indirect Effects**

To determine the indirect effects of patient and caregiver characteristics through the mediating variable of coping, the direct effects of patient and caregiver characteristics must be investigated on the coping ability of the caregiver, followed by an investigation of the direct effects of the coping ability on the quality of life outcomes for the caregivers. The multiplication of these direct effects determines the indirect effects of patient and caregiver characteristics through the mediating variable of coping on the quality of life outcomes for caregivers at one and six months post stroke.

**Research Hypothesis 1.0:** Patient characteristics influence the coping experience of the caregiver.

**Research Hypothesis 2.0:** Caregiver characteristics influence the coping experience of the caregiver.

Direct effects and significance levels of patient and caregiver characteristics on the coping ability of the caregiver are summarized in Table 4.5 and 4.6, respectively. These path relationships are depicted in Figures 4.1 and 4.2. At one and six months, the
stroke survivors functional status did not directly influence the ability to cope for the caregiver ($\beta_1=0.05, p=.65$) ($\beta_6=0.03, p=.90$), nor did income level 2 ($\beta_1=-0.07, p=.54$) ($\beta_6=0.02, p=.83$), or income group 3,4,5 ($\beta_1=0.10, p=.40$) ($\beta_6=0.004, p=.97$) when compared with income group 1. Ethnic differences also did not impact the ability to cope for the caregivers in this study when compared with Caucasian caregivers at one or six month post stroke (Hispanic $\beta_1=-0.02, p=.87$; $\beta_6=0.04, p=.70$; African-American $\beta_1=-0.08, p=.48$, $\beta_6=0.11, p=.34$). Nonspouses also did not differ significantly from spouses in terms of the coping ability of the caregiver at one or six months ($\beta_1=0.01, p=.91$), ($\beta_6=0.15, p=.16$). Finally, male caregivers did not differ significantly at one or six months in terms of ability to cope when compared with female caregivers ($\beta_1=-0.12, p=.25$) ($\beta_6=0.06, p=.60$).

This first analysis is that of patient and caregiver characteristics directly on the coping ability of the caregiver. All patient and caregiver characteristics did not significantly influence the caregivers’ coping ability at one or six months.

<table>
<thead>
<tr>
<th>Patient Characteristic</th>
<th>$\beta$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Functional Status - 1</td>
<td>0.05</td>
<td>.65</td>
</tr>
<tr>
<td>Patient Functional Status - 6</td>
<td>0.03</td>
<td>.90</td>
</tr>
<tr>
<td>Income (15,000-25000) - 1</td>
<td>-0.02</td>
<td>.82</td>
</tr>
<tr>
<td>Income (15,000-25000) - 6</td>
<td>-0.07</td>
<td>.54</td>
</tr>
<tr>
<td>Income (25001-&gt;45,000) - 1</td>
<td>0.005</td>
<td>.83</td>
</tr>
<tr>
<td>Income (25001-&gt;45,000) - 6</td>
<td>-0.10</td>
<td>.40</td>
</tr>
</tbody>
</table>
Table 4.6 Direct Effects of Caregiver Characteristics on Sense of Coherence

<table>
<thead>
<tr>
<th>Caregiver Characteristic</th>
<th>β</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity-Hispanic - 1</td>
<td>-0.02</td>
<td>.87</td>
</tr>
<tr>
<td>Ethnicity-Hispanic - 6</td>
<td>-0.04</td>
<td>.70</td>
</tr>
<tr>
<td>Ethnicity-African-American - 1</td>
<td>-0.08</td>
<td>.48</td>
</tr>
<tr>
<td>Ethnicity-African-American - 6</td>
<td>0.11</td>
<td>.34</td>
</tr>
<tr>
<td>Relationship-Nonspouse - 1</td>
<td>0.01</td>
<td>.91</td>
</tr>
<tr>
<td>Relationship-Nonspouse - 6</td>
<td>0.15</td>
<td>.16</td>
</tr>
<tr>
<td>Gender-Male - 1</td>
<td>-0.12</td>
<td>.25</td>
</tr>
<tr>
<td>Gender-Male - 6</td>
<td>0.06</td>
<td>.60</td>
</tr>
</tbody>
</table>

Figure 4.1. Path Depiction of Patient Characteristics on Coping

Figure 4.2 Path Depiction of Caregiver Characteristics on Coping
Research Hypothesis 3.0: The coping ability of the caregiver will influence the quality of life outcomes for caregivers.

The direct effects of the coping ability of the caregiver on the quality of life outcomes for the stroke caregivers are summarized in Table 4.7. These paths are depicted graphically in Figure 4.3. At one and six months post stroke, the overall burden level is significantly and inversely impacted by the coping ability of the caregiver ($\beta_1 = -0.45, p < 0.0001$, $\beta_6 = -0.47, p < 0.0001$), as is satisfaction with the care recipient ($\beta_1 = -0.37, p = 0.0002$, $\beta_6 = -0.42, p < 0.0001$). That is, caregivers who cope better experience less overall burden and feel less dissatisfied with the care recipient. The caregivers coping ability also is significantly inversely influential on their satisfaction with themselves as the provider of care at one and six months post stroke ($\beta_1 = -0.47, p < 0.0001$, $\beta_6 = -0.32, p = 0.002$). This indicates that the caregivers who cope better feel more satisfied with themselves as caregivers. Further, consequences in their personal life as a result of providing care is inversely significantly related to coping ability at one and six months ($\beta_1 = -0.23, p = 0.02$, $\beta_6 = -0.44, p < 0.0001$). That is, at one to six months, caregivers who cope better experience a significantly less amount of negative consequences in their personal life as a result of caring for their care recipient. Finally, the ability to cope is also significantly inversely related with the amount of depressive symptoms in the caregiver at one month ($\beta_1 = 0.75, p < 0.0001$) and six months ($\beta_6 = -0.76, p < 0.0001$), indicating that caregivers who cope more effectively experience less depressive symptoms.

These analyses present the direct effect of coping on all quality of life outcomes. Sense of coherence (SOC) is significantly and inversely related with all outcomes at one
and six months, indicating that a stronger SOC provides a buffering effect from the deleterious impact of caregiving.

Table 4.7 Direct Effects of Sense of Coherence on QOL Outcomes for the Stroke Caregiver

<table>
<thead>
<tr>
<th>QOL Outcome</th>
<th>β</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCQ Composite - 1</td>
<td>-0.45</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>SCQ Composite - 6</td>
<td>-0.47</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Satisfaction w/CR - 1</td>
<td>-0.37</td>
<td>&lt;.0002</td>
</tr>
<tr>
<td>Satisfaction w/CR - 6</td>
<td>-0.42</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Satisfaction w/self - 1</td>
<td>-0.47</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Satisfaction w/self - 6</td>
<td>-0.32</td>
<td>.0002</td>
</tr>
<tr>
<td>Consequences - 1</td>
<td>-0.23</td>
<td>.02</td>
</tr>
<tr>
<td>Consequences - 6</td>
<td>-0.44</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>GDS full - 1</td>
<td>-0.73</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>GDS full - 6</td>
<td>-0.76</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

‘†’ = p <.0001    ‘*’ = p < .05    =1 month        =6 month

Figure 4.3 Path Depiction of Coping on QOL Outcomes at 1 and 6 Months
Calculation of Indirect Effects

The determination of the indirect effects is calculated by multiplying the standardized coefficients for the patient and caregiver characteristics on the sense of coherence (Table 4.5 and 4.6) by the sense of coherence standardized coefficients on the quality of life outcomes (Table 4.7). However, the fact that all the patient and caregiver characteristics on the sense of coherence are not statistically significant indicates that there is no significant indirect effect of those variables through the mediating variable of coping on the quality of life outcomes for caregivers. This is evident in the calculation tables found in the Appendix. Therefore, only the direct effect of patient and caregiver characteristics, and caregiver coping ability are able to statistically significantly influence the quality of life outcomes for stroke caregivers. Thus, the remaining analysis will examine the direct effects of each patient and caregiver characteristic on each quality of life outcome at one and six months.

Direct Effects

The data will be presented by outcome measure so that the impact of the independent variables can be examined together. For each outcome measure, all pathways are presented, regardless of significance. Following the explanation of all pathways, the significant predictors were included in a separate multiple linear regression calculation, and the results of these analyses follows the models which have all pathways included. These analyses answer the following hypotheses:

Research Hypothesis 4.0: Patient characteristics directly influence the quality of life for caregivers.

Research Hypothesis 5.0: Caregiver characteristics directly influence the quality of life for caregivers.
**Sense of Competence Composite Score at 1 Month**

The path model for the composite score of the SCQ at one month is found in Figure 4.4. A multiple linear regression was calculated to predict the SCQ composite score at one month based on the functional status and income of the patient, and the gender, ethnicity, relation to patient, and coping ability of the caregiver. A significant regression equation was found ($F(8,83) = 4.71, p<.0001$), with an $R^2$ of .31. That is, this model explains 31% of the variance in caregiving burden.

Patient functional status did not significantly impact the overall burden level of the stroke caregivers ($\beta=-0.008, p=.93$) at one month. Overall caregiving burden level at one month is not significantly different for individuals when compared with an annual income of less than $15,000 annually at one and six months post stroke. Specifically, the standardized estimates for these individuals were: income group 2 [15,000-25,000] ($\beta =0.04, p=.74$) and income groups 3,4,5 [25,001-over $45,000] ($\beta =0.02, p=.84$). At one month post stroke, nonspouses experienced significantly less overall burden ($\beta =-0.25, p=.02$) than spouses. Hispanic and African-American caregivers did not differ significantly from Caucasian caregivers in terms of overall burden level at one month ($\beta_{H} =0.13, p=.23$) ($\beta_{AA} =0.19, p=.07$). Finally, male caregivers did not differ significantly from female caregivers in terms of overall burden ($\beta =0.14, p=.20$) at one month. Coping ability was inversely related with overall burden at one month ($\beta =-0.45, p<.0001$). This indicates that caregivers who cope more effectively experience less burden at one month.

A multiple linear regression was calculated predicting the overall burden level at one month with only the significant pathways identified in the previous paragraphs. These paths are displayed in Figure 4.5. The regression equation was significant ($F(2,89)=16.30, p<.0001$), with an $R^2$ of .27. Therefore, 27% of the variance in overall burden...
burden is predicted by relation to patient and coping ability at one month. Compared with spouses, nonspouses experience significantly less overall burden than spouses at one month ($\beta = -0.18, p = .05$). Also, caregivers who cope more effectively experience less overall burden at one month ($\beta = -0.48, p < .0001$).

Figure 4.4 Path Model of the Sense of Competence at 1 Month
Figure 4.5 Significant Pathways on the Sense of Competence at 1 Month

**Sense of Competence Composite Score at 6 Months**

The path model for the composite score of the SCQ at six months is found in Figure 4.6. A multiple linear regression was calculated to predict the SCQ composite score based on the functional status and income of the patient, and the gender, ethnicity, relation to patient, and coping ability of the caregiver. A significant regression equation was found \( F (8,83) = 3.96, p<.0005 \), with an \( R^2 \) of .28. That is, this model explains 28% of the variance in caregiving burden at six months.

Patient functional status did not significantly impact the overall burden level of the stroke caregivers at six months post stroke \( (\beta =-0.07, p=.50) \). Overall caregiving burden level at six months is not significantly different for individuals when compared with an annual income of less than $15,000. Specifically, the standardized estimates for these individuals were: income group 2 \([15,000-25,000]\) \( (\beta =0.04, p=.68) \) and income groups 3,4,5 \([25,001-over $45,000]\) \( (\beta =-.05, p=.65) \). At six months, nonspouses did not experience significantly different levels of burden than spouses \( (\beta =-.14, p=.18) \). Hispanic and African-American caregivers did not differ significantly from Caucasian caregivers in terms of overall burden level at six months \( (\beta_H =0.05, p=.62) \) \( (\beta_{AA} =0.15, p=.15) \). Male caregivers did not differ significantly from female caregivers in terms of
overall burden ($\beta = 0.18, p = .08$). Coping ability is inversely related with burden at six months ($\beta = -0.47, p < .0001$). This indicates that caregivers who cope more effectively experience less overall burden at six months.

Figure 4.6 Path Model on the Sense of Competence at 6 Months

A multiple linear regression was calculated predicting the overall burden level at six months with only the significant pathway identified in the previous paragraphs. This path is displayed in Figure 4.7. The regression equation was significant ($F(1, 90) = 24.98, p < .0001$), with an $R^2$ of .22. Therefore, 22% of the variance in overall burden is predicted.
by coping ability at six months. Caregivers who cope more effectively experience less overall burden at six months ($\beta = -0.47, p < .0001$).

Figure 4.7 Significant Pathway on Sense of Competence at 6 Months

**Satisfaction With The Care Recipient At 1 Month**

The path model for satisfaction with the care recipient at one month is found in Figure 4.8. A multiple linear regression was calculated to predict the SCQ composite score based on the functional status and income of the patient, and the gender, ethnicity, relation to patient and coping ability of the caregiver. A significant regression equation was found ($F(8, 83) = 3.66, p = .001$), with an $R^2$ of .26. That is, this model explains 26% of the variance in satisfaction with the care recipient.

Satisfaction with the care recipient at one month ($\beta = 0.11, p = .25$) was not significantly impacted by patient functional status. Satisfaction with the care recipient was not significantly impacted by level of income when compared with individuals whose annual income is less than $15,000. This is evidenced by the following standardized coefficients at one month: income group 2 ($\beta = -0.02, p = .86$) and income group 3, 4, 5 ($\beta = -0.16, p = .15$). Nonspouses did differ significantly from spouses in terms of satisfaction with the care recipient at one month ($\beta = -0.21, p = .05$). This indicates that nonspouses experience less dissatisfaction with the care recipient at one month than spouses. Satisfaction with the care recipient was not significantly different for Hispanics at one month ($\beta_H = 0.06, p = .57$) or African-Americans ($\beta_{AA} = 0.19, p = .08$). Male caregivers
did not differ from female caregiver in terms of satisfaction with the care recipient ($\beta = 0.14, p = .21$) at one month. Finally, caregivers who cope more effectively experience significantly less dissatisfaction with the care recipient at six months ($\beta = -0.39, p < .0001$).

Figure 4.8 Path Model on Satisfaction with the Care Recipient at 1 Month

A multiple linear regression was calculated predicting the satisfaction with the care recipient at one month with only the significant pathways identified in the previous paragraphs. These paths are displayed in Figure 4.9. The regression equation was significant ($F(2, 89) = 9.48, p = .0002$), with an $R^2$ of .18. Therefore, 18% of the variance in satisfaction with the care recipient is predicted by coping ability at one month. Relation to patient became insignificant when entered into this regression equation ($\beta = -0.10$, $p = .21$).
This indicates when other variables are not controlled for, nonspouses do not differ significantly from spouses in terms of satisfaction with the care recipient. Caregivers who cope more effectively experience more satisfaction with the care recipient at one month ($\beta = -0.40, p < 0.0001$).

Figure 4.9 Significant Pathways on Satisfaction with Care Recipient at 1 Month

### Satisfaction With The Care Recipient At 6 Months

The path model for satisfaction with the care recipient at six months is found in Figure 4.10. A multiple linear regression was calculated to predict the SCQ composite score based on the functional status and income of the patient, and the gender, ethnicity, relation to patient, and coping ability of the caregiver. A significant regression equation was found ($F(8,83) = 3.65, p < 0.0011$), with an $R^2$ of 0.26. This indicates that 26% of the variance in satisfaction with the care recipient is explained by this model.

Satisfaction with the care recipient at six months ($\beta = 0.10, p = 0.30$) was not significantly impacted by patient functional status. Satisfaction with the care recipient was not significantly impacted by level of income when compared with individuals whose annual income is less than $15,000. At six months the standardized coefficients for income group 2 was ($\beta = 0.09, p = 0.44$), and for income group 3,4,5 was ($\beta = -0.15, p = 0.17$). Nonspouses did not differ significantly from spouses in terms of satisfaction with
the care recipient at six months ($\beta = -0.13, p = .20$). Satisfaction with the care recipient was not significantly different for Hispanics at six months ($\beta_H = 0.02, p = .83$) or African-Americans ($\beta_{AA} = 0.14, p = .20$). At six months post stroke, male caregivers did not differ significantly from female caregivers in terms satisfaction with the care recipient ($\beta = 0.17, p = .12$). Finally, coping ability was inversely related with satisfaction with the care recipient at six months ($\beta = -0.42, p < .0001$). This indicates that caregivers who cope more effectively experience less dissatisfaction with the care recipient at six months.

Figure 4.10 Path Model on Satisfaction with the Care Recipient at 6 Months
A multiple linear regression was calculated predicting the satisfaction with the care recipient at six months with only the significant pathway identified in the previous paragraphs. This path is displayed in Figure 4.11. The regression equation was significant (F(1,90) = 18.34, p<.0001), with an $R^2$ of .17. Therefore, 17% of the variance in satisfaction with the care recipient is predicted by coping ability at six months. Caregivers who cope more effectively experience more satisfaction with the care recipient at six months ($\beta = -0.41$, $p<.0001$).

![Figure 4.11 Significant Pathway for Satisfaction with Care Recipient at 6 Months]

**Satisfaction With One’s Own Performance As Caregiver At 1 Month**

The path model for satisfaction with one’s own performance as caregiver at one month is found in Figure 4.12. A multiple linear regression was calculated to predict the SCQ composite score based on the functional status and income of the patient, and the gender, ethnicity, relation to patient, and coping ability of the caregiver. A significant regression equation was found (F(8,83) = 5.65, p<.0001), with an $R^2$ of .35. That is, this model explains 35% of the variance in satisfaction with one’s own performance as caregiver.

Satisfaction with their own performance as a caregiver was not significantly impacted by patient functional status at one month ($\beta = 0.09$, $p=.33$). Satisfaction with one’s own performance as a caregiver at one month post stroke was not significantly impacted by level of income when compared with individuals whose annual income is
less than $15,000 for individuals in income group 2 ($\beta = 0.02, p = 0.82$) or income group 3,4,5 at one month ($\beta = 0.05, p = 0.65$). Caregivers’ satisfaction with themselves in the caregiving role did not differ significantly for nonspouses compared with spouses at one month ($\beta = -0.18, p = 0.07$). Neither Hispanic caregivers nor African-American caregivers

![Diagram](image)

$^\dagger = p < 0.0001 \quad ^* = p < 0.05$

Figure 4.12 Path Model on Satisfaction with One’s Own Performance as a Caregiver at 1 Month

experienced significantly different levels of satisfaction with themselves as caregiver when compared with Caucasian caregivers at one month ($\beta_H = -0.06, p = 0.53$) and ($\beta_{AA} = 0.13, p = 0.19$), respectively. Further, males did not differ significantly at one month in terms of satisfaction with themselves as caregiver ($\beta = 0.15, p = 0.15$). Finally, coping
ability was inversely related with satisfaction with own performance as a caregiver at six months \((\beta = -0.45, p<.0001)\). This indicates that caregivers who cope more effectively experience less dissatisfaction with the care recipient at six months.

A multiple linear regression was calculated predicting the satisfaction with one’s own performance as a caregiver at one month with only the significant pathways identified in the previous paragraphs. This path is displayed in Figure 4.13. The regression equation was significant \((F(1,90) = 28.11, p<.0001)\), with an \(R^2\) of .24. Therefore, 24\% of the variance in satisfaction with one’s own performance as a caregiver is predicted by coping ability at one month. Caregivers who cope more effectively experience less overall burden at one month \((\beta = -0.49, p<.0001)\).

![Figure 4.13 Significant Pathway on Satisfaction with Performance as Caregiver at 1 Month]

\[\text{Coping} \rightarrow \text{Satisfaction with Own Performance} \]

\[^{†}p < .0001\]

**Satisfaction With One’s Own Performance As Caregiver At 6 Months**

The path model for satisfaction with one’s own performance as caregiver at six months is found in Figure 4.14. A multiple linear regression was calculated to predict the SCQ composite score based on the functional status and income of the patient, and the gender, ethnicity, relation to patient, and coping ability of the caregiver. A significant regression equation was found \((F (8,83) = 2.30, p=.03)\), with an \(R^2\) of .18. That is, this model explains 18\% of the variance in satisfaction with one’s own performance as
caregiver, which is approximately half of the variance explained in this subscale at 1 month.

Satisfaction with their own performance as a caregiver was not significantly impacted by patient functional status at six months (β = -0.009, p = .93). Satisfaction with one’s own performance as a caregiver at one month post stroke was not significantly different for income group 2 (β = 0.03, p = .86) or group 3,4,5 (β = 0.13, p = .28).

Caregivers’ satisfaction with their role as caregiver did not differ significantly for nonspouses compared with spouses at six months (β = -0.10, p = .38). Neither Hispanic caregivers nor African-American caregivers experienced significantly different levels of satisfaction with themselves as caregiver when compared with Caucasian caregivers at six months (β_H = .09, p = .42) (β_AA = 0.17, p = .14), respectively. Further, males did not differ significantly at six months in terms of satisfaction with themselves as caregiver (β = 0.20, p = .08). Finally, coping ability was inversely related with satisfaction with one’s own performance as a caregiver at six months (β = -0.32, p = .002). This indicates that caregivers who cope more effectively experience less dissatisfaction with their performance as a caregiver at six months.

A multiple linear regression was calculated predicting the satisfaction with one’s own performance as a caregiver at six months with only the significant pathway identified in the previous paragraphs. This path is displayed in Figure 4.15. The regression equation was significant (F(1,90) = 8.30, p = .005), with an R² of .09. Therefore, 9% of the variance in satisfaction with one’s own performance as a caregiver at six months is predicted by coping ability. Caregivers who cope more effectively experience more satisfaction with their performance as a caregiver at six months (β = -0.29, p = .005).
Figure 4.14 Path Model on Satisfaction with One’s Own Performance as a Caregiver at 6 Months

\[ \hat{=} = p < .005 \]

Figure 4.15 Significant Pathway on Satisfaction with One’s Own Performance as Caregiver at Six Months

\[ \hat{=} = p < .005 \]

Consequences of involvement in care for the personal life of the caregiver at 1 month

The path model for consequences in the personal life of the caregiver at one month is found in Figure 4.16. A multiple linear regression was calculated to predict the SCQ composite score based on the functional status and income of the patient, and the
gender, ethnicity, relation to patient, and coping ability of the caregiver. A significant regression equation was found ($F(8,83) = 3.986, p=.0005$), with an $R^2$ of .28. That is, this model explains 28% of the variance in consequences in the personal life of the caregiver.

![Figure 4.16 Path Model on Consequences of Involvement in Care for the Personal Life of the Caregiver at 1 Month](image)

Figure 4.16 Path Model on Consequences of Involvement in Care for the Personal Life of the Caregiver at 1 Month

Patient functional status was inversely related to the consequences of involvement in the care for the personal life of the caregiver at one month ($\beta = -0.24, p=.02$). This indicates that when caregivers provide care to individuals with higher functional status, they experience less negative consequences in their personal life. Income did not have a
significant impact on the consequences of involvement in care for the personal life of the
caregiver for the either income group 2, or group 3,4,5 at one month compared with
individuals whose income in less than 15,000 annually as evidenced by: income group 2
one month: (β =0.05, p=.67); income group 3,4,5 one (β =-0.02, p=.87).

Nonspouses had significantly less negative consequences in their life as a result of
providing care at one month (β =-0.22, p=.03). Hispanic caregivers experienced
significantly more consequences in their personal life as a result of providing care at one
month than Caucasian caregivers (β_H =0.34, p=.002), while African-Americans did not
differ significantly (β_AA =0.14, p=.18). Men also did not differ significantly from female
caregivers in terms of consequences in their personal life at one month (β =0.04, p=.70).
Finally, coping ability was inversely related with consequences of involvement in care
for the personal life of the caregiver at six months (β =-0.23, p=.02). This indicates that
caregivers who cope more effectively experience less negative consequences in their
lives as a result of providing care at six months.

A multiple linear regression was calculated predicting the consequences of
involvement in care for the personal life of the caregiver at one month with only the
significant pathways identified in the previous paragraphs. These paths are displayed in
Figure 4.17. The regression equation was significant (F(5,86)= 6.43, p<.0001), with an R²
of .27. Therefore, 27% of the variance in overall burden is predicted by patient functional
status, ethnicity, relation to patient and coping ability at one month. Patient functional
status has an inverse relationship with negative consequences in the personal life of the
caregiver (β =-0.24, p=.02). This indicates that caregivers who provide care for stroke
survivors with a higher functional status experience less negative consequences in their
personal as a result of providing care. Compared with African Americans and Caucasians, Hispanics experience significantly more negative consequences in their life as a result of providing care ($\beta_H = 0.33, p = 0.002$). Compared with spouses, nonspouses experience significantly less negative consequences in their personal life as a result of providing care than spouses at one month ($\beta = -0.21, p = 0.03$). Also, caregivers who cope more effectively experience less negative consequences in their personal life as a result of providing care at one month ($\beta = -0.24, p = 0.01$).

![Pathway diagram](image)

* $p < 0.05$  † $p < 0.0001$

Figure 4.17 Significant Pathways on Consequences of Involvement in Care for Personal Life of the Caregiver

**Consequences of Involvement In Care for the Personal Life of the Caregiver at 6 Months**

The path model for consequences in the personal life of the caregiver at six months is found in Figure 4.18. A multiple linear regression was calculated to predict the SCQ composite score based on the functional status and income of the patient, and the gender, ethnicity, relation to patient, and coping ability of the caregiver. A significant regression equation was found ($F (8, 83) = 6.37, p < 0.0001$), with an $R^2$ of 0.38 at six
months. That is, this model explains 38% of the variance in consequences in the personal life of the caregiver at six months.

Patient functional status was inversely related to the consequences of involvement in the care for the personal life of the caregiver at six months ($\beta = -0.25, p = .008$). This indicates that when caregivers provide care to individuals with higher functional status, they experience less negative consequences in their personal life. Income did not have a significant impact on the consequences of involvement in care for the personal life of the caregiver for the either income group 2, or group 3,4,5 at six months compared with
individuals whose income in less than 15,000 annually as evidenced by: income group 2 six months: ($\beta =0.003, p=.97$); income group 3,4,5 six month ($\beta =-0.13, p=.18$). At six months, nonspouses did not differ significantly from spouses ($\beta =-0.12, p=.20$) in terms of negative consequences for the personal life of the caregiver. Hispanic caregivers experienced significantly more consequences in their personal life as a result of providing care at six months than Caucasian caregivers ($\beta_{H} =0.22, p=.03$), while African-Americans did not differ significantly ($\beta_{AA} =0.07, p=.44$). Men also did not differ significantly from female caregivers in terms of consequences in their personal life at six months ($\beta =0.08, p=.40$). Finally, coping ability was inversely related with satisfaction with the care recipient at six months ($\beta =-0.44, p<.0001$). This indicates that caregivers who cope more effectively experience negative consequences in their personal life as a result of providing care at six months.

A multiple linear regression was calculated predicting the consequences of involvement in care for the personal life of the caregiver at six months with only the significant pathway identified in the previous paragraphs. These paths are displayed in Figure 4.19. The regression equation was significant ($F(4,87)= 11.76, p<.0001$), with an $R^2$ of .35. Therefore, 35% of the variance in negative consequences in the personal life of the caregiver as a result of providing care is predicted by patient functional status, ethnicity and coping ability at six months. Patient functional status has an inverse relationship with consequences of involvement in care for the personal life of the caregiver ($\beta =-0.27, p=.003$). That is, caregivers who provide care to individuals with higher functional status experience less negative consequences as a result of providing care. Hispanics experience significantly more negative consequences in their personal life
as a result of providing care than do African Americans or Caucasians ($\beta = 0.21, p = .03$). Caregivers who cope more effectively experience less overall burden at six months ($\beta = -0.47, p < .0001$).

![Figure 4.19 Significant Pathways on Consequences of Involvement in Care for the Personal Life of the Caregiver](image)

**Depression at 1 month**

The path model for depression at 1 month is found in Figure 4.20. A multiple linear regression was calculated to predict the SCQ composite score based on the functional status and income of the patient, and the gender, ethnicity, relation to patient, and coping ability of the caregiver. A significant regression equation was found ($F (8, 83) = 14.54, p < .0001$), with an $R^2$ of .58. This indicates that this model explains 58% of the variance in caregiver depression at one month. Patient functional status at one month is inversely related with the depression level of the stroke caregiver ($\beta = -0.17, p = .02$). This indicates that caregivers of patients with higher functional independence experience fewer depressive symptoms at one month post stroke. Compared with individuals whose income is less than $15,000, depression level of the caregiver was not significantly impacted by income level, as evidenced by the
following standardized coefficients at one month: income group 2 (β = -0.06, p = .45); and income group 3,4,5 (β = -0.07, p = .43). Nonspouses did not differ significantly from spouses in terms of depressive symptoms experienced at one month (β = 0.01, p = .89). Hispanic and African-American caregivers did not differ significantly from Caucasian caregivers in terms of depression at one month (β_H = -0.02, p = .77) and (β_AA = -0.09, p = .26) respectively. Men also did not differ significantly from female caregivers in level of depression at one month (β = -0.14, p = .10).

A multiple linear regression was calculated predicting depression at one month with only the significant pathways identified in the previous paragraphs. These paths are displayed in Figure 4.21. The regression equation was significant (F(2,89) = 56.80,
p<.0001), with an $R^2$ of .56. Therefore, 56% of the variance in depression is predicted by patient functional status and coping ability at one month. Patient functional status has an inverse relationship with caregiver depression at one month ($\beta = -0.21, p = .003$). That is, caregivers who provide care for individuals with higher functional status experience less depression at one month. Also, caregivers who cope more effectively experience less depression at one month ($\beta = -0.71, p < .0001$).

![Diagram of significant pathways on depression at 1 month](image)

**Figure 4.21 Significant Pathways on Depression at 1 Month**

**Depression at 6 months**

The path model for depression at 6 months is found in Figure 4.22. A multiple linear regression was calculated to predict the SCQ composite score based on the functional status and income of the patient, and the gender, ethnicity, relation to patient, and coping ability of the caregiver. A significant regression equation was found ($F (8, 83) = 15.03, p < .0001$), with an $R^2$ of .59. That is, this model explains 59% of the variance in caregiver depression.

Patient functional status at six months is inversely related with the depression level of the stroke caregiver ($\beta = -0.18, p = .02$). This indicates that caregivers of patients with higher functional independence experience fewer depressive symptoms at one and
six months post stroke. Compared with individuals whose income is less than $15,000, depression level of the caregiver was not significantly impacted by income level, as evidenced by the following standardized coefficients at six months: income group 2 (\(\beta = -0.05, p = .56\); and income group 3,4,5 (\(\beta = -0.01, p = .88\). Nonspouses did not differ significantly from spouses in terms of depressive symptoms experienced at six months (\(\beta = 0.05, p = .54\). Hispanic and African-American caregivers did not differ significantly from Caucasian caregivers in terms of depression at six months (\(\beta_{H} = -0.03, p = .67\) (\(\beta_{AA} = 0.08, p = .30\) respectively. Men also did not differ significantly from female caregivers in terms of level of depression at six months (\(\beta = -0.01, p = .86\). Finally, coping ability was inversely related with satisfaction with the care recipient at six months (\(\beta = -0.76, p < .0001\). This indicates that caregivers who cope more effectively experience less depression at six months.

A multiple linear regression was calculated predicting depression at six months with only the significant pathways identified in the previous paragraphs. These paths are displayed in Figure 4.23. The regression equation was significant (F(2,89)= 60.73, \(p < .0001\), with an \(R^2\) of .58. Therefore, 58% of the variance in depression is predicted by patient functional status and coping ability at six months. Patient functional status has an inverse relationship with caregiver depression at one month (\(\beta = -0.14, p = .04\). That is, caregivers who provide care for individuals with higher functional status experience less depression at six months. Also, caregivers who cope more effectively experience less depression at six months (\(\beta = -0.74, p < .0001\).
Figure 4.22 Path Model on Depression at 6 Months

Figure 4.23 Significant Pathways on Depression at 6 Months
Summary of Path Analyses

Patient and caregiver characteristics do not significantly impact the sense of the coherence for the caregiver. As a result, there is no significant impact of indirect effects of the patient and caregiver characteristics through the mediating variable of coping. However, there are direct effects of patient and caregiver variables on the quality of life outcomes, and of sense of coherence on the quality of life outcomes.

In the next section, we explore other potential influences on the quality of life outcomes for stroke caregivers. These influences are time spent in the caregiving role, change over time in quality of life outcomes and ethnic differences in outcomes.

Time Influence on QOL Outcomes

Hypothesis 6.0  Patient characteristics influence the time spent in the caregiving role

A multiple linear regression was calculated predicting caregivers time spent with the care recipient at one month based on patient characteristics. The regression equation was not significant (F(3,87)=2.35, p=.08) with an R^2 of .07. Neither patient functional status nor patient income can be used to predict time caregiver spends per day with the care recipient.

To examine the influence of time spent with the care recipient based on patient characteristics at six months, a multiple regression equation was calculated. The regression model was not significant (F(3,83)=1.03, p=.38), with an R^2 of .04. Again at six months, neither patient functional status nor income can be used to predict the time the caregiver spends with the care recipient.
Hypothesis 7.0 Caregiver Characteristics Influence the Time Spent in the Caregiving Role

A multiple linear regression was calculated to predict the amount of time spent with the care recipient based on caregiver characteristics. A significant regression equation was found (F(4,86)=2.64, p=.04), with an R² of .11. Caregiver ethnicity significantly predicts time spent with the care recipient. Compared with Caucasian caregivers and African Americans, Hispanic caregivers are more likely to spend more time with the care recipient (β=.27, p=.02). Nonspouses spend significantly less time than spouses with the care recipient (β=-.21, p=.05), but gender is not a significant predictor of time spent with care recipient (β=-.04, p=.71).

To determine if caregiver characteristics predict amount of time spent with the care recipient at six month, a multiple linear regression was calculated. The regression equation was not significant (F(4,82)=1.46, p=.22), with an R² of .07. Caregiver ethnicity, relation to patient, and gender do not significantly predict time spent with care recipient at six months.

Hypothesis 8.0 The Time Spent Helping the Care Recipient Will Influence Quality of Life Outcomes for Caregivers

To determine if time spent helping the care recipient influenced the quality of life outcomes for caregivers, numerous single linear regressions were run. The summary of results for all simple linear regression coefficients related to this hypothesis are located in Table 4.8.

A significant regression equation was not found when time was regressed on the overall burden level of the caregiver at one month (F(1,62)=0.00, p>.98), with an R² of 0.00. Time spent with the care recipient does not predict overall burden level of the
caregiver at one month. At six months, the amount of time spent with the care recipient also does not influence overall burden level as evidenced by the regression model with the following information: (F(1,55) =2.07, p>.16), with an $R^2$ of .03.

A significant regression equation was not found when time was regressed on satisfaction with the care recipient at one month (F(1,62)=0.15, p>.70), with an $R^2$ of 0.0025. Time spent with the care recipient does not predict satisfaction with the care recipient at one month. At six months, the amount of time spent with the care recipient also does not influence satisfaction with the care recipient as evidenced by the regression model with the following information: (F(1,55) =1.80, p>.19), with an $R^2$ of .03.

A significant regression equation was not found when time was regressed on the satisfaction with one’s own performance as a caregiver at one month (F(1,62)=1.30, p>.26), with an $R^2$ of 0.02. Time spent with the care recipient does not predict satisfaction with one’s own performance as a caregiver at one month. At six months, the amount of time spent with the care recipient also does not influence satisfaction with role as caregiver as evidenced by the regression model with the following information: (F(1,55) =.04, p>.83), with an $R^2$ of .0008.

A significant regression equation was not found when time was regressed on the consequences of involvement in the personal life of the caregiver at one month (F(1,62)=2.67, p>.11), with an $R^2$ of 0.04. Time spent with the care recipient does not predict consequences in the personal life of the caregiver at one month. At six months, the amount of time spent with the care recipient does predict consequences in the personal life of the caregiver evidenced by the regression model with the following
information: (F(1,55) =5.66, p<.02), with an R^2 of .09. Time spent in caregiver role does cause negative consequences in the personal life of the caregiver at six months.

A significant regression equation was not found when time was regressed on the depression level of the caregiver at one month (F(1,62)=.61, p>.44), with an R^2 of 0.01. Time spent with the care recipient does not predict caregiver depression at one month. At six months, the amount of time spent with the care recipient does predict caregiver depression as evidenced by the regression model with the following information: (F(1,55) =6.40, p<.01), with an R^2 of .10. Time spent in caregiver role does cause negative consequences in the personal life of the caregiver at six months.

Finally, a significant regression equation was not found when time was regressed on the caregiver coping ability at one month (F(1,62)=0.00, p>.98), with an R^2 of 0.00. Time spent with the care recipient does not predict coping ability of the caregiver at one month. At six months, the amount of time spent with the care recipient does not predict caregiver coping as evidenced by the regression model with the following information: (F(1,55) =2.05, p<.16), with an R^2 of .04. Time spent in caregiver role does not predict coping ability of the caregiver at six months.
Table 4.8 Effect of Time Spent With Patient on QOL Outcomes

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<th>Outcome Measure</th>
<th>n</th>
<th>β</th>
<th>p-value</th>
</tr>
</thead>
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<td>63</td>
<td>0.002</td>
<td>.99</td>
</tr>
<tr>
<td>SCQ Composite - 6</td>
<td>56</td>
<td>0.19</td>
<td>.16</td>
</tr>
<tr>
<td>Satisfaction w/CR - 1</td>
<td>63</td>
<td>-0.05</td>
<td>.70</td>
</tr>
<tr>
<td>Satisfaction w/CR - 6</td>
<td>56</td>
<td>0.18</td>
<td>.19</td>
</tr>
<tr>
<td>Satisfaction w/self - 1</td>
<td>63</td>
<td>-0.14</td>
<td>.26</td>
</tr>
<tr>
<td>Satisfaction w/self - 6</td>
<td>56</td>
<td>0.03</td>
<td>.83</td>
</tr>
<tr>
<td>Consequences - 1</td>
<td>63</td>
<td>0.20</td>
<td>.11</td>
</tr>
<tr>
<td>Consequences - 6</td>
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<td>0.31</td>
<td>.02*</td>
</tr>
<tr>
<td>GDS - 1</td>
<td>63</td>
<td>0.10</td>
<td>.44</td>
</tr>
<tr>
<td>GDS - 6</td>
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<td>0.32</td>
<td>.01*</td>
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<tr>
<td>Sense of coherence - 6</td>
<td>56</td>
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<td>.16</td>
</tr>
</tbody>
</table>

* p<.05

Change Over Time in QOL Outcomes

Hypothesis 9.0 Caregiver Outcomes Change Over Time

To determine if there is a mean difference in mean QOL measures at one and six months post stroke for stroke caregivers, paired-samples t tests were run. The mean scores for the caregivers on the outcome measures at one and six months are located in Tables 4.3 and 4.4, respectively.

Geriatric depression scale. A paired-samples t test was calculated to compare the mean Geriatric Depression Scale (GDS) scores at one and six month. The mean on the one month test was 6.52 (sd=5.88) and the mean on six month test was 6.28 (sd=5.73). No significant difference from one month to six month was found (t(91) = .645, p>.05). Mean scores on the GDS at one and six months are not significantly different.

A paired samples t-test was calculated for the nonspouses’ scores on the GDS at one and six months. The scores do no differ significantly (t (28) =.49, p=.63). A paired samples t-test was calculated for the spouses’ scores on the GDS at one and six months.
The scores do not differ significantly ($t(62)=.42$, $p=.68$). Mean scores on the GDS at one and six months are not significantly different for nonspouses or spouses.

A paired samples t-test was calculated for the males’ scores on the GDS at one and six months. The scores do not differ at all ($t(28)=.00$, $p=1.00$). A paired samples t-test was calculated for the females’ scores on the GDS at one and six months. The scores do not differ significantly ($t(62)=.66$, $p=.51$). Mean scores on the GDS at one and six months are not significantly different for males or females.

A paired samples t-test was calculated for income group 1 (<$15,000) on the GDS. The mean scores do not differ significantly ($t(42)=.34$, $p=.74$). A paired samples t-test was calculated for income group 2 ($15,001-$25,000) on the GDS at one and six months. The scores do not differ at all ($t(22)=0.00$, $p=1.00$). A paired samples t-test was calculated for income group 3 (>25,000). The mean scores did not differ significantly ($t(25)=.91$, .37). Mean scores on the GDS at one and six months are not significantly different for income levels.

**Sense of competence.** A paired-samples $t$ test was calculated to compare the mean Sense of Competence composite scores at one and six month. The mean on the one month test was 51.30 (sd=11.30) and the mean on six month test was 52.48 (sd=11.80). No significant difference from one month to six month was found ($t(91)=-1.211$, $p>.05$). Mean scores on the SCQ at one and six months are not significantly different.

A paired samples t-test was calculated for the nonspouses’ scores on the SCQ at one and six months. The scores do no differ significantly ($t (28)=-1.50$, $p=.15$). A paired samples t-test was calculated for the spouses’ scores on the SCQ at one and six months.
The scores do not differ significantly \((t(62)=-.57, p=.57)\). Mean scores on the SCQ at one and six months are not significantly different for nonspouses or spouses.

A paired samples t-test was calculated for the males’ scores on the SCQ at one and six months. The scores do not differ significantly \((t (28) =-.55, p=.60)\). A paired samples t-test was calculated for the females’ scores on the SCQ at one and six months. The scores do not differ significantly \((t(62)=-1.08, p=.28)\). Mean scores on the SCQ at one and six months are not significantly different for males or females.

A paired samples t-test was calculated for income group 1 (<$15,000) on the SCQ. The mean scores do differ significantly \((t(42)=-2.06, p=.05)\). This indicates that scores on the SCQ for income group 1 are significantly lower at 6 months. A paired samples t-test was calculated for income group 2 ($15,001-$25,000) on the SCQ at one and six months. The scores do not differ significantly \((t(22) = -.67, p=.51)\). A paired samples t-test was calculated for income group 3 (> $25,000). The mean scores did not differ significantly \((t(25) = .58, .56)\). Mean scores on the SCQ at one and six months are not significantly different for patient income levels.

**Satisfaction with the care recipient.** A paired-samples \(t\) test was calculated to compare the mean scores on subscale one of the SCQ, the Satisfaction with the Care Recipient (SCQ 1) at one and six month. The mean on the one month test was 12.76 \((sd=4.01)\) and the mean on six month test was 13.16 \((sd=4.18)\). No significant difference from one month to six month was found \((t(91) = -1.034, p>.05)\). Mean scores on the SCQ-1 at one and six months are not significantly different.

A paired samples t-test was calculated for the nonspouses’ scores on the SCQ-1 at one and six months. The scores do not differ significantly \((t (28) =-.51, p=.62)\). A paired
samples t-test was calculated for the spouses’ scores on the SCQ-1 at one and six months. The scores do not differ significantly (t(62) = -.90, p = .37). Mean scores on the SCQ-1 at one and six months are not significantly different for nonspouses or spouses.

A paired samples t-test was calculated for the males’ scores on the SCQ-1 at one and six months. The scores do no differ significantly (t(28) = .25, p = .81). A paired samples t-test was calculated for the females’ scores on the SCQ-1 at one and six months. The scores do not differ significantly (t(62) = -1.18, p = .24). Mean scores on the SCQ-1 at one and six months are not significantly different for males or females.

A paired samples t-test was calculated for income group 1 (<$15,000) on the SCQ-1. The mean scores do differ significantly (t(42) = -1.17, p = .26). A paired samples t-test was calculated for income group 2 ($15,001-$25,000) on the SCQ-1 at one and six months. The scores do not differ significantly (t(22) = -.78, p = .44). A paired samples t-test was calculated for income group 3 (>+$25,000). The mean scores did not differ significantly (t(25) = .10, p = .92). Mean scores on the SCQ-1 at one and six months are not significantly different for patient income levels.

Satisfaction with one’s own performance as a caregiver. A paired-samples t-test was calculated to compare the mean scores one subscale two of the SCQ, the Satisfaction with One’s Own Performance as a Caregiver (SCQ-2) at one and six month. The mean on the one month test was 20.64 (sd=5.52) and the mean on six month test was 21.29 (sd=5.35). No significant difference from one month to six month was found (t(91) = -1.318, p>.05). Mean scores on the SCQ-2 at one and six months are not significantly different.
A paired samples t-test was calculated for the nonspouses’ scores on the SCQ-2 at one and six months. The scores do differ significantly ($t(28) = -2.27, p = .02$). This indicates that scores for nonspouses are significantly less satisfied with their performance at six months than at one month on the SCQ-2. A paired samples t-test was calculated for the spouses’ scores on the SCQ-2 at one and six months. The scores do not differ significantly ($t(62) = -0.60, p = .55$). Mean scores on the SCQ-2 at one and six months are not significantly different for nonspouses or spouses.

A paired samples t-test was calculated for the males’ scores on the SCQ-2 at one and six months. The scores do not differ significantly ($t(28) = -0.69, p = .51$). A paired samples t-test was calculated for the females’ scores on the SCQ-2 at one and six months. The scores do not differ significantly ($t(62) = -1.19, p = .24$). Mean scores on the SCQ-2 at one and six months are not significantly different for men and women.

A paired samples t-test was calculated for income group 1 (<$15,000) on the SCQ-2. The mean scores do differ significantly ($t(42) = -2.16, p = .04$). This indicates that scores on the SCQ-2 for income group 1 are significantly lower at 6 months. A paired samples t-test was calculated for income group 2 ($15,001-$25,000) on the SCQ at one and six months. The scores do not differ significantly ($t(22) = -.45, p = .66$). A paired samples t-test was calculated for income group 3 (>=$25,000). The mean scores did not differ significantly ($t(25) = .22, .83$). Mean scores on the SCQ-2 at one and six months are not significantly different by patient income level.

**Consequences in the life of the caregiver as a result of providing care.** A paired-samples $t$ test was calculated to compare the mean subscale three of the SCQ, Consequences in the Life of the Caregiver as a Result of Providing Care (SCQ 3) scores
at one and six month. The mean on the one month test was 17.9 (sd=4.47) and the mean on six month test was 18.02 (sd=4.70). No significant difference from one month to six month was found (t(91) = -.317, p>.05).

A paired samples t-test was calculated for the nonspouses’ scores on the SCQ-3 at one and six months. The scores do not differ significantly (t (28) = -.86, p=.40). A paired samples t-test was calculated for the spouses’ scores on the GDS at one and six months. The scores do not differ significantly (t(62)=.30, p=.77). Mean scores on the SCQ-3 at one and six months are not significantly different for nonspouses or spouses.

A paired samples t-test was calculated for the males’ scores on the SCQ-3 at one and six months. The scores do no differ significantly (t (28) =-.78, p=.46). A paired samples t-test was calculated for the females’ scores on the SOC at one and six months. The scores do not differ significantly (t(62)=.10, p=.92). Mean scores on the GDS at one and six months are not significantly different for males or females.

A paired samples t-test was calculated for income group 1 (<$15,000) on the SCQ-3. The mean scores do differ significantly (t(42) =-1.52, p=.14). A paired samples t-test was calculated for income group 2 ($15,001-$25,000) on the SCQ-3 at one and six months. The scores do not differ significantly (t(22) = .05, p=.96). A paired samples t-test was calculated for income group 3 (>=$25,000). The mean scores did not differ significantly (t(25) = 1.47, .16). Mean scores on the SCQ-3 at one and six months are not significantly different for patient income level.

**Sense of coherence.** Finally, a paired-samples $t$ test was calculated to compare the mean Sense of Coherence (SOC) scores at one and six month. The mean on the one month test was 70.77 (sd=14.93) and the mean on six month test was 70.93 (sd=13.60).
No significant difference from one month to six month was found ($t(91) = -.153, p>.05$).

Mean scores on the SOC at one and six months are not significantly different.

A paired samples t-test was calculated for the nonspouses’ scores on the SOC at one and six months. The scores do not differ significantly ($t(28) =-1.43, p=.16$). A paired samples t-test was calculated for the spouses’ scores on the SOC at one and six months. The scores do not differ significantly ($t(62)=.85, p=.40$). Mean scores on the SOC at one and six months are not significantly different for nonspouses or spouses.

A paired samples t-test was calculated for the males’ scores on the SOC at one and six months. The scores do not differ significantly ($t(28) =-1.75, p=.11$). A paired samples t-test was calculated for the females’ scores on the SOC at one and six months. The scores do not differ significantly ($t(62)=.66, p=.51$). Mean scores on the SOC at one and six months are not significantly different for males or females.

A paired samples t-test was calculated for income group 1 (<$15,000) on the SOC. The mean scores do not differ significantly ($t(42) =.83, p=.41$). A paired samples t-test was calculated for income group 2 ($15,001-$25,000) on the SCQ at one and six months. The scores do not differ significantly ($t(22) =-.1.01, p=.33$). A paired samples t-test was calculated for income group 3 (>$25,000). The mean scores did not differ significantly ($t(25) =-.1.10, p=.28$). Mean scores on the SOC at one and six months are not significantly different for patient income level.

**Two-Way Fixed Effects Repeated Measures ANOVA**

A two-way fixed effects repeated measures ANOVA was calculated for each dependent measure to compare the beta weights for each independent variable and time at one and six months. These models were estimated to determine if the coefficient (beta weight) changed significantly from one month to six months.
For the GDS, time was not significant as a main effect ($p=.32$). Time also was not significant as an interaction effect with patient functional status ($p=.78$), income ($p=.62$), ethnicity ($p=.24$), relation to patient ($p=.74$), gender ($p=.28$) or SOC ($p=.47$). This indicates that the beta weights did not differ significantly from one to six months on the GDS for any of the independent variables.

For the SCQ, time was not significant as a main effect ($p=.35$). Time did not interact significantly with patient functional status ($p=.34$), income ($p=.63$), ethnicity ($p=.85$), relation to patient ($p=.49$), gender ($p=.72$) or SOC ($p=.54$). This indicates that the beta weights did not differ significantly over time on the SCQ for any of the independent variables.

For the SCQ-1, time was not significant as a main effect ($p=.64$). Time also did not interact significantly with patient functional status ($p=.93$), income ($p=.76$), ethnicity ($p=.95$), relation to patient ($p=.65$), gender ($p=.82$) or SOC ($p=.53$). This indicates that the beta weights did not differ significantly over time on the SCQ-1 for any of the independent variables.

For the SCQ-2, time was not significant as a main effect ($p=.82$). Time also did not interact significantly with patient functional status ($p=.50$), income ($p=.94$), ethnicity ($p=.94$), relation to patient ($p=.58$), gender ($p=.75$), or SOC ($p=.43$). This indicates that the beta weights did not differ significantly over time on the SCQ-2 for any of the independent variables.

For the SCQ-3, time was not significant as a main effect ($p=.08$). Time was not significant as an interaction effect with patient functional status ($p=.62$), income ($p=.71$), ethnicity ($p=.74$), relation to patient ($p=.51$), gender ($p=.76$). Time did significantly
interact with SOC \((p=.05)\). This indicates that the beta weight of SOC on SCQ-3 is significantly more than that at one month \((t=-2.00, p=.05)\). The beta weights of the other independent variables did not differ significantly over time for the SCQ-3.

**Ethnic Differences in the Caregiving Outcomes**

**Hypothesis 10.0** There are statistically significant differences in caregiver outcomes by ethnicity

The characteristics for each group of caregivers are broken apart from the entire cohort in Tables 4.9 (Caucasians), 4.10 (Puerto-Rican Hispanics) and 4.11 (African Americans). The caregiving groups look fairly similar. The Caucasians are older than the other groups, with a mean age of 62.63 (compared with 58.64 [Hispanics] and 58.33 [African Americans]). Eleven Caucasian caregivers were employed, three part time and eight full time. Ten Hispanic caregivers were employed, nine full time and one part time. Finally, five African Americans were employed, with three having full time employment and two having part time employment.

To determine if there is a mean difference in QOL outcomes for stroke caregivers by ethnicity over time, paired-samples \(t\) tests were run to determine if mean scores differed at one and six months for each ethnic group. One-way ANOVA’s were then calculated to determine if mean scores on the outcome measures differed by ethnicity.

The mean scores for the caregivers on the outcome measures for Caucasians are summarized in Table 4.12, in Table 4.13 for Puerto Rican Hispanics, and in Table 4.14 for African-Americans.
Table 4.9 Characteristics of the Caucasian Caregivers (n=35)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>% or Mean (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relationship to Patient</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spouse</td>
<td>27</td>
<td>77.1%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>14.5%</td>
<td></td>
</tr>
<tr>
<td>Friend</td>
<td>2</td>
<td>5.7%</td>
<td></td>
</tr>
<tr>
<td>Daughter</td>
<td>1</td>
<td>2.9%</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>35</td>
<td>62.63 (10.23)</td>
<td>40-86</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>32</td>
<td>91.4%</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>3</td>
<td>8.6%</td>
<td></td>
</tr>
<tr>
<td><strong>Employment Status-1mo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>8</td>
<td>22.8%</td>
<td></td>
</tr>
<tr>
<td>Part-time</td>
<td>3</td>
<td>8.5%</td>
<td></td>
</tr>
<tr>
<td>Not outside of home</td>
<td>24</td>
<td>68.57%</td>
<td></td>
</tr>
<tr>
<td><strong>Employment Status-6mo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>6</td>
<td>17.1%</td>
<td></td>
</tr>
<tr>
<td>Part-time</td>
<td>5</td>
<td>14.28%</td>
<td></td>
</tr>
<tr>
<td>Not outside of home</td>
<td>24</td>
<td>68.47%</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.10 Characteristics of the Puerto Rican Caregivers (n=42)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>% or Mean (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relationship to Patient</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spouse</td>
<td>27</td>
<td>64.3%</td>
<td></td>
</tr>
<tr>
<td>Daughter</td>
<td>5</td>
<td>11.9%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>11.9%</td>
<td></td>
</tr>
<tr>
<td>Friend</td>
<td>3</td>
<td>7.1%</td>
<td></td>
</tr>
<tr>
<td>Son</td>
<td>2</td>
<td>4.8%</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>42</td>
<td>58.64 (14.84)</td>
<td>23-81</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
<td>22.1%</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
<td>11.9%</td>
<td></td>
</tr>
<tr>
<td><strong>Employment Status-1mo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>9</td>
<td>21.4%</td>
<td></td>
</tr>
<tr>
<td>Part-time</td>
<td>1</td>
<td>2.3%</td>
<td></td>
</tr>
<tr>
<td>Not outside of home</td>
<td>32</td>
<td>76.19</td>
<td></td>
</tr>
<tr>
<td><strong>Employment Status-6mo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>9</td>
<td>21.4%</td>
<td></td>
</tr>
<tr>
<td>Part-time</td>
<td>2</td>
<td>4.7%</td>
<td></td>
</tr>
<tr>
<td>Not outside of home</td>
<td>31</td>
<td>73.8%</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.11 Characteristics of the African American Caregivers (n=15)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>% or Mean (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relationship to Patient</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spouse</td>
<td>9</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>26.7%</td>
<td></td>
</tr>
<tr>
<td>Friend</td>
<td>2</td>
<td>13.3%</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>15</td>
<td>58.33 (10.4)</td>
<td>43-78</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>13</td>
<td>86.7%</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td>13.3%</td>
<td></td>
</tr>
<tr>
<td><strong>Employment Status-1mo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>3</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Part-time</td>
<td>2</td>
<td>13.3%</td>
<td></td>
</tr>
<tr>
<td>Not outside of home</td>
<td>10</td>
<td>66.6%</td>
<td></td>
</tr>
<tr>
<td><strong>Employment Status-6mo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>3</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Part-time</td>
<td>2</td>
<td>13.3%</td>
<td></td>
</tr>
<tr>
<td>Not outside of home</td>
<td>10</td>
<td>66.6%</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.12 Mean Scores for Caucasian Caregivers on QOL Outcome Measures (n=35)

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Mean at 1 month (sd)</th>
<th>Range at 1 month</th>
<th>Mean at 6 months (sd)</th>
<th>Range at 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDS</td>
<td>6.46 (5.84)</td>
<td>0-23</td>
<td>6.25 (5.57)</td>
<td>0-24</td>
</tr>
<tr>
<td>SOC</td>
<td>71.57 (13.90)</td>
<td>31-90</td>
<td>70.82 (13.53)</td>
<td>39-91</td>
</tr>
<tr>
<td>SCQ</td>
<td>49.31 (10.42)</td>
<td>30-74</td>
<td>51.34 (10.26)</td>
<td>31-72</td>
</tr>
<tr>
<td>SCQ 1</td>
<td>12.23 (3.82)</td>
<td>7-20</td>
<td>12.94 (3.80)</td>
<td>7-22</td>
</tr>
<tr>
<td>SCQ 2</td>
<td>20.82 (4.77)</td>
<td>13-31</td>
<td>21.45 (4.60)</td>
<td>13-31</td>
</tr>
<tr>
<td>SCQ 3</td>
<td>16.26 (3.61)</td>
<td>9-28</td>
<td>16.94 (4.51)</td>
<td>9-27</td>
</tr>
</tbody>
</table>

Table 4.13 Mean Scores for Hispanic Caregivers on QOL Outcome Measures (n=42)

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Mean at 1 month (sd)</th>
<th>Range at 1 month</th>
<th>Mean at 6 months (sd)</th>
<th>Range at 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDS</td>
<td>6.88 (5.85)</td>
<td>1-26</td>
<td>6.47 (5.57)</td>
<td>0-24</td>
</tr>
<tr>
<td>SOC</td>
<td>71.0 (13.61)</td>
<td>35-90</td>
<td>69.61 (12.94)</td>
<td>39-90</td>
</tr>
<tr>
<td>SCQ</td>
<td>51.55 (10.63)</td>
<td>30-71</td>
<td>52.92 (12.31)</td>
<td>32-79</td>
</tr>
<tr>
<td>SCQ 1</td>
<td>12.59 (3.79)</td>
<td>7-20</td>
<td>13.02 (4.59)</td>
<td>7-22</td>
</tr>
<tr>
<td>SCQ 2</td>
<td>19.57 (5.63)</td>
<td>12-34</td>
<td>20.43 (5.57)</td>
<td>12-33</td>
</tr>
<tr>
<td>SCQ 3</td>
<td>19.38 (4.23)</td>
<td>10-27</td>
<td>19.48 (4.61)</td>
<td>9-28</td>
</tr>
</tbody>
</table>
Table 4.14 Mean Scores for African-American Caregivers on QOL Outcome Measures (n=15)

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Mean at 1 month (sd)</th>
<th>Range at 1 month</th>
<th>Mean at 6 months (sd)</th>
<th>Range at 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDS</td>
<td>5.67 (6.38)</td>
<td>0-23</td>
<td>5.80 (6.88)</td>
<td>0-25</td>
</tr>
<tr>
<td>SOC</td>
<td>68.27 (20.74)</td>
<td>26-90</td>
<td>74.87 (15.68)</td>
<td>40-91</td>
</tr>
<tr>
<td>SCQ</td>
<td>55.27 (14.45)</td>
<td>29-77</td>
<td>53.87 (14.14)</td>
<td>27-71</td>
</tr>
<tr>
<td>SCQ 1</td>
<td>14.47 (4.78)</td>
<td>7-23</td>
<td>14.07 (3.97)</td>
<td>7-21</td>
</tr>
<tr>
<td>SCQ 2</td>
<td>23.20 (6.26)</td>
<td>13-35</td>
<td>23.33 (5.7)</td>
<td>12-31</td>
</tr>
<tr>
<td>SCQ 3</td>
<td>17.60 (5.70)</td>
<td>8-31</td>
<td>16.47 (4.50)</td>
<td>8-24</td>
</tr>
</tbody>
</table>

**Depression.** A paired-samples *t* test was calculated to compare the mean Geriatric Depression Scale (GDS) scores at one and six month for each ethnicity. For Caucasian caregivers, the mean on the one-month test was 6.46 (sd=5.84) and the mean at six months was 6.25 (sd=5.57). No significant difference was found from one to six months (*t*(34)=.47, *p*=.64). For Hispanic caregivers, the mean on the one-month test was 6.88 (sd=5.85) and the mean at six months was 6.47 (sd=5.57). No significant difference was found from one to six months (*t*(41)=.62, *p*=.54). For African-American caregivers, the mean on the one month test was 5.67 (sd=6.38) and the mean at six months was 5.80 (sd=6.88). No significant difference was found from one to six months (*t*(14)=.13, *p*=.90).

Two separate one-way ANOVA’s were conducted to determine if the mean scores on the GDS differed significantly by ethnicity at one and six months. No significant difference was found (F(2,89)=.23, *p*=.79). At six months, there is also no significant difference in depression levels (F(2,89)=.08, *p*=.93). Caregivers do not differ in depression levels, regardless of ethnicity at one or six months post stroke.

Therefore, although the mean score on the GDS for Caucasians and Hispanics decreased over time (indicating less depressive symptoms), and African-Americans means score increased over time, these numbers were not statistically significant.
However, Figure 4.24 portrays the data graphically, indicating the differences in direction and slope over time for the three ethnic groups. The graph indicates that changes for Caucasians and Hispanics are similar on depression levels, and they are inversely related to the changes for African-Americans. Caucasian and Hispanic caregivers tend to have more depression at one month, but this level decreases slightly by six months. African-Americans experience a slight increase over time, but have average lower depression scores overall.

![Figure 4.24 Changes in Mean Scores on the GDS by Ethnicity](image)

**Coping.** A paired-samples *t* test was calculated to compare the mean Sense of Coherence (SOC) scores at one and six month for each ethnicity. For Caucasians, the mean on the one-month test was 71.57 (sd=13.90) and the mean at six months was 70.82 (sd=13.53). No significant difference was found from one to six months for Caucasian caregivers (*t*(34)=.46, *p*=.65). For Hispanic caregivers, the mean on the one-month test was 71.0 (sd=13.61) and the mean at six months was 69.61 (sd=12.94). No significant difference was found from one to six months for Hispanic caregivers (*t*(41)=.92, *p*=.36).
For African-American caregivers, the mean on the one-month test was 68.27 (sd=20.74) and the mean at six months was 74.87 (sd=15.68). A significant difference was found from one to six months (t(14)=−2.22, p=.04), indicating that African-Americans cope significantly better at six months than at one month.

Two separate one-way ANOVA’s were conducted to determine if the mean scores on the SOC differed significantly by ethnicity at one and six months. No significant difference was found (F(2,89)=.26, p=.77). At six months, there is also no significant difference in coping ability (F(2,89)=.82, p=.23). Caregivers do not differ in coping ability, regardless of ethnicity at one or six months post stroke.

Therefore, although the mean score on the SOC for Caucasians and Hispanics decreased over time (indicating less coping ability), these numbers were not statistically significant. However, Figure 4.25 portrays the data graphically, indicating the differences in direction and slope over time for the three ethnic groups. The graph indicates that decreases in coping ability for Caucasians and Hispanics are similar from one to six months. However, this decline is in sharp opposition to the change in African-American caregivers, who experience significantly better coping at six months.

![Figure 4.25 Changes in Mean Scores on the SOC by Ethnicity](image-url)
**Overall burden.** A paired-samples \( t \) test was calculated to compare the mean Sense of Competence (SCQ) scores at one and six month for each ethnicity. For Caucasian caregivers, the mean on the one-month test was 49.31 (sd=10.42) and the mean at six months was 51.34 (sd=10.26). No significant difference was found from one to six months \((t(34)=-1.37, p=.18)\). For Hispanic caregivers, the mean on the one-month test was 51.55 (sd=10.63) and the mean at six months was 52.92 (sd=12.31). No significant difference was found from one to six months \((t(41)=-.85, p=.40)\). For African-American caregivers, the mean on the one-month test was 55.27 (sd=14.45) and the mean at six months was 53.87 (sd=14.14). No significant difference was found from one to six months \((t(14)=.81, p=.43)\).

Two separate one-way ANOVA’s were conducted to determine if the mean scores on the SCQ differed significantly by ethnicity at one and six months. No significant difference was found \((F(2,89)=1.49, p=.23)\). At six months, there is also no significant difference in coping ability \((F(2,89)=.29, p=.75)\). Caregivers do not differ in overall burden, regardless of ethnicity at one or six months post stroke.

Therefore, although the mean score on the SCQ for Caucasians and Hispanics increased over time (indicating more burden), and African-Americans mean score decreased over time, these numbers were not statistically significant. However, Figure 4.26 portrays the data graphically, indicating the differences in direction and slope over time for the three ethnic groups. The graph indicates that the data for Caucasian caregivers tend to start with the least amount of burden, and African-Americans, the most. Caucasian and Hispanic caregivers tend experience an increase over time in burden level, while African-Americans experience less burden over time.
Figure 4.26 Changes in Mean Scores on the SCQ by Ethnicity

### Satisfaction with the Care Recipient

A paired-samples t test was calculated to compare the mean Satisfaction with the Care Recipient (SCQ 1) scores at one and six months for each ethnicity. For Caucasians, the mean on the one-month test was 12.23 (sd=3.82) and the mean at six months was 12.94 (sd=3.80). No significant difference was found from one to six months (t(34)=-1.28, p=.21). For Hispanic caregivers, the mean on the one-month test was 12.59 (sd=3.79) and the mean at six months was 13.02 (sd=4.59). No significant difference was found from one to six months (t(41)=-.65, p=.52). For African-American caregivers, the mean on the one-month test was 14.47 (sd=4.78) and the mean at six months was 14.07 (sd=3.97). No significant difference was found from one to six months (t(14)=.49, p=.63).

Two separate one-way ANOVA’s were conducted to determine if the mean scores on the SCQ-1 differed significantly by ethnicity at one and six months. No significant difference was found (F(2,89)=1.73, p=.18). At six months, there is also no significant
difference in satisfaction with the care recipient \((F(2,89)=.42, p=.66)\). Caregivers do not differ in satisfaction with the care recipient, regardless of ethnicity at one or six months.

Therefore, although the mean score on the SCQ 1 for Caucasians and Hispanics increased over time (indicating less satisfaction with the care recipient), and African-Americans mean score decreased over time, these numbers were not statistically significant. However, Figure 4.27 portrays the data graphically, indicating the differences in direction and slope over time for the three ethnic groups. The graph indicates that changes for Caucasians and Hispanics are slightly increased over time, and about 2 points less at six months than African-Americans caregivers.

**Satisfaction with one’s own performance as caregiver.** A paired-samples \(t\) test was calculated to compare the mean Satisfaction With One’s Own Performance as Caregiver (SCQ 2) scores at one and six month for each ethnicity. For Caucasians, the mean on the one-month test was 20.82 (sd=4.77) and the mean at six months was 21.45 (sd=4.60).

![Figure 4.27 Changes in Mean Scores on the SCQ 1 by Ethnicity](image)
No significant difference was found from one to six months $(t(34)=-.93, p=.36)$. For Hispanic caregivers, the mean on the one-month test was 19.57 (sd=5.63) and the mean at six months was 20.43 (sd=5.57). No significant difference was found from one to six months $(t(41)=-.96, p=.34)$. For African-American caregivers, the mean on the one-month test was 23.20 (sd=6.26) and the mean at six months was 23.33 (sd=5.7). No significant difference was found from one to six months $(t(14)=-.18, p=.63)$.

Two separate one-way ANOVA’s were conducted to determine if the mean scores on the SCQ-2 differed significantly by ethnicity. No significant difference was found $(F(2,89)=2.50, p=.09)$. At six months, there is also no significant difference in satisfaction with one’s own performance as a caregiver $(F(2,89)=1.67, p=.19)$. The caregivers in each ethnic group do not differ significantly at one or six months in satisfaction with their performance as a caregiver.

Therefore, although the mean score on the SCQ-2 for Caucasians, Hispanics, and African-Americans increased over time (indicating less satisfaction with themselves as a caregiver), these numbers were not statistically significant. However, Figure 4.28 portrays the data graphically, indicating the differences in direction and slope over time for the three ethnic groups. The graph indicates that changes for Caucasians and Hispanics are similar, and it appears that the mean score tends to be higher for African-Americans.
Consequences of involvement in care for the personal life of the caregiver. A paired-samples *t* test was calculated to compare the mean Consequences of Involvement in Care for the Personal Life of the Caregiver (SCQ-3) scores at one and six month for each ethnicity. For Caucasians, the mean on the one-month test was 16.26 (sd=3.61) and the mean at six months was 16.94 (sd=4.51). No significant difference was found from one to six months (*t*(34)=−.99, *p*=.33). For Hispanic caregivers, the mean on the one-month test was 19.38 (sd=4.23) and the mean at six months was 19.48 (sd=4.61). No significant difference was found from one to six months (*t*(41)=−.19, *p*=.85). For African-American caregivers, the mean on the one-month test was 17.60 (sd=5.70) and the mean at six months was 16.47 (sd=4.50). No significant difference was found from one to six months (*t*(14)=1.43, *p*=.17).

Two separate one-way ANOVA’s were computed to determine if the mean scores on the SCQ-3 differed significantly by ethnicity at one and six months post stroke. A significant difference was found among the ethnic groups at one month (F(2,89)=5.12, *p*=.0078). Hispanic caregivers experiences significantly more negative consequences in
their lives as a result of providing care. A significant difference was also found at six months ($F(2,89)=3.99, p=.02$), indicating that Hispanic caregivers experience significantly more negative consequences in their lives as a result of providing care.

Therefore, although the mean score on the SCQ 3 for Caucasians and Hispanics tend to increase over time (indicating more negative consequences in the life of the caregiver), and African-Americans means score tend to decrease over time, these numbers were not statistically significant. However, Hispanics experience significantly more negative consequences in their lives as a result of providing care than Caucasians or African-Americans. Figure 4.29 portrays the data graphically, indicating the differences in direction and slope over time for the three ethnic groups. The graph indicates that changes for Hispanics experience more consequences in their personal life as a result of providing care, and this remains relatively stable from one to six months. Caucasians experience more negative consequences over time, and African-Americans experience less negative consequences over time.

Summary of Results

This caregiver cohort experienced fairly stable quality of life outcomes over time. These caregivers did not score as depressed on average, and had fairly strong coping abilities at one and six months. The burden scores were low to moderate on the composite and subscale scores.
Figure 4.29 Changes in Mean Scores on the SCQ 3 by Ethnicity

Patient and caregiver characteristics did not influence the coping ability of the caregiver. Therefore, coping ability cannot be differentiated by stroke survivor income or functional status. Coping ability also cannot be differentiated by caregiver ethnicity, relationship to patient, or gender. However, the coping ability of the caregiver did greatly influence the quality of life outcomes experienced by the caregiver.

Caregiver burden at one month was predicted by relationship to patient (nonspouses experience less burden) and stronger coping buffered burden in this cohort at one and six months. Satisfaction was influenced by coping ability, as caregivers who had stronger coping abilities were more satisfied with their care recipient and with their own performance as a caregiver at one and six months. Caregivers experienced many negative consequences in their lives as a result of providing care. Specifically, the strongest predictors of these negative consequences at one month were patient functional status, relationship to patient, caregiver ethnicity, and caregiver coping. At six months, patient
functional status, caregiver ethnicity, and coping ability were the strongest predictors of negative consequences.

Caregiver depression was predicted at one and six months by patient functional status. Depression was buffered for those with higher coping abilities.

Patient characteristics did not influence time spent in caregiving role at one or six months. Hispanic caregivers are likely to spend more time in the caregiving role, while nonspouses are likely to spend less time in this role at one month. At six months, caregiver characteristics do not predict time spent in caregiving role. Overall burden level, satisfaction with the care recipient, satisfaction with their own performance as a caregiver, coping ability, and caregiver depression were not predicted by time spent in the caregiving role at one or six months. Time spent with the care recipient did significantly predict more negative consequences in the life of the caregiver at six months, but not at one month.

Mean responses on the quality of life measures for stroke caregivers did not detect change in either direction over time. Mean scores on the dependent measures differentiated by the independent variable (e.g., gender on GDS) did not differ by independent variable. When comparing beta weights over time, the only significant difference was for SOC. The beta weight for the TIME x SOC interaction was significant, indicating that the beta coefficient at six months is significantly less than at one month.

Interestingly, ethnic differences appeared in overall patterns of change in burden, depression, and coping ability. These were not statistically significant differences, but rather present interesting trends in the ethnicity data. Caucasian and Hispanic caregivers experience more depression at one month, but this level decreases slightly by six months,
while African-Americans experience a slight increase over time, but have average lower depression scores overall. Coping ability decreases for Caucasians and Hispanics over time, while coping ability sharply increased for African-Americans over time. Caucasian and Hispanic caregivers experience an increase over time in overall burden level, while African-Americans experience less burden over time. Caucasian and Hispanic caregivers experience more dissatisfaction with the care recipient at one and six months, while African-Americans experience less dissatisfaction over time. Caucasian and Hispanic caregivers are similar with their satisfaction with themselves as caregivers, and African Americans experience less satisfaction with their performance as caregiver over time. Hispanic caregivers experience more negative consequences in their personal life as a result of providing care at one and six months, while Caucasians experience more negative consequences over time, and African-Americans experience less negative consequences over time.
The preceding analyses offer some interesting insights into the stroke caregiving experience. The discussion will first examine the results of the descriptive analyses, then the path analyses, and finally will examine the remaining analyses. This study supports George and Gwyther’s (1986) contention that the caregiving experience is multidimensional, as the quality of life outcomes for stroke caregivers differ by patient and caregiver characteristics. In the following sections, empirical evidence on the impact of patient and caregiver characteristics on the caregiving experience and quality of life outcomes will be explored.

**Persistent Worry**

The caregivers in this study identified being worried about the deterioration of the care recipients physical health and the occurrence of another stroke. These descriptive findings support previous research that worry typically accompanies the stroke caregiving experience (Anderson et al., 1995; Kerr & Smith, 2001; Scholte op Reimer et al., 1998; Secrest, 2000; Snyder, 2000; Thommessen et al., 2001).

**Benefits of Caregiving**

In this study, many caregivers reported that doing things and providing care for the stroke survivor provided pleasure for them. Also, increasing the care recipients’ quality of life was identified as benefits of the caregiving experience. These findings support previous work that identified that caregivers can experience positive benefits as a
result of providing care (Cohen et al., 2002; Forsberg-Warleby et al., 2001; Hartke & King, 2003; Kinney et al., 1995; Silliman et al., 1986).

**Coping Ability**

Patient and caregiver characteristics have been shown to influence the ability for caregivers to cope. However, these data did not support any such findings. Patient functional status has been shown to have differential effects on caregiver coping. Some studies have found that income levels influence ability to cope. The data in this study did not support that these patient characteristics influence the caregivers’ ability to cope at one or six months. This may support the theory that coping ability is a personality trait, and is not differentially influenced by a dynamic concept like functional status or a static concept like income. Coping abilities which are typically thought of as personality traits are resiliency (Jacelon, 1997; Walsh, 1996), hardiness (Rochette & Desrosiers, 2002), and sense of coherence (Antonovsky, 1987; Rena, Moshe, & Abraham, 1996). Adding further support to this theory are the findings from this study that caregiver characteristics also did not influence the coping ability of the caregiver. Ethnicity, relationship to patient, and gender are static concepts that are not able to be changed; thus, the fact that they do not influence coping ability, indicates that coping ability does not differ for caregivers who are Caucasian, Puerto Rican Hispanic, or African American. Nor does coping ability differ for spouses and nonspouses, or male and females. These non-significant findings are interesting particularly from a psychosocial standpoint as they indicate that therapists may not need to differentiate between caregivers based on these factors when assisting them with coping mechanisms. Further, researchers may not need to differentiate between patient and caregiver characteristics when assigning caregivers to
interventional studies when coping ability is an independent variable. Of course, therapists and researchers need to consider language differences which may exist when providing care to individuals from a variety of backgrounds.

Coping ability of the caregiver significantly impacted all of the quality of life outcomes for stroke caregivers at both one and six months post stroke. This indicates that caregivers who positively appraise the situation may adapt better to the caregiving experience, supporting previous research (Rochette & Desrosiers, 2002). Better coping ability is associated in this study with significantly decreased overall burden, more satisfaction with the care recipient and more satisfaction with themselves as caregivers. Also, stroke caregivers who cope effectively experience fewer consequences in their personal life as a result of providing care, and also experience less depression. These results may be explained by recognizing that the caregivers in this study had a fairly high sense of coherence at one month, which likely buffered the potential deleterious effects of caregiving. This supports previous work that caregivers who have lower SOC have been found to be at higher risk of caregiving burnout and had increased difficulty coping with the caregiving situation (Nilsson, Axelsson, Gustafson, Lundman, & Norberg, 2001). These results speak to the importance of assisting caregivers with enhancing their coping abilities, so that they can decrease the detrimental impact of caregiving.

**Burden**

This study examined four components of burden, including an overall burden score and three dimensions shown to increase burden levels for caregivers. Two of the three dimensions did not have a lot of statistical support; however, overall burden level and negative consequences in the life of the caregiver did.
Overall burden level of the stroke caregiver was predicted by the relationship to the patient and the coping ability of the stroke caregiver. Nonspouses experience less overall burden than do spousal caregivers at one month, but this influence on burden disappears at six months. Therefore, it is possible that nonspouses feel initially more removed from the situation or the obligation to provide care, but by six months have accepted the caregiving role. These finding support previous work (e.g., Cohen et al., 2002; Morimoto et al., 2003) that found that spousal caregivers experience higher levels of burden than nonspousal caregivers. This may be due in part to findings that spousal caregivers are likely to remain in the caregiving role longer and are more likely to experience negative consequences as a result of providing care (Cohen et al., 2002).

This study did not support findings that gender influences burden level as previous studies have (Dennis et al., 1998; van den Heuvel et al., 2001; Yee, 1997; Yee & Schulz, 2000). This may be in part to previous work has found that women maintain the caregiving role longer than men (Yee & Schulz, 2000), so it is possible that over time there would be a significant gender difference.

This study did not support findings that patient functional status increases stress or strain for the caregiver (Blake, Lincoln, & Clarke, 2003; Jones, Charlesworth, & Hendra, 2000; van den Heuvel et al., 2001). Previous studies have found that when there is change in the physical, social, or mental functioning of the stroke survivor, these changes negatively influence the strain experienced by the caregiver (van den Heuvel et al., 2001). These findings may not be supported as the stroke survivors in this study have relatively high levels of physical functioning.
Caregivers with higher SOC in this study experienced less burden. These results support findings of previous work that found that caregivers of people with memory impairments who had higher SOC experienced lower levels of burden (Chumbler et al., 2003a; Gallagher et al., 1994). Two studies have examined SOC and burden in stroke caregivers, and each found that strong SOC tempers burden levels in this population (Chumbler et al., 2003b; Nilsson, Axelsson, Gustafson, Lundman, & Norberg, 2001).

**Satisfaction.** Dissatisfaction with the care recipient was predicted by coping ability of the caregiver. That is, caregivers who cope more effectively are able to feel more satisfied with the care recipient. Dissatisfaction with one’s own performance as a caregiver was only predicted by coping ability at one and six months, indicating that individuals who cope better experience more satisfaction with their role as a caregiver.

**Role disruption.** In this study, many patient and caregiver characteristics predicted that caregivers experience negative consequences in their personal lives as a result of providing care. This supports previous work that stroke caregivers experience distressing lifestyle changes as a result of providing care (Periard & Ames, 1993; Williams, 1994).

Patient functional status has an inverse relationship with the caregivers experiencing negative consequences in their personal lives as a result of providing care at one and six months. This is an intuitive predictor, as people who are less functionally impaired require less of the caregiver’s time, and thus impact the personal lives of the caregivers less severely than a person who has a lot of functional impairment. Caregiver characteristics also had significant influence on the negative consequences in their personal lives as a result of providing care, which supports previous work (Scholte op
Reimer et al., 1998). Increased burden in this area is likely to influence recreation and leisure activities, worry, and feeling unsure of how to care for the stroke survivor (Scholte op Reimer et al., 1998). Caregiver ethnicity is also a significant predictor of the caregiver experiencing negative consequences in their personal life as a result of providing care. Hispanic caregivers experience significantly more negative consequences than do Caucasian or African-American caregivers of stroke survivors. Relationship to the patient has an inverse relationship with the prediction of the caregivers experiencing negative consequences in their personal lives. This influence is present at one month, but disappears at six months, providing further support for the notion that nonspouses are more removed from the experience, but have accepted the role by six months. These findings are supported by DeLaune & Brown (2001) who identified that spousal caregivers particularly experience a decrease in social and recreational activities. Coping ability is strongly related with experience of negative consequences for stroke caregivers. Caregivers who cope better experience significantly less negative consequences in their lives as a result of providing care, which supports the theory that a stronger SOC buffers the negative effects of stressful situations (Gallagher et al., 1994).

**Depression**

Caregiver depression is significantly influenced by patient functional status at one and six months. That is, caregivers who provide care to individuals who have more functional impairments are likely to experience more depressive symptoms. These findings are consistent with previous studies that found that stroke caregivers are more likely to be depressed when providing care to individuals with higher functional
impairment (Dennis et al., 1998; Forsberg-Warleby et al., 2001; Grant, Elliott, Giger, & Bartolucci, 2001; Kotila, Numminen, Waltimo, & Kaste, 1998; Wright et al., 1999).

Coping ability is also significantly related to depression in caregivers, as caregivers who cope better experience less depression. This finding supports previous findings that depression is inversely associated with a strong SOC (Buchi, Sensky, Allard, Stoll, Schnyder, Klaghofer, & Buddeberg, 1998; Snekkevik, Anke, Stanghelle, & Fugl-Meyer, 2003).

This study does not support previous findings that caregiver depression is predicted by gender (King et al., 2001; Kotila et al., 1998). King and colleagues (2001) found that female caregivers were more likely to be depressed during the transition to home, but that at six months post stroke, an increased amount of men were also depressed.

**Time Spent in Caregiving Role**

Time spent in the caregiving role was predicted by caregiver characteristics, but not patient characteristics. Caregiver ethnicity predicted time spent in the caregiving role, with Hispanic caregivers most likely to spend more time with the care recipient, compared with Caucasians and African-Americans. This is in line with the previous findings that Hispanic caregivers experience significantly more negative consequences in their personal life as a result of providing care than Caucasians or African-Americans. So, the more time spent providing care naturally lends to the idea of the caregiver experiencing more negative consequences in the personal life as a result of doing so. Nonspouses spend significantly less time than spouses in the caregiving role at one
Time spent with the care recipient does not significantly impact the overall burden of the caregiver, satisfaction with the care recipient, and satisfaction with one’s own performance as a caregiver at one or six months. These results do not support previous work by Bugge et al. (1999) who found that the amount of time required to help the stroke survivor and the time spent with the stroke survivor were predictive of strain at one, three, and six months post stroke. Time spent with the care recipient does not predict the negative consequences experienced in the personal life of caregivers at one month, but it does at six months. This is intuitive, as the length of time of providing care increases, so does the consequences of this time on the personal life of the caregiver. This supports Bugge et al. (1999) findings that strain is increased at six months, and the amount of time spent with the stroke survivor at six months was predictive of strain. Dewey et al. (2002) also support these findings, as they found that most caregivers are likely to substitute time to care for leisure time.

Caregiver depression is also predicted by time spent with the care recipient at six months, but not at one month. This is likely due to a similar reason as the increased negative consequences for the caregiver, as depression levels increase over time when long periods of time are spent with the care recipient. These findings warrant further investigation over time, as numerous studies have found that time spent in the caregiving role impacts the ability of the caregiver to manage the caregiving experience (Bethoux et al., 1996; Bugge et al., 1999; Scholte op Reimer et al., 1998).
Changes Over Time

The mean scores on the outcome measures were not statistically significant at one or six months for change over time. Therefore, it is possible that coping ability, burden, satisfaction with the care recipient, satisfaction with one’s own performance as a caregiver, and depression levels remain constant over time for stroke caregivers. This is supported by two separate studies, which found that caregiver strain was present and fairly consistent at three and six months post stroke (Blake & Lincoln, 2000; Blake et al., 2003). Only the beta coefficient for the interaction of time and SOC on the negative consequences scale was significant. This indicates that at six months, caregivers experience significantly less buffer of coping ability on the negative consequences in their personal lives as a result of providing care. Literature to support or deny this interesting finding does not exist in the literature to my knowledge.

Ethnic Differences in the Caregiving Experience

There were no differences between the depression scores at one and six months in the specific ethnic groups or across the ethnic groups. When examining the data over time, trends in the Caucasian and Hispanic caregivers data showed an increase in depression level at one month, and this decreased by six months. Another trend in the data was that African-Americans experienced less depression overall. These trends are supported in the data, as White and colleagues (2000) found more Caucasian caregivers scored higher on than African-Americans on a depression scale. The finding that there were not significant differences in the depression levels by ethnicity support supports previous work (Cox, 1993; Knight & McCallum, 1998; Knight, Silverstein, McCallum, & Fox, 2000; White, Townsend, & Stephens, 2000). However, this same finding does not
support other work that Caucasian caregivers experience significantly more depression than African American (Farran, Miller, Kaufman, & Davis, 1997; Haley et al., 1995) or Hispanic caregivers (Harwood, Barker, Carntillon, Loewenstein, Ownby, & Duara, 1998), or that Hispanic caregivers tend to be depressed in the caregiving role (Cox & Monk, 1993). Several possible explanations for these differences exist. One, these studies were done on caregivers of dementia patients. The stroke caregiving experience may be quite different for ethnic groups. Two, different studies utilize different depression measures which may not be culturally sensitive. Finally, these other studies are cross-sectional and do not examine the same sample longitudinally.

Coping ability was not different for Hispanic and Caucasian caregivers. However, African-Americans scored as having significantly higher coping ability at six months. The mean scores for each ethnic group did not differ at one or six months. The trends in the data from one to six months revealed that coping ability decreased over time for Hispanics and Caucasians, but increased significantly for African Americans at six months. These findings support previous work that African Americans are likely to appraised their caregiving situation more favorably than Caucasian caregivers (Farran et al., 1997; Knight & McCallum, 1998; Knight et al., 2000). This may be due to African-Americans finding less stress in the caregiving experience (White et al., 2000).

Overall burden levels were not significantly different within the ethnic groups or across them. This supports previous research that burden does not differ by ethnicity (Cox, 1993; Cox & Monk, 1990; Cox & Monk, 1996). Caucasians and Hispanic caregiver data trended toward increasing over time, while African Americans trended toward decreasing over time. However, these findings dispute other studies which have
found that Caucasian caregivers experience more burden (Macera, Eaker, Goslar, Deandrade, Williamson, Cornman, & Jannarone, 1992). In this study, burden was measured as a composite score and with three separate subscales. Numerous studies examine overall burden in the caregiving experience, but few examine other dimensions of it, therefore, there is minimal literature on the burden specific components which are subscales used in this study. Therefore, few comparisons can be made with other studies. Satisfaction with the care recipient in this data was not different over time for the specific ethic group or across ethnic groups. However, the Caucasians and Hispanics trended toward experiencing more dissatisfaction with the care recipient, and African Americans dissatisfaction appeared to decrease over time. Satisfaction with one’s own performance as a caregiver was not significantly different between ethnic groups, or across them. Caucasians and Hispanics trended toward more dissatisfaction over time, while African Americans appear to experience more dissatisfaction which remains fairly stable from one to six months. Hispanic caregivers experienced significantly more negative consequences in their personal life as a result of providing care than African Americans or Caucasians. This supports Cox and Monk’s (1996) work that Hispanic caregivers experience higher personal strain than African American caregivers.

**Summary**

Overall, these findings support the idea that coping ability provides the strongest support for overall QOL for stroke caregivers. This supports previous work that the caregiver’s appraisal of the stress from the caregiving experience was a key determinant in overall QOL (Hodgson, Wood, & Langton-Hewer, 1996). George and Gwyther (1986)
recommended looking at many dimensions when studying the stroke caregiving experience, so as to more fully capture the nuances inherent in the experience.

As a result of this study, we know that patient and caregiver characteristics differentially influence the overall QOL for stroke caregivers. Caregiver characteristics had more influence overall than did patient characteristics. This is supported by previous findings that caregiving characteristics influence the quality of life outcomes for stroke caregivers (White, Mayo, Hanely, & Wood-Dauphinee, 2003) while patient functional status decreases in the QOL for stroke caregiver (White et al., 2003).

This work supports that better QOL for stroke caregivers is associated with functional coping styles (Smout et al., 2001). In this study, stroke caregivers experienced quite a bit of negative consequences in their lives as a result of providing care. This supports previous work by Thommessen and colleagues (2001) who found that stroke caregivers experience the burden as a result of a disruption in social, leisure and recreational activities.

**Implications for Future Research**

These data provide very interesting trends in the stroke caregiving experience. It is indicated and necessary to continue following these trends longitudinally. This is necessary to determine what patient and caregiver characteristics, if any, impact the stroke caregiving experience over the long term. This study should be repeated with a larger sample size to see if there are significant differences in the trends evident with Caucasians, Puerto Rican Hispanics and African Americans. Also, this study could be expanded to include other ethnic groups to compare the stroke caregiving experience.
It is also important to determine if the SOC continues to have a strong impact on the quality of life outcomes for stroke caregivers. Interventions which target the positive appraisal of stress and the SOC should be implemented and tested for efficacy with stroke caregivers. This study should be replicated with a primarily female sample of care recipients to determine if gender of the care recipient influences the quality of life outcomes for the stroke caregiver.

Implications for Practice

The sense of coherence is an important concept to understand when caring for caregivers. As demonstrated strongly by this study, and supported by other studies, a strong sense of coherence in stroke caregivers ameliorates high levels of burden and depression. Thus, rehabilitation therapists who provide care, support, or interventions for caregivers should assist the caregiver in developing or strengthening their SOC. This is particularly important, since it has been found that when family members cope effectively, there is a positive impact on the stroke survivor (Teasell, Foley, Bhogal, & Speechley, 2003). Since the patient and caregiver characteristics in this study did not significantly impact the SOC, it is indicated that when focusing on enhancing the SOC, rehabilitation therapists need not differentiate between caregivers who provide care for individuals with differing functional status, or income levels. Also therapists do not need to differentiate between ethnic groups, relation to patient and gender when working with caregivers on enhancing their SOC.

Limitations and Strengths

This study has a few limitations that should be addressed. First, these data are on caregivers whose care recipient has minimal to moderate functional impairment as
measured by the FIM motor, and inclusion in the larger study required a minimum score on the MMSE, which would screen out individuals with moderate to severe cognitive impairments. Also, these individuals were functional enough to be discharged to home, as opposed to a nursing home or long term care facility. Therefore, these caregivers are providing care to individuals with minimal to moderate overall functional impairment who are community-dwelling. Results may be quite different for caregivers providing care to individuals with severe levels of impairment and for care recipients who are not residing at home.

Also, the stroke survivors in this sample were almost all male (99%) since the data is derived from the VA medical care system. Therefore, these data may not be representative of providing care to both genders.

In addition, this study has the possibility of Type II error, that is not detecting results that are truly are significantly different. For this study, the alpha level was set at .05, following traditional social science literature. However, several data points had significance levels at less than or equal to .10. Therefore, these data may truly be indicating a difference that was not addressed in this study. Therefore, those items may require further investigation. In addition, increasing the sample size of all ethnic groups so that they are equivalent may change the trend data. It is important to continue this study, and increase the sample size so that these important data can be reviewed properly.

In spite of these limitations, there are numerous strengths to this study. First, the use of multivariate statistics and path models allowed a multidimensional examination of the stroke caregiving experience. Beta weights indicate the strength of relationships, as opposed to simply identifying if concepts are related. This study also had an a priori
power analysis, which indicated that the power for this study was quite strong. Further, this is one of a few studies that have examined caregiver quality of life in a diverse ethnic population of stroke caregivers. Most stroke caregiving studies do not control for ethnic variation, or examine the differences between the ethnic groups (Chumbler et al., 2003b; Han & Haley, 1999). Also, this study had 30% of caregivers who were nonspouses. This is important because more nonspouses, especially daughters, are taking on caregiving roles due to demographic changes in society (Chumbler et al., 2003a; Chumbler et al., 2003b). Finally, this study is one of the few to examine the caregivers’ quality of life outcomes at one and six months. Most studies have been cross sectional which limits the generalizability of these results, and lack the ability to examine the dynamic multidimensionality of the caregiving experience.

**Conclusion**

This study used multivariate techniques to determine beta weights of influential variables on the caregiving experience. The sense of coherence has significant influence on all quality of life outcomes included in this study. This indicates that to ameliorate the negative impact of caregiving, interventions should target this concept. Further, trends in the caregiving experience emerged by ethnicity with regards to the caregiving outcomes over time. These trends need to be examined longitudinally to determine if significant patterns emerge. Finally, this study supports the notion that the caregiving experience is multidimensional, as there are many influences on the quality of life for stroke caregivers.
APPENDIX

CALCULATION OF INDIRECT, DIRECT AND TOTAL EFFECTS FOR EACH QUALITY OF LIFE OUTCOME FOR STROKE CAREGIVERS AT ONE AND SIX MONTHS POST STROKE

Computation of Indirect, Direct and Total Effects of SCQ 1 month

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<th>SCQ COMPOSITE</th>
<th>Total R2=.32</th>
<th></th>
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<tr>
<td>FIM Mot 1</td>
<td>0.05</td>
<td>-0.45†</td>
</tr>
<tr>
<td>Income 2</td>
<td>-0.03</td>
<td>-0.45†</td>
</tr>
<tr>
<td>Income 3, 4, 5</td>
<td>0.006</td>
<td>-0.45†</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-0.02</td>
<td>-0.45†</td>
</tr>
<tr>
<td>African American</td>
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<td>-0.45†</td>
</tr>
<tr>
<td>Nonspouse</td>
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</tr>
<tr>
<td>Male</td>
<td>-0.12</td>
<td>-0.45†</td>
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</tbody>
</table>

† = p <.001    * p<.05

Computation of Indirect, Direct and Total Effects of SCQ 6 months

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</tr>
<tr>
<td>Income 2</td>
<td>0.03</td>
<td>-0.47</td>
</tr>
<tr>
<td>Income 3, 4, 5</td>
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<td>-0.47</td>
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<tr>
<td>Nonspouse</td>
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</tr>
<tr>
<td>Male</td>
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<td>-0.47</td>
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</tbody>
</table>

† = p <.001    * p<.05
Computation Table of Indirect, Direct and Total Effects on SCQ 1 month

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<th>Indirect of IV on SOC</th>
<th>SOC on Outcome</th>
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<th>Direct</th>
<th>TOTAL</th>
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<td>FIM Mot 1</td>
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<td>-0.37(^t)</td>
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<td>0.0974</td>
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<tr>
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<td>Nonspouse</td>
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\(^t\) = p < .001  \* p<.05

Computations of Indirect, Direct and Total Effects on SCQ1 6 months

<table>
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<th>SCQ 1</th>
<th>Independent Variable</th>
<th>Indirect of IV on SOC</th>
<th>SOC on Outcome</th>
<th>Total Indirect</th>
<th>Direct</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td></td>
<td>FIM Mot 6</td>
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<td>-0.0126</td>
<td>0.08</td>
<td>0.0674</td>
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<td>Income 2</td>
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<td>-0.42(^t)</td>
<td>-0.0126</td>
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<td>0.1374</td>
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<tr>
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<td>Income 3, 4, 5</td>
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<td>-0.42(^t)</td>
<td>-0.0126</td>
<td>-0.01</td>
<td>-0.0226</td>
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<td>Hispanic</td>
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<td>-0.42(^t)</td>
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<td>African American</td>
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<td>Nonspouse</td>
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\(^t\) = p < .001  \* p<.05

Computations of Indirect, Direct, and Total Effects on SCQ2 1 month

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<th>SCQ2</th>
<th>Independent Variable</th>
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<th>Total Indirect</th>
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<td>-0.47(^t)</td>
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<tr>
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\(^t\) = p < .001  \* p<.05
## Computations of Direct, Indirect, and Total Effects for SCQ 2 6 months

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<th>Indirect of IV on SOC</th>
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<th>Direct</th>
<th>TOTAL</th>
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<td>FIM Mot 6</td>
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<tr>
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<td>-0.12</td>
<td>-0.1072</td>
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<tr>
<td>African American</td>
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<td>0.0352</td>
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</tr>
<tr>
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<td>-0.32</td>
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<td>-0.148</td>
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<tr>
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*† = p <.001  * p<.05*

## Computations of Indirect, Direct and Total Effects for SCQ 3 1 month

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<th>Independent Variable</th>
<th>Indirect of IV on SOC</th>
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<td>0.0869</td>
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<tr>
<td>Income 3, 4, 5</td>
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<td>-0.00138</td>
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<tr>
<td>African American</td>
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<tr>
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*† = p <.001  * p<.05*

## Computations of Indirect, Direct, and Total Effects on SCQ3 6 months

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<td>-0.0132</td>
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<tr>
<td>Income 3, 4, 5</td>
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<td>-0.0132</td>
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<tr>
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<td>0.2576</td>
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<tr>
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*† = p <.001  * p<.05*
Computations of Indirect, Direct and Total Effects on GDS at 1 month

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<td>0.0146</td>
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</tr>
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† = p <.001  * p<.05

Computations of Indirect, Direct, and Total Effects on GDS 6 months

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<td>-0.0056</td>
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† = p <.001  * p<.05
REFERENCES


BIOGRAPHICAL SKETCH

Anna-Marie “Marieke” Van Puymbroeck was born in Tehran, Iran, in October 1972. She was born a Belgian and American citizen. She was raised primarily in Reston, Virginia, and attended undergraduate school at Longwood College in Farmville, Virginia. Marieke worked for five years as a recreation therapist in Myrtle Beach, South Carolina, prior to returning to graduate school at the University of Florida. Marieke completed her master’s degree at the University of Florida in therapeutic recreation. During her doctoral career, Marieke was awarded a VA Pre-Doctoral Health Rehabilitation Research Fellowship to fund her dissertation research. Marieke has accepted a faculty position in Disability and Aging in Leisure Studies at the University of Illinois, Urbana-Champaign. Marieke plans to continue to do research with caregivers, and has a particular interest in examining and enhancing quality of life for individuals with diseases and disabilities. In her spare time, Marieke enjoys reading, going to the beach or pool, spending time with family and friends, and playing with her dog, Honeybear.