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Alzheimer's Disease Dementia: Stress, Female Caregiver Burden, and Older Caregiver Health Outcomes

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Abstract

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MS, Rutgers University, 2002

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Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy
Community Health Promotion and Education

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Abstract

Alzheimer’s disease dementia caregivers are heavily engaged in providing daily assistance to individuals encumbered with Alzheimer’s disease, but these caregiving duties can have a devastating effect on caregivers’ self-reported health and mental outcomes. The purpose of this study was to evaluate older female caregivers’ background and contextual stressors and care stressors on caregivers’ self-reported harm to health resulting from the stress of caregiving, health status and emotional stress. The stress process model for Alzheimer’s caregivers served as the theoretical foundation for this study. Correlation and logistic and linear regression analysis were used to evaluate if a relationship exists between the independent and dependent variables. Independent variables included background and contextual stressors such as age, and income and demand for care stressors such as caregivers' stress stemming from the care-recipients' dependence for caregivers' help with getting out of bed and chairs and bathing. The dependent variables were older female caregivers’ self-reports of caregiving regarding their health and emotional stress. The study results revealed a significant relationship exists between age and marital status on caregivers’self-reported harm to health resulting from the stress of caregiving and income on health status as well as a significant relationship between the caregivers' stress stemming from the care-recipients' dependence for caregivers' help with getting out of bed and chairs on emotional stress. Findings from this study may raise caregiver, community, and government awareness regarding stressors, which can affect caregivers’ health and affect their ability to fulfill their caregiving role.

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Dedication

This dissertation is in memory of my beloved Mother, Hadiyah El-Amin Muhammad, the quintessential caregiver. I thank her for her unwavering love, patience, compassion and personal sacrifices.

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Chapter 1: Introduction to the Study

Introduction

Alzheimer’s disease is widespread in the United Sates and is the most prevalent form of dementia (Alzheimer’s Association, 2015). Approximately 5.3 million individuals in the United States are afflicted with Alzheimer’s disease (Alzheimer’s Association, 2015). About 5.1 million individuals, age 65 years and older, have Alzheimer’s disease. Roughly 200,000 individuals ages 65 years and younger have early onset Alzheimer’s disease (Alzheimer’s Association, 2015). Alzheimer’s disease destroys regular brain activity. Persons with the disease lose their ability to remember, read, speak, write, and think clearly (Alzheimer’s Association, 2015). They may experience mental confusion, becoming perplexed with how to identify loved ones and determine the time and where they are in terms of location (Alzheimer’s Association, 2015). They may also exhibit problematic behavior patterns such as aggression, depression, agitation, and sleep disruptions (Alzheimer’s Association, 2015). From a functional standpoint, people with Alzheimer's disease tend to lose control of managing their activities of daily living. Because the brain is not functioning at an optimal rate in people with Alzheimer's disease, assistance from the caregiver is essential in ensuring that the care recipient is safe and their psychological and physical needs are being addressed on a daily basis. Caregivers may need to take a primary role in helping care recipients with bathing, dressing, walking, eating, and toileting (Alzheimer’s Association, 2015). For individuals with a more progressive state of Alzheimer’s disease, caregivers may need to provide 24-

hour care. Around the clock care can entail changing diapers, applying wound care treatments, and administering tube feedings (Alzheimer’s Association, 2015).

Depending on the severity of the disease, informal caregivers may also play a fundamental role in Alzheimer’s disease care decision-making (Huang et al., 2015). They may become involved in ensuring that the personal, medical, and financial interests of their family members are protected by securing the power of attorney documents, healthcare proxy documents, and living and personal will documentation (Alzheimer's Association, 2016a).

Most people who assume the responsibility of taking care of an individual with Alzheimer’s disease are informal caregivers (Alzheimer’s Association, 2015). Alzheimer’s disease caregivers have the proclivity to develop emotional and physical disturbances. They may also suffer from financial setbacks due to having to reduce hours at work or relinquishing their employment status because of the demands of caregiving (Mausbach et al., 2012; Pearlin et al., 1990; Vitalinao, Zhang & Scanlon, 2003).

Pearlin et al. (1990) highlighted that methods of coping and social support can mitigate the negative outcomes experienced by caregivers. Coping can be perceived as how a caregiver manages the caregiving situation (Pearlin et al., 1990). A caregiver may choose to use humor, positive thinking, lean on friends and relatives, or reach out to members of their religious community for emotional support to help them deal with their caregiving situation (Gallagher et al., 2011; Heo, 2014). Caregivers may also choose to join a caregiver support group to help them deal with the stressors of caregiving (Pearlin et al., 1990). Research suggests that coping and social support can serve as buffers to help ease the emotional burden affiliated with caregiving (Heo, 2014; Pearlin et al., 1990). Chapter 1 addresses the background of the study topic, problem statement, purpose, research questions, theoretical basis, and nature of the study.

Background

Alzheimer's disease caregivers may be overwhelmed with providing caregiving duties for a loved one, which could conflict with their work, social and family life (Pearlin et al., 1990). Caregivers may experience significant amount of stress and caregiver burden stemming from caregiving, which can ultimately influence their health outcomes (Buhr et al., 2006; Hazzan et al., 2014; Heo, 2014; Huang et al., 2008).

Buhr et al. (2006) found that older Alzheimer's disease or stroke-induced dementia caregivers with higher stress had more frequent visits to the hospital, sick days, and illnesses. Caregivers also reported that their poor health status served as a catalyst to institutionalizing Alzheimer's disease or vascular dementia care recipients (Buhr et al., 2006). Similarly, Hazzan et al. (2014) revealed that Alzheimer's disease caregivers who provided care for a minimum of four hours daily over a six-month period had a lower quality of life.

Andren and Elmstahl (2008) determined that there was an association between older dementia caregivers' burden and health. They found that caregivers' self-reported high burden of strain, isolation, disappointment, and emotions were strongly associated with lower quality of life outcomes relating to anxiety, physical pain, and energy (Andren & Elmstahl, 2008). A caregiver burden questionnaire and health-related questionnaire was used to measure caregivers' burden and health among older caregivers (Andren & Elmstahl, 2008).

Papastavrou, Kalokerinou, Papacostas, Tsangari, and Sourtzio (2007) evaluated the relationship between caregiver burden and depression among older caregivers and found that care-recipients apathetic behavior predicted caregiver depression. Hall et al. (2014) determined that there was a relationship between care recipients’ cognitive deficiencies and caregiver burden. They found that caregiver's self-reported burden was strongly associated with care recipients’ severe dementia, sleep, and psychological disruptions. A caregiver burden questionnaire and depression questionnaire was used to measure caregivers' burden and depression among older caregivers (Papastavrou et al., 2007). A cognitive ability test was used to measure care-recipients' cognitive abilities and a caregiver burden questionnaire was used to measure caregivers' burden.

While caregiver stress and burden can produce adverse outcomes such as depression and anxiety, factors such as coping and social support could mitigate these outcomes (Häusler et al., 2016; Heo, 2014; Wilks & Croom, 2008). Heo (2014) found that spiritual coping could be mediate or moderate the relationship between caregiver burden, and depression among older caregivers. Heo (2014) found that caregivers who used positive religious coping such as seeking a spiritual connection with God reported lower burden and depression while caregivers who used negative religious coping relating to spiritual discontent reported more burden and depression. A religious coping questionnaire was used to measure caregivers' religious coping.

Häusler et al. (2016) analyzed how caregivers' dyadic coping played a role in mediating the effect between older Alzheimer's disease spousal caregivers' stress and quality of life outcomes, and determined that dyadic coping mediated the relationship between caregivers' stress and quality of life outcomes. A dyadic coping inventory questionnaire was used to measure caregivers' dyadic coping and a quality of life questionnaire was used to measure caregivers' quality of life (Häusler et al., 2016). Wilks and Croom (2008) determined that caregivers' social support from family and friends moderated the effect of stress and resilience among older Alzheimer’s disease caregivers. They found that caregivers who had a great deal of interaction with family and friends reported less feelings of nervousness and rising difficulties and higher resilience while caregivers who had less interaction with family and friends reported more feelings of nervousness and rising difficulties and lower resilience.

The conceptual framework of Pearlin et al.’s (1990) stress process for Alzheimer’s caregivers stress served as the theoretical underpinning for this study and used as the basis to build on previous Alzheimer’s disease caregiver literature. The basis for conducting this research is to identify the stress and caregiver burden variables that can potentially influence caregiver outcomes and discuss the literature related to coping and social support networks and how they potentially have a moderating effect on outcomes in older Alzheimer’s disease caregivers. This study aims to fill the gap in the literature regarding stress, burden, and self-reported health outcomes in older female Alzheimer’s disease caregivers. Because older adults are often in a fragile state and are dealing with their own set of healthcare issues, providing care for another person can add extra difficulty. Building on previous research and given that a majority of Alzheimer's disease caregivers are female, the focus of this study was to uncover which caregiving challenges were unique to older female Alzheimer's disease caregivers and which caregiver stress variables predicted caregiver health outcomes . Results from this study may aid interventionists in tailoring caregiver support programs that are specific for older female caregivers, which in turn may help to ease stress and burden stemming from caregiving.

Problem Statement

Dementia is a condition that causes disorders that affect the brain (National Institute of Neurological Disorders and Stroke [NINDS], 2015). These symptoms appear when the nerves in the brain die and no longer function properly (NINDS, 2015; Popescu et al., 2014). People with dementia experience significant cognitive, emotional, and physical impairments, which interfere with relationships and daily living activities (NINDS, 2015). There are many forms of dementia. Alzheimer’s disease is the most common form, afflicting more than 5.3 million individuals (Alzheimer’s Association, 2015). In 2014, more than 15 million American caregivers provided noncompensatory care to family members with Alzheimer’s disease and 17.9 billion hours of caregiving. The economic value of noncompensatory caregiving for people with dementia was $217.7 billion (Alzheimer’s Association, 2015). It is forecasted that by 2030, Alzheimer's disease diagnoses will increase by 35%. It is expected that care for individuals with dementia will also increase, highlighting that dementia care has become a prominent public health issue (Alzheimer’s Association, 2015).

Attending to the needs of someone with Alzheimer’s disease can be a stressful and burdensome experience and significantly influence caregivers' emotional and physical stability, hence presenting a serious social problem (Andren & Elmstahl, 2008; Vitaliano, Zhang & Scanlan, 2003). Caregivers often suffer from social isolation, physical stress, emotional duress, depression, anxiety, and financial strain as a result of providing care (Adelman et al., 2014; Rosdinom, Norzarina, Zanariah & Ruzzana, 2011). Many caregivers have limited ability to cope with care recipient behavioral problems and are overwhelmed attending to the care recipients’ essential needs (Kim et al., 2011).

A majority of Alzheimer disease caregivers in the United States are female comprising 60% to 70% of the Alzheimer’s disease caregiver workforce; 34% are 65 years or older and about one-third of Alzheimer's disease female caregivers in the United States provide around the clock care (Alzheimer’s Association, 2010; Alzheimer’s Association, 2015). Female caregivers who hold multiple roles such as caring for a love one with Alzheimer's disease at home while also maintaining a full time job are likely to experience negative consequences in the workplace. For instance, caregivers may have to take an early retirement, resign from a position at work, or turn down work promotions to focus on caregiving demands (MetLife Mature Market Institute, 2010). Female caregivers may also experience high caregiver stress, caregiver burden, and depression in response to caregiving demands (Pinquart & Sorenson, 2006; Willette-Murphy, Todero, & Yeaworth, 2006).More research is needed to explain how these relationships are evaluated among older female Alzheimer’s disease caregivers; hence, further evaluation is warranted. This research discusses existing literature regarding cognitive impairment caregiving with an emphasis on Alzheimer’s disease caregiving among older female caregivers. The independent and dependent variables for this study were derived from Pearlin’s Alzheimer’s disease caregivers’ conceptual stress process model.

Background and contextual stressors (caregiver’s age, income, education, marital status, whether the care recipient lives with the caregiver), demand for care stressors (toileting, challenging behaviors, moving out of beds/chairs, getting dressed, feeding, diapers, and bathing) served as the independent variables. Twelve independent variables were evaluated in this study. The caregivers’ self-reported harm to health resulting from the stress of caregiving, health status, and emotional stress served as the three dependent variables for the study. Responses from the 2015 National Alliance for Caregiving (NAC) and American Association of Retired Persons (AARP) Survey on Caregiving in the United States, 2015 were used as measurements to assess caregivers' harm to health resulting from the stress of caregiving, health status, and emotional stress.

Purpose of the Study

The goal of this quantitative research study was to determine the impact of background and contextual stressors and demand for care stressors on caregivers’ self-reported health in older female Alzheimer's disease caregivers. Due to the complex nature of Alzheimer’s disease and cognitive impairment caregiving, understanding the various influences that affect caregivers’ self-reported health in older female Alzheimer's disease caregiver populations is warranted.

Study variables were based on the questions contained in the 2015 NAC / AARP Survey on Caregiving in the United States and basis for the questions were derived from the conceptual framework of Pearlin et al.'s (1990) stress process model for Alzheimer's caregivers'. The independent variables for this study were background and contextual stressors, and demand for care stressors. The dependent variables for this study were the caregivers' self-reported harm to health resulting from the stress of caregiving, health status, and emotional stress.

Research Questions/Hypotheses

The research questions/hypotheses under evaluation for this study are as follows:

RQ1: Does a significant relationship exist between background and contextual stressors (age, income, education, marital status, whether the care recipient lives with the caregiver), demand for care stressors (toileting, challenging behaviors, moving out of beds/chairs, dressing, feeding, diapers, and bathing), and caregivers' self-reported harm to health resulting from the stress of caregiving among older female Alzheimer's disease caregivers?

H_01: No significant relationship exists between caregivers' self-reported beliefs that their caregiving experiences harmed their health and the combination of background contextual factors, and demand for care stressors.

H_a1: A significant relationship exists between caregivers' self-reported beliefs that their caregiving experiences harmed their health, and the combination of background contextual factors, and demand for care stressors.

RQ2: Does a significant relationship exist between background and contextual stressors, demand for care stressors, and caregivers' self-reported health status among older female Alzheimer's disease caregivers?

$H_0$2: No significant relationship exists between caregivers’ self-reported health status and the combination of background and contextual stressors and demand for care stressors.

H_a2: A significant relationship exists between caregivers’ self-reported health status and the combination of background and contextual stressors and demand for care stressors.

RQ3: Does a significant relationship exist between background and contextual stressors, demand for care stressors and caregivers’ self-reported emotional stress among older female Alzheimer's disease caregivers?

$H_0$3: No significant relationship exists between caregivers’ emotional stress and the combination of background and contextual stressors and demand for care stressors.

H_a3: A significant relationship exists between caregivers’ self-reported emotional stress and the combination of background and contextual factors and demand for care stressors.

Theoretical Basis

The stress process model for Alzheimer's caregivers' was used as the theoretical foundation for this research. Pearlin et al. (1990) constructed the stress process model for Alzheimer's caregivers' to assess stress within the framework of informal caregiving. The model is comprised of four domains with each domain containing several components. The four domains are background and contextual stressors, demand for care stressors and secondary strains, moderators of stress, and health outcomes or manifestations resulting from stress (Pearlin et al., 1990). Caregiver background and contextual stressors include age, gender, education, ethnicity, financial status, and occupation. Demand for care stressors relate to the caregiver's stress stemming from the care recipient’s need for help with activities of bathing, dressing, toileting, and transferring from bed and chairs. Caregivers' stress may also stem from having to contend with the care-recipient's cognitive status (memory problems), behavior problems (foul language and threatening behavior), and self-reported stress experienced by the caregiver. These stressors can lead to other problems, (e.g., loss of self, competence) which are considered secondary strains (Pearlin et al., 1990). Secondary strains involve activities that occur outside of the caregiving realm but could complicate the caregiver process. For example, caregivers may experience conflicts with family, work, and financial hardship because of their caregiving responsibilities (Pearlin et al., 1990). Caregivers may also begin to lose a sense of self and may have the propensity to develop depression or other mental ailments (Willette-Murphy, Todero, & Yeaworth, 2006). Because how a person chooses to mitigate stress will vary from caregiver to caregiver, examining caregiver's use of coping and social support variables may help to explain how coping and social variables can influence caregiver health outcomes (Heo, 2014; Wilks & Croom, 2008). Caregivers' use of coping and social support to help ease the burden of caregiving were discussed in the literature review but were not analyzed in this study since the NAC/American Association of Retired Persons (AARP) Survey on Caregiving in the United States, 2015 did not contain questions relating to caregivers' use of coping and social support.

The Pearlin et al. (1990) stress process model for Alzheimer’s caregivers was used as the foundation to assess the variables under study. All aspects of the Pearlin et al.

(1990) stress process model for Alzheimer's caregivers' are important in outlining the stressors that stem from the Alzheimer's disease caregiver experience (see Figure 1).

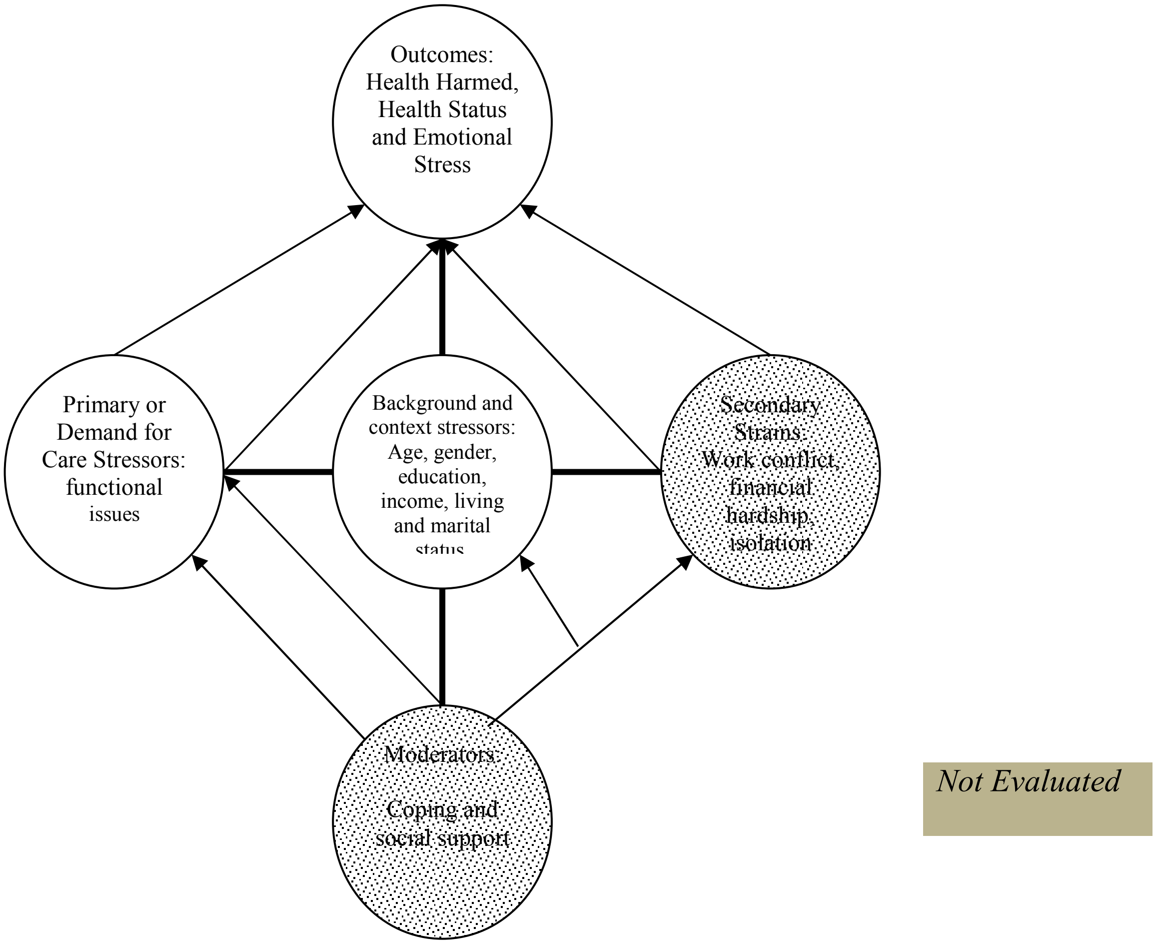

Figure 1. Alzheimer's disease caregivers' stress process model.

Nature of the Study

A nonexperimental correlational quantitative research approach was used to conduct this study. Correlation and linear regression analysis was used to evaluate the relationship between caregivers background and contextual stressors, demand for care stressors and older female Alzheimer's disease self-reported harm to health resulting from the stress of caregiving health status, and emotional stress. A secondary archival dataset was used to extract study data for analysis. The 2015 NAC/AARP Survey on Caregiving in the United States, 2015 open data set was used as the secondary dataset resource for this study.

Definitions

Alzheimer's disease caregiver: A family member who is responsible for addressing emotional, physical, and sometimes financial needs for a person with Alzheimer's disease (Alzheimer's Association, 2015).

Background and contextual stressors: The characteristics of the Alzheimer's disease caregiver that could impact their self-reported outcomes. Age, gender, education, income, marital status, and living status are some of the stressors that can impact caregivers' self-reported outcomes (Pearlin et al., 1990).

Caregiver burden: An emotional, psychological, physical, and social response to self-reported stress that has been negatively associated with caregivers' health outcomes (Andren & Elmstahl, 2008; Huang et al., 2008; Kim et al., 2011). In the framework of Pearlin's Alzheimer's disease caregivers' conceptual stress process model, addressing the physical needs of a care recipient on an everyday basis contributes to caregiver burden and is affiliated with caregivers' self-reported health outcomes (Pearlin et al., 1990).

Self-reported health outcomes: The self-reported assessment of an individual's physical, mental, financial, and social status (Felce & Perry, 1995; Lee, Martin & Poon, 2017).

Demand for care stressors: These stressors stress stem from the care-recipient's dependence on the caregiver for help with toileting, moving out of beds/chairs, dressing, feeding, diapers and bathing and from the caregiver having to manage the care-recipients' problematic behavior (e.g., wandering, combative, hallucination) (Alzheimer's Association, 2015). Caregivers often need to extend a considerable amount of attention and care to the care recipient to meet the care-recipient's daily needs (Alzheimer’s Association, 2015). Caregiving can become intense and lead to caregiver overload (Pearlin et al., 1990).

Assumptions

The following assumptions were made in this study. It was assumed that the respondents in the study comprehended the questions contained in the 2015 NAC/AARP Survey on Caregiving in the United States. It was assumed that the caregivers provided honest responses to the questions contained in the NAC/AARP Survey on Caregiving in the United States, 2015. It was assumed that the 2015 NAC/AARP Survey on Caregiving in the United States was aimed at the intended audience, older female Alzheimer's disease caregivers. It was also assumed that survey responses were captured and recorded accurately.

Scope and Delimitations

Results from this study add to the existing caregiving literature and research. Using the 2015 NAC/AARP Survey on Caregiving in the United States dataset, caregivers who were female, 50 years of age or older, and provided care to another individual with Alzheimer’s disease was selected for inclusion in this study. Statistical methods were used to establish the potential generalizability of research outcomes to a broader audience of older female Alzheimer's disease caregivers and inferences were made about the sample population represented in this study were made.

Limitations

A potential deficiency of the study is that it was difficult to determine which instruments in the 2015 NAC/AARP Survey on Caregiving in the United States were employed to determine the reliability and validity of survey questions as this information was not provided publicly. Face validity was used as the primary measurement of validity; consequently, it was unclear whether the items in the data set were measured as intended. Since the archival data obtained in this study was self-reported, it may be subjected to participant bias (e.g., recall bias and honesty) and interviewer bias (e.g., change in scores over time) (McKenzie, Neiger & Thackeray, 2009). In addition, there were a number of limitations surrounding the collection of secondary data for study. The data was collected by another researcher. Hence I was not able to authenticate the quality of the data and did not cover all of the intended study requirements.

Another limitation is that this study did not cover other factors that may influence caregiver stressors that may occur throughout the process of caregiving such as a life changing events . Caregivers' lives may change due to a recent loss of a family member, which may cause a disruption to a caregiver's psychological stability, hence complication the caregiving situation (Romas & Sharma, 2017). In addition, this study did not cover the role of the caregiver's use of protective factors such as mediation and humor to reduce caregiver's stress (Romas & Sharma, 2017). In addition, caregiver's use of social support can play a role in mitigating the adverse health effects associated with caregiving, however, the role of social support and coping in the context of caregiving support was discussed in this study but were not evaluated.

Significance

It is anticipated that by 2025, 7.1 million individuals 65 years and older will have developed Alzheimer's disease (Alzheimer's Association, 2015). This increase in number will significantly affect families and caregivers because it is forecasted that more people will develop Alzheimer's disease and more caregivers will be needed (Alzheimer's Association, 2015). Alzheimer's disease caregivers can face an inordinate amount of emotional stress, and about 40% of caregivers develop depression (Alzheimer's Association, 2015; Wortmann, 2012). Because of the emotional and physical impact of caregiving, $9.7 billion dollars in additional healthcare costs were spent on Alzheimer's disease caregivers to address their healthcare needs (Alzheimer's Association, 2015). There are a number of caregiver stressors that influence health outcomes of Alzheimer's disease caregivers; many of these health outcomes such as depression, anxiety, and isolation are considered harmful (Pearlin et al., 1990).

Without members in the society having a full comprehension of the Alzheimer's disease caregiver experience, and the need for coping and support services to assist caregivers to continue in their role as caregivers', caregivers may continue to be significantly burdened with Alzheimer's disease caregiving (Alzheimer's Association, 2004; NAC, 2015). This study may provide additional information about how stress and caregiving burden influence caregivers' self-reported outcomes among older female caregiver population. Moreover, additional caregiver study information can be shared with members of Congress, and the Alzheimer’s Association. Sharing study information with both groups can serve two purposes. First, members of Congress can become more knowledgeable about the Alzheimer’s disease caregiving process among vulnerable populations. Second, the dissemination of additional findings can help the Alzheimer’s Association engage members of Congress to allocate more expenditures for Alzheimer’s disease research.

Furthermore, findings from this study can help bring improved Alzheimer's disease awareness to family and friends of people with Alzheimer's disease, members of the government and community. In doing so, program planners, policymakers, and advocacy groups can develop programs, campaigns, and interventions with relevance and accuracy, which could help reduce burdens and improve outcomes for older female Alzheimer’s disease caregivers. Results from this research study could serve to lead to positive social change by providing insightful information to family and friends of people with Alzheimer's disease, members of the government and community about the challenges that older female Alzheimer’s caregivers’ battle when providing care for individuals in their home setting and by promoting caregivers' overall need for extra caregiver support. In addition, the results from this research can provide more clarity regarding the current realities of Alzheimer’s disease caregiver duties as well as inspire older female caregivers to incorporate self- health approaches to mitigate caregiving stress (e.g., meditation, self-reflection).

Summary

Taking care of a person with Alzheimer’s disease can cause stress, pose a considerable amount of responsibility and financial hardship on caregivers, and is affiliated with adverse health effects (Huang et al., 2008). Care recipients' cognitive impairment, need for help with activities of daily living (e.g., bathing, dressing), and problematic behavior patterns add to the overall personal stress and burden of Alzheimer’s disease caregivers (Pearlin et al., 1990). Moreover, women bear the brunt of Alzheimer’s disease caregiving, and approximately half of the women who provide care spend at least 40 hours per week attending to the needs of care recipients (Alzheimer’s Association, 2010). Acknowledging the impact of coping and social support and how such factors can serve to reduce Alzheimer’s disease caregiving stress, burden, and self-reported health outcomes are essential. In Chapter 2, the theoretical underpinnings of Alzheimer’s disease caregiving, the literature search strategy, a literature overview regarding stress, burdens, and self-reported health outcomes in older female Alzheimer's caregivers, and the impact of coping and socialization support methods on their self-reported health outcomes are discussed.

Chapter 2: Literature Overview

Introduction

The focus of this chapter is to discuss how background and contextual stressors and demand for care stressors influence older female Alzheimer's caregivers' self-reported health and to determine if coping and social support methods play a part in moderating the effect between caregivers' background and contextual stressors, demand for care stressors and caregiver's self-reported health. Alzheimer's disease caregiving can place an untold amount of stress and burden on caregivers and contribute to caregivers' adverse health outcomes such as depression and anxiety (Andren & Elmstahl, 2008). In comparison to other caregiver groups, Alzheimer's disease caregivers spend additional time towards caregiving and duties are more laborious from a physical and emotional standpoint. Caregivers may suffer economic loss due to providing full-time care or may be required to attend to the various needs of the care recipient at home while simultaneously carrying out duties in the workplace. Caregivers are primarily comprised of women and are considered informal caregivers (Alzheimer's Association, 2010). In addition, it is more likely that caregivers who are 65 years and older are unpaid and tend to provide care for more extended periods compared to younger caregiver groups (AARP, 2009; NAC, 2009). Alzheimer's disease caregiving is overwhelming and daunting, and the tasks associated with such a process could produce negative health outcomes among caregivers (Alzheimer's Association, 2015; Gonzalez, Polansky, Lippa, Walker, & Feng, 2011; Pearlin et al., 1990). While both stress and caregiver burden can have a negative influence on older Alzheimer's caregiver outcomes, more research is needed to understand to what extent older female caregivers' health is impacted by caregivers' stressors to fill the gap in knowledge in the caregiving literature.

Importance of the Problem

Caregiver stress could be considered a consequence of a combination of stressors (Pearlin et al., 1990). These stressors may be derived from the overall caregiving experience (Pearlin et al., 1990). Caregivers may become overwhelmed with the caregiving situation leading to feeling of isolation, anxiety depression (Alzheimer’s Association, 2015; [FCA], 2015;Pearlin et al., 1990; Willette-Murphy, Todero, & Yeaworth, 2006).Caregivers may be responsible for helping care recipients with bathing, dressing, and toileting and managing care recipients' challenging behavior (e.g., aggression, agitation). Caregivers may also be responsible for other areas of care, including managing the care recipient’s medication schedule, going grocery shopping, cooking, and cleaning (FCA, 2015; Pearlin et al., 1990). Because of the intensity of stressors and strains due to providing care for a person with Alzheimer’s disease, it is possible for caregivers to experience unpleasant health outcomes. Understanding how caregivers’ coping and socialization support methods influence caregivers' health outcomes, it is essential to further explore why caregivers' use of coping and social support is important in influencing caregivers’ health outcomes (Heo, 2014;Pearlin et al., 1990; Wilks & Croom, 2008).

Literature Search

A literature search on Alzheimer’s disease caregiving was conducted using the following terms: *Alzheimer’s disease*, *dementia*, *caregiver*, *burden*, *caregiver burden*, *coping*, *health*, *interventions*, *social support*, *stress older*, *quality of life*, *health,* and *demographic factors*. Academic Search Premier, Google Scholar, Medline, PsycINFO databases, and reference list were used to conduct the literature search. Academic Search Premier, Google Scholar, Medline, and PsycINFO as well as reference lists yielded 48 full-text articles to address research questions.

Theoretical Underpinning

The theoretical framework for this study is Pearlin et al.’s (1990) Alzheimer's disease caregivers' conceptual stress process model. The model is commonly used in caregiver research and the model consists of the following variables: background and contextual stressors, demand for care stressors, secondary strains, moderators, and health outcomes (Pearlin et al., 1990; see Appendix A). The next section will include a literature overview of key caregiver stressors that contribute to Alzheimer’s disease caregivers’ stress.

Literature Review and Key Variables

Background and Contextual Stressors

Background and contextual stressors outlined in Pearlin et al. (1990) stress process model for Alzheimer's caregivers' relate to the characteristics of the caregiver and include the following: age, gender, ethnicity, caregiving history, family and social resources, and economic, educational, and occupational status. These factors influence the caregiving experience and are taken into consideration while evaluating the overall stress process for Alzheimer's caregivers. The background and contextual stressors for this study were age (50 years or older), educational level, gender (female), income, marital and residential status (see Appendix B). The next section is a compilation of reviews of literature on background and contextual stressors.

Age and educational status. Serrano-Aguilar, Lopez-Bastida & Yanes-Lopez (2006) evaluated how caregiver characteristics predicted self-reported burden and health outcomes in 237 Alzheimer's disease caregivers. Education, age, and gender were predictors of caregivers' self-reported burden and outcomes (Serrano-Aguilar et al., 2006). In terms of education, Serrano-Aguilar et al. (2006) found that adult-child caregivers who had more education reported better health-related outcomes. In terms of age, high levels of burden among caregivers were directly related with increased age family relationship, and education status (Serrano-Aguilar et al., 2006). Germain et al. (2009) determined that being a younger Alzheimer's disease caregiver served as a predictor of caregiver burden. Caregiver and care recipient relationship, care recipients' cognitive impairments, behavior and eating problems, being married, and being male was also associated with caregiver burden (Germain et al., 2009). Cook, Snellings, and Cohen (2018) reported that younger adult children caregivers were more likely to experience caregiver burden than older adult children caregivers were (*n* = 1014). Also, when tending to the physical needs of care-recipients, the social burden was more pronounced in older adult children caregivers than younger adult children caregivers (Cook et al., 2018).

Gender, residential status, and role overload. Women primarily make up the Alzheimer's disease caregiving community, thus are mostly responsible for taking care of individuals with Alzheimer's disease (Alzheimer's Association, 2014). Female caregivers are two times more likely to provide 24-hour care for a person with Alzheimer's disease than male caregivers (Alzheimer's Association, 2014). Furthermore, female caregivers received less social support and experience more adverse health effects associated with caregiving than male caregivers (Alzheimer's Association, 2014). Researchers have determined that gender was a significant factor in predicting caregivers' self-reported stress and negative outcomes. Female caregivers tended to experience more self-reported stress and negative outcomes than male caregivers (Kosmala & Kloszewska, 2004; Mausbach et al., 2013; Robinson, Son & Weinrich, 2001).

Robinson et al. (2001) studied how gender influenced caregivers' self-reported burden and depression in 23 female caregivers and 7 male caregivers. They determined that female caregivers reported more adverse responses to care recipients' negative behavior and depression than male caregivers did. They also found that female caregivers were less engaged in life activities and experienced worse health than male caregivers experienced (Robinson et al., 2001). A study by Mahoney, Regan, Katona, and Livingston (2005) found that caregiver's' gender, relationship type, employment and marital status, and living with children under 18 years, influenced caregivers' emotional outcomes. Mahoney et al. (2005) evaluated the role of gender on self-reported health in 153 caregivers. They determined that male care recipients were more likely to be cared by female caregivers (Mahoney et al., 2005). Furthermore, they found female caregivers had more notable levels of anxiety and depression than male caregivers did (Mahoney et al., 2005). Other variables impacted caregivers' self-reported health such as care recipients' reliance for help caregiver/care recipient relationship, and caregiver living with their care recipient (Mahoney et al., 2005).

A study by Kosmala and Kloszewska (2004) examined how gender, depression, stress, burden, and hopelessness influenced life satisfaction in 99 caregivers. They found that female caregivers had greater stress, depression, health issues, and burden than male caregivers (Kosmala & Kloszewska, 2004). However, when factoring in care recipients' negative behavior, male caregivers experienced more self-reported stress than female caregivers did (Kosmala & Kloszewska, 2004).

A more current study produced similar findings. Mausbach et al. (2013) evaluated the impact of gender on stress, coping, and social support on emotional outcomes in 125 caregivers and 60 non-caregivers; they further evaluated these relationships comparing male to female caregivers (Mausbach et al.,2013). Overall, caregivers had a higher risk for depression, reported greater levels of stress, depression symptoms, activity restrictions, mood disturbances, and fewer feelings of joviality than non-caregivers (Mausbach et al., 2013). They also reported that caregivers had less access to external social support (e.g., pleasant activities) and less internal coping skills (e.g., self-efficacy for problem-focused coping) than non-caregivers (Mausbach et al., 2013). No differences were observed between caregivers in comparison to non-caregivers in the following areas of coping: positive religious, self-efficacy, and problem-focused (Mausbach et al., 2013). Also, Mausbach et al. (2013) determined that female caregivers reported a greater number of negative health effects from providing care than male caregivers (Mausbach et al., 2013). Male caregivers reported fewer levels of role overload, symptoms of depression, better sleep quality and higher self-efficacy rates (problem-focused coping) than female caregivers (Mausbach et al., 2013). On the other hand, male caregivers reported more negative coping strategies than female caregivers (Mausbach et al., 2013).

Mausbach et al. (2013) said that gender affects a caregivers' perception of overload and predicts depression and vulnerability in caregivers. Furthermore, they found that tendencies towards experiencing role overload, depression, and vulnerability were more prevalent among female caregivers compared to male caregivers and that psychological, educational, coping, and social support intervention services are needed to help manage caregivers' distress (Mausbach et al., 2013).

Income. Researchers have determined that Alzheimer's disease caregivers' income was a significant predictor in influencing caregivers' health or quality of life (Covinsky et al., 2003; Gonzalez et al., 2011; Vellone, Piras, Taluccii & Cohen, 2008). Covinsky et al. (2003) studied the impact of income on the relationship between caregiver's depression in older caregivers and care recipients (N = 5,627); caregiver's mean age was 64 years (Covinsky et al., 2003). They determined that low income was a strong predictor of depression. Caregivers in the low-income category, less than $10,000 per year, experienced a greater level of depression compared to caregivers in a higher income bracket, more than $20,000 per year (Covinsky et al., 2003). Caregivers' weakened functional state, relationship to care recipient, and increased caregiving time were all notable predictors of caregiver's depression (Covinsky et al., 2003).

Gonzalez et al. (2011) also evaluated the influence of income on health in 121 high and low risk caregivers. Caregivers who depicted their health as “fair" or "poor," and had a minimum of one health condition recorded in their medical history (e.g., diabetes and arthritis), were considered high risk (Gonzalez et al., 2011). Caregivers who reported that their health was either "fair" or "poor" and had no recorded health problem noted in their medical history were considered low-risk caregivers (Gonzalez et al., 2011). They also determined that high-risk caregivers' with low income had poorer health than the low-risk caregivers (Gonzalez et al., 2011). A host of other variables affected the caregivers' health, which included caregivers' self-reported stressors relating to the demands of care and self-reported burden (Gonzalez et al., 2011).

Vellone et al. (2008) studied caregiving factors that influenced caregivers' well-being. Caregivers' financial status, family challenges (e.g., communication and coping), care recipients' negative behavior, and the amount of time devoted to caregiving, dictated caregiver' outcomes (Vellone et al., 2008). Caregivers' affiliated a more esteemed quality of life with well-being, calmness, tranquility, psychological and financial stability, and related stress and worry with worsening quality of life outcomes (Vellone et al., 2008).

Caregiver/care recipient relationship. Individuals afflicted with Alzheimer's disease may receive caregiving support from a friend or a relative (e.g., husband, wife, son, or daughter) (Alzheimer's Association, 2014; Pearlin et al., 1990). Researchers found that the caregiver/care recipient relationship was the basis for affecting how a caregiver responded to the caregiving experience, regarding stress and burden (Conde-Sala et al., 2010). However, there is still a question surrounding which caregiver/care recipient relationship type is most impacted since research findings have been indeterminate (Conde-Sala et al.,2010; Pearlin et al., 1990; Reed et al., 2014).

Conde-Sala et al. (2010) evaluated the influence of the relationship of the caregiver to its caregiver/care recipient relationship type on caregiver burden among 121 spouse caregivers and 139 adult (child) caregivers. They found that adult daughter (child) caregivers experienced more burden than spouse caregivers experienced (Conde-Sala et al., 2010). Adult (child) caregiver burden was related to social burden, feelings of psychological stress, guilt, and living with the care recipient (Conde-Sala et al., 2010). Although both adult-child caregivers and spouse caregivers experienced high burden relating to the care recipients negative behavior and cognitive symptoms, adult (child) caregivers reported more depression-related caregiver burden than spouse caregivers (Conde-Sala et al., 2010).

Reed et al. (2014) also determined that adult (child) caregivers (n = 405) had greater burden than spouse caregivers did (n = 985). They found that although adult (child) caregivers spent less time with care recipients, they reported numerous levels of caregiver burden, and a lower health quality than spouse caregivers (Reed et al., 2014). They also found that adult-children caregivers' increased burden was linked to living with the care recipient, residing in an urban area, and if the care recipient fell within the past three months. The researchers suggested that being a female, younger, and more educated was linked to higher caregiver burden in spouse caregivers. Despite the caregiver/care recipients' relationship, the care recipients' limited functional status and caregiver stress (associated with problematic behavior) were related to caregiver burden (Reed et al., 2014). Overall, caregiver burden worsened with Alzheimer's disease severity (Reed et al., 2014).

Conversely, findings from an earlier research study produced different results than what was found in more recent findings (Conde-Sala et al., 2010; Reed, et al., 2014). Ott, Sanders, and Kelber (2007) evaluated the influence of caregiver/care recipient relationship type on caregivers' emotional outcomes. Ott et al. (2007) examined elements that added to a caregivers' burden, feelings of emotional grief and growth which in turn impacted psychological outcomes in adult-child caregivers (*n* = 111) and spouse caregivers (*n* = 90). They found that sense of burden, worry, and isolation was more prevalent among spouse caregivers than adult (child) caregivers (Ott et al., 2007). Also, since learning of care recipients' Alzheimer's disease diagnosis, spouse caregivers reported more emotional health changes (e.g., optimism and pessimism) and felt that they made more personal sacrifices than adult (child) caregivers (Ott et al., 2007).

Prince et al. (2012) evaluated the influence of caregiver demographic characteristics and caregiver/care recipient relationship type on caregivers' self-reported burden. However, his findings were inconsistent with what was found in other research surrounding the influence of relationship type on caregivers' self-reported burden (Conde-Sala et al., 2010; Ott et al., 2007; Reed, 2014). Prince et al. (2012) determined that no notable differences of caregiver strain or burden were found between spouse caregivers (*n* = 74) and adult-child, or child-in-law, caregivers (*n* = 284) (Prince et al., 2012). Although there are differences in research findings in determining what caregiver/care recipient relationship type bears the highest burden, several results provide insight into how the burden is exclusively expressed among various caregiver types. Understanding these factors help aid researchers in creating interventions with both adult children and spouse caregiver types in mind (Conde-Sala et al., 2010; Ott et al., 2007; Reed et al., 2014).

In closing, caregivers' background and contextual stressors such as age, gender, residence, income, and caregiver/care recipient relationship type, played a vital role in influencing caregivers' stress, burden, and outcomes (Conde-Sala et al., 2010; Covinsky et al., 2003; Germain et al., 2009; Gonzalez et al., 2011; Mausbach et al., 2013; Pearlin et al., 1990). The background and contextual stressors of age, gender, residential status, income, and caregiver/care recipient relationship interrelate with a host of other poignant caregiver variables outlined in the Alzheimer's disease caregivers' conceptual stress process model (Pearlin et al., 1990). The next section covers essential caregiving variables relating to stress, burden, and outcomes and provides a commentary on demand for care stressors and secondary strains (Pearlin et al., 1990).

Demand for Care Stressors and Secondary Strains

Many factors affect the Alzheimer’s disease caregiving process. Nevertheless, stress is the most unambiguous feature of caregiving (Pearlin et al., 1990). Demand for care stressors and secondary strains contribute to caregivers' fatigue, depression, financial demise, and caregiver's outcome (Black et al., 2010; Ferrara et al., 2008; Gonzalez-Salvador, Arango, Lyketsos & Barba, 1999; Pearlin et al., 1990). Demand for care stressors point to the challenges and problems that caregiver's face when assisting the care recipient with daily functional activities (Pearlin et al., 1990). The magnitude and extent of care towards a person influences how the caregiver perceives personal stress (Pearlin et al., 1990). Caregiver secondary strains are those that add to caregivers' primary stress and further complicate the caregiving process (Pearlin et al., 1990). These stressors derive from other aspects of a caregivers' life such as having to co-manage caregiving activities along with work and family obligations (Pearlin et al., 1990).

Demand for care stressors. These stressors relate to the challenges and problems that caregiver's battle when providing care for a care recipient (Pearlin et al., 1990). Care recipients rely on the caregiver to aid them with toileting bathing, feeding, and lifting. Caregivers may also be responsible for managing the care recipient’s behavioral problems (e.g., wandering, swearing, and irritability) and addressing care recipients cognitive deficiencies (e.g., inability to remember events, and communicate). These stressors directly affect emotional and health outcomes among caregivers (Pearlin et al., 1990). The primary stressors outlined in Pearlin et al. (1990) Alzheimer's disease caregivers' conceptual stress process model includes the following: problems with care recipient’s behavior, challenges with care recipient's physical and cognitive state, caregiver overload, and loss of intimate experiences between the caregiver and care recipient. The demand for care stressors under evaluation or this study include caregiver assistance with care recipients: toileting, challenging behaviors, moving out of beds/chairs, dressing, feeding, diapers and bathing. Researchers have determined that demand for care stressors have been shown to predict caregivers' self-reported stress and burden, which in turn had an impact on caregivers’ outcome (Ferrara et al., 2008; Gonzalez-Salvador et al., 1999; Pearlin et al., 1990).

Gonzalez-Salvador et al. (1999) evaluated the impact of care recipient's functional status and behavior on caregivers' subjected stress and burden among a sample of 58

Alzheimer's disease caregivers and 32 non-dementia caregivers (Gonzalez-Salvador et al., 1999). The Activity Daily Living Index is a six-item scale measured care recipients' functional limitation concerning assistance needed with bathing, toileting, dressing, feeding, bathing, continence, and transferring (Gonzalez-Salvador et al., 2011). Scores ranged from 0 to 6 with greater scores indicating greater disabling factors correlating to care recipients' activities of daily living (Gonzalez-Salvador et al., 2011). The Behavior Pathology in Alzheimer's Disease Rating Scale, a 25-item scale, was used to measure care recipients behavior patterns (e.g., ideations, hallucinations, and aggression). Scores went from 1 to 4, with higher scores indicative of higher severity (Gonzalez-Salvador et al., 2011). The Relatives Stress Scale, a 15-item instrument, measured stress. Scores ranged from 0, indicating "no stress," to 4, “very stressful" (Gonzalez-Salvador et al., 2011). Gonzalez-Salvador et al. (1999) determined that caregivers reported more stress and psychological duress than non-caregivers did. They found that caregivers' self-reported burden predicted stress and that the source of caregivers' self-reported burden derived from the presence of behavior problems on the part of the care recipient and care recipients' functional reliance on the caregiver (Gonzalez-Salvador et al., 1999).

Aguglia et al. (2004) examined the relativity of care recipients' cognitive and physical impairment on stress in 236 caregivers consisting of 158 females and 77 males. The mean age for females was 61 years old, and the mean age for males was 64 years old. Aguglia et al. (2004) found that greater levels of cognitive impairment and lower functional abilities on part of the care recipient predicted higher subject stress and anxiety in older caregivers.

Ferrara et al. (2008) evaluated the impact on care recipient’s functional behavioral and cognitive capabilities on stress and burden in 200 older caregivers. Sixty-four percent of caregivers were female, 70% were daughters and 30% were wives, who provided care for a care recipient living at home (79%), and the mean age of the caregiver was 56.1 years (Ferrara et al., 2008). Several survey instruments were used to assess caregivers' self-reported burden and stress on care recipient's functional and behavior capabilities (Ferrara et al., 2008). A cognitive survey instrument was used to capture the care recipients' cognitive capabilities and functional state (e.g., bathing, dressing, and toileting). The Caregiver Burden Inventory instrument was used to capture caregivers' burden, which was a 24-item survey assessing stress, psychological and physical impact of caregiving, the time consumed by caregiving, work-place conflict, and social burden (Ferrara et al., 2008). Ferrara et al. (2008) found a correlation between the care recipients cognitive and behavior problems, and caregivers' self-reported stress and depression. They found that higher stress and depression were tied to care recipient's worsening Alzheimer's, inferring that care recipient's worsening Alzheimer's predicted caregiver stress and burden (Ferrara et al., 2008).

Secondary strains. Secondary strains are considered role strains that influence caregivers' self-reported stress, burden, and outcomes (Pearlin et al., 1990). Secondary strains relate to a set of activities that occur in addition to the caregiving circumstance (Pearlin et al., 1990). For example, a caregiver may hold multiple roles in tandem with parenting, maintaining a full-time job, and providing companionship to a family member, such as a spouse (Pearlin et al., 1990). Financial burden and work-related conflicts are also considered secondary strains (Pearlin et al., 1990). Other factors that may contribute to caregivers' financial burden include caregivers' age, loss of income, living arrangements, the cost of care associated with caregiving and caregiver's health status (AARP, 2005; NAC, 2005; Pearlin et al., 1990). Regarding work-related conflicts, caregivers may be required to cut down on work hours, take an early retirement, or take a pass on a promotion in order to address the needs of a family member (AARP, 2009; NAC, 2009; Pearlin et al., 1990). The vast majority of Alzheimer's disease caregivers (n = 1247) are both full-time or part-time employees, and their caregiver responsibilities have interfered with their work-related duties compared to other caregiver groups (Alzheimer's Association, 2004; NAC, 2004). Two-thirds of caregivers reported that they missed days from work due to caregiving duties; 14% reported they had to give up working altogether or were forced to retire early (Alzheimer's Association, 2004; NAC, 2004). Furthermore, 13% of caregivers were forced to reduce work hours or accept less demanding positions, and 7% passed on a promotion and lost employment benefits (Alzheimer's Association, 2004; NAC, 2004). The secondary strains delineated in Pearlin et al.'s (1990) Alzheimer's disease caregivers' conceptual stress process model include the following: conflict with family members, work-caregiver situation, financial problems, and isolation (e.g., social life). The secondary strains will be discussed; however, they will not be evaluated in this study.

Caregiver Burden

Alzheimer's disease caregiving oversight is draining, stressful, and can be a challenging experience from an emotional, psychological, physical, financial, and social standpoint (Black et al., 2010; Ferrara et al., 2008; Gonzalez-Salvador et al., 2011; Karg, Graessel, Randzio & Pendergrass, 2018; Lou et al., 2015; Pearlin et al., 1990). Caregiving pressures give rise to an inordinate amount of caregiver's burden and stress (Pearlin et al., 1990). The source of these stressors may emanate from the care recipient's reliance on the caregiver (e.g., bathing and feeding). They may also derive from care recipients confrontational behavior (e.g., swearing and wandering) and cognitive problems (e.g., memory loss) (Ferrara et al., 2008; Gonzalez-Salvador et al., 2011; Pearlin et al., 1990). Pearlin et al. (1990) suggested that demand for care stressors outlined in the Alzheimer's disease caregivers' conceptual stress process model predicts caregiver burden and profoundly influence caregiver's outcome. Kim et al., (2011) evaluated the impact of care recipient's activities of daily living on caregiver's burden in 302 caregivers. The activities involved dressing, bathing, toileting, transferring, and dealings with incontinence. They found a significant correlation between the caregiver dealings with care recipient's activities of daily living impairments and burden. The determined the greater care-recipients impairment, the greater the caregivers' burden. Similarly, Lee et al. (2017) found that care-recipients need for physical assistance served as a predictor of burden. They determined that care recipients with a better physical condition predicted lower burden among caregivers (Lee, et al., 2017).

The following demand for care stressors will be evaluated in this study: care-recipient needing help with toileting, challenging behaviors, moving out of beds/chairs, dressing, feeding, diapers, and bathing (NAC, 2015).

Moderator Variables

Although extending care to a family, friend, or an associate with Alzheimer's disease can cause stress and burden producing adverse health effects in caregivers, there are hosts of other elements that can direct the reduction of caregivers' stressors by buffering their outcomes (Pearlin et al., 1990). According to Pearlin et al.’s (1990) Alzheimer's disease caregivers' conceptual stress process model, both coping and socialization support methods are prominent mediating variables. They are involved in reducing the force of stressors, and if utilized, could have controlling effect on stressors in terms of preventing proliferation (Goode et al., 1998; Pearlin et al., 1990; Wilks & Croom, 2008). However, coping and social support are considered moderating variables. Moderator variables are considered variables that can serve to direct the strength between independent and dependent variables (Baron & Kenny, 1986). Coping and social support are considered third variables and play an influential role in changing the direction between demand for care stressors and caregivers' outcome as well secondary strains and caregivers' outcome (Goode et al., 1998; Pearlin et al., 1990; Wilks & Croom, 2008). Coping and social support will be discussed in the literature review, however will not be evaluated in this study.

Coping. Coping is a mechanism that individuals use to respond to life conditions through behavior and practice (Pearlin et al., 1990). There are a range of coping techniques that individuals incorporate to manage caregiving stress and burden (Goode et al., 1998). Some may choose to pray, meditate, or exercise. Others may use emotion-focused techniques or medications for calming to alleviate burden (Goode et al., 1998).

Researchers have determined that coping moderates caregivers' outcome (Goode et al., 1998; Pearlin et al., 1990). Goode et al. (1998) examined the moderating impact of coping and supportive resources on caregivers' health. Researchers used instruments to assess caregivers (*n* = 122) methods of coping, social support, and stressors (Goode et al., 1998). A scale assessing the care recipient's activities of daily living measured care recipients need for assistance with bathing, dressing, and feeding. A scale assessing the care recipient's instrumental activities of daily living scale measured care recipients need for help with managing money and household activities. The scores ranged from 1 "no impairment” to 4 “severe impairment” (Goode et al., 1998). The Memory and Behavior Problem Checklist is a 30-item instrument measured frequency of memory and behavior deficiencies on the part of the care recipient (Goode et al., 1998). Scores ranged from 0 "no occurrence" to 3 "occurrence on a daily basis or more often" (Goode et al., 1998). Appraisal scales were used to measure caregivers' self-reported stress and self-efficacy. Scores for both items ranged from 0 "not at all" to 3 "extremely" (Goode et al., 1998). The Coping Response Inventory, a 4-item scale, was used to measure coping and social support. The range of scores was from 0 "not at all" to 3 "fairly often" (Goode et al., 1998). A 20-item depression questionnaire, measured self-reported depression, and the Cornell Medical Index measured self-reported health (Goode et al., 1998). Goode et al. (1998) determined that caregivers' approach to coping, and use of social support from the inception of assuming caregiving duties had a profound impact on caregiver's outcome over a span of time (Goode et al., 1998). Goode et al. (1998) determined the use of coping and social support produced positive outcomes associated with preventing harmful health effects and promoting positive outcomes (Goode et al., 1998). Conversely, caregivers with limited supportive resources reported an elevation in health symptoms (Goode et al., 1998).

Social support. There are two forms of social support: physical and emotional (Pearlin et al., 1990). Physical support involves receiving help from a family or friend to assist with day-to-day activities (e.g., cooking, cleaning, and running errands) (Pearlin et al., 1990). However, a family or friend can provide emotional support by offering words of encouragement and consolation (Wilks & Croom, 2008). Researchers determined that social factors had a moderating influence on resilience among caregivers (e.g., a risk for emotional and physical outcomes) (Pearlin et al., 1990; Wilks & Croom, 2008).

Wilks and Croom (2008) studied the relationship between caregivers' self-reported stress and resilience (risk for harmful outcomes) and the moderating impact of social factors on stress and resilience in 229 caregivers (Wilks & Croom, 2008). Researchers used several instruments to assess caregiver's stress, social support, and resilience (Wilks & Croom, 2008). Wilks and Croom (2008) determined that caregivers' self-reported stress influenced caregiver's resilience. They also determined that social support had a moderating effect on caregiver's resilience (Baron & Kenny, 1986; Wilks & Croom, 2008). Wilks and Croom (2008) found that caregiver's self-reported stress influenced caregiver's resilience. They found that social support had a moderating impact or caregiver's resilience (Baron & Kenny, 1986; Wilks & Croom, 2008). Caregivers who had more family and friends disclosed that they felt more resilient compared to caregivers who had little social support (Wilks & Croom, 2008).

Caregiver Outcomes

Caregiver outcomes represent the effects of demands of care stressors, and secondary strains on emotional and physical outcomes (Pearlin et al., 1990). These outcomes have negative implications on caregiver's health. Caregivers suffer from emotional and physical exhaustion, depression, anxiety, and experience worse health which lowers quality of life (Kosmala & Kloszewska, 2004; Mahoney, Regan, Katona & Livingston, 2005; Pearlin et al., 1990; Robinson et al., 2001). Finding ways to cope and gain social support is essential for caregivers' survival, hence the concept of coping and social support are important elements in mitigating the adverse outcomes associated with caregiving. The outcomes represented in Pearlin et al.'s (1990) Alzheimer's disease caregiver's conceptual stress process model include the following: anxiety, depression, irritability, cognitive disruptions, and relinquishing caregiver role. The health outcomes for this study will be defined as the caregiver's self-reported health status, caregivers' self-reported harm to health resulting from the stress of caregiving and emotional stress outcomes (see Appendix B).

Background and contextual stressors, demand for care stressors and strains influence caregivers' outcome (Pearlin et al., 1990; von Kanel et al., 2006). von Kanel et al. (2006) evaluated the magnitude of stress and age on caregivers' health. Psychosocial instruments were used to capture caregivers' stress, overload, and social support (von Kanel et al., 2006). Researchers also collected blood samples for biomarker testing (von Kanel et al., 2006). C-reactive protein, D-dimer, and interleukin-6 biomarkers (frailty markers) measurements were obtained and used to assess caregiver's health (von Kanel et al., 2006). There were 170 caregiver participants in the study; the sample consisted of 116 caregivers and 54 non-caregivers; 51 males and 119 females (von Kanel et al., 2006). von Kanel et al. (2006) found that caregivers had increased levels of D-dimer and interleukin-6 than non-caregivers and that the interactive effect between caregiver's age and status was a strong predictor for D-dimer biomarker and borderline for interleukin-6 (von Kanel et al., 2006). Overall, caregivers had higher D-dimer levels than non-caregivers had (von Kanel et al., 2006). The interactive effect between a caregiver's age and caregiving status was not a strong predictor of C-reactive protein between caregivers and non-caregivers (von Kanel et al., 2006). Caregiver's demographic attributes, medical and psychosocial measurements, were associated with high amounts of D-dimer, concluding that the D-dimer biomarker is associated with caregivers' stress (von Kanel et al., 2006). Conclusions from this study infer that elevated levels of D-dimer and interleukin-6 biomarkers are significant and may play a role in accelerating negative health and coronary risk outcomes (e.g., cardiovascular risk and stroke) in older Alzheimer's disease female caregivers (von Kanel et al., 2006). Researchers inferred that older caregivers could be susceptible to rapid changes in health (e.g., deterioration) and more relief services should be offered to older caregivers to help offset caregiving stress (von Kanel et al., 2006).

Black et al. (2009) studied the impact of caregivers living arrangements, the financial, physical, emotional, and social strain on caregivers' quality of life among 398 caregivers. Black et al. (2009) found that 35% of caregivers disclosed that their self-reported general health and financial status had worsened since assuming the responsibility of becoming a caregiver. Feelings of tiredness, stress, and depression were similar across co-residing and non-residing caregivers. However, older caregivers stated that they experienced fewer feelings of helplessness (Black et al., 2009). Caregivers' financial loss was mostly related to care recipients' medical costs and workplace conflict (Black et al., 2009). Additionally, Black et al. (2009) found that caregivers' living arrangement, financial, social, mental and physical burden had an adverse toll on quality of life among caregivers and found among the majority of caregivers who resided with the care recipient. Black et al. (2009) suggested that Alzheimer's disease caregivers will need access to caregiving supportive services and interventions to help them fulfill their caregiving responsibilities, keep care recipients in the home environment for longer periods, and ease their caregiver burden (Black et al., 2010).

Summary

Alzheimer's disease is a severe and chronic health issue. It takes a devastating toll on the person afflicted with Alzheimer's disease as well as the caregiver (Pearlin et al., 1990). Caregivers play a dominant role in tending to the everyday needs of Alzheimer's disease care recipients (Pearlin et al., 1990). The process is cumbersome, time-consuming, tiring, and creates stress and strain for caregivers (Pearlin et al., 1990). There are multiple factors that contribute to caregivers' overall stress impacting health and emotional outcomes (Pearlin et al., 1990). A caregivers' socioeconomic status, gender, and relationship type can predict caregivers' stress and strain (Conde- Sala et al., 2010; Pearlin et al., 1990; Reed, et al., 2014; Serrano-Aguilar et al., 2006; Vellone et al., 2008; von Kanel et al., 2006;). Care recipient factors also predict emotional and health outcomes (Pearlin et al., 1990). Many caregivers develop depression, anxiety, and worsening of health (Ferrara et al., 2008; Gonzalez-Salvador et al., 2011; Kosmala & Kloszewska, 2004; Mahoney et al., 2005; Ott et al., 2007; Pearlin et al., 1990; Reed et al., 2014; von Kanel et al., 2006). However, researchers have determined that the invocation of coping and social support methods alleviated caregivers' stress and burden, thus, suggesting that such mechanisms could serve to lighten the stress and burden associated with care (Goode et al., 2008; Wilks & Croom, 2008). Therefore, evaluating stress, burden, and various outcomes in older caregivers is essential (AARP, 2009; Covinsky et al., 2003; Ferrara et al., 2008; NAC, 2009). Furthermore, older adults are often weak and have a combination of health problems that they have to contend with (Torpy, Lynm & Glass, 2006; von Kanel et al., 2006). For a caregiver already in a weakened health state, adding stress and burden can place them at risk for developing other harmful health conditions (Torpy et al., 2006; von Kanel et al., 2006). A gap in the caregiving literature exists as it relates to determining the impact of the Alzheimer's disease caregiving process among older female caregivers (Pearlin et al., 1990; Pinquart & Sorenson, 2007). This research study will focus on filling the gap by gaining a more clear understanding of the caregiving experience among older female caregivers within the modality of the Alzheimer's disease caregiver conceptual stress process model (Pearlin et al., 1990; Pinquart & Sorenson, 2007). Chapter 3 addresses the research design and purpose, methods, secondary data collection instruments data analysis, the study independent and dependent variables, the threat to validity, and sample size.

Chapter 3: Methods of Research

Introduction

The features surrounding stress using Pearlin et al.'s Alzheimer's disease caregivers' stress process model on caregiver outcomes in older female Alzheimer's caregivers were evaluated in this study. Chapter 3 addresses the study design, methods of research, criteria for inclusion and exclusion, sampling, and archival data collection methods for the study. This chapter also addresses study procedures involving instrumentation and operationalization of variables, reliability, and validity of data analysis, threats to validity, and ethical procedures.

Research Design

A non-experimental correlational quantitative research design approach was used for this study. Using data from the NAC/AARP Survey on Caregiving in the United States, 2015, secondary data analysis was conducted to explore the relationship between the study's independent and dependent variables. The independent variables under study will be background and contextual stressors, and demand for care stressors. The dependent variables for this study will be caregivers' self-reported, harm to health resulting from the stress of caregiving, health status and emotional stress.

A correlational quantitative study design was used to assess the relationship between the study's independent and dependent variables. Stressors that best predict older Alzheimer's disease female caregivers' self-reported health outcomes are also assessed. This design is consistent with previous Alzheimer's disease caregiver survey research in that it allows for an outlet to collect additional information describing caregiver data from an analytical standpoint as well gain more information on the attitudes, beliefs, and opinions of caregiving older female Alzheimer's caregivers.

Survey Research Method

Data for this study was collected from The 2015 NAC / AARP Survey on Caregiving in the United States .This survey was used to assist researchers with identifying some of the factors that influence caregiving such as income, health, work-related responsibilities, and the functional status of care recipients (NAC, 2015). Caregivers selected to take part in the survey were asked to answer questions concerning the help they provided to care recipients and their caregiving experiences, work circumstances, living conditions, emotional and health status, and financial stress as well as sociodemographic information.

Inclusion and Exclusion Criterion

To meet inclusion for the study, participants must be female, 50 years or older, respond to caregiver questions outlined in the 2015 NAC / AARP Survey on Caregiving in the United States and provide care for an Alzheimer's disease dementia care recipient who remained inside or outside the home environment. Caregivers under the age 50 were excluded from the study.

Sampling, Power Analysis, and Population

The 2015 NAC/ AARP Survey on Caregiving in the United States open dataset contain data for 103 participants (NAC, 2015). All participants in the dataset who met the inclusion criteria were included in the sample of participants. A population of older female Alzheimer's disease female caregiver participants was derived from the 2015

NAC/AARP Survey on Caregiving in the United States open dataset. . G* Power software was used to determine the minimum sample size required to achieve power equal to .80 for a multiple linear regression with five predictors. The alpha level was set at .05, and the expected effect size was set at the value suggested by the program as a medium effect size, Cohen's $f^2 = .15$. The value chosen was identified as a medium effect size by Cohen. Based on the settings, the G* Power tool indicated that at the minimum, the sample size required would be 92.

Collection

The NAC and AARP disseminated the 2015 NAC / AARP Survey on Caregiving in the United States. The data collection work is sponsored collaboratively by the NAC and AARP (NAC, 2015). Data from the 2015 NAC / AARP Survey on Caregiving in the United States can be accessed through a downloadable SPSS file (NAC, 2015).

Instrumentation, Reliability, and Validity

The 2015 NAC / AARP Survey on Caregiving in the United States were the most recent version of the survey and licensed under the auspice of Creative Commons Attribution (International License 4.0). .

Operationalization of Variables

To measure caregivers' characteristics, self-reported stress, and burdens on caregiver outcomes, the following variables were operationalized.

Independent Variables

Background and contextual stressors. Background and contextual stressors refer to the characteristics of the Alzheimer's caregiver that can influence the caregivers' stress process (Pearlin et al., 1990). Caregivers' age, gender, marital status, education, income, and care recipient living status with the caregiver are some of the characteristics that can influence caregivers' stress process (Pearlin et al., 1990). Frequency counts were used to tabulate caregiver characteristics.

Demand for care stressors. Demand for care stressors refers to caregiver stressors that may stem from the needs of the care recipient and magnitude of care that Alzheimer's disease caregivers need to provide. These stressors are manifested in the Alzheimer's disease care recipients' behavior, activities of daily living (e.g., bathing and toileting), and instrumental activities of daily living and caregivers overload. To evaluate caregivers' physical support to care recipient's dependence for help with toileting, challenging behaviors, getting out of bed and chairs, getting dresses, feeding , incontinence and bathing, measurements were obtained by using the following replies: 1 = Yes, 2 = No, 3 = Not sure, and 4 = Refused.

Dependent Variables

Caregivers' self-reported harm to health resulting from the stress of caregiving, health status, and emotional stress. These variables provide a personal assessment of caregivers' self-reported health outcome. The caregivers' self-reported harm to health resulting from the stress of caregiving variable was created using the response to the survey question, "How has caregiving affected your health?" Caregivers who chose the "made it worse" option to the survey question were scored as "Yes" on the "health harmed by caregiving" variable. Self-reported scores relating to the caregiver's health affected were measured with the following replies: 1 = made it better, 2 = not affected, 3 = made it worse, 4 = not sure, and 5 = refuse (National Alliance for Caregiving, 2015). A 1-item scale was used to measure caregivers' health status using the following replies: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, and 5 = Excellent. Self-reported scores relating to the caregiver's emotional stress were measured by the following replies: 1 = not at all stressful, 2 = 2, 3 = 3, 4 = 4, 5 = very stressful, 6 = not sure, and 7 = refuse.

Data Analysis

The following research question/hypotheses will serve as the foundation for this study:

RQ1: Does a significant relationship exist between background and contextual stressors (age, income, education, marital status, whether the care recipient lives with the caregiver), demand for care stressors (toileting, challenging behaviors, moving out of beds/chairs, dressing, feeding, diapers, and bathing), and caregivers' self-reported caregivers' self-reported harm to health resulting from the stress of caregiving by caregiving among older female Alzheimer's disease caregivers?

H_01 *:* No significant relationship exists between caregivers' self-reported beliefs that their caregiving experiences harmed their health and the combination of background contextual factors, and demand for care stressors.

H_a1*:* A significant relationship exists between caregivers' self-reported beliefs that their caregiving experiences harmed their health, and the combination of background contextual factors, and demand for care stressors.

RQ2: Does a significant relationship exist between background and contextual stressors, demand for care stressors, and caregivers' self-reported health status among older female Alzheimer's disease caregivers?

$H_0$2: No significant relationship exists between caregivers' self-reported health status and the combination of background and contextual stressors and demand for care stressors.

H_a2: A significant relationship exists between caregivers' self-reported health status and the combination of background and contextual stressors and demand for care stressors.

RQ3: Does a significant relationship exist between background and contextual stressors, demand for care stressors and caregivers' self-reported emotional stress among older female Alzheimer's disease female caregivers?

Hierarchical Linear Regression and Spearman correlations analysis was used to determine whether a relationship lies between caregivers' background and contextual stressors, demand for care stressors, and self-reported emotional stress by caregiving among Alzheimer's disease female caregivers. The linear regression model was used to measure the strength of the relationship between the study independent variables in the model and its influence on the dependent variable (health status). R squared values (coefficient of determination) was calculated to determine the predictive power of the linear regression model. Spearman correlation analysis was conducted to explore the bivariate relationship between the study's independent variables and the dependent variable (emotional stress). As a first step, a frequency distribution was computed for each variable to discover any invalid data values. Invalid values were recorded as missing values. Correlational as well as hierarchical logistic and linear regression were used as analysis methods to determine the relationship between the study's independent and dependent variables and to test the study's hypotheses and research questions (Trochim, 2006b).

SPSS statistical software was used to analyze research data. The sign and statistical significance (*p* values) of correlation coefficient values determined whether significant relationships exist among the study variables (Trochim, 2006b).

As described above, hierarchical linear and logistic regressions were used to test each of the study hypotheses and interpret results (Trochim, 2006c). Logistic regression was used for Research Question1, which used a dichotomous independent variable. Linear regressions were used for Research Questions 2 and 3, which employed continuous dependent variables (Tabachnick & Fidell, 1983; Field, 2009). The sign and statistical significance (*p* values) of correlation coefficient values were used to determine whether significant relationships exist among the study variables (Trochim, 2006b).

As described in Tabachnick and Fidell (1983) and Field (2009), sets of variables are to be entered into the regression in order of increasing theoretical interest. For each research question, caregiver background and contextual variables such as age and income were entered in the first step, care-recipient background and contextual variables were entered in the second step, and the independent variable associated with the research question was entered in the third step. This will allow the assessment of whether the independent variables add useful information to the prediction, beyond information provided by the background and contextual stressors. If the independent variable had a statistically significant regression coefficient ($p < .05$) in the final step, and a sign that was in accordance with the hypothesis, the study hypothesis for the research question was supported. Descriptive statistics was used to provide an overall summary of caregiver and care-recipient characteristics (Trochim, 2006d; Christensen, Johnson, & Turner, 2014). The descriptive statistics for the caregiver and care-recipients allow readers to understand the sample that was used and to determine the comparability of the current sample with the samples used in other research.

Threats to Validity

Although the survey developers do not provide information about the measurement of validity, the survey is used in caregiving U.S. evidence-based research (NAC, 2015). Since the archival data obtained for the study is self-reported, it could be subject to recall bias, interviewer bias, and dishonest responses to survey questions (McKenzie et al., 2009). Because the study is using archival data and not comparing groups, selection history, maturation, test, instrumentation, and mortality threats do not apply to this study (Trochim, 2006a).

Ethical Procedures

The 2015 Caregiving in the U.S dataset is a public domain dataset; however, the participant data is private and confidential. The dataset does not contain participant's private identifiers such as name, address, and social security numbers and is de-identified. Based on information provided by Walden's University's Institutional Review Board (IRB) guidance document for archival research, an IRB approval is required before the collection of archival data (Walden University, 2015). A request for IRB approval to collect secondary data for this study was granted. The IRB approval number is 10-27-16-0115852.

Summary

This chapter expounded on the research design for this study. It defined the study sample, how the sample was extracted, and outlined a proposed method to determine sample size. Also, this chapter detailed how study variables were measured and provided background information on the 2015 NAC/AARP Survey on Caregiving in the United States, 2015 instrument.. The topic of establishing reliability and validity of data, as well as concerns surrounding threats to validity involving study variables were discussed. The chapter ends with a discussion on ethical procedures and the caregivers' privacy and non-disclosure protections. Chapter 4 includes details on collection methods and a discussion on research results.

Chapter 4: Results

Introduction

The goal of this research was to examine stress, caregiver burden, and self-reported health outcomes among older female Alzheimer's disease caregivers. A nonexperimental correlational quantitative research method was conducted to determine if a relationship exists between the study's independent variables (background and contextual stressors, demand for care stressors) and dependent variables (caregivers' self-reported health status, caregivers' self-reported harm to health resulting from the stress of caregiving, and emotional stress). This chapter includes a presentation of descriptive data regarding the caregiver and care recipient population followed by descriptive statistics and study results.

Data Collection

The 2015 NAC/AARP Survey on Caregiving in the United States is being used in this research. It is a public domain data set and the survey can be downloaded from the NAC website.The data for this study were originally collected by the NAC in collaboration with the AARP to assess the attitudes and opinions of unpaid older caregivers on caregiving activities for Alzheimer's disease, dementia, or mental confusion conditions. The demographic makeup of the caregiver population includes age, gender, education, marital status, care recipient living status, and household income.

Descriptive Statistics

The study analysis included 103 older female Alzheimer's disease caregivers. There were no outlier responses evaluated. There were three missing values from the caregiver marital and living status items. Caregivers range between50 and 89 years old. Nine caregivers (8.7%) were between 50 and 54 years old. Seventeen caregivers (16.5%) were between 55 and 59 years old. Eighteen caregivers (17.4%) were between 60 and 64 years old. Twenty-one caregivers (20.3%) were between the 65 and 69 years old (20.3%). Nine caregivers (8.7%) were between 70 and 74 years old. Seventeen caregivers (16.5%) were between 75 and 79 years old. Seven caregivers (6.8%) were between 80 and 84 years old. Five caregivers (3.9%) were between 85 and 89 years old. The mean age of female caregivers was 67.05 years (see Appendix C).

Regarding education, 93% of caregivers had at least a high school education and 32% had college degrees or more. Caregiver income ranged from under $15,000 to $100,000 or more. Income varied among the 103 caregivers (see Table 1). Over 50 % of caregivers were married (*n* = 60, 58.3%). Frequency and percent values are outlined in Table 1.

Table 1

Female Caregiver Demographics

Demographic Characteristics	Frequency	Percent
Overall Age		
50 - 54 years	9	8.7
55 - 59 years	17	16.5
60 - 64 years	18	17.4
65 - 69 years	21	20.3
70 - 74 years	9	8.7
75 -79 years	17	16.5
80 - 84 years	7	6.8
85 - 89 years	5	3.9
Level of Education		
Less than high school	7	6.8
High school graduate or GED	33	32
Some college	20	19.4
Technical school	11	10.7
College graduate	15	14.6
Graduate school or Graduate work	17	16.5
Household Income		
Under $15,000	8	7.8
$15,000 to $29,999	24	23.3
$30,000 to $49,000	16	15.5
$50,000 to $74,999	20	19.4
$75,000 to $99,999	17	16.5
$100,000 or more	18	17.5

(table continues)

Demographic Characteristics	Frequency	Percent
Marital Status		
Married	60	58.3
Living with a partner	5	4.9
Widowed	17	16.5
Separated	3	2.9
Divorced	9	8.7
Single, never married	6	5.8

There were 103 care recipients in this study who had Alzheimer's disease dementia . Care recipients were between the ages of 26 and 101 years. The mean age of care recipients was 79.12 years (see Appendix C). Individuals receiving the most care were between the ages of 66 and 95. Fifty percent of care recipients lived with their caregiver (see Table 2).

Table 2

Care Recipient Demographics

Demographic Characteristics	Frequency	Percent
Overall Age		
26 - 30 years	1	.97
31 - 35 years	0	0
36 - 40 years	2	1.9
41 - 45 years	2	1.9
46 - 50 years	2	1.9
51 - 55 years	2	1.9

(table continues)

Demographic Characteristics	Frequency	Percent
56 - 60 years	4	3.9
61 - 65 years	2	1.9
66 - 70 years	6	5.8
71 - 75 years	7	6.8
76 - 80 years	17	16.5
81 - 85 years	19	18.4
86 - 90 years	20	19.4
91 - 95 years	14	13.6
96 - 100 years	3	2.9
101 - 105 years	2	1.9
Gender		
Male	53	51.5
Female	50	48.5
Lives with Caregiver		
No	51	49.5
Yes	50	48.5
Missing	2	1.9

Results

RQ1

RQ1 was as follows: Does a significant relationship exist between background and contextual stressors (age, income, education, marital status, whether the care recipient lives with the caregiver), demand for care stressors: toileting, challenging behaviors, moving out of beds/chairs, dressing, feeding, diapers, bathing and the caregiver's self-reported caregivers' self-reported harm to health resulting from the stress of caregiving by caregiving among older female Alzheimer's disease caregivers . For RQ1, hierarchical logistic regression and Spearman correlations were used to determine if a relationship exists between caregiver's background and contextual stressors, demand for care stressors, and self-reported caregivers’ self-reported harm to health resulting from the stress of caregiving by caregiving among older female Alzheimer's disease caregivers. Background and contextual stressors were the independent variables. They included age, education, household income, marital status, and care recipient living status. The dependent variable was caregivers’ self-reported harm to health resulting from the stress of caregiving. The caregivers’ self-reported harm to health resulting from the stress of caregiving variable was created using the response to the survey question, “How has caregiving affected your health?” Caregivers who chose the made it worse option to the survey question were scored as “Yes” on the caregivers’ self-reported harm to health resulting from the stress of caregiving variable. Caregivers who chose the made it better or not affected option to the survey question were scored as “No” on the caregivers’ self-reported harm to health resulting from the stress of caregiving variable. Of the 101 caregivers who answered the survey question, 43% said that they had harm to health resulting from the stress of caregiving and 57% said that they did not have harm to health resulting from the stress of caregiving (see Table 8).

For the hierarchical logistic regression analysis, a combination of independent variables (predictors) were entered in the regression in three steps. The following caregiver background and contextual stressors were entered in the first step of analysis: caregiver exact age, household income, education, and marital status. This step included four predictor variables. This combination was statistically significant at predicting at whether caregiver health was harmed. The significant individual background and contextual factors on harm to health resulting from the stress of caregiving were caregiver's exact age and marital status. Refer to Table 3 for details.

The following care recipient background and contextual stressors were added to the combination in the second step of analysis: care recipient's age, care recipient's gender, and whether they lived with the caregiver. Thus, this step included seven predictor variables. This combination was statistically significant at predicting whether caregivers had harm to health. The significant individual predictors were the same as step one: the significant individual background and contextual factors on harm to health resulting from the stress of caregiving were caregiver's exact age and marital status. The care recipient background and contextual stressors of age and gender were not significant. See Table 3 for details.

The following demand for care stressors were added in the third step of analysis: toilet, challenging behaviors, getting out of bed/chairs, dressing, feeding incontinence/diapers, and bathing. Thus, this step included 14 predictor variables. The combination was statistically significant at predicting caregiver's self-reported harm to health resulting from the stress of caregiving. The significant predictors were the same as steps one and two: the significant individual background and contextual factors on harm to health resulting from the stress of caregiving were caregiver's exact age and marital status. See Table 3 for details. None of the demand for care stressors and most of the background contextual stressors were not significant predictors of whether the caregivers had harm to health. Only the caregiver's age and marital status were significant predictors. Therefore, the results supported rejection of only a portion of the null hypothesis H_10. Averages, medians, and modes of caregiver's responses to health affected and harmed can be found in Appendix C.

Table 3

Logistic Regression Predicting Caregivers' self-reported harm to health resulting from the stress of caregiving on Background and Contextual Stressors, and Demand for Care Stressors

Predictor	*B*	Standard Error for *B*	Odds Ratio	*P*
Model 1^a (CG Demographics)				
CG Age	**-0.06**	**0.02**	**0.94**	**0.008**
CG Married (1=Yes)	**1.38**	**0.53**	**3.96**	**0.010**
CG Household Income	-0.25	0.17	0.78	0.136
CG Education	-0.07	0.15	0.93	0.631
Model 2^b (Add CR Demographics)				
CG Age	**-0.07**	**0.03**	**0.94**	**0.014**

CG Married (1=Yes)	**1.46**	**0.60**	**4.31**	**0.015**
CG Household Income	-0.26	0.17	0.77	0.124

(*table continues*)

Predictor	*B*	Standard Error for *B*	Odds Ratio	*P*
CG Education	-0.09	0.16	0.92	0.573
CR Gender (1=Female)	-0.26	0.61	0.77	0.671
CR Age	-0.02	0.02	0.98	0.385
CR Lives with CG (1=Yes)	0.00	0.52	1.00	0.993
Model 3[c] (Add Demand for Care Stressors)				
CG Age	**-0.06**	**0.03**	**0.94**	**0.031**
CG Married (1=Yes)	**1.33**	**0.66**	**3.78**	**0.044**
CG Household Income	-0.32	0.18	0.73	0.081
CG Education	-0.08	0.17	0.93	0.652
CR Gender (1=Female)	-0.87	0.71	0.42	0.223
CR Age	-0.01	0.02	0.99	0.548
CR Lives with CG (1=Yes)	-0.29	0.61	0.75	0.633
Help to and from toilet	-1.29	0.98	0.27	0.188
Help with challenging behaviors	0.01	0.55	1.01	0.982
Help get out of bed and chairs	1.62	0.95	5.07	0.086
Help getting dressed	0.01	0.88	1.01	0.988
Help with feeding	-1.51	0.79	0.22	0.055
Help with incontinence, diapers	1.19	0.63	3.27	0.062
Help with bathing	-0.13	0.78	0.88	0.867

Note. N = 97. Predictors in bold font are significant ($p < .05$).
[a]Model 1: $R^2 = .147$ (Cox & Snell), .197 (Nagelkerke). Model $\chi^2(4) = 15.43$, p =.004.
[b]Model 2: $R^2 = .164$ (Cox & Snell), .219 (Nagelkerke). Model $\chi^2(7) = 17.34$, p =.015. Step $\chi^2(3) = 1.91$, p =.591.
[c]Model 3: $R^2 = .259$ (Cox & Snell), .347 (Nagelkerke). Model $\chi^2(14) = 29.13$, p =.010. Step $\chi^2(7) = 11.80$, p =.107.

Spearman correlation was used to determine if there was a relationship between caregiver's background and contextual stressors, demand for care stressors and self-reported caregivers’ self-reported harm to health resulting from the stress of caregiving among older female Alzheimer's disease caregivers.

This correlation analysis approach was most fitting for determining the relationship between the explanatory and response variables that were evaluated in this study (Gertsman, 2008). Spearman correlations results revealed that caregivers’ self-reported harm to health resulting from the stress of caregiving (who answered yes to health affected) by caregiving was significantly associated with younger caregivers ($r = -.215$, $p = .031$, $N = 101$). Spearman correlations also revealed that caregivers’ self-reported harm to health resulting from the stress of caregiving was significantly associated with caregivers who had more difficulty with incontinence/diapers ($r = +.209$, $p = .03$, $N = 101$). The results from the correlational analysis can be found in Table 6.

Research Question 2

Research Question 2 was as follows: Does a significant relationship exist between background and contextual stressors (caregiver's age, income, education, marital status, whether the care recipient lives with the caregiver), demand for care stressors (activities of daily living (ADLs): toileting, challenging behaviors, getting out of beds/chairs, getting dressed, feeding, incontinence/diapers and bathing), and the caregiver's self-reported health status among older female Alzheimer's disease caregivers.

For Research Question 2, Hierarchical Linear Regression and Spearman correlations were used to determine if a relationship exists between caregiver's background and contextual stressors, demand for care stressors and self-reported health status by caregiving among older female Alzheimer's disease caregivers. Background and contextual stressors were the independent variables and included age, education, household income, marital status, and care recipient living status. The dependent variable was caregiver's health status. For the hierarchical linear regression analysis, a combination of independent variables (predictors) was entered in the regression in three steps. Numeric results for these steps are shown below in Table 4. The following caregiver background and contextual stressors were entered in the first step of analysis: caregiver exact age, household income, education, and marital status. This step included four predictor variables. This combination was statistically significant at predicting health status. The only significant individual predictor on health status was household income. Worse health status was significantly associated with lower household income. The following care recipient background and contextual stressors were added to the combination in the second step of analysis: care recipient's gender, care recipient's exact age, and whether they lived with the caregiver. Thus, this step included seven predictor variables. This combination was statistically significant at predicting health status. The only significant individual predictor was household income. The following demand for care stressors was added in the third step of analysis: toilet, challenging behaviors, moving out of bed/chairs, dressing, feeding diapers, and bathing. Thus, this step included 14 predictor variables. The combination was statistically significant at predicting health status; the only significant individual predictor was household income. The overall regression result showed that the combination of the background and contextual stressors, demand for care stressor had a significant relationship with health status. The demand for care stressors and most of the background contextual were not significant predictors of the caregiver's health status. Only the caregiver's household income was a significant predictor. Therefore, the results supported rejection of only a portion of the null hypotheses H_20. Averages, medians, and modes of caregivers who responded to the reported health status question can be found in Appendix C.

Table 4

Linear Regression Predicting Caregivers' Health Status on Background and Contextual Stressors, and Demand for Care Stressors

Predictor	*B*	Standard Error for *B*	Beta	*P*
Model 1[a] (CG Demographics)				
CG Household Income	**0.219**	**0.065**	**0.365**	**0.001**
CG Education	0.039	0.062	0.065	0.531
CG Married (1=Yes)	0.013	0.202	0.007	0.947
CG Age	0.000	0.009	-0.004	0.969
Model 2[b] (Add CR Demographics)				
CG Household Income	**0.213**	**0.065**	**0.355**	**0.001**
CG Education	0.047	0.062	0.079	0.447
CG Married (1=Yes)	0.051	0.221	0.026	0.817
CG Age	0.002	0.010	0.025	0.818
CR Age	0.009	0.007	0.137	0.226
CR Lives with CG (1=Yes)	-0.139	0.205	-0.073	0.500
CR Gender (1=Female)	0.158	0.240	0.083	0.513
Model 3[c] (Add Demand for Care Stressors)				
CG Household Income	**0.201**	**0.067**	**0.335**	**0.003**
CG Education	0.060	0.063	0.100	0.345

(*table continues*)

Predictor	*B*	Standard Error for *B*	Beta	*p*
CG Married (1=Yes)	0.109	0.232	0.055	0.641
CG Age	0.000	0.011	0.004	0.970
CR Age	0.011	0.008	0.176	0.145
CR Gender (1=Female)	0.175	0.257	0.092	0.499
CR Lives with CG (1=Yes)	-0.091	0.217	-0.048	0.676
Help with incontinence, diapers	-0.387	0.239	-0.200	0.109
Help getting dressed	-0.439	0.328	-0.227	0.185
Help with bathing	0.245	0.287	0.128	0.396
Help to and from toilet	0.197	0.348	0.096	0.573
Help with challenging behaviors	0.073	0.204	0.036	0.722
Help with feeding	-0.030	0.261	-0.013	0.910
Help get out of bed and chairs	0.029	0.309	0.015	0.926

Note. $N = 98$. Predictors in bold font are significant ($p < .05$).
[a]Model 1: $R^2 = .156$. Model $F(4, 93) = 4.29$, $p = .003$.
[b]Model 2: $R^2 = .204$. Model $F(7, 90) = 3.29$, $p = .004$. R^2 change $F(3, 90) = 1.80$, $p = .154$.
[c]Model 3: $R^2 = .259$. Model $F(14, 83) = 2.05$, $p = .023$. R^2 change $F(7, 83) = 0.85$, $p = .548$.

Spearman correlation was used to determine if there was a relationship between caregiver's background and contextual stressors, demand for care stressors and self-reported health status by caregiving among older female Alzheimer's disease caregivers .Spearman correlations results revealed that worse health status is significantly associated with caregivers who had a lower household income ($r = .381$, $p = < .001$, $N = 102$). Thus, caregivers with a higher household income reported a higher health status and caregivers with a lower household income reported worse health status. The results from the correlational analysis can be found in Table 6.

Research Question 3

Research Question 3 was as follows, Does a significant relationship exist between background and contextual stressors (caregiver's age, income, education, marital status, whether the care recipient lives with the caregiver), demand for care stressors: toileting, challenging behaviors, moving out of beds/chairs, dressing, feeding, diapers, and bathing and the caregiver's self-reported emotional stress among older female Alzheimer's disease caregivers?

For Research Question 3, both Hierarchical Linear Regression and Spearman correlations were used to determine if a relationship exists between caregiver's background and contextual stressors, demand for care stressors and self-reported emotional stress by caregiving among older female Alzheimer's disease caregivers. Background and contextual stressors were the independent variables, which included age, education, household income, marital status, and care recipient living status. The dependent variable was caregiver's emotional stress. For the hierarchical logistic regression analysis, a combination of independent variables (predictors) was entered in the regression in three steps. The numerical results of the analysis are shown in Table 5. The following caregiver background and contextual stressors were entered in the first step of analysis: caregiver exact age, household income, education, and marital status. This step included four predictor variables. This combination was not statistically significant at predicting emotional stress. The following care recipient background and contextual stressors were added to the combination in the second step of analysis: care recipient's gender, care recipient's exact age, and whether they lived with the caregiver.

Thus, this step included seven predictor variables. This combination was not statistically significant at predicting emotional stress. There were no significant individual predictors. The following demand for care stressors was added in the third step of analysis: toilet, challenging behaviors, moving out of bed/chairs, dressing, feeding, diapers, and bathing. This step included 14 predictor variables. The combination was not statistically significant at predicting emotional stress. There was one significant individual predictor: helping the care recipient get out of bed and chairs (caregivers who had trouble with this were more likely to feel emotional stress). The overall regression result showed that the combination of the background and contextual stressors, demand for care stressor did not have a significant relationship with emotional stress. In summary, the results completely failed to reject the null hypothesis H_30. Averages, medians, and modes of caregivers who provided a response to the reported emotional stress question can be found in Appendix C.

Table 5

Linear Regression Predicting Caregivers' Emotional Stress on Background and Contextual Stressors, and Demand for Care Stressors

Predictor	B	SE(B)	Beta	*P*
Model 1[a] (CG Demographics)				
CG Education	-0.148	0.083	-0.195	0.078
CG Married (1=Yes)	0.292	0.271	0.117	0.284
CG Household Income	0.050	0.088	0.065	0.573
CG Age	-0.002	0.013	-0.016	0.877

(*table continues*)

Predictor	B	SE(B)	Beta	*P*

Model 2[b] (Add CR Demographics)				
CG Education	-0.144	0.085	-0.190	0.095
CG Married (1 = Yes)	0.456	0.303	0.183	0.136
CG Household Income	0.040	0.089	0.053	0.649
CG Age	0.003	0.014	0.028	0.810
CR Lives with CG	-0.302	0.280	-0.127	0.285
CR Age	-0.008	0.010	-0.095	0.438
CR Gender (1 = Female)	0.103	0.328	0.043	0.755
Model 3[c] (Add Demand for Care Stressors)				
CG Education	-0.122	0.085	-0.161	0.155
CG Married (1=Yes)	0.399	0.312	0.160	0.205
CG Household Income	0.006	0.014	0.047	0.690
CG Age	-0.001	0.090	-0.001	0.991
CR Lives with CG	-0.388	0.289	-0.163	0.183
CR Gender (1 = Female)	-0.234	0.350	-0.098	0.506
CR Age	-0.003	0.010	-0.043	0.737
Help get out of bed and chairs	**1.124**	**0.437**	**0.459**	**0.012**
Help with feeding	-0.569	0.350	-0.201	0.108
Help getting dressed	-0.576	0.443	-0.237	0.197
Help with incontinence or diapers	0.220	0.324	0.090	0.499
Help to and from toilet	-0.244	0.470	-0.095	0.605
Help with challenging behaviors	0.036	0.274	0.014	0.897
Help with bathing	0.024	0.385	0.010	0.951

Note. $N = 96$. Predictor in bold font is significant ($p < .05$).

[a]Model 1: $R^2 = .052$. Model $F(4, 91) = 1.26, p = .292$.

[b]Model 2: $R^2 = .071$. Model $F(7, 88) = 0.96, p = .466$. R^2 change $F(3, 88) = 0.58, p = .629$.

[c]Model 3: $R^2 = .259$. Model $F(14, 81) = 1.16, p = .320$. R^2 change $F(7, 81) = 1.34, p = .243$.

Spearman correlation was used to determine if there was a relationship between caregiver's background and contextual stressors, demand for care stressors and self-reported emotional stress by caregiving among older female Alzheimer's disease caregivers.

Spearman correlation results revealed that emotional stress by caregiving is associated with helping the care recipient move out of bed/chairs ($r = + .212$, $p = .035$, $N = 100$). The results from the correlational analysis can be found in Table 6.

Table 6

Spearman rho Correlations Among Study Variables^{a,b}

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 CG Emotional Stress	--															
2 CG Health Status	-.11	--														
3 CG Health Harmed^{c}	**.50**	**-.33**	--													
4 CG Household Income	.00	**.38**	-.10	--												
5 CG Education	-.14	.16	-.10	**.35**	--											
6 CG Age	.04	-.05	**-.21**	-.02	-.06	--										
7 CG Married^{c}	.11	.13	.19	**.32**	-.03	.03	--									
8 CR Age	-.02	.17	-.09	.01	-.02	.07	.07	--								
9 CR Gender^{d}	.02	.10	-.01	-.05	-.10	**-.34**	**-.22**	**.46**	--							
10 CR Lives with CG^{c}	-.05	-.10	.07	.02	-.01	.19	**.30**	-.19	**-.45**	--						
11 ADL: Help to and from toilet^{c}	.03	-.07	-.02	-.08	-.08	.05	.13	.02	-.04	.18	--					
12 ADL: Help with challenging behaviors^{c}	.08	.01	.07	-.07	-.04	.06	-.06	.00	-.04	.04	.09	--				
13 ADL: Help get out of bed and chairs^{c}	**.21**	-.05	.15	.00	-.11	.00	.13	.00	.14	.17	**.69**	.17	--			
14 ADL: Help getting dressed^{c}	.03	-.14	.09	-.05	-.03	.07	.19	.04	-.08	**.27**	**.72**	**.20**	**.70**	--		
15 ADL: Help with feeding^{c}	-.08	-.03	-.16	-.05	-.08	.09	.02	.07	.04	-.02	**.47**	-.04	**.43**	**.37**	--	
16 ADL: Help with incontinence/diapers^{c}	.12	-.18	**.21**	-.10	-.08	-.05	.19	.12	.08	.07	**.55**	-.01	**.53**	**.51**	**.33**	--
17 ADL: Help with bathing^{c}	.04	-.05	.07	-.04	-.09	.11	**.33**	.11	-.09	**.27**	**.66**	.06	**.51**	**.70**	**.27**	**.50**

Note: *N* values are all in the range 98 to 102.

[a] CG = Caregiver; CR = Care Recipient.

[b] Significant values are shown in bold font. Correlations with absolute values greater than .19 have $p < .05$; absolute rho values greater than .25 have $p < .01$; absolute rho values greater than .33 have $p < .001$.

[c] 1 = Yes, 0 = No. [d] 1 = Female, 0 = Male.

Analysis of Relation between Age and Impact of Caregiving on Caregiver Health

Kendall's rank correlational analysis evaluated the relationship between age and caregivers' self-reported harm to health resulting from the stress of caregiving, age, and health status from caregiving as well age and emotional stress from caregiving (significance revealed in the linear regressions, and Spearman correlations in research question 1). For age and caregivers' self-reported harm to health resulting from the stress of caregiving, a lower percentage of caregivers between the ages of 70 and 79 years and between the ages of 80 and 89 years reported that caregiving made their health worse, compared to caregivers between the ages of 50 and 59 years and caregivers between 60 and 69 years. The outcome was significant for caregiver age and caregivers' self-reported harm to health resulting from the stress of caregiving (*p* = .008). Kendall's rank correlation results can be found in Table 7.

Table 7

Age and Caregivers' self-reported harm to health resulting from the stress of Caregiving

		Caregiver caregivers' self-reported harm to health resulting from the stress of caregiving		
Caregiver Age		No – Health not harmed	Yes – Caregivers' self-reported harm to health resulting from the stress of caregiving	Total
50 – 59 years	Count	12	13	25
	% within Caregiver Age Group	48.0%	52.0%	100.0%

(*table continues*)

		Caregiver caregivers' self-reported harm to health resulting from the stress of caregiving		
Caregiver Age		No – Health not harmed	Yes – Caregivers' self-reported harm to health resulting from the stress of caregiving	Total
	% within Caregiver Age Group	42.1%	57.9%	100.0%
70 – 79 years	Count	20	6	26
	% within Caregiver Age Group	76.9%	23.1%	100.0%
80 – 89 years	Count	9	3	12
	% within Caregiver Age Group	75%	25.0%	100.0%
All participants	Count	57	44	101
	% within Caregiver Age Group	56.4%	43.6%	100.0%

Note. Kendall's Tau-b = -0.232, *p* = .008

Kendall's rank correlational analysis evaluated the relationship between age and health affected. This crosstab revealed that a lower percentage of caregivers between the ages of 70 and 79 and 80 and 89 years reported that caregiving made their health worse, compared to caregivers 50 and 59 and 60 and 69 years. Kendall's rank correlation results can be found in Table 8. The outcome is significant (*p* = .030).

Table 8

Age and Caregivers' Health Affected by Caregiving

Caregiver Age		How caregiving affected health			Total
		Made it better	Not affected	**Made it worse**	
50 – 59 years	Count	2	10	13	25
	% within Caregiver Age Group	8.0%	40.0%	**52.0%**	100.0%
60 – 69 years	Count	2	14	22	38
	% within Caregiver Age Group	5.3%	36.8%	**57.9%**	100.0%
70 – 79 years	Count	1	19	6	26
	% within Caregiver Age Group	3.8%	73.1%	**23.1%**	100.0%
80 – 89 years	Count	0	9	3	12
	% within Caregiver Age Group	0.0%	75.0%	**25.0%**	100.0%
All participants	Count	5	52	44	101
	% within Caregiver Age Group	5.0%	51.5%	43.6%	100.0%

Note. Kendall's Tau-b = -0.187, *p* = .030

Kendall's rank correlational analysis was used to evaluate the relationship between age and health status by caregiving. This crosstab did not reveal a significant relationship between age group and health status. Kendall's rank correlation results revealed that the outcome was not significant (p = .680). Kendall's rank correlation results can be found in Table 9.

Table 9

Age and Health Status from Caregiving

Caregiver Age		d1 – Health status of caregiver					
		Poor	Fair	Good	Very Good	Excellent	Total
50 – 59 years	Count	1	3	8	8	5	25
	% within Caregiver Age Group	4.0%	12.0%	32.0%	32.0%	20.0%	100%
60 – 69 years	Count	2	7	14	13	3	39
	% within Caregiver Age Group	5.1%	17.9%	35.9%	33.3%	7.7%	100%
70 – 79 years	Count	0	4	6	13	3	26
	% within Caregiver Age Group	0.0%	15.4%	23.1%	50.0%	11.5%	100.0%
80 – 89 years	Count	0	1	8	3	0	12
	% within Caregiver Age Group	0.0%	8.3%	66.7%	25.0%	0.0%	100.0%
All participants	Count	3	15	36	37	11	102
	% within Caregiver Age Group	2.9%	14.7%	35.3%	36.3%	10.8%	100.0%

Note. Kendall's Tau-b = -0.033, p = .680

Kendall’s rank correlational analysis evaluated the relationship between age and emotional stress by caregiving. This crosstab did not reveal a significant relationship between age group and emotional stress. Kendall's rank correlation results revealed that the outcome was not significant (*p* = .955). Kendall's rank correlation results can be found in Table 10.

Table 10

Age and Emotional Stress from Caregiving

Caregiver Age		Q36 – How emotionally stressful caring for recipient is/was?					
		Not at all stressful	2 out of 5	3 out of 5	4 out of 5	Very stressful	Total
50 – 59 years	Count	1	4	7	6	8	26
	% within Caregiver Age Group	3.8%	15.4%	26.9%	23.1%	30.8%	100.0%
60 – 69 years	Count	0	10	5	9	12	36
	% within Caregiver Age Group	0.0%	27.8%	13.9%	25.0%	33.3%	100.0%
70 – 79 years	Count	1	6	5	5	9	26
	% within Caregiver Age Group	3.8%	23.1%	19.2%	19.2%	34.6%	100.0%
80 – 89 years	Count	0	2	1	7	2	12
	% within Caregiver Age Group	0.0%	16.7%	8.3%	58.3%	16.7%	100.0%
All participants	Count	2	22	18	27	31	100
	% within Caregiver Age Group	2.0%	22.0%	18.0%	27.0%	31.0%	100.0%

Note. Kendall's Tau-b = 0.004, *p* = .955

Summary

Respondent data from 103 caregivers were used for analysis in this study. However, the number of survey responses received varied across caregiver questions (see Appendix B). Hierarchical logistic regression, Hierarchical linear regression, and Spearman correlation analysis were used to evaluate the three research questions. For each regression, the predictors included measures of the caregiver's background and contextual stressors (age, income, education, marital status, care recipient's age, gender, and care recipient living status in relationship to the caregiver), demand for care stressors: toileting, challenging behaviors, moving out of bed/chairs, dressing, feeding diapers, and bathing), and self-reported caregivers’ self-reported harm to health resulting from the stress of caregiving, health status, and emotional stress by caregiving.

Hierarchical logistic regression found the background and contextual stressors were sufficient to predict whether the caregiver’s health was harmed by caregiving. The addition of demand for care stressors (predictors) did not significantly improve prediction. Throughout the analysis, the only significant individual predictors were the caregivers’ exact age and marital status. Specifically, younger caregivers and married caregivers were more likely to report that they had harm to health resulting from the stress of caregiving. Only a portion of the null hypothesis H_10 was rejected. See Table 3 for details.

Spearman correlation analysis found that caregivers’ self-reported harm to health resulting from the stress of caregiving by caregiving was significantly associated with younger caregivers and caregivers who had a difficult time dealing with care-recipient's diapers. Caregiver’s age and caregivers’ self-reported harm to health resulting from the stress of caregiving were negatively correlated and care-recipients needing help with diapers and caregivers’ self-reported harm to health resulting from the stress of caregiving were positively correlated.

In the evaluation of Research Question 2, Hierarchical Linear Regression found that caregivers’ background and contextual stressors were able to predict the caregiver's health status. The only significant individual predictor was caregiver household income, with higher income being associated with better health status. The addition of demand for care stressors to the regression did not significantly improve overall prediction or reveal additional significant individual predictors. Only a portion of the null hypothesis H_20 was rejected. See Table 4 for details.

Spearman correlations among the variables found that there was a significant association between the caregiver's household income and health status. The caregiver's household income and health status was positively correlated. There was no significant relationship between the demand for care stressors and health status.

In the evaluation of Research Question 3, hierarchical linear regression was unable to produce a model that could significantly predict a caregiver's level of emotional stress from the predictors that were tested. The only significant individual predictor was the caregiver’s need to help the recipient move out of bed and chairs, which had a positive relationship with the stress level reported by the caregiver. Only a portion of the null hypothesis H_30 was rejected. See Table 5 for details. Spearman correlations found that caregiver stress was significantly correlated with helping the care recipient move out of bed /chairs. In Chapter 5, research findings, the limitations of this research study, and recommendations for additional study exploration will be further discussed.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The rationale for conducting this quantitative research study was to explore the relevance of background and contextual stressors and demand for care stressors on caregivers' self-reported caregivers' self-reported harm to health resulting from the stress of caregiving, health status, and emotional stress in older female Alzheimer's disease caregivers.

Rendering care to individuals with Alzheimer's disease can be a stressful experience and have a deleterious effect on caregivers' health from both a physical and mental standpoint (Alzheimer's Association, 2014; Conde-Sala et al., 2010; Gonzalez et al., 2011; Mausbach et al., 2013; Pearlin et al., 1990). Pearlin et al.'s (1990) stress process model for Alzheimer's caregivers' highlights that there is a multitude of stressors that contribute to and complicate Alzheimer's disease caregiving, which can lead to unhealthy caregiver outcomes. This study was conducted to explore whether a statistical impact was observed between background and contextual stressors (age, income, education, marital status, whether the care recipient lives with the caregiver) and demand for care stressors (toileting, challenging behaviors, getting out of beds/chairs, dressing, feeding, diapers and bathing) on female caregivers' self-reported caregivers' self-reported harm to health resulting from the stress of caregiving, health status, and emotional stress.

Summary of Key Findings

The mean age of older female Alzheimer's disease caregivers under study was 67.05 years. All caregivers were older females between the ages of 50 and 89. The 30%

of caregivers had a high school diploma and nearly one-third had postsecondary education. Caregivers were predominantly married, though their income varied. A small percentage of caregivers had an annual income under \$15,000. An approximately equal portion of caregivers had an income from \$15,000 to \$29,999, \$30,000 to \$49,000, \$50,000 to \$74,999, \$75,000 to \$99,000, and \$100,000 or more. To evaluate RQ1 1, hierarchical logistic regression analyses and 12 Spearman correlations were used to evaluate if a significant relationship existed between the caregivers' backgrounds and contextual stressors (age, income, education, marital status, whether the care recipient lives with the caregiver), demand for care stressors (toileting, challenging behaviors, moving out of beds/chairs, dressing, feeding, diapers, and bathing) and the caregivers' self-reported harm to health resulting from the stress of caregiving. The results from the logistic regression revealed that there was a relationship between the caregivers' age, income, education, marital status, whether the care recipient lives with the caregiver, demand for care stressors (toileting, challenging behaviors, moving out of beds/chairs, getting dressing , feeding, diapers, and bathing), and the caregiver's caregivers' self-reported harm to health resulting from the stress of caregiving. The significant individual predictors were the caregivers' age and marital status. These results indicated that married and younger caregivers were more likely to report that they had harm to health resulting from the stress of caregiving.

Spearman correlation analyses showed that caregivers' self-reported harm to health resulting from the stress of caregiving was significantly associated with some caregivers' backgrounds and contextual stressors and demand care stressors, though not all of them. Out of the 12 independent variables, age and help with diapers were the only two independent variables that had a significant relationship with caregivers' self-reported harm to health resulting from the stress of caregiving. The remaining 10 independent variables education, income, status of care recipient living with caregiver, toileting, challenging behavior, moving out of bed/chairs, dressing, feeding, and bathing, did not reveal a significant relationship with caregivers' self-reported harm to health resulting from the stress of caregiving. Kendall's rank analysis was conducted to further explore the impact of caregivers' age and caregivers' self-reported harm to health resulting from the stress of caregiving among older caregiver population. The results revealed that caregivers in the 70 to 89 years age range, reported less harm to health to caregivers in the 50 to 79 year range.

To evaluate RQ2, hierarchical linear regression analyses and 12 Spearman correlations were used. The results derived from the hierarchical linear regression revealed that that there was a relationship between the combination of caregiver background and contextual stressors, and the caregivers' health status. The only significant individual predictor was caregivers' income. This result revealed that worse health status was significantly associated with caregivers who had a lower household income.

Similar to the hierarchical linear regression result, Spearman correlation analysis revealed that worse health status was significantly associated with caregivers who had a lower household income. Among the 12 independent variables, income was the only independent variable that revealed a significant relationship with a caregiver's health status. The remaining 11 independent variables did not reveal a significant relationship with caregivers' health status. Kendall's rank analysis was conducted to further explore the relationship between caregivers' age and health status. The analysis did not produce any meaningful output.

To evaluate RQ3, hierarchical linear regression analyses and 12 Spearman correlations were used to determine if a significant relationship exists between the caregivers' background and the contextual stressors, and caregivers' self-reported emotional stress. The results from the hierarchical linear regression did not reveal a significant relationship between the contextual stressors demand for care stressors, and the caregiver's emotional stress. The only significant individual predictor was helping the care recipient to get out of bed/chairs. Furthermore, the Spearman correlation analysis revealed that emotional stress was associated with helping the care recipient get out of bed/chairs. Amongst the 12 variables, helping the care recipient move out of bed/chairs was the only independent variable that had a significant relationship with caregivers' emotional stress. The remaining 11 independent variables did not reveal a significant relationship with caregivers' emotional stress. When further evaluating if a significant relationship exists between caregivers' age and emotional stress, the analysis did not provide any additional meaningful output.

Interpretation

The Alzheimer's disease stress process model served as a basis for this study in describing the intricacies of Alzheimer's disease caregiving and the many components that play a role in influencing the health of older female Alzheimer's disease caregivers

(Pearlin et al., 1990). Buttressed by Alzheimer's disease stress process model, the three research questions were posed to evaluate the relationship between background and contextual stressors, demand for care stressors, on the self-reported caregivers' self-reported harm to health resulting from the stress of caregiving, health status and emotional stress among older female Alzheimer's disease caregivers. In presenting the first question, using hierarchical logistic regression, the objective was to assess the relationship between background and contextual stressors, demand for care stressors and the self-reported caregivers' self-reported harm to health resulting from the stress of caregiving among older female Alzheimer's disease caregivers. The overall regression was significant. However, the caregiver's age and marital status were the only two independent variables that predicted whether the caregiver's health was harmed by caregiving. The following independent variables did not reveal significance: income, education, whether the care recipient lives with the caregiver, toileting, challenging behaviors, moving out of beds/chairs, dressing, feeding, diapers, and bathing.

On age and caregivers' self-reported harm to health resulting from the stress of caregiving, Kendall's rank correlational analysis further revealed that younger caregivers (50 to 69 years) reported more caregivers' self-reported harm to health resulting from the stress of caregiving than older caregivers did (70 to 89 years).

The results further the knowledge from previous studies regarding the impact of age, and marital status on caregiver burden. Regarding age, Germain et al. (2009) purported that predicted caregiver burden rested on the Alzheimer's disease caregiver being younger while Serrano-Aguilar et al. (2006) purported that being older, with emphasis on being a female, played a significant role in predicting burden and poor health-related outcomes in Alzheimer's disease caregivers. As it concerns marital status, Lou et al., (2015) determined that that caregiver burden was associated with being a spousal caregiver, while Conde-Sala et al. (2010) determined that caregiver burden loomed more with non-spousal caregivers (adult daughter caregiver) versus spousal caregivers. Conversely, Ott et al. (2007) determined that more caregiver burden resided among spousal caregivers versus non-spousal caregivers (adult caregivers).

In evaluating RQ2, hierarchical linear regression was used to determine the relation between background and contextual stressors, demand for care stressors, and the self-reported health status among older female Alzheimer's disease caregivers. The regression showed an overall significance, although, the caregiver's income was the only independent variable that had a significant relationship. The following independent variables did not have a significant impact in the relationship: age, education, marital status, whether the care-recipient lived the caregiver, toileting, challenging behaviors, moving out of bed /chairs, dressing, feeding, diapers, and bathing. Results from the Spearman correlation revealed a similar significant relationship. Results from this study broaden the discussion surrounding the impact of income on caregiver's health highlighted in previous research (Covinsky et al., 2003; Gonzalez et al., 2011). Covinsky et al. (2003) and Gonzalez et al. (2011) purported that low income served as a predictor for depression among older Alzheimer's disease caregivers.

In evaluating the third research question, hierarchical linear regression was used to determine if a relationship exists between background and contextual stressors and self-reported emotional stress among older female Alzheimer's disease caregivers. The overall regression was not significant. However, there was one individual significant predictor, which was helping the care-recipient move out of bed/chairs that caused Caregivers to feel emotional stress.

This result adds to the existing knowledge on the relationship between care-recipient's low functional abilities and caregiver's emotional stress as well as the relationship between care recipient's worsening Alzheimer's and caregiver's depression (Aguglia et al. 2004; Ferrara et al.,2008). Aguglia et al. (2004) determined that low cognitive and functional ability of the care recipient predicted high levels of stress and anxiousness in caregivers. Ferrara et al. (2008) determined that care recipient’s worsening cognitive abilities predicted depression, anxiousness, and stress among older female Alzheimer's disease caregivers.

Through incorporating the underlying principles that contribute to the Alzheimer's disease stress process model, this study revealed specific caregiving factors associated with the caregivers’ self-reported harm to health resulting from the stress of caregiving, health status, and emotional stress. Research Question 1 revealed that age and marital status predicted the caregivers’ self-reported harm to health resulting from the stress of caregiving, though predictive results were not demonstrated with the remaining independent variables.

Research Question 2 revealed that, among the caregiver's background and contextual and demand for care stressors, only the caregiver's income significantly predicted caregiver's health status. Caregivers with greater household incomes tended to have a better health status.

Research Question 3 revealed that, overall, the model containing the caregiver's background contextual and demand for care stressors as independent variables was not a significant predictor of the caregiver's emotional stress. However, the individual predictor, moving the care recipient get out of bed/chairs, did have a significant positive relationship with the caregiver's experience of emotional stress. Spearman correlation results also showed that greater demand for helping the care-recipient get out of bed /chairs was associated with greater emotional stress.

Study Limitations

A primary limitation regarding this research study surrounds the survey process that collected the data analyzed. It is possible that caregivers whose health had been harmed more severely, or those with more demanding caregiving responsibilities were less able to participate in the survey. Thus, those groups may have been under-sampled. Another limitation of the study was sample size. The sample size was restricted to female caregivers at least 50 years old, caring for individuals with older Alzheimer's disease female caregivers, which shrank the sample size to just 104 participants. A larger sample would be more representative and can provide more generalizability. The National Alliance for Caregiving website did not provide did not provide information on the validity and reliability of the 2015National NAC/AARP Survey on Caregiving in the United States. However, the content validity of the survey should be strong. The survey questions are simple and factual, and do not require interpretation, guessing, or judgment on the part of the respondents. It would be infeasible to measure test-retest reliability with such a survey, and the heterogeneity of the items makes internal consistency reliability measures inappropriate.

Study Recommendations

Conducting a longitudinal study that evaluates caregiver stressors, burden, and health outcomes over a long period, would offer additional insights for reporting among older female Alzheimer's disease caregivers. Since there is a scarcity of information on the consequential effects of Alzheimer's disease caregiving in older females, more empirical research is needed, with a study design specific for older female caregiver populations. In addition, non-empirical based research in conjunction with empirical based research could offer additional valuable and meaningful in-depth perspectives on the experience of Alzheimer's disease caregiving. Both research approaches could help decision-makers frame caregiver resources that are applicable to this vulnerable population.

Study Implications

Alzheimer's disease caregiving is multifactorial process, challenging, stressful, and impactful from an economic, emotional, and physical standpoint. Communicating the realities of Alzheimer's disease caregiving among older populations to a broader audience is essential. Outcomes from this study can create positive social change by bringing more awareness to the public about the complications surrounding Alzheimer's disease caregiving. The results from this research study can be utilized to help drive policy and appeal for funding from the government, philanthropist, humanitarian, and charitable organizations to be spent on Alzheimer's disease caregiving research, on caregivers' for respite care and home health services to relieve caregiver burden. In addition, key-points from these findings can be disseminated to Alzheimer's disease support groups to bring more awareness to caregivers, their families, and friends as well as to key-stakeholders about the complications surrounding Alzheimer's disease caregiving with the specific focus on caregivers who are older and female. In addition, perhaps findings from this study can help justify the need to appeal to individual contributor's philanthropist, humanitarian, and charitable organizations for financial resources to help alleviate the stress and burden related to Alzheimer's disease caregiving.

Study Conclusion

This Alzheimer's disease caregiving study offered a meaning analysis of factors that contribute to a caregiver’s stress and burden, thus playing a pivotal role in caregiver health and emotional outcomes among an older female population. With Alzheimer's disease being the most expensive disease in the United States, and with the expectation of

1 million new cases to emerge by 2050, an assessment of caregiver needs warrants further investigation (Alzheimer's Association, 2018). The studies aimed to evaluate a variety of caregiver stressors on emotional health and emotional outcomes in a select population undergirded by the Alzheimer's disease caregivers stress process model (Pearlin et al., 1990).

Results reported from this study determined that factors such as age, income, and marital status were predictors of health outcomes and that more emotional stress was significantly associated with caregivers dealing with care-recipient's diapers. Research studies determined that coping and social support are two mediums that could be influential in buffering against the negative outcomes associated with caregiving (Heo, 2014; Pearlin et al., 1990). Research that is more extensive is necessary to help establish a stronger understanding of the factors that influence caregiver outcomes in older female Alzheimer's disease caregivers. More dialogue between individuals, community members, as well as the medical and public health community is needed to find solutions to address the deleterious effects of Alzheimer’s disease caregiving in older females.

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Appendix A: 2015 NAC / AARP Survey on Caregiving in the United States

Demographic Responses

Study Inclusion Criteria

Presence of Alzheimer's dementia (variable "alzdem")

1 = Yes
2 = No
3 = Not sure/refused

Primary Caregiver (variable "primary")

1.00 = Primary- sole or provides most
2.00 = Non- primary- other is share
3.00 = Not sure/Refused

Background and Contextual Stressors (Independent Variables)

Age (variable "agecgcat")

1 = 18 to 49 (not included in the study)
2 = 50 to 64
3 = 65+
4 = Don't know, Refused

Gender (variable "sexcg")

1 = Male (not included in the study)
2 = Female

Education (variable "edu")

1 = Less than high school
2 = High school grad/GED
3 = Some college

4 = Technical School

5 = College grad

6 = Graduate school/Grad work

7 = Don't know

8 = Refused

Income (variable "income")

1 = Under $15,000

2 = $15,000 to $29,999

3 = $30,000 to $49,999

4 = $50,000 to $74,000

5 = $75,000 to $99,000

6 = $100,000 or more

6 = Graduate school/Grad work

7 = Not sure

8 = Refused

9 = Less than $50,000, not fully specified

10 = More than $50,000, not fully specified

Marital status of care-recipient (variable "marital")

1 = Married
2 = Living with a partner
3 = Widowed
4 = Separated
5 = Divorced
6 = Single, never married
8 = Don't know
9 = Refused

Note: Marital status variable created

Married = Yes/No
Caregiver with a 1 or 2 = Married or partnered
Caregiver with a 3, 4, 5,or 6 = Not married or partnered
Caregiver with a 8 or 9 = Missing data

Living status of care recipient (variable "banlives')

1 = Yes - lives with the caregiver
2 = No -lives elsewhere
3 = Don't know

Appendix B: 2015 NAC / AARP Survey on Caregiving in the United States Study Research Responses

Demand for Care Stressors Frequency and Percent

Table B1

Caregiver Response for Helping Care-Recipient With Getting Out of Bed and Chairs

Q22a - Get in and out of beds and chairs - Help with ADL

		Frequency	Percent	Valid Percent
Valid	(1) Yes	40	38.8	38.8
	(0) No	63	61.2	61.2
	Total	103	100.0	100.0

Table B2

Caregiver Response To Helping Care-Recipient With Getting Dressed

Q22b - Get dressed - Help with ADL

		Frequency	Percent	Valid Percent
Valid	(1) Yes	41	39.8	39.8
	(0) No	62	60.2	60.2
	Total	103	100.0	100.0

Table B3

Caregiver Response To Helping Care-Recipient With Toileting

Q22c - Get to and from toilet - Help with ADL

		Frequency	Percent	Valid Percent
Valid	(1) Yes	31	30.1	30.1
	(0) No	72	69.9	69.9
	Total	103	100.0	100.0

Table B4

Caregiver Response To Helping Care-Recipient With Bathing

Q22d - Bathe or shower - Help with ADL

		Frequency	Percent	Valid Percent
Valid	(1) Yes	42	40.8	40.8
	(0) No	61	59.2	59.2
	Total	103	100.0	100.0

Table B5

Caregiver Response To Helping Care-Recipient Deal with Incontinence or Diapers

Q22e - Dealing with incontinence or diapers

		Frequency	Percent	Valid Percent
Valid	(1) Yes	41	39.8	39.8
	(0) No	62	60.2	60.2
	Total	103	100.0	100.0

Table B6

Caregiver Response To Helping Care-Recipient With Feeding

Q22f - Feeding him/her

		Frequency	Percent	Valid Percent
Valid	(1) Yes	25	24.3	24.3
	(0) No	78	75.7	75.7
	Total	103	100.0	100.0

Table B7

Caregiver Response To Helping Care-Recipient Manage Challenging Behaviors

Q48b - Managing challenging behaviors, such as wandering - need more help/info

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	69	67.0	67.6	67.6
	Yes	33	32.0	32.4	100.
	Total	102	99.0	100.0	
Missing	System	1	1.0		
Total		103	100.0		

Self-Reported Health Status, Caregivers' self-reported harm to health resulting from the stress of caregiving and Emotional Stress Outcomes.

Table B8

Caregiver Response To Self-Reported Health Status

D1 - Health status of caregiver

		Frequency	Percent	Valid Percent
Valid	(1) Poor	3	2.9	2.9
	(2) Fair	15	14.6	14.7
	(3) Good	36	35.0	35.3
	(4) Very Good	37	35.9	36.3
	(5) Excellent	11	10.7	10.8
	Total	102	99.0	100.0
Missing	System	1	1.0	
Total		103	100.0	

Table B9

Caregiver Response To Self-Reported Health Affected

D2 - How has caregiving affected health?

		Frequency	Percent	Valid Percent
Valid	(1) Made it better	5	4.9	5.0
	(2) Not affected	52	50.5	51.5
	(3) Made it worse	44	42.7	43.6
	Total	101	98.1	100.0
Missing	Refused	1	1.0	
	System	1	1.0	
	Total	2	1.9	
Total		103	100.0	

Created Variable "Caregivers' self-reported harm to health resulting from the stress of caregiving"

Table B10

Caregiver Response To Self-Reported Health Harmed Resulting From The Stress of Caregiving

Caregivers' self-reported harm to health resulting from the stress of caregiving

		Frequency	Percent	Valid Percent
Valid	(0) Health not harmed	57	55.3	56.4
	(1) Caregivers' self-reported harm to health resulting from the stress of caregiving	44	42.7	43.6
	Total	101	98.1	100.0
Missing	System	2	1.9	
Total		103	100.0	

Table B11

Caregiver Response To Self-Reported Emotional Stress From Caregiving

Q36 - How emotionally stressful caring for recipient is/was?

		Frequency	Percent	Valid Percent
Valid	(1) Not at all stressful	2	1.9	2.0
	(2) 2 out of 5	22	21.4	22.0
	(3) 3 out of 5	18	17.5	18.0
	(4) 4 out of 5	27	26.2	27.0
	(5) Very stressful	31	30.1	31.0
	Total	100	97.1	100.0
Missing	System	3	2.9	
Total		103	100.0	

Appendix C: Averages (Means, Medians, and Modes)

Table C1

Averages (Means and Medians) for Interval and Ratio Variables

	Care - Recipients exact age	Caregivers exact age
N	103	103
Missing	0	0
Mean	79.12	67.05
Median	83.00	65.00
Std. Deviation	14.58	9.71
Minimum	26	50
Maximum	101	89

Table C2

Averages (Medians and Modes) for Ordinal and Nominal Variables

		CG caregivers' self-reported harm to health resulting from the stress of caregiving	Q22a - Get in and out of beds and chairs - Help with ADL	Q22b - Get dressed - Help with ADL	Q22c - Get to and from toilet - Help with ADL	Q22d - Bathe or shower - Help with ADL	Q22e - Dealing with incontinence or diapers - Help with ADL	Q22f - Feeding him/her - Help with ADL	D1 - Health status of caregiver	D2 - How has caregiving affected health	Q36 - How emotionally stressful caring for recipient is/was?
N		101	103	103	103	103	103	103	102	101	100
	Missing	2	0	0	0	0	0	0	1	2	3
Mean		.4356	1.61	1.60	1.70	1.59	1.60	1.76	3.37	2.39	3.63
Median		.0000	2.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00	4.00
Mode		.00	2	2	2	2	2	2	4	2	5
Std. Deviation		.49831	.490	.492	.461	.494	.492	.431	.964	.583	1.195
Minimum		.00	1	1	1	1	1	1	1	1	1
Maximum		1.00	2	2	2	2	2	2	5	3	5