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Marital Status and Burdensomeness as Risk Factors of Suicide Ideation in Poststroke Patients

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BA, Edinboro University of Pennsylvania, 1996

MS, University of District of Columbia, 1998

Dissertation Submitted in Partial Fulfillment

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Abstract

Suicide ideation, suicide attempts, and suicide (SISAS) are increased in poststroke patients, yet not everyone who has suffered a stroke is at risk for SISAS. Two risk factors for SISAS, marital status and burdensomeness, may be of particular relevance to poststroke patients. The majority of poststroke patients have a disability that may require help from a family member with basic functions such as dressing and bathing. It was not known if being married decreases risk of SISAS for stoke victims as shown in studies with nonpoststroke subjects or increases risk for SISAS due to its influence on feelings of burdensomeness. Guided by the interpersonal psychological theory of suicidal behavior, the purpose of this study was to examine if marital status moderates the association between burdensomeness (measured by disability level) and suicide ideation. A secondary analysis was performed of the Outcome and Assessment Information Set data, which was collected by the National Centers for Medicare and Medicaid Services. A data sample of 1,596,962 records was obtained. This data sample included 5% of the Home Health Outcome Information and Assessment Set for the year 2008. Of those, 8,6381 (5.4%) individuals had suffered a stroke. The results suggested partial support for the hypotheses presented in this study. However, a significant moderation was found. As burdensomeness increased, suicide ideation increased in patients who were married. High levels of burdensomeness increase suicide risk to those who are married. Identifying a vulnerable population can provide potential positive social change by serving as basis for future research regarding program implementation in reducing suicide rates.

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Dedication

To all the persons who have suffered from any type of stroke and for their inner emotional strength that allows them to face another day, every day.

To the caregivers, you have my utmost respect. Your selfless contribution is what allows me to keep fighting for our patients. Since I started working with stroke patients, I have been humbled by your sheer determination. I am especially humbled by caregivers who have taken on a role without applying for it and made it their own daily commitment with little in return. This is what I call true altruism. I see you daily, admire you constantly, and appreciate you always.

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Chapter 1: Introduction to the Study

Introduction

The topic of this investigation was suicide ideation in patients who have suffered a stroke. Suicide ideation, suicide attempts, and suicide (SISAS) have been found to be increased poststroke, yet not everyone who has suffered a stroke is at risk for SISAS. Currently, it is not well understood who is at greater risk for SISAS (Pompili, Forte et al., 2012). My intent with this study was to provide an understanding of the association between stroke, disability, and risk factors for SISAS. Marital status is one of the risk factors for suicidal ideation in general, yet it has not been examined as a risk factor for poststroke suicide ideation. Existing data suggests that being married protects against suicide. However, poststroke, being married or partnered also suggests an increased level of burdensomeness towards the spouse, which has been shown to increase SISAS. Therefore, the purpose of the research was to examine whether marital status may affect suicide ideation in poststroke patients by increasing burdensomeness. Identifying a vulnerable population can provide a basis for future research regarding program implementation in reducing suicide rates.

A historical perspective of suicide across time and cultures follows. Next, I provide definitions of frequently used terms, followed by a summary of a literature review on SISAS and the existing gap in the literature that this study addressed. In the remainder of Chapter 1 I state the research questions and hypotheses as well as the theoretical and conceptual framework for this study, including the rationale for selection of the chosen design. I provide a description of any assumptions, limitations, and

delimitations of the study along with a justification of the significance of the study and potential implications for positive social change.

Background

The word suicide derives from the Latin words *sui* ("of oneself") and *cidium* ("killing" or "slaying"; Minois, 1999). Suicide is not a new phenomenon, and a brief description of the history of suicide indicates how the concept and act has changed over time. Suicide existed from the time of primitive hunters, where it was quite common for one individual to volunteer to draw the attention of a herd of animals in order to either save the tribe or to attract attention for easier capture of the animal. Even though death was not the ultimate goal, the chances of survival under those circumstances were low (Stillion & McDowell, 1996). Bromberg and Cassel (1983) reported that many of the elderly in primitive cultures were encouraged to commit suicide in order to avoid old age pains and preserve their honor, an act of what is currently called *altruistic suicide*. Altruistic suicides are volunteer deaths and still occur today, such as those in 20th century Eskimo tribes, where the elderly sacrificed their own lives by exposing themselves to the freezing weather when they no longer believed they were of much use in the society (Bromberg & Cassel, 1983).

The oldest written accounts of suicide are from the *Old Testament*, which describes six cases of suicide. The first written example of suicide from the *Old Testament* was in 1,000 B.C. when Samson killed himself after he violated his faith. In addition, King Saul fell on his own sword and killed himself after the loss of his three sons. As a result of King Saul's death, his servant, overtaken by grief, took his own life. Other instances of suicide in the *Old Testament* are when Ahitophels' plan to attack King

David failed, and he later hung himself (Stillion & McDonell, 1996). Abimelech and Zimri were the other individuals who killed themselves in the *Old Testament* (Mariottini, 2009). The *New Testament,* which is the second section of Christian Bible, which is based mostly upon the Hebrew Bible (Bandstra, 2004), mentions Judas Iscariot as the only one who committed suicide. Later the Greco-Roman culture viewed suicide as a disgraceful act. It was believed that a person's life was a gift from Gods and that taking one's own life was seen as an act of rebellion towards the gods (Retterson, 1998). Eventually though, many Greek philosophers realized that suicide is a choice of free will and even a heroic act (Nock, 1952). During the same time, in other cultures such as in India, there were two forms of altruistic suicide: *Jauha*, which was a mass suicide by women when their men were defeated in battle, and *Sati*, which was suicide by a widow after her husband was cremated (Vijayakumar, 2004). In the middle ages, the Christian church viewed suicide as a sinful and criminal act. Louis XIV of France (1670) issued a criminal ordinance where the dead person's body was to be disrespected and thrown in the garbage (Pickering & Walford, 2000). By the 19th century, suicide changed from being a sinful act to an act of insanity. In Europe, suicide was still illegal during that time (Maris, Berman, & Silverman, 2000). By the 20th century it became increasingly recognized that suicide was related to mental illness. Suicide became legal, and the person was even allowed to have a burial (St. John-Stevas, 1961).

Another important milestone in the 20th century was euthanasia; a law that was passed in Switzerland in 1942 that allowed for those who have only short time to live the opportunity to experience a more dignified death. Some advocate that the person's pain can be so intolerable and that euthanasia is a possible solution to end this hopeless

situation (Battin & Lipman, 1996). Even though euthanasia, called mercy killings, had existed in ancient Greece and Rome, euthanasia was illegal and against the Hippocratic Oath (Dowbiggin, 2003). Other countries have since legalized euthanasia, and some allow it for circumstances were death is not imminent but the patient experiences constant and unbearable suffering. In Belgium, euthanasia is even allowed for minors (Bradbury, 2003)

The literature review in Chapter 2 provides an understanding of the association between stroke, disability, and risk factors for SISAS. SISAS have been found to exist poststroke, yet not everyone who has suffered a stroke is at risk for SISAS. Currently, it is not well understood who is at greater risk (Pompili, Venturini et al., 2012).

What Is a Stroke?

Even after major developments in understanding the pathophysiology of cerebrovascular diseases, the definition of "stroke" still remains rather inconsistent (Sacco et al., 2013). A brain injury, or stroke, occurs when the blood that leads to the brain does not carry enough oxygen or sugar, making the brain functions unable to perform (Caplan, 2006). According to Caplan, "Stroke is a very broad term that describes a variety of different types of diseases involving the blood vessels that supply the brain with needed nourishment and fuel. Treatment depends on the types of stroke and the location of the blood vessels involved. Thus, it is very important for treating doctors to determine precisely what caused the vascular and brain injury, and where the abnormalities are located" (Caplan, 2006, p. 10)

Two main types of stroke, *hemorrhagic* and *ischemic,* are described as opposites. In the hemorrhagic type, an abundance of blood overflows the brain, while in the

ischemic stroke the brain does not receive enough blood (Caplan, 2006). In the first, cells die after the vessel is broken and excessive blood leaks into the interstitial tissue. In the second, cells die due to lack of blood. Hemorrhagic strokes that occur inside the brain are called intracerebral hemorrhages. A transient ischemic attack, also referred to as a "mini stroke," is caused by a temporary clot or blockage (American Stroke Association, 2012). Transient ischemic attack occurs when the blood that leads to the brain does not carry enough oxygen or sugar, making the brain functions unable to be performed (Caplan, 2006). The two main sources of energy the brain uses are oxygen and sugar, carried primarily in the hemoglobin of red blood cells and in the blood serum, respectively (Caplan, 2006).

The location of a hemorrhagic stroke is not limited to the skull but can occur in any space between the skull and the brain. Under the hemorrhagic stroke, different subcategories are named mainly for their location inside the skull (Caplan, 2006) The brain is covered with three membranes; the outer membrane layer is called *pia mater,* which literally means "soft mother"; the second membrane is called the *arachnoid membrane*, which resembles a spider web; and the third layer of membranes that surrounds the brain is called the *dura mater,* which literally means "hard mother." When a stroke occurs in the pia mater, this is called an intracranial hemorrhage. When the hemorrhage occurs between the pia mater and the arachnoid membrane, this occurrence is called subarachnoid hemorrhage. A brain hemorrhage occurring inside the dura matter is called subdural hemorrhage. Those strokes that occur outside the dura mater are called epidural hemorrhages. Depending on the types of hemorrhage, different results occur (Caplan, 2006).

Stroke Statistics

Even though stroke mortality has decreased in the last few decades due to the use of antithrombotic therapy and advances in lowering blood pressure, stroke still remains the number four cause of death in the United States (Asuzu & Sheth, 2013). A projected number of four million individuals are to have a stroke by the year 2030. Available statistics point to the increased levels of stroke occurrences. In 1993, cerebrovascular accidents (CVA) occurred to 4.5% of individuals of 45 years and younger. In the year 2005, this statistic rose from 4.5% to 7.3%. In 1993, the average age for a CVA was 72 years. By 2005 the average age was lowered to 68 years of age (American Stroke Association, 2010).

Stroke and Disability

Disability refers to the changes in the interaction between patient and environment. Any restriction that results from an impairment that prevents the individual from performing an activity is considered a disability. In the case of stroke patients, consequences are impairment of activities of daily living or instrumental activities of daily living (ADL/IADL) such as dressing, bathing, feeding, toileting, grooming, transferring, and mobility (Astrom, Olsson, & Asplund, 1993). Poststroke effects can lead to an array of physical, emotional, and financial issues. Stroke, as is true of many chronic illnesses, can be unpredictable, unfamiliar, and threatening (Falvo, 2014). Anger at oneself, anger at others for the injustice of the experience, depression, guilt, and social isolation are some of feelings that the individual with chronic illness is likely to experience (Pompili, Venturini et al., 2012). Furthermore, lower income, inability to drive, and higher levels of physical disability can be among the characteristics that

individuals with chronic illnesses experience (Pompili, Venturini et al., 2012). When a patient's meaningful functions or activities are altered or cannot be executed due to stroke or other illness, the level of the patient's disability is increased (Astrom & Asplund, 2003). Adding to this, about 62% of stroke patients were reported to have either died or be dependent at 6 months poststroke when there was no intervention (Mendis, 2012). Samson (2010) further stated that 5 years poststroke, two thirds of the stroke survivors had some neurological disability: about 22% had dementia, 15% were institutionalized, and about 20% had suffered another stroke. Among the many changes the stroke survivor may go through are bodily changes. The individual then faces an altered perception of self. Stroke survivors perceive their bodies as unreliable, unfamiliar, and fragile, and they often disassociate the body from the self (Kitzmuller, Haggstrom, & Asplund, 2012). One of the many results of chronic illness is SISAS (Kitzmuller et al., 2012)

Stroke and Burdensomeness

Most of the studies have found how family members are affected from a chronic illness such as stroke, but very few examined the patients' self-perceived burdensomeness that the illness imposes. The stroke survivor often has physical challenges and limitations; furthermore, the stroke survivor often faces chronic pain as a result of the stroke (Kowal et al., 2012). Chronic pain's intensity, functional limitations, depressive symptoms, and caregiver burden were among the reasons as to why the patient's self-perceived level of burdensomeness increases.

Stroke can be a life threatening and debilitating illness with a great impact on families. Lack of communication often leads to marital conflicts that, as seen earlier, can

be one of the predictors for suicide ideation. In addition, patients' education in terms of what to expect can be important; for instance, ischemic injury often affects learning (Cameron, Naglie, Silver, & Gignac, 2013). As many as one third of stroke survivors experience poststroke depression in which case social support is an important variable in reducing or preventing psychiatric distress (Salter, Foley, & Teasell, 2010). As part of the social support, further explanation as to how marriage and SISAS are related is needed.

Marriage and Suicide Ideation, Suicide Attempts, and Suicide

As described earlier, existing data supports that marriage acts as a protective factor against SISAS (Zhang, 2010). According to the Office for National Statistics (Sigman, 2009), the protective effect of marriage against suicides has been persisting for over 25 years, even though marriage patterns are changing. Between 1983 and 2004, suicide rates in Britain were three times higher among single people when compared to married people (Sigman, 2009). In Japan, a study of 94,000 single individuals revealed that not being married constituted adverse health effects. Similar results in Denmark revealed that individuals who lived alone experienced increased mortality when they were compared to individuals who lived together (Sigman, 2009). It is then of no surprise that disruption of the marriage, such as divorce, can have a strong association with higher suicide rates (Umberson, 1992).

Some of the reasons that marriage can serve as a protective factor against SISAS are that married couples provide support in stressful events (Zhang, 2010). Sharing a person's problems or being responsible towards a spouse lowers the risk for suicide mortality (Denney, Rogers, Krueger, & Wadsworth, 2009). Further studies stated that marriage can be seen as a protective factor against suicide ideation, especially in the

elderly population (Hintikka et al., 2009). As a whole, married individuals tend to have greater immunity to suicide due to the fact that married persons may be more integrated into a supportive network than nonmarried persons (Smith, Marcy, & Conn, 1998). A traditional family structure is often associated with lower risks for suicide. For women especially, the effect of being a parent tends to act as a protective mechanism against suicide (Mortensen, Agerbo, Erickson, Qin, Westergaard-nielsen, 2012). Mortensen et al. (2012) further examined the gender differences relative to the effects of marital status and suicide. As mentioned above, being a parent acts as a protective factor for women against suicide, whereas being married, on its own, served as a protective factor for men (Hawton, 2000).

While much has been done to show the positive effects of marital status against SISAS, little has been done to show whether marital status can lead to SISAS when burdensomeness increases; more precisely, how marital status and burdensomeness affect each other in the stroke survivor. This research examined whether marital status in stroke survivors increases or decreases levels of burdensomeness and whether this may lead to higher levels of SISAS.

Statement of the Problem

The focus of this study was suicide ideation in stroke patients and the link, if any, between this particular population and risk factors for suicide. Multiple risk factors have been identified in the literature on SISAS: family history, personal history, marital status, gender, age, chronic or acute stress, substance abuse, economic factors, and other types of psychiatric disorders besides depression, among others. Existing data suggests that marital status, specifically being married, acts as a protector against suicide (Zhang,

2010). However, being married as well as having a partner might work differently in the case of poststroke patients, who may need help with basic tasks such as dressing and eating, which increases their perception of burdensomeness towards their spouse. Of great interest to the focus of the research was to examine whether marital status affected suicide ideation in stroke patients by increasing burdensomeness.

Purpose of the Study

The purpose of this study was to examine if burdensomeness (independent variable) was associated with suicide ideation (dependent variable) and if this association was moderated by marital status. This study could contribute to understanding the role of burdensomeness and marital status on suicide ideation among stroke survivors. In addition, identifying a vulnerable population can provide a basis for future research regarding program implementation in reducing suicide rates.

Research Questions and Hypotheses

Following are the research questions and hypotheses for the study:

RQ1: Is marital status associated with suicide ideation among adult stroke patients?

$H_0$1: There is no relation between marital status and suicide ideation among elderly adults who have had a stroke within the past 12 months.

H_a1: There is a relation between marital status and suicide ideation among elderly adults who have had a stroke within the past 12 months; self-reported suicide ideation is greater among married adult stroke patients than unmarried (widowed or divorced) stroke patients.

RQ2: Is the level of burdensomeness associated with suicide ideation among adult stroke patients?

$H_0$2: There is no relation between level of burdensomeness and suicide ideation among elderly stoke patients.

H_a2: Level of burdensomeness and suicide ideation are positively correlated among adult stroke patients.

RQ3: Does marital status moderate the relationship between burdensomeness and suicide ideation in stroke patients?

$H_0$3: The effect of marital status on suicide ideation is not moderated by burdensomeness.

H_a3: The effect of marital status on suicide ideation is moderated by burdensomeness; suicide ideation differs based on level of burdensomeness among married versus unmarried stroke patients.

Theoretical and Conceptual Framework for the Study

Suicidal behavior is not fully understood, yet theories have been introduced regarding causes. Of current interest was the interpersonal psychological theory of suicidal behavior (Joiner et al., 2005). Although it is a relatively new theory, it's proponents have claimed it provides greater understanding of suicidal behavior. The theory was put forth by Joiner et al. (2005) who proposed that both the desire to commit suicide and the ability to do so need to coexist in order for the individual to die. Furthermore, the interpersonal theory of suicide supports the idea that some factors are necessary in order for an individual to experience suicidal behavior or suicide. The individual feels a lack of belongingness with other people, feels like a burden on others or

on society, and has acquired the capability to act on the fear and pain that are associated with suicide. When a person experiences high levels of burdensomeness as well as thwarted belongingness, suicide ideation is the strongest (Joiner et al., 2005). Furthermore, according to this theory, individuals will not act towards suicide unless they have developed the capability to do so. This capability is developed through exposure to painful and fearsome experiences (Joiner et al., 2005). Even during these painful experiences, suicide ideation does not necessarily lead to death, as individuals have an innate drive for self-preservation. Individuals must possess the ability to engage in lethal activities (Joiner et al, 2009).

Joiner et al. (2009) found that when individuals had low family and social support and felt that they did not matter, suicide ideation was present. This was found independently of the existence of depression. To further support the family and social role of support, Joiner, Holar, and Van Order (2007) found that in instances where people pull together and go through an experience collectively, the suicide rates were lower. An example was the low rates of suicide on September 11, 2001. The interpersonal theory of suicide has stood up to 20 direct empirical tests and results have supported this theory's main predictors. An example of this was a study by Van Orden, Witte, Gordon, Bender, and Joiner, (2008) of a diverse undergraduate sample that revealed that the highest levels of suicide ideation were reported by individuals who also reported higher levels of perceived burdensomeness and thwarted belonging. This occurred independent of age, gender, and levels of depression.

Nature of the Study

Types, Sources of Information, and Data

This study was a quantitative study with a cross-sectional design and included a secondary analysis of the Outcome and Assessment Information Set (OASIS) data set. OASIS is collected by National Centers for Medicare and Medicaid Services (CMS) for the purpose of measuring patient home health care outcomes, with appropriate adjustment for patient risk factors that affect those outcomes (CMS, 2012). The OASIS instrument consists of nearly 100 items that are related to the home care patients' demographics, clinical status, functional status, and further service needs (CMS, 2009)

From this dataset, data were extracted on a national sample of adults who had a CVA (both ischemic stroke and hemorrhagic stroke) in the past 12 months. The study's population comprised patients who received home care due to a stroke. In these cases, the stroke patients were homebound and in need of skilled services (CMS, 2009). Certain criteria were required as part of the study: (a) both genders, (b) ages 50 and above, and (c) a primary diagnosis of CVA within the 12 months of data collection. In addition, the patients may have been verbal or nonverbal, as long as they could communicate in some form to answer questions. The population was diverse in terms of demographics, status, race, and gender, which allowed for less biased results.

Analytical Strategies

The first step in the analysis plan was to summarize all of the variables using descriptive statistics; mean, median, mode, standard deviation, and range were reported for continuous variables and frequencies were reported for categorical variables. I also examined visual depictions of the data (e.g., histograms for continuous variables and line

graph for the interaction effect). I further explored evidence of the relationship between marital status and burdensomeness. Then I examined associations between any relationships using inferential statistics. I used bivariate analyses to investigate relationships and associations between two or more variables, marital status, and burdensomeness.

The steps of the analysis plan are described by RQ below and according to the relationships illustrated in the conceptual framework (see Figure 1 in Chapter 3). The alpha level of significance was set at the conventional $p < .05$ and all tests were two-tailed.

RQ1: Is marital status associated with suicide ideation among adult stroke patients?

Marital status (married or unmarried) and suicide ideation (yes or no) were both dichotomous variables, and I examined their association with the chi square test of independence and cross tabulations.

RQ2: Is level of burdensomeness associated with suicide ideation among adult stroke patients?

I used regression analysis to determine if burdensomeness (independent variable) was associated with suicide ideation (dependent variable).

RQ3: Does marital status moderate the relationship between burdensomeness and suicide ideation in stroke patients?

I used regression analysis with burdensomeness and marital status, as well as burdensomeness-by-marital status interaction variable as independent variables and suicide ideation as dependent variable.

Definition of Terms

A list of the most important and frequently used definitions and abbreviations is provided below.

Activities of daily living and instrumental activities of daily living (ADL/IADL): People's daily self-care activities.

Belongingness: The need to belong, feeling accepted by others. (Baumeister & Leary, 1995).

Cerebrovascular accident: Also referred to as stroke.

Hemorrhagic stroke: An abundance of blood that overflows the brain (Caplan, 2006).

Ischemic stroke: When the brain does not receive enough blood (Caplan, 2006)

Perceived Burdensomeness: A person's belief that that person is a burden on others or society, and that their death is worth more than their life (Joiner et al., 2005).

Suicide attempt: A potentially self-injurious behavior with a nonfatal outcome for which there is evidence that the person intended at some level to themself (O'Carroll et al., 1996).

Suicide ideation: Reported thoughts about engaging in any suicide-related behavior

Suicide: Death caused by self-directed injurious behavior with any intent to die as a result of the behavior (Centers for Disease Control and Prevention, 2013).

Thwarted belongingness: The extent to which people believe their need to belong is unmet.

Study Significance

Identifying vulnerable populations within stroke patients will help lead to early intervention for SISAS. Not only may this increase well-being and outcomes of the stroke patients and their family members, as a result, Medicare and Medicaid costs may also be reduced. Mortality rates from suicide may also be decrease with early prevention measures. Furthermore, the study could add to the scientific literature by applying the interpersonal theory to the stroke patient population and examine the interaction between marital status and burdensomeness in predicting SISAS. This may also have important implications for other disorders, which can increase levels of burdensomeness in the patients.

Assumptions

It was an assumption of this study that level of burdensomeness is increased in the presence of a caregiver. McPherson, Wilson, Chyurlia, and Leclerc (2010) examined perceptions of burden to others using the Self-Perceived Burden Scale (SPBS) in a sample of stroke survivors and concluded that high levels of self-perceived burden are consequences of changes such as distress and quality of life which results from receiving care from caregivers (McPherson et al., 2010). The OASIS collects data on patient functional impairment which was used as a proxy for burdensomeness in this study. This was supported by the self-determination theory (Ryan & Deci, 2000) that asserts functional impairment is associated with risk of suicide due increased perception of burdensomeness (Conwell et al., 2010; Conwell et al., 2000). Although *perception* of burdensomeness was not measured in this study, level of burdensomeness was estimated by the severity of functional impairment. This was obtained by combing all OASIS

questions that pertain to ADL/IADL, and if the patient was more physically impaired, then it was assumed that impairment was higher. Other assumptions were that people honestly answered all questions and the interviewers did not influence the answers nor made mistakes in data entry.

Scope and Delimitations

One of the delimitations of this study was that the data utilized was from 2008, the last year that the item M590 (suicide ideation questions) was included in the OASIS form. Another delimitation of this study was the population selected. The fact that the participants were homebound may not have been a true representation of stroke patients in general. Results may have varied had the participating stroke patients been in the hospital setting, for example. An assumption could have been made that when the patient was at the hospital or any other inpatient setting, medical care was paid (whether privately or via insurance). This crucial fact may have decreased the level of burdensomeness.

Limitations

An important limitation was that cause and effect cannot be determined from the cross-sectional design of the study. The analysis and conclusion were restricted to describing the characteristics of the sample population in terms of disability, level of burdensomeness and suicide ideation. Associations and relationships were examined, but it was not possible from this data to determine if level of burdensome preceded suicide ideation or vice versa.

A final limitation was that the OASIS assessment was conducted within 48 hours of referral or return to the home from an inpatient facility, or when the physician ordered

the ‘Start of Care.’ The emotional state of the patient when first discharged from an inpatient facility could have been different after 48 hours post discharge, than from a week post discharge, 3 months, or 6 months. This timing issue represented a problem in that the data collected may not have been an accurate representation of the levels of burdensomeness or suicide ideation. Comparing OASIS data at the start of care with OASIS data in 60 days of Recertification or longer when the patients was discharged may have been a more representative and valid outcome.

Summary

This chapter was an attempt to provide an overall description and breakdown of the study at hand. This chapter stated research questions and hypotheses, as well as the theoretical and conceptual framework for this study, including the rationale for selection of the chosen design. A description of any assumptions, limitations, and delimitations of the proposed study was provided, as well as a justification as to the significance of this study and potential implications for positive social change.

Chapter 2 provides a concise synopsis of the current literature review and establishes the relevance of this problem; in addition, various theories of SISAS are discussed and provide a rationale as to why the Interpersonal Theory of Suicide was chosen for the current study. Chapter 3 states the study variables as they related to the study, identifies the research design used as well as its connection to the research questions. In addition, the process of how to gain access to the data set is described in detail, as well as how this data was analyzed.

Following, chapter 4 provides a thorough analysis of the data collected (in this case, use of secondary data) and reports statistical analysis findings. Lastly, chapter 5

interprets the findings, reiterates the social change benefits for conducting this study and describes recommendations for further research that were grounded in the strengths and limitations of the current study as well as the literature reviewed in Chapter 2.

Chapter 2: Literature Review

Introduction

Each year, approximately 800,000 individuals in the United States suffer the effects of a stroke (American Heart Association, 2010). After a stroke, life function is disrupted in every possible way. From social interactions to functional and economic impact, these 800,000 individuals need to start living a new life (American Heart Association, 2012). As the average age for stroke occurrences in the United States is 51 years of age, many stroke victims are already well into middle age when they must deal with the myriad of changes. The majority of strokes occur in men (79%), while a relatively lower 21% occur in women (American Heart Association, 2012).

Stroke is one of the most expensive of all disabilities as it affects individuals' ability to fully participate in their lives (Ma, Chan, & Carruthers, 2014). According to the American Heart Association, the direct and indirect cost of stroke in 2011 in the United States was 65.5 billion dollars (National Heart, Lung, and Blood Institute, 2014). The main cost of stroke is lack of productivity. Because of the increased percentage of individuals who have strokes at a working age, the overall cost is rising (Wolf, Baum, & Connor, 2009). Apart from the economic challenge, recovery from stroke poses a significant physical as well as psychological challenge; furthermore, poststroke adjustment, coping behaviors, and acceptance of new roles add to the long-term recovery (Ch'NgDavina & McLean, 2008). Furthermore, stroke increases the risk of SISAS (Hadidi, Treat-Jacobson, & Lindquist, 2008). Kishi, Kosier, and Robinson. (1996) evaluated 301 patients for suicide ideation after acute stroke. Of those individuals, 19 had expressed suicide ideation and one attempted suicide. Twenty-four months following the

initial study, Kishi et al. (1996) further supported the association between stroke and suicide as 16 patients who were initially nonsuicidal developed suicidal ideation.

SISAS have been found to exist poststroke, yet not everyone who has suffered a stroke is at risk for SISAS. Currently, it is not well understood who is at greater risk (Pompili et al., 2012). This literature review was designed to offer an understanding of the risk factors for SISAS and how this applied to patients with a stroke. In an attempt to perform nonbiased and representative research, I used a three-pronged method in conducting the literature review. The first method was an electronic database search in order to gather information of the following combinations of descriptors as they pertained to suicide ideation, suicide attempts, complete suicides, and stroke. The descriptors below were used to locate literature from 2009-2015 in the following search engines: Search Complete, ERIC, Medscape, PsycBooks, PsycArticles, ProQuest Multisearch, Thoreau Multi-Database Search, Science Direct, PubMed. These database search terms yielded the following:

- *stroke prevalence,* which resulted in 248 articles;
- *stroke and depression,* which resulted in 831 articles;
- *risk factors for suicide ideation,* which resulted in 379 articles;
- *risk factors for suicide completions,* which resulted in 42 articles;
- *risk factors for suicide attempts,* which resulted in 823 articles;
- *stroke and suicide,* which resulted in 23,000 articles; due to the large number, this combination was further narrowed down to *stroke and death by suicide;*
- *suicide ideation and stroke,* which resulted in 14 articles;
- *suicide attempts and stroke,* which resulted in 17 articles;

- *stroke and age,* which resulted in 1,346 articles; due to the large number, this combination was further narrowed to *stroke and age in the USA* which resulted in 215 articles;
- *stroke and gender*, which resulted in 825 articles;
- *stroke and marital status*, which resulted in 35 articles;
- *suicide ideation and age*, which resulted in 139 articles;
- *suicide and age, which* resulted in 6,726; in an attempt to further narrow this search, the terms *suicide completion and age* was used, which resulted in 23 articles;
- *suicide attempts and age* which resulted in 101 articles;
- *suicide ideation and age differences* which resulted in 23 articles;
- *suicide ideation and chronic illness,* which resulted in 3 articles;
- *suicide and chronic illness,* which resulted in 165 articles;
- *suicide attempts and chronic illness* which resulted in 34 articles;
- *suicide ideation and physical disability* which resulted in 3 articles;
- *suicide attempts and physical disability* which resulted in 88 articles; and
- *suicide and physical disability* which resulted in 86 articles.

The second literature search included a second database search for relevant articles. At this time, the search was performed in the following journals:

- *Journal of Crisis Intervention and Suicide Prevention,*
- *Journal of Disability and Health,*
- *Journal of Stroke and Cerebrovascular Disease,*
- *Stroke Rehabilitation,*

- *Clinical Rehabilitation,*
- *Stroke,*
- *The American Journal of Psychiatry,*
- *American Journal of Public Health,*
- *The Journal of Aging and Mental Health,* and
- *Journal of the American Geriatric Society.*

Relevant articles were obtained by using the following terms: *suicide ideation, suicide attempts and suicide, theories of suicide, interpersonal theory of suicide, perceived burdensomeness, stroke, stroke and suicide, long term illness and suicide, stroke and burdensomeness, thwarted belongingness,* and *suicide in the elderly.* Articles from journals were limited to the years 2009-2015. I reviewed only articles presented in English were reviewed. Eligible publications were restricted to books, dissertations, and articles from peer-reviewed journals. Furthermore, articles related only to "suicide in the elderly" were included. These articles numbered 611. Further, results on "stroke, burdensomeness, and suicide ideation in the elderly" resulted in 305 articles.

All relevant publications from the above two searches were evaluated first through the title and abstract and next by reading the whole article. I retained only publications relevant to the chapter aim. Furthermore, I used reference lists of relevant publications to identify any missing and relevant publications.

The first section of this chapter contains definitions that were further used in this literature review. The second section of this chapter relates five different theories of suicide used to establish a deeper understanding of suicide causes and how these theories relate to SISAS. In the third section I explore suicide ideation, suicide attempts and

suicide risk factors in the general population to serve as a baseline for the fourth section in which I review the impact that stroke in particular had on SISAS. In the fifth section I posit that the interpersonal theory of suicide is particularly relevant to poststroke studies. Finally, in this literature review I briefly discuss the gap that exists between marital burdensomeness after stroke and suicidal ideation.

Definitions of Suicide Ideation, Suicide Attempts, and Suicide

After numerous empirical and clinical studies, the distinctions between *suicide behaviors* and *suicide attempts* remain a major debate. Furthermore, the challenge in defining suicidal behavior lay in the presence or absence of suicidal intent. Throughout this chapter the term "suicide attempt" is used, and this is understood as a potentially self-injurious behavior with a nonfatal outcome for which there is evidence that the person intended at some level to kill themself (O'Carroll et al., 1996).

By contrast, the term "suicide ideation" is not as straightforward and is controversial in how it is used. Lewinsohn, Rohde, and Seeley (1996) went into detail about suicide ideation and distinguished between thought of death, the wish to die, thought of killing or hurting oneself, and whether a suicidal plan existed. Mavreas and Ustun (1997) identified three classes of people experiencing suicide ideation: those who wish to die, those with thoughts of death, and those with thoughts of suicide. It is of great importance to add that suicide is not considered a disorder according to the DSM-5 but rather, it is a behavior resulting from a mood disorder (APA, 2013). The DSM-5 team is currently proposing that suicide behavior disorder be listed as its own distinct diagnosis, but as of now, it is a behavior and not a disorder (APA, 2013).

Throughout this chapter, the variables examined are suicide ideation, suicide attempt, and suicide, collectively known as SISAS. Understanding the nature of SISAS could help identify those who may benefit from therapy, which could lead to prevention or, minimally, a decrease in the rates of suicide (Beck, Brown, Steer, Dahisgaard, & Grisham, 1999).

Theoretical Framework Overview

A solid understanding of suicide theories can provide the clinician and clinician-in-training with some useful guidelines when working with the suicidal patient. As such, I examined multiple theories of suicide as they relate to the identification of possible risk factors. I described risk factors that stemmed from these theories via psychological, sociological, and biological theories. The psychological theories focused on the functioning of the human mind (thoughts, emotions, behavior). Sociological theories of suicide focused on the relationship of social factors to ill health and suicide (Yousuf, 2011). Biological theories of suicide, on the other hand, derived from the understanding of suicide behaviors and attempts as they related to the functioning of the human body. The importance of suicide theories cannot be stressed enough. By gaining understanding of this taboo and controversial issue, potential suicides can be averted. Guidelines can, in turn, assist in the management and treatment of the suicidal patient (Bongar, 1992).

Psychodynamic Theories of Suicide

Psychodynamic theories emerged from the work of Sigmund Freud. According to pioneer Freud's notion of death instinct, humans are drawn to death not because of despair but by an interest in the unknown (Freud, 1915). We are idiosyncratic creatures that by nature seek out, desire, want, or need to know the unknowable. Freud viewed

suicidal acts as aggressive and murderous wishes that people feel towards others but reverse to themselves. In other words, the individual who wants to commit suicide often wants to kill someone else. Being overwhelmed by the object or the other person is what draws the individual to suicide (Freud, 1915). According to the psychodynamic theories of suicide, suicide is caused by unconscious drives (Menninger, 1938), intense affective states (Hendin, 1991), desire to escape from psychological pain (Baumeister, 1990; Shneidman, 1998), existential desires for meaning (Rogers, 2001), and disturbed attachment (Bowlby, 1973).

Psychodynamic theories of suicide also suggest that, in order for the aggression to manifest itself into action, the aggression towards others must be supplemented by three dynamic mechanisms: internalization, detachment from self, and acting out (Lees & Stimpson, 2013). Internalization refers to the aggression being situated or existing inside one's mind and focused on the self. Further, the ego can treat itself as an object and detach from it. Lastly, suicide can be a form of acting out by reenacting an early childhood trauma in the present (Lees & Stimpson, 2002). Understanding the mental processes that accompany suicide can lead to an understanding of suicide (Kaslow et al., 1988). Further understanding of the etiology of SISAS assists in differentiating which individuals may be prone to such actions, as well as lead to better intervention (Kaslow et al., 1988). According to this theory, suicide can be viewed as the ultimate step of one's effort to escape from self and the world (Baumeister, 1990). When an individual internalizes failures and inadequacies as a negative effect, the individual then wishes to escape from those by accepting drastic steps, as in suicide (Baumesister, 1990).

Strain Theory and Suicide

Shifting gears from psychology, the following theory was born from criminology and sociology. According to the strain theory of suicide, conflicting and competing pressure tend to exist in the individual prior to a suicide. The strain theory of suicide (GST) was first coined in 1992 by Robert Agnew (Agnew, 1992). Agnew was interested in the role psychosocial factors play in deviant behaviors and responses to anger. According to Agnew's (1992) GST, the focus is on individuals' relationships with others. An individual may encounter the following types of strain if not treated as wanted by others: (a) strain derived from either actual or anticipated failure in achieving positively valued goals, (b) strain as a result of either actual or anticipated removal of positively valued stimuli, and (c) strain as a result of either actual or anticipated removal of positively valued stimuli (Agnew, 1992). Zhang and Lester published a study in 2008 in which they analyzed 40 suicide notes (20 by individuals who attempted suicide and 20 by individuals who completed suicide) and found strong support towards the strain theory of suicide. Both of those groups have had conflicting and competing pressures in their lives prior to both suicide attempts and suicide completion (Zhang & Lester, 2008). Strain issues such as economic loss, unemployment, and noxious work environments are some factors that can generate suicide risks in an individual (Stack, 2010). Having an understanding of the early and overt signs of such behavior, and recognizing red flags, allows for a response pathway towards the safety of the suicidal patient (Riley, 2004).

Strain theory states that what pressures the individual to commit a crime are the social structures within the society (Berk, 2006). To the contrary, psychodynamic theories of suicide as stated above stem from inner built-up aggression that results in

inward animosity. One can further assume that in deprived cultures, the strain theory may be more prevalent, as opposed to a smaller, structure such as family in which an individual is deprived. Suicide completers were more likely to have encountered significant stress or strains such as job loss or financial problems than suicide attempters (DeJong, Overholser, & Stockmeier, 2009). To further validate Agnew's strain theory as it relates to SISAS, when a nationally representative sample of 572 of maltreated individuals was gathered, results revealed that those individuals with depressed mood and higher levels of strain such as poorer relationships with peers were at risk for suicide ideation (Coohey, Dirks-Bihum, Renner, & Baller, 2014).

Durkheim's Model of Suicide

Another theory that has similarities with the strain theory of suicide is Durkheim's (1951) model of suicide. Both share sociological foundations and upon those describe how society plays a role in suicides. According to Durkheim's suicide theory, suicide has a sociological explanation (Pope, 1976). Durkheim refers to two kinds of suicide, the altruistic suicide and the egoistic suicide. The altruistic suicide is when the person martyrs for the sociocultural norm, such in the case of hara-kiri, and egoistic suicide is when the individual feels rejected by society and is no longer able to integrate within that society (Durkheim, 1951). Furthermore, Durkheim stated that suicide rates tend to drop when society and social groups in general are more integrated. When the individual feels more a part of the society and part of social groups, then suicide decreases. What appears to be interesting in Durkheim's model of suicide is the interconnection as well as the contradiction of altruistic suicides and the egoistic suicide; one can commit suicide that is approved by culture in order to benefit the social order (Stack, 2010). Altruistic suicides

may be misleading then, in that the individual's decision for suicide may not always be optional but rather obligatory (Stack, 2010).

The ongoing financial crisis in Greece is an appropriate and current example. Social capital and interpersonal trust can protect citizens from suicide ideation, even during periods of economic crisis. In the case of Greece's continuing economic crisis, interpersonal trust has decreased and there has been a substantial increase in the prevalence of suicide ideation and suicide attempts (Economou et al., 2013). Durkheim (1951) further linked weak integration into society to a lack of meaning in life (Pope, 1975). Durkheim extended the role of integration and meaning to religion and posited that the more integrated the individual is in religion, the less the risk of suicide. In Catholicism, for instance, suicide is considered to be a sin (Stack & Lester, 1991). Furthermore, Durkheim believed that Catholics were subject to more rigorous religious practice and dogmas than Protestants. Later studies have shown that suicide rates were lower among Catholics than non-Catholics (Breault, 1986). Religious affiliation in general tends to be a protective factor against suicide. This may be due to moral objections against suicide, and it may be that religion oftentimes stigmatizes suicides. There also tends to be more cohesion among religious peoples, therefore more social connection (which, according to Durkheim's model of suicide, acts as a protector against suicides; Dervic et al., 2004).

Durkheim (1951) also argued that suicide risks differ among females and males. His argument was that women tend to participate less in social life than men, therefore the greater risk for suicide (Pope, 1975). This reasoning may seem odd to us nowadays but this theory is more than a century old when women had a different role in society.

Durkheim assumed that because women tended to participate less in society back then, there was less development of mental and intellectual life and less fulfillment of more complex needs that can be achieved through collective life (Pope, 1975). These sociological investigations of suicide that surfaced in the 1970s were a way to describe the historical perspective of suicide.

A major difference was seen between theories of suicide in that the individual's inner psyche was the driving force towards suicide in the case of the psychoanalytic theories, as opposed to Durkheim's (1951) model in which society was mostly the leading force.

Biological Theories

Following the sociological model that once served as the foundation of suicide theory (Wray, Colen, & Pescosolido, 2011), the biological model was also examined. Biological theories of suicide suggested that SISAS is a result of biologically-based diathesis along with an activating psychological stressor (Mann, 2003; Plutchik, Van Praag, & Conte, 1989; Van Praag, 2001). Data regarding SISAS and biology are rather new, specifically serotogenic system alterations (the system of nerve cells that uses serotonin as the neurotransmitter and is associated with many mental health diseases such as depression). The first evidence of serotonergic alterations in the brain of individuals who attempted suicide was reported 40 years ago by Asberg et al. (1976). These authors further reported decreased levels of 5-hydroxyindoleacetic acid (5-HIAA) in the Cerebrospinal fluid (CSF); 5-HIAA is the major metabolite of serotonin (Purselle & Nemeroff, 2003). Furthermore, Kruesi et al. (1990) also found lower cerebrospinal fluid levels of (5-HIAA) in impulsive and violent suicides. Cremniter et al. (1999) examined

two groups to investigate the relationship between CSF and 5-HIAA concentration levels in depression, anxiety, and impulsivity. Both groups were violent suicide attempters. These results complement the results of Kruesi et al., as we have seen above, in that levels of CSF 5-HIAA were significantly lower in impulsive attempters (Cremniter et al., 1999). Furthermore, lower levels of CSF and 5-HIAA in depressed individuals did not lead to more severe depression, rather a history of suicide attempts (Mann, 1999).

An important distinction was made between levels of serotonin in depression and in suicides. Levels of CSF 5-HIAA have been found to be lower in depressed individuals with a history of suicidal attempts combined with a history of depression, as compared to depressed individuals with no history of suicide attempts (Purselle & Nemeroff, 2003). These data may explain why psychopharmacological treatment for selective serotonin reuptake inhibitor (SSRI) can be resistant in suicidal individuals with depression. They also explain why alternative treatments for depression, such as cognitive-behavioral therapy along with medication, respond more effectively in depressed individuals (Rosenbaum-Asarnow et al., 2009). Chatzittofis et al. (2013) further support the positive relationship between lower levels of CSF and 5-HIAA and suicidal behavior (Chatzittofis et al., 2013). Lower levels of 5-HIAA in the cerebrospinal fluid (CSF), along with a history of suicide attempts can be good predictors of suicide risk (Jokinen, Norstrom, & Norstrom, 2015). It can then be assumed that knowing the person's levels of 5-HIAA can act as a tool in decreasing suicide rates by providing early and appropriate intervention. Even though certain neurotransmitters such as serotonin play a role in the pathophysiology of SISAS, changes in those neurotransmitters do not necessarily change the predisposition of the individual to suicide (Purselle & Nemeroff, 2003) and other

factors are important as well. As with Durkheim's (1951) model of suicide, biological theories do not seem to distinguish different risk factors among suicide completions and suicide ideation.

Despite the large amount of evidence regarding suicide generated by the theories discussed so far, little was known about the disparate theories being integrated (Kleiman, Law, & Anestis, 2013). The next theory combined many of the previously discussed factors in a model to predict suicide.

Interpersonal Psychological Theory of Suicidal Behavior

The interpersonal psychological theory of suicide integrates some aspects from all of the theories discussed above—from aggression towards one's self, to societal expectations and strains, to biological and innate traits. It makes four predictions. First, suicide ideation and suicide attempt are driven by three factors including perception of burdening others, desire to alienate socially and a desire for death. The second predictor is that individuals will not act toward their desire to die unless they are capable of doing so. Third, according to the theory this capacity can be created by frequent exposure to physically painful or fear-inducing experiences, and some evidence has been found for this (Van Orden et al., 2010. Finally, the number of suicide attempts is a strong predictor of acquired capability for suicide (Joiner et al., 2005).

Social isolation is the strongest predictor of suicide attempts, suicide ideation, and suicides. Social connectedness, which is part of social isolation, also predicts lethal suicides. Lack of social connectedness is an indicator that a core human psychological need is unmet. This need is also described as the need to belong. When the need to belong is unmet, a desire for death occurs. This is also referred to as passive suicidal

ideation (Van Orden et al., 2010). Furthermore, when perceived burdensomeness is present, as the interpersonal theory of suicide suggests, suicide ideation is more likely to be predicted than suicide attempts (Joiner et al., 2009).

Thus, through the interpersonal theory of suicide an attempt was made to integrate both the psychological as well as the sociological theories. Joiner et al. (2005), who first developed the interpersonal theory of suicide, reported that the "acquired" capability to die alone is not enough to lead to death; thwarted belongingness and perceived burdensomeness have to accompany this acquired capability in order for life to result in death (Joiner et al., 2005). An example of two theories being integrated (biological and psychological) is when an individual has a predisposition for developing suicidal traits (biological) and is being compelled by a stressful event that disrupts equilibrium (psychodynamic theory).

Theories of Suicide as They Relate to Suicide Ideation, Suicide Attempts, and Suicide Completions:

As discussed above, the theories offered many different risk factors for suicide ideations, attempts, and completions. These included desperation, feeling overwhelmed, desire to escape from psychological pain, existential attachment, disturbed attachment (psychodynamic theories), different types of strain as seen in the strain theory of suicide, social inclusion and social isolation as seen above in Durkheim (1951) theory, biological risk factors such as lower levels of CSF and 5-HIAA; additional risk factors as indicated by Joiner et al.'s (2005) theory-the interpersonal theory of suicide include thwarted belongingness, and perceived burdensomeness. There were some overlaps between theories. For example, social inclusion or social isolation were included in several

theories as risk factors for either decrease of risk of suicide or increase. Both Durkheim's theory of suicide and the interpersonal theory of suicide proposed that this is a predictor for SISAS. Social inclusion has been theorized to decrease suicide attempts but increase suicide ideation.

Furthermore, both the psychodynamic theories and strain theory of suicide included risk factors of desperation, feeling overwhelmed, as well as different types of strain as seen in the strain theory of suicide as being strong predictors towards suicide; what differentiated those two was that the stressors in the psychodynamic theories are from within the individual but the stressors in the strain theory that lead the individual to suicide stem from outside the individual, the society.

Risk factors for suicide ideation, attempt, and completion were not differentiated in all theories. Psychodynamic, biological and Durkheim's (1951) theories do not distinguish suicide ideation and suicide completion (DeJong, Overholser, & Stockmeier, 2009), while strain theory predicts that suicide completers are more likely to have encountered significant stress or strains such as job loss or financial problems than suicide attempters (DeJong, Overholser, & Stockmeier, 2009). The interpersonal theory predicts that burdensomeness is a risk factor for suicide ideation, but in order for the individual to proceed to suicide completion, a third variable needs to be in existence, which is the capability to act on that desire (Ribeiro & Joiner, 2009). Evidence for risk factors of SISAS is discussed below in more detail.

Risk Factors for Suicide Ideation, Suicide Attempts, and Suicide

Multiple risk factors were identified in this literature on suicide: family history, personal history, marital status, gender, age, chronic or acute stress, substance abuse,

economic factors, and other types of psychiatric disorders besides depression, among others. I further explored the above theories and provided reasoning as to why people commit suicide. The theory further explored was the Interpersonal Theory of Suicide (ITS). Even though much research has been done based on the Interpersonal theory and suicide, as it applied to burdensomeness and suicide, what has not been established was whether varying degrees of burdensomeness can lead to suicide ideation and how it is affected by marital status. The ones that were discussed below are: marital status, gender, age, depression, and burdensomeness. The reason that only these risk factors were discussed is that those above risk factors were identified as being risk factors in the theories discussed above; the Interpersonal Theory of Suicide discusses marital status and burdensomeness as being risk factors for suicide; the Psychodynamic Theories of Suicide discuss how depression plays a factor for suicides, as well as gender and age; those factors were identified by the above theories as being factors for suicide ideation, suicide attempts and suicide completion. Each discussed below.

Marital Status and Suicide Ideation, Suicide Attempts, and Suicide

There exist only a handful of studies examining the association between marriage and SISAS. Hintikka et al. (2009) identified that living alone and suicide ideation are associated. O'Connell, Chin, and Cunningham (2004) further supported Hintikka et al. in stating that marriage can be seen as a protective factor against suicide ideation, especially in the elderly population. Purcell et al. (2012) conducted a study of 130 individuals 50 years and older. Individuals who reported that they were living alone—hence were not married—as opposed to having family connectedness, were more likely to report *suicide ideation* (Purcell at al., 2012). Lower levels of *suicide completions* were also found in

married individuals when compared to individuals with other marital statuses (Zhang, 2010). No studies have looked at the associations of *suicide attempt* and marital status. These findings showed that marriage may be a factor in SISAS but more data were needed to confirm these findings.

Being married can serve as a protective factor for decreased suicides for several reasons. Married couples provide support under stressful events (Zhang, 2010). Furthermore, sharing one's problems or being responsible towards a spouse lowers the risk for suicide mortality (Denney et al., 2009). It is then of no surprise that disruption of the marriage, such as divorce, can then have a strong association with higher suicide rates (Umberson, 1992). Furthermore, married persons' immunity to suicide may be due not only to spousal support but also to being more integrated in a larger supportive network (e.g., family) than nonmarried persons (Smith et al., 1998). One could assume that the length of marriage may play a role, and that the longer the couple is married, the higher the suicide rates after a loss of one's partner, but no such data exists.

These protective factors may differ by gender. Mortense et al. (2009) examined the gender differences of marital status on suicide further. They noted that being a parent acted as a protective factor for women, whereas marriage on its own served as a protective factor for men (Hawton, 2000). Gender differences were discussed below in further detail.

Gender Differences

According to the World Health Organization (2010), gender is the socially constructed role that is assigned by society and that can vary among cultures. Gender includes behaviors, attributes, and activities that a given society considers to be

appropriate for either males or females (World Health Organization, 2010). There are considerable differences between genders (Hawton, 2000) in SISAS.

Gender differences have been established as a relevant variable in SISAS. Women are more likely to report suicide ideation than men (Kumar et al., 2012). As opposed to men, women use suicide ideation as a refuge in order to escape depressive symptoms or levels of hopelessness (Gibb, Andover, & Beach, 2006). Brausch & Gutierez (2009) examined suicide ideation in young adults and results have been consistent in that suicide ideation is more prevalent among females (Brausch & Gutierez, 2009). As in the case of suicidal ideation, women are more likely to engage in suicide attempts (Centers for Disease Control 2010). More accurately, 60% of the females who experience suicide ideation, would transition to suicide attempt within the first year after the onset of the ideation (Nock, Hwang, Sampson, & Kessler, 2009). Furthermore, Kaess et al. (2011) in a study of young adolescents 19.8% of female students reported suicidal ideation as opposed to men, whose history of suicide ideation was 9.3% (Kaess et al., 2011). McCullumsmith, Clark, Perkins, Fife, and Cropsey (2013) added insight into gender differences by stating that suicide attempters tend to be females who take psychotropic medications, have had some kind of physical or sexual abuse, and meet the criteria for drugs and alcohol dependency. Even though most suicide attempts are not fatal, each carries a possibility of long term physical injury as well as a lifetime of psychological suffering (Borges et al., 2010).

On the other hand, *suicide completion* rates among men are four times higher than rates for women (Centers for Disease Control and Prevention, 2013). In 2013, the rate of suicide for men was 20.2%, while the rate of suicide for women was 5.5%. Nearly 80%

(77.9%) of males died by suicide as opposed to 22.1% of female deaths by suicide (Centers for Disease Control and Prevention, 2013). Men between the ages of 45 to 64 have been found to be at greater risks for suicides than any other group, with this risk increasing in the past 15 years (U.S. Preventive Services Task Force, 2014). Thus, women are more likely to report suicide ideation and attempt suicide, while men are more likely to die by suicide.

There are various explanations to account for gender differences in SISAS. Brausch and Gutierez (2009) concluded that suicide ideation was higher in women as a result of body image and disordered eating. According to world health statistics, women live longer wherever they live in the world (World Health Organization, 2014). Given this statistic, females may face more adversities. From an evolutionary point, aging results in impairment of basic mechanisms and functions of cells of organs, leading to diseases (e.g., neurodegenerative diseases, cancer, cardiovascular diseases) that ultimately impair or kill individuals (Cutler & Mattson, 2006). In addition to the above mentioned conditions, there are others (i.e., diabetes, stroke, dementia, metabolic syndrome, and osteoporosis) that often occur in later life and may lead to major depressive disorders (MDD) which, in turn, result in an accelerated aging at the cellular level (Wolkowitz, Reus, & Mellon, 2011).

Gender plays a significant role in the rate of suicide completions. White older men who place great value on autonomy were found to be more likely to be depressed and at risk for suicide completion. Components of autonomy include excessive perfectionism, need for control, and defensive separation from others (Mazure et al., 2002; O'Riley & Fiske, 2012). Typically women are more likely to engage in suicide

attempts and experience depressive symptoms, while men often externalize their behaviors more strongly, thus die more often than women (Verona, Sachs-Ericcson, & Joiner, 2004). The fact that more men die may be closely related to men being at higher risk towards alcohol and drug abuse. Men show much higher levels of alcohol abuse and use of other illegal drugs, which have been found to be major components for increased rates of suicide (Hawton, 2000). Alcohol intoxication is often a predictor of the use of firearms (Coleman, Kaplan, & Casey, 2011). Alcohol has the ability to increase aggressiveness and psychological distress, as well as to limit one's cognitive function, which impairs thinking and alternative coping mechanisms. Baumeister's 1990 escape theory supports the link between alcohol use and suicide. In the case where both genders choose firearms as a method of suicide, men are more likely to shoot themselves in the head as opposed to the body; this is more likely to be fatal (Stack & Wasserman, 2011). Even though there have been identifiable gender differences and SISAS, gender differences may also vary depending on the age of the person.

Aging and Suicide Ideation, Suicide Attempt, and Suicide

While suicide success tends to be rare in children five years and younger, successful suicide tends to increase as a function of age (Brock, Sandoval, & Hart, 2006). Concomitant factors and illness are more prevalent as we age. Adolescence often is a big life transition and throughout this period teenagers may go through periods of stress, isolation, and depression (Kroger, Martinussen, & Martinussen, 2010); this critical period has also been associated with SISAS. In 2009, suicide was the second leading death in Canada of adolescents and young adults between the ages of 15-24 (Statistics Canada, 2009). In the United States, 10% of high school students have reported that they have

made a suicide attempt (Langille, Asbridge, Cragg, & Rasic, 2015). It is also estimated that 12% of individuals will experience some form of suicide ideation during college. Of those, 25% will have more than one episode (Wilcox et al., 2010). In this particular study, risk factors were related to suicide ideation among college students. Besides age, the study included low social support, exposure to domestic violence, high self-reported depressive symptoms, and high maternal depression (Wilcox et al., 2010)

The other group at highest risk for suicide ideation is the elderly, and suicide ideation has been established as one of the greatest risk factors for death by suicide in older individuals (Jahn & Cukrowicz, 2011). Further, it is estimated that the number of suicides in the elderly will increase in the next decades due to the growing number of seniors and the fact that their proportion to the population is increasing all over the world (Christense et al., 2009). In addition to the expected challenges which advanced age may present, often the elderly who commit suicide have concomitant complex problems such as mental illness, somatic illness, functional decline, and social isolation (Conwell & Thompson, 2008).

Lapierre et al. (2011) identified several specific factors that may predict suicide in older age, including psychiatric disorders (mainly depression), functional limitations, stressful life events (e.g., loss of a spouse), and physical illness. Agreeing with Lapierre et al. (2011), Van Orden and Conwell (2011) further add social disconnectedness to physical illnesses and functional impairments as risk factors that contribute to SISAS in late life.

Clark (1993) refers to the subgroup of older adults with psychiatric illness such as depression as having inflexibility in adapting to age-related limitations, which, in turn,

promotes suicidal rates (Clark, 1993). In addition, (Gilman et al., 2013) reported that depression that results from social inequality toward the elderly elevates the risk for suicide. Financial insecurity in late life can also play a big role in suicide ideation, especially in older males. As many people age, they may have fewer financial resources and uncertainty about the future (Van Orden & Conwell, 2011). They may require nursing home care, home health care, or skilled care; unless the person is indigent, they will have to pay a certain amount as insurance will not cover all (Coghlan, 2009). When one cannot pay for basic needs, psychological distress intensifies, which elevates the risk for suicide.

Functional decline among the elderly also seems to be a consistent factor leading to SISAS. When an individual no longer has freedom of action and self-determination, then a feeling of "death is better than life" follows (Kjolseth, Ekeberg, & Steihaug, 2010). When older adults feel that they are a burden to younger generations, they start believing that one's death is more valuable than their life to those around them (Van Orden et al., 2010).

What also appears to be a general theme in various studies involving suicides in the elderly population is that factors contributing to suicide involve comorbid physical conditions or multiple illnesses (Patel & Patel, 2013). The elderly tend to have higher rates of disability hence more loss of independence, which may lead to more suicides (Yang, 2006). Older individuals who attempt suicide tend to be frailer, more isolated, and more determined to die, and so have a well thought-out plan, when compared with the elderly who did not attempt suicide (Substance Abuse and Mental Health Services Administration, 2012). The elderly fear that society does not really care for them in a

dignified manner. Their perception of belonging is often reduced; thus, the elderly feel that their value, self-respect, and dignity are declining (Kjolseth et al., 2010).

Depression as a Risk Factor

It is evident that mental disorders can be strong predictors of suicide attempts. According to the National Comorbidity Survey Replication (2009), approximately 80% of the individuals who attempt suicide in the United States have had a prior mental disorder. Anxiety, impulse-control, mood, and substance abuse were found to exhibit strong association with suicide attempts. According to the National Comorbidity Survey Replication, depression can be a predictor for suicidal ideation but not necessarily for suicide attempts, as opposed to disorders such as anxiety disorders (such as posttraumatic stress disorder), and poor impulse control (such as substance abuse disorders, or conduct disorder) that can predict which individuals with suicide ideation may proceed to actual suicide or a plan for suicide (Nock et al., 2009). This sheds light on which mental disorders are more closely related to suicide ideation vs. suicide attempts.

Depression as a risk factor for SISAS. Depression is one of the strongest risk factors for suicide ideation, however, 85 percent of depression sufferers, will not commit suicide (National Institutes of Mental health, 2015). The link between suicide ideation and depression mat be explained by hopelessness (Beck, Kovscs, & Weissman, 1975). Suicide ideation has been linked to hopelessness and hopelessness, in turn, is one of the hallmarks of depression. When one is unable to overcome obstacles in times of distress, thoughts of suicide ideation can occur (Quinones, Jurska, Fener, & Miranda, 2015).

Symptoms of interpersonal dysfunction associated with depression are more likely to increase interpersonal risk for suicide ideation (Davidson, Wingate, Grant,

Judah, & Mills, 2011. A direct association between depression and suicide ideation can be found when the individual feels that she is a burden, as the interpersonal theory of suicide suggests (Davidson et al., 2011).

Two additional concepts, *defeat* and *entrapment,* have long been used in describing depression (Gilbert, 2001). Baumeister and Scher (1988) describes self-defeat as a way to harm one's self through poor judgments and maladaptive responses. According to Brokner and Rubin (1985) entrapment can be defined as "a decision making process whereby individuals escalate their commitment to a previously chosen, though failing, course of action in order to justify or 'make good on' prior investments". Baumeister (1990) also described defeat and entrapment as circumstances from which the individual cannot escape suicidal ideation. A person who is feeling defeated and trapped descends into perceptions of hopelessness, which was discussed above as factor in explaining the link between depression and suicide ideation (Taylor, Gooding, Wood, Johnson, & Tarrier, 2011).

A depressed individual can convert suicide ideation into action by attempting suicide, the second element of SISAS, suicide attempts. Bradvik and Berglund (2011) supported that there is a strong link between suicide attempts and depression; they further reported that 43-44% of the individuals who attempted suicide had previously suffered from depression. Galfalvy, Oquendo, and Mann (2008) on the other hand state that the rates for lifetime suicide attempt rates in major depressive disorders is 15.9%. Olin et al. (2012) reported that major depressive disorder, especially the type of depression which is resistant to treatment, is associated with suicide attempts. The fact that depressed individuals have a decreased ability in experiencing anhedonia, along with

the motivation of wanting to relieve pain, leads to an increase in the likelihood of suicide (Xie et al., 2014). Nanayakkara, Misch, Chang, and Hensry (2013) agreed with Xie et al. (2014) when they tested the interaction between depression and suicide attempts and found that there is a strong connection between the two.

Contrary to Nanayakkara et al. (2013), Jager-Hayman et al. (2014) found that distorted thinking and not depression was what is more likely to lead individuals to attempt suicide. In a study of 168 individuals, Jager-Hayman et al., found that 111 individuals who attempted suicide had distorted thinking as opposed to 57 individuals who had depression and hopelessness. This is to say that depression alone may not have been the catalyst for suicide attempts since in this instance the individuals with depression and hopelessness were controlled (Jager-Hayman et al., 2014). Studies have also shown that those with major depression have a lifetime risk for suicide of 21%. The reason for this strong relationship between depression and suicide could be genetics, or psychological factors such as anger turned on oneself (Nizamie & Garg, 2012).

Among individuals who die by suicide, depression is the most common psychiatric disorder (Hawton, Casanas, Comabella, Haw, & Saunders, 2013). The link from clinical depression to suicide is not direct, however. According to the American Association of Suicidology (2014), only 15% of individuals who have sought help and been treated for depression will succumb to suicide. On the contrary, individuals who believe that life's negative events are a result of external and specific risk factors, rather than self-characteristics, may experience fewer suicidal ideation, attempts, and suicides (Hirsch, Wolford, LaLonde, Brunk, & Parker-Morris, 2009).

Another way to view the complexity of depression is using an example. Women are two times more likely than men to suffer from major depression (APA, 1996). If depression, then, is directly related to suicide, then one would expect that more women would commit suicide. Instead, as we have seen earlier, more men die from suicide than women. The symptoms of depression may also differ as individuals' age, due to coexisting physical or emotional illnesses, lack of energy, headache, neck ache, or even anxiety (Batterham, Christensen, & Calear, 2013). Thus, it may be difficult to test the effect of depression on suicide in isolation.

Stroke as a Chronic Illness and Suicide Ideation, Suicide Attempts, and Suicide Completion

Any chronic illness has multifaceted consequences. Often the individual is affected not only physically, but also emotionally and financially. The implications of such disruptions can be grave. According to Charmaz (1997), there are three ways in which people experience chronic illness: *interruption*, *immersion,* and *intrusion*. During a time when an individual's symptoms *interrupt* life, the patient often believes and hopes that the illness will simply go away, and the patient can return to daily living. Individuals may also experience *immersion* to the illness—such as balancing fatigue with rest, as one tends to tire easier. Illness becomes part of their lives. Lastly, the individual may experience chronic illness as an *intrusive* illness—symptoms may become so severe that the individual may have to be homebound and be taken over by the illness. Chronic illness can drain one's energy, decrease concentration, increase irritability and lethargy, lead to sleep disturbances, and drive one into depression, among others. Living with a serious illness takes effort, time, and decision-making.

Quality of life after suffering a stroke has been studied and results seem to be consistent with lower quality of life scores in patients. Disability after a stroke interferes with ADL/IADL, thus the quality of life is affected (Dayapoglu & Tan, 2010). Quality of life encompasses the physical, emotional, and social aspects of someone's well-being (Mayo et al., 1999). WHO identifies quality of life as it relates to health and the person's perception of their purpose, standards, and expectations within the culture that they live in (Tozon & Eker, 2003). In the above study, the quality of life of 70 patients with a first ischemic and hemorrhagic stroke was studied. The stroke patients were studied in the three months or more after suffering a stroke, and quality of life tended to be poor, especially in men ages from 61-71 (Tozon & Eker, 2003).

Adjustment to chronic illness can be affected by the direction of medical treatment. In the United States, the path that chronic illness often takes depends upon the medical system. The medical profession is considered to be the authority that is responsible for diagnosing, curing, and managing the condition. The individual or the patient is a passive recipient of medical care (Falvo, 2014). The main philosophy of the medical system is to return to "normalcy"**;** that is, an acceptable level of quality of life (Falvo, 2014). Even though the medical model may be considered the authority responsible for "curing" and returning the individual to "normalcy", it is the individual who determines how the illness will define quality of life. The individual may view the illness as challenging, as an enemy to be fought, a relief, a sign of weakness, or an uplifting spiritual experience (Falvo, 2014). Any type of illness is often viewed as some sort of loss. With loss comes grieving; the individual is undergoing bodily, emotional, and other changes (Falvo, 2014). Grieving, then, is a highly individualized process and

each person travels this road differently. Illness can be unpredictable, unfamiliar, and threatening (Falvo, 2014). Anger at oneself, as well as anger at others for injustice, depression, and guilt are some other feelings that the individual with chronic illness is likely to experience. Depression, social isolation, lower income, not driving, and higher levels of physical disability can be among the characteristics that individuals with chronic illnesses experience (Pompili et al., 2012). The loss of ability to engage in any sort of physical activity such as walking, running, driving, and cooking can lead the individual to feel isolated and without a purpose.

Stroke as a chronic illness can lead to various psychological, physiological, and financial losses for the individual (Jood, Redfors, Rosengren, Blomstrand, & Jern, 2009). Stroke oftentimes comes with a history of coexisting medical factors. One of the sequelae that often follows stroke is depression—an illness that is a high risk factor for SISAS (Hadidi et al., 2008). It is not uncommon for an individual to suffer from depression, which can then lead to completed suicides, suicides attempts, and suicidal ideation (Pompili et al., 2012). Nearly 30% of the individuals who have suffered a stroke will develop depression; this could be either at the early stages or in the late stages after a stroke (Paolucci, 2008). Poststroke depression tends to be a common emotional disorder affecting stroke sufferers (Gaete & Bogousslacsky, 2008). Santos et al. (1999) reported that patients with stroke, transient ischemic attack, and peripheral vascular disease with frontal lobe impairment were at higher risk for SISAS as well as higher levels of impulsivity (Santos et al., 2008). As illnesses become chronic it can result in higher risks for SISAS. Increasing evidence suggest that there is great risk for suicide following a

stroke and this literature is summarized in the next section. The first 5 years following the stroke present the highest risk for suicide (Pompili et al., 2012).

Stroke and Suicide Ideation

Kishi et al. (1996) did not find a direct relationship between stroke and suicide ideation; rather suicide ideation is associated with the presence of depressive disorder during stroke recovery. Pompili et al. (2012) further support the idea of poststroke depression and suicide ideation, and that not just the stroke alone is a factor for suicide ideation. Contrary to Kishi et al. (1996) and Pompili et al. (2012), Pohjasvaara, Leppavuiri, and Erkinjunti (2001) reported that suicide ideation is associated with right-sided strokes, especially those that are more disabling. Depression, a major risk factor for suicide may be more likely in stroke patients with more severe disease or physical limitations (Pompili et al., 2012) Thus, poststroke limitations may cause depression and increase risk for suicide. In addition to depression that affects stroke sufferers, physiological changes occur as a result of stroke. When a patient's meaningful functions or activities are altered or not able to be executed due to stroke or other illness, the level of one's disability is increased (Astrom & Asplund, 2003). As seen, the direct link between stroke and suicidal ideation is rather controversial; most studies agree on depression acting as the link between stroke and suicide ideation than the direct link between stroke and suicide ideation.

Kishi, Robinson, and Kosier further complemented on the link between SISAS and lesions-acute-onset suicidal ideation patients were found to have more anterior lesions, vs delayed onset suicidal ideation patients who had posterior stroke lesions Depending on the lesion or location of the stroke, different results may occur. In major

depressive disorder structural brain abnormalities have been found in brain areas that are involved in in processing emotions as well as brain areas that regulate stress (Cedric et al., 2009). In terms of brain volume, patients with depressive disorder shower larger volume reduction in frontal regions. Thus, stroke in these specific locations of the brain may cause poststroke depression (Bhogal, Teasell, Foley, & Speechley, 2004) and hence increase suicide risk. McHale et al. (1997) found strong associations between large lesions in the right hemisphere and depression after a stroke. Left anterior cerebral lesions were more likely associated with poststroke depression than left posterior lesions in one study (Robinson, 1996). Pompili et al. (2015) found that individuals who attempted suicide after a stroke were more likely to have suffered a stroke on the right side. Studies have also found those anterior brain lesions to be associated with SISAS poststroke; such lesions as seen are also associated with depressive symptoms, as well as impulsivity (Brittain & Castleden, 1998). Contrary to these findings, Carson et al. (2002) reviewed 34 studies and concluded that data did not show any association between lesion location and poststroke depression. It is crucial then when diagnosing a patient to have a clear idea as to whether lesion location may be associated with their depression and SISAS or psychological factors alone or both. Not only the importance of origin is to be examined but that will lead different rehabilitative approaches and possible higher levels of prognosis

Another cause that has been found to contribute to SISAS is underlying and organic neurological changes as a result of the stroke. Katayama et al. (2010) found that the underlying neurological and organic cause may be the case for stroke and suicide attempts. The use of selective serotonin uptake inhibitors (SSRI) then may serve as a

bridge between functional recovery and depression prophylaxis after a stroke (Flaster, Sharma, & Rao, 2013).

Burdensomeness and Stroke

Chronic illness has multifaceted consequences. Stroke as a chronic illness can lead to various psychological, physiological, and financial losses for the individual (Jood et al., 2009). Stroke oftentimes comes with a history of coexisting medical factors. One of the sequelae that often follows stroke is depression, an illness that is a high risk factor for SISAS (Hadidi et al., 2008).

Following a stroke, individuals often feel powerless; as a result of their disability, they suffer from loss of self-identify (Kutz, Saint-Louis, Burke, & Stineman, 2008). ADL/IADLs are impaired such as dressing, bathing, feeding, toileting, grooming, transferring, and mobility (Astrom & Asplund, 2003). These impairments may lead to feeling of being a burden to others, especially if the patient has to rely on others to have basic needs met. Burdensomeness in itself is a risk factor for SISAS (Astrom & Asplund, 2003). McPherson et al. (2010) completed a mail survey of 57 stroke patients which included measures of functional status, quality of life, marital dissatisfaction, equity in the relationship, psychological distress and by using the Self-Perceived Burden Scale (SPBS); burdensomeness was found to be a profound concern—individuals who receive care from a partner after a stroke has been reported to increase the level of self-perceived burden. Pain which often exists after stroke is debilitating and affects the person's interpersonal functioning; self-perceived; burden was often experienced among the patients with chronic pain. Furthermore, self-perceived burden was correlated with SISAS (Kowai, Wilson, McWilliams, Peloquin, & Duong, 2012).

Burdensomeness and Suicide Ideation

Perceived burdensomeness has been found to be related to the desire for death, otherwise known as suicidal ideation (Van Orden et al., 2008). Perceived burdensomeness is one of the components of the interpersonal theory of suicide in that suicide and suicide attempts exist only when the individual has the capability to enact lethal self-injury. Burdensomeness, then, acts as a moderator with suicide attempts and suicide, and a more direct relationship with suicidal ideation (Van Orden et al., 2008). When the individual feels their own existence is draining others or society, suicide ideation may be more prevalent. Even after controlling for age, pain severity, gender, duration of pain, depressive symptoms, functional limitations, depressive symptoms, and interpersonal and catastrophic relationships (Van Orden et al., 2008).

Perception of burdensomeness is an important suicide factor, one that carries a heavier weight among the older generation (Jahn, Van Orden, & Cukrowicz, 2013). Again, Gunn, Lester, Haines, and Williams (2012) found perceived burdensomeness to be ranked higher as a risk factor in adults, while the theme of belongingness exists in the suicide notes of younger individuals.

Burdensomeness and Attempts

There is evidence that burdensomeness and suicide attempts may be connected. Van Orden et al. (2010) conducted a study between nonsuicidal attempters and burdensomeness and suicidal attempters and burdensomeness. Those who perceived burdensomeness were more likely to attempt suicide. Joiner et al. (2003) further support the association between being a burden to others is associated with lethality of suicide

attempts; even when age, gender, and hopelessness were controlled, a sense of burdensomeness remained significant.

Burdensomeness and Suicide Completion

Jahn, Cucrowicz, Linton, and Prabhu (2011) also studied perceived burdensomeness and suicide completions, but in this case, burdensomeness was found to be a mediator between depression and suicide ideation rather than being a direct risk factor for suicide ideation. This study used suicide notes to determine perceived burdensomeness but this, by itself, may be problematic. One can never know whether there was absence of burdensomeness or absences of disclosure of burdensomeness. Thus, other measures need to be used for assessing perceived burdensomeness in suicide (Hill & Pettit, 2014).

One of the problems that has been consistent throughout the literature as it applies to burdensomeness and SISAS was that burdensomeness is not something stable, it tends to vary even within the individual (Hill & Pettit, 2014). This may have been one of the limitations of single case designs and more longitudinal studies may have proven to be beneficial. It may also have been useful to examine degrees of burdensomeness and SISAS, as one would assume that this varies.

Conclusion

Although PSD is a common consequence of stroke, the different risk factors for suicide ideation in this patient population are not well understood. Many studies, as discussed above, have examined risk factors for SISAS. Marital status, burdensomeness, age, and gender, are predictors of suicide in general, but these have not been examined as risk factors for poststroke suicide ideation. Existing data suggest that marital status,

specifically being married, acts as a protector against suicide. However, being married or partnered in stroke patients also suggested an increased level of burdensomeness towards the spouse, which can increase SISAS. Therefore, the purpose of the proposed research was to examine whether marital status affected suicide ideation in stroke patients by increasing burdensomeness.

This study contributes to understanding the role of burdensomeness and marital status on suicide ideation among stroke survivors. In addition, identifying a vulnerable population provides a basis for future research regarding program implementation in reducing suicide rates. The patients' well-being and progress towards their independence or their given goals were highly associated with their psychological and emotional well-being. Identifying at-risk vulnerable populations will also help lead to early intervention, which will contribute to quicker recovery of the stroke patient. Quick recovery can have a direct effect on the individual and family members, as well as reducing Medicare and Medicaid costs. A faster recovery of the patient assists in a healthier financial community. Finally, early and regular screenings for suicidal ideation can provide early detection for further and better treatment. Thus, mortality rates from suicide can decrease with early prevention measures.

Chapter 3: Research Method

Introduction

The purpose of this study was to examine if burdensomeness (independent variable) was associated with suicide ideation (dependent variable) and if this association was moderated by marital status in a national sample of adults who have had a CVA (both ischemic stroke and hemorrhagic stroke) in the past 12 months. As previously indicated, there was a paucity of research between marital burdensomeness after stroke and suicidal ideation. Burdensomeness was a risk factor for suicide ideation (Joiner et al., 2009) and was expected to be of special relevance in stroke patients who, due to extensive disabilities, potentially feel increased burdensomeness.

Marital status, on the other hand, has been shown to be a protective factor for suicide ideation. It was not clear whether the support of a spouse increases or decreases the risk of suicide ideation in stroke patients due to a self-perceived burdensomeness. The current study filled this gap by my examination of the relationship between the two.

While the primary aim of this study was to establish whether some level of burdensomeness and marital status were predictors of suicide ideation, and if marital status acted as a moderator in burdensomeness and suicide ideation, this study also established feasibility for future studies directed towards intervention strategies for suicide prevention for stroke patients. I intended this study to contribute to the literature by determining factors closely associated with suicidal ideation. Early detection and identification of patients at risk can then lead to a more comprehensive assessment and rapid intervention that may improve outcomes for stroke survivors. Furthermore, early and regular screenings for suicidal ideation can provide early detection for further and

better treatment. Ultimately, mortality rates from suicide can decrease with early prevention measures.

Preview of the Chapter

This chapter begins with an overview of the research approach and rationale for this current study and achieving the scientific objectives. Furthermore, I provide the operationalization of variables and analytical steps in order to answer RQs that were formulated in Chapter 1. In this chapter I further address the data collection methods and the analysis approach of the study. The following were the topics included: research questions and hypotheses, research design, sampling method and sampling size, instrumentation and materials, procedures, data analysis, and protection of participants' privacy and rights. Below I describe the research questions in detail.

Research Questions and Hypotheses

Following are the research questions, hypotheses and conceptual framework that guided this study that I developed after a comprehensive and extensive literature review.

RQ1: Is marital status associated with suicide ideation among adult stroke patients?

$H_0$1: There is no relation between marital status and suicide ideation among elderly adults who have had a stroke within the past 12 months.

H_a1: There is a relation between marital status and suicide ideation among elderly adults who have had a stroke within the past 12 months; self-reported suicide ideation is greater among married adult stroke patients than unmarried (widowed or divorced) stroke patients.

RQ2: Is level of burdensomeness associated with suicide ideation among adult stroke patients?

$H_0$2: There is no relation between level of burdensomeness and suicide ideation among elderly adult stoke patients.

H_a2: Level of burdensomeness and suicide ideation are positively correlated among adult stroke patients.

RQ3: Does marital status moderate the relationship between burdensomeness and suicide ideation in stroke patients?

$H_0$3. The effect of marital status on suicide ideation is not moderated by burdensomeness.

H_a3: The effect of marital status on suicide ideation is moderated by burdensomeness; suicide ideation differs based on level of burdensomeness among married versus unmarried stroke patients.

These hypotheses and association in the conceptual framework are depicted in Figure 1.

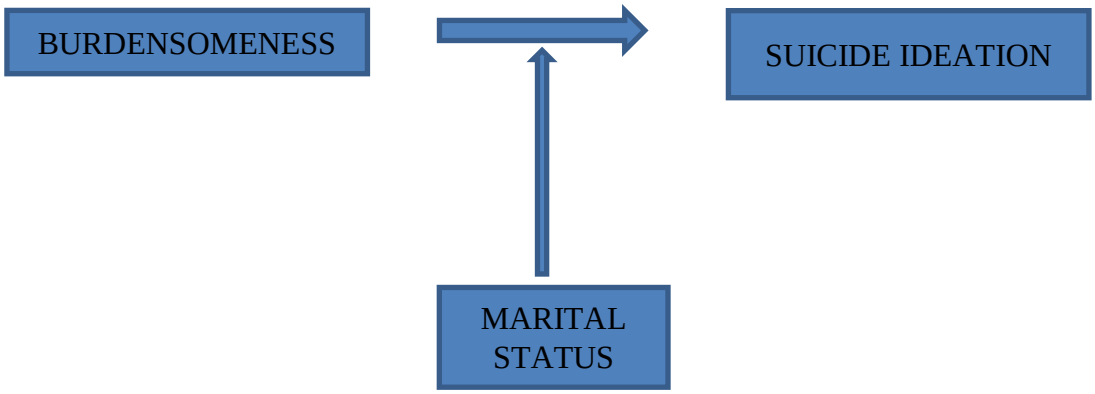

Figure 1. Conceptual framework.

Research Design and Rationale

This study was cross-sectional in design and was a secondary analysis of the OASIS data set that was collected by CMS for the purpose of measuring patient home health care outcomes, with appropriate adjustment for patient risk factors that affected those outcomes (CMS, 2012). The OASIS instrument consisted of nearly 100 items related to the home care patients' demographics, clinical status, functional status, and further service needs (CMS, 2009) and are discussed in more detail in the Data Source section below.

The use of secondary data, especially high-quality data sets, is a beneficial and cost-effective approach to analyzing data, especially for researchers who have limited funding and who would like to further contribute to the literature on an important topic. Furthermore, the time of obtaining, planning, and cleaning the data is often avoided (Lewis-Beck, Bryman, & Liao, 2004). The use of previously collected large data is more

beneficial when issues such as suicide and suicide ideation are more uncommon and would require collection of large number of patients to obtain enough power to study the issue. A limitation of using secondary data was that the data was not collected for the current study aim; however, the data collected was still suitable for a comprehensive examination of the RQs for this study. Another limitation of secondary data was the timeframe in which the data were collected (Denscombe, 2007).

Population of the Study

To allow for examination of various factors that could have been associated with suicide ideation, I restricted the study sample to adults who had had a stroke within 12 months of data collection. The OASIS data was obtained from CMS, and 1,789 records were randomly selected during the year 2008 for the current study. The year 2008 was selected because it was the most recent year that suicide ideation questions were asked of participants. After 2008, OASIS B1 was updated to OASIS C1 and question #590 that referred to depressive feelings that were reported or observed by the patients was eliminated. This question asked about (a) depressed mood (e.g., feeling sad, tearful), (b) sense of failure or self-reproach, (c) hopelessness, (d) recurrent thoughts of death, and (e) thoughts of suicide. According to Bruce et al. (2007) data gathered from OASIS about depression may have overlooked symptoms that were earlier identified from diagnostic interviews. However, this did not necessarily decrease the validity of the questions for suicide ideation.

Inclusion criteria for this study consisted of (a) men and women, (b) persons aged 50 and older, and (c) persons who had suffered a CVA as their primary diagnosis within 12 months of data collection. Furthermore, these patients could be been both verbal and

nonverbal as long as they could communicate in some form to answer the questions. The OASIS was only administered to patients who met the criteria for home care; that is, the patient had to be homebound and in need for skilled services (CMS, 2008). OASIS collected information during start of care, resumption of care following an impatient facility stay of more than 24 hours, every 60 days (recertification), and during discharge. For this study, only OASIS information obtained at the start of care was included.

Exclusion criteria included (a) patients who were unable to communicate, and (b) individuals with primary or secondary diagnosis of dementia or any other cognitive decline. The reason these individuals were excluded was to ensure that the patient was at a mental state in which the patient was able to understand the questions and provide answers. I reviewed the demographic data in order to gather information on stroke, marital status, burdensomeness, and suicide ideation. All participants provided consent at the time of data collection for the OASIS study. To protect patient confidentiality, personal identification was not included, such as patient name, Social Security number, and Medicare or Medicaid number.

Data Source and Data Collection

As a practice, the OASIS is completed when admitting a patient into home health care, upon transferring the patient, when discharging the patient, or when there is a change in condition; this information is collected for all Medicare and Medicaid nonmaternity adult patients. The nurse or the therapist present upon admission of the patient into home care collects this information with both direct observation and by interviewing both the patient and the patient's caregiver. Collection of OASIS data

averages 2 hours, depending on the number of diagnoses and severity of the patient's illness.

The primary goal of the OASIS is to provide data to assist in better planning the care of the patient, measuring quality of care, and determining reimbursement for the services to be rendered (Davitt & Kaye, 2010). At its outset, the majority of the OASIS question items were derived from a CMS-funded national research program that was cofunded by the Robert Wood Johnson Foundation; the goal was to develop a system that measured outcomes for home health care. This program, along with the OASIS, evolved over a period of 10 years through clinical and empirical research (CMS, 2012). Only registered nurses, physical therapists and speech-language pathologists are now qualified to perform the comprehensive assessment upon the start of care. Licensed practical nurses, occupational therapists assistant, physical therapist assistant, and social workers are not qualified to perform the OASIS Comprehensive Assessment. Occupational therapists can conduct subsequent evaluations such as recertification (after 60 days from the start of care) or discharges (CMS, 2009).

Since 2003, CMS has created a website, "Home Health Compare" that publicly informs outcome measures of a given home health agency and indicates how well each agency assists its patients in regaining or maintaining their functional ability. While the OASIS was developed over a period of 10 years, the question set was more finely tuned by both research and clinician feedback (Shaughnessy, Crisler, & Schlenker, 1998). Interrater reliability Kappas .50-1 on functional variables were reported by the initial team that developed the OASIS (Shaughnessy et al., 1994)

To determine whether severity levels were associated with increased depression levels or contributed to suicide ideation, OASIS data were analyzed using questions such as "is patient ambulatory, able to express self, able to prepare meals" and so forth (CMS, 2014). I obtained permission for this data from the CMS. Individuals seen for homecare have just been discharged from the hospital and hence meet the requirements for homebound status. For an individual to be considered homebound, the patient's physician must certify that the patient is confined to their home due to either illness or injury, or the patient requires the aid of supportive devices such as crutches, wheelchair, walker, use of special transportation, or the help of another person in order to leave the house, or the person is considered homebound when the patient has a condition for which leaving the house is medically contraindicated (CMS, 2008). If the person meets one of the two above criteria and absences from the house are infrequent, for short periods of times, and medical purposes only, then the person can be eligible for home care services (CMS, 2012). An example of a stroke patient who is considered homebound is when a patient is paralyzed from the stroke, is confined to the wheelchair, or requires assistance to walk. In this instance, for the stroke patient to be considered homebound, a severity of disability was established. Homebound patients, therefore, tended to have greater medical severity.

Ethical Considerations

This study was based on already existing data, therefore there was no concern of influencing or manipulating the data collection process. I collected OASIS data in the Washington, DC area as part of my own work, and to avoid any ethical conflict the OASIS data requested was gathered nationwide. To protect patient confidentiality, no

personal identifiers were extracted from the database. The information used in this research was coded, and only the aggregated results were released.

As part of the agreement to release the data, the CMS incorporated the following guidelines for using these limited data sets:

1. The CMS retains all ownership rights to the data and I do not obtain any rights;
2. I only used the data for the purpose of this research only;
3. I agreed not to contact or identify any of the participants that are included in this data set;
4. CMS has a retention date, in that the researcher is to notify CMS within 30 days of completion of the research using the limited data; in addition the researcher is to destroy any such data. And send a written notification to CMS stating so. I did not gain access to this data except for the purpose stated above;
5. I agreed that appropriate administrative, technical, and physical safeguards would be used in order to protect the individual's confidentiality.

The data was stored at MedStar VNA campus in Washington DC. The file that stored the individuals' data was protected by a separate password. With respect to the individuals' anonymity, only numerical IDs were provided and analyzed, therefore the individual could not be identified on the basis of the information provided to CMS. To further safeguard anonymity, this study presented findings nationwide and not by the state that the individual is associated with.

Instrumentation and Operationalization of Constructs

Methods and Measures

Suicide ideation was measured by using a dichotomous variable of presence of recurrent thoughts of death and thoughts of suicide. Patients indicated if they did or did not have (a) recurrent thoughts of death, or (b) thoughts of suicide. Answering positively to at least one of these items was considered suicide ideation.

Marital status was measured by using a dichotomous variable of married vs. nonmarried status of the stroke survivor that was recoded from the response options of married, not married, widowed, divorced, separated and unknown. Not married, widowed, divorced, and separated were defined as unmarried for the purposes of this study.

Gender was measured as a dichotomous variable of male or female.

Age is reported as a continuous variables (in years).

Burdensomeness was measured by level of disability (i.e., requiring help from a caregiver to perform daily tasks such as bathing and dressing). In the present study, level of disability was used as a proxy for burdensomeness. In the OASIS data, there were two main categories with 8 subcategories of disability (ADL/IADL). Each consisted of those 16 different items asking about disability which were summed to create one disability score. The data was obtained by patient's self-report, caregiver's report, or observation by the clinician. The scoring ranged from 0 (*independent*), 1 and 2 (*needs some assistance*), and 3 (*totally dependent*). In measuring disability, the higher the level of dependency, the higher the degree of disability. Therefore, the sum of all 16 items were used to determine the severity of disability with a range of 0 (*completely independent*) to

48 (*completely dependent*). Each OASIS item was identified by the letter M and a number between 0001 and 9999).

Any restriction resulting from an impairment that prevented the individual from performing an activity was considered a disability. In the case of stroke patients, consequences were ADL/IADL impairments such as dressing, bathing, feeding, toileting, grooming, transferring, mobility (Astrom & Asplund, 2003). In order for the individual to be reintegrated to the community, the individual must have gone through a transition after having reached certain rehabilitation goals (Wood, Connelly, & Maly, 2010).

McPherson et al. (2010) examined perceptions of burden to others using the Self-Perceived Burden Scale (SPBS) in a sample of stroke survivors and concluded that high levels of self-perceived burden are consequences of changes such as distress and quality of life which results of receiving care from caregivers (McPherson, Wilson, Livia, & Charles, 2010). This is consistent with the Interpersonal Theory of Suicide, explained in detail in Chapter 2, which posits that SISAS can be predicted from the presence of perceived burdensomeness (Joiner et al., 2009).

It is therefore an assumption of this study, based on the Interpersonal Theory of Suicide, that level of burdensomeness is increased in the presence of a caregiver, which is associated with SISAS. The OASIS collected data on patient functional impairment which was used as a proxy for burdensomeness in this study. This was supported by the self-determination theory (Ryan & Deci, 2000) that asserts functional impairment is associated with risk of suicide due increased perception of burdensomeness (Conwell et al., 2010; Conwell et al., 2000). Although *perception* of burdensomeness was not

measured in this study, level of burdensomeness was estimated by the severity of functional impairment.

Other authors have used similar approaches to measure disability. In 1965, Mahoney and Barther (1965) measured what is now widely known as Barthel's index. This index consisted of 10 items that measure level of independence in activities of daily living: bowels, bladder, grooming, toilet use, feeding, chair and bed transfer, mobility, dressing, stairs, and bathing (Mahoney & Barther, 1965). The above items were rated by level of difficulty, in three response categories: "dependent," "needs help," and "independent" (Mahoney & Barther, 1965). This was one of the first indices developed to rate a patient's extent of disability. The same 10 items were extracted and measured from the OASIS in order to arrive at the level of disability.

The following are14 IDL items included in the OASIS. The categories for ADL/IADL are scored from 0-3:

- Grooming: This subcategory assesses the individual's ability to tend to personal hygiene needs such as washing face and hands, hair care, shaving, make up, and so forth.
- Ability to dress upper body with or without dressing aids: This ability includes managing undergarments, pullovers, front-opening shirts and blouses, and managing zippers, buttons, and snaps:
- Ability to dress lower body with or without dressing aids: This ability includes managing undergarments, slacks, socks or nylons, and shoes:
- Bathing: This involves the ability to wash entire body excluding grooming (washing face and hands only).

- Toileting: This involves the ability to get to and from the toilet or bedside commode.
- Transferring: This involves the ability to move from bed to char, on and off toilet or commode, into and out of tub or shower, and ability to turn and position self in bed if patient is bedfast.
- Ambulation and locomotion: This involves the ability to safely walk, once in a standing position, or use a wheelchair, once in a seated position, on a variety of surfaces.
- Feeding or eating: This involves the ability to eat meals and snacks. Note: This refers only to the process of eating, chewing, and swallowing, not preparing the food to be eaten.
- Planning and preparing light meals (e.g., cereal, sandwich). This includes reheating delivered meals.
- Transportation: This involves the physical and mental ability to safely use a car, taxi, or public transportation (bus, train, subway).
- Laundry: This involves the ability to do laundry, to carry laundry to and from washing machine, to use the washer and dryer, to wash small items by hand.
- Housekeeping: This involves the ability to safely and effectively perform light housekeeping and heavier cleaning tasks.
- Shopping: This involves the ability to plan for, select, and purchase items in a store and to carry them home or arrange delivery.

- Ability to use telephone: This includes the ability to answer the phone, dial numbers, and effectively use the telephone to communicate.

Data Analysis

IBM SPSS Statistics Version 21 was used for all data analysis procedures. Given that the study was restricted to stroke patients, only data for such diagnosis was analyzed. The data was analyzed using regressions with suicide ideation as the dependent variable (DV), marital status, and level of disability the independent variables (IV). Depression, gender, and age were included as control variables.

The first step in the analysis plan was to summarize all of the variables using descriptive statistics; mean, median, mode, standard deviation, and range were reported for continuous variables and frequencies were reported for categorical variables. Visual depictions of the data (e.g., histograms for continuous variables and Line graph for the Interaction effect) were also examined. Evidence of the relationship between marital status and burdensomeness was further explored. Then associations and relationships were examined using inferential statistics. Bivariate analyses were used to investigate relationships and associations between two or more variables.

The steps of the analysis plan are described by research question (RQ) below and according to the relationships illustrated in the conceptual framework (see Figure 1). The alpha level of significance was set at the conventional $p < .05$ and all tests were two-tailed.

RQ1: Is marital status associated with suicide ideation among adult stroke patients?

Marital status (married or unmarried) and suicide ideation (yes or no) are both dichotomous variables and their association were examined the chi square test of independence and cross tabulations.

RQ2: Is level of burdensomeness associated with suicide ideation among adult stroke patients?

The next step was achieved by using regression analyses to determine if the IV (burdensomeness) was correlated with the outcome of the DV (suicide ideation). A separate regression was run for each dependent variable.

RQ3: Does marital status moderate the relationship between burdensomeness and suicide ideation in stroke patients?

The final step was to establish that the moderator (marital status) had a significant effect between the Independent Variable (burdensomeness) and the Dependent Variable (suicide ideation) using logistic regression. In addition to burdensomeness and marital status, burdensomeness-by-marital status interaction variable was entered as an independent variable.

Power and Sample Size

Power analysis was run with G*Power. A medium effect size of 0.3 was predicted (Cohen, 1988). With a significance level alpha = .05, 80% effect size 0.3, and 5 independent variables a sample of 149 was required. According to the literature, an average of 8.33% of stroke survivors has suicide ideation. To assure the sample included enough individuals with suicide ideation, we selected 1789 individuals and expected that at least 149 (8%) would report suicide ideation.

Threats to Validity

A threat to validity was that the OASIS data were collected for the purpose of measuring home health care outcomes and not to measure suicide ideation among stroke victims. However, the existence of specific items that measured patient mental status and risks towards suicide ideation clearly justified its use. OASIS Item M590 assessed not only depressive feelings but *suicide ideation*. As such, the data utilized in this study were from 2008 by design. This fact constituted one of the delimitations as well as limitations of this study. Unfortunately, 2008 was the last year in which OASIS included the M590 item.

Another important limitation was that cause and effect could not be determined from the cross-sectional design of the study. The analyses and conclusion were restricted to describing the characteristics of the sample population in terms of disability, level of burdensomeness and suicide ideation. Associations and relationships could be examined, but it was not possible from this data to determine if level of burdensome precedes suicide ideation or vice versa.

Another delimitation of this study was the population selected. The fact that the participants were homebound may not have been a true representation of stroke patients in general. Results may have varied had the participating stroke patients been in the hospital setting, for example. An assumption could be made that when the patient is at the hospital or any other inpatient setting, she pays (whether privately or via insurance) for the medical care. This crucial fact may decrease the level of burdensomeness. It was therefore an assumption of this study, based on the Interpersonal Theory of Suicide, that level of burdensomeness is increased in the presence of a caregiver, which is associated

with SISAS. The OASIS collected data on patient functional impairment that was used as a proxy for burdensomeness in this study. This could be supported by the self-determination theory (Ryan & Deci, 2000) that asserts functional impairment is associated with risk of suicide due to increased *perception* of burdensomeness (Conwell et al., 2010; Conwell et al., 2000). Although perception of burdensomeness was not measured in this study, level of burdensomeness was estimated by the severity of functional impairment.

Another assumption was that physical disability led to increased perception of burdensomeness. The healthcare professional was not necessarily emotionally invested with the patient so an assumption was that the patient could have felt "pressured" to elaborate by another person in the room with whom there may have been an emotionally bonded relationship.

The OASIS was and is a somewhat subjective method of gather information. The information is gathered by individuals in various disciplines within the home health care system. These disciplines include registered nurses, physical therapists, speech-language pathologists, and occupational therapists. While all professionals are well trained on how to gather information for OASIS, with a nonbiased tool that uses a set of questions and observations, it is important to note that each discipline has a different background with a different focus. For example, the speech language pathologist is likely to have stronger skills assessing communication skills rather than, say, a wound.

A final limitation was that the OASIS assessment was to be conducted within 48 hours of referral or returning home from an inpatient facility or when the physician ordered the 'Start of Care.' The emotional state of the patient when first discharged may

be different after 48 hours post discharge, from a week post discharge, 3 months, 6 months. This timing issue represented a problem in that the data collected may not have been an accurate representation of the levels of burdensomeness or suicide ideation. Comparing OASIS data at the start of care with OASIS data in 60 days of recertification or longer when the patients is discharged may have been a more representative and valid outcome. Due to time constraints, though, this was not performed. This may serve as the foundation for further studies comparing OASIS results in various time increments.

Summary

This chapter described the methodology of this study. Furthermore, the research questions as well as hypotheses were described along with the study design, instrumentation and analysis plan. The ethical considerations were also addressed. The OASIS data collection process was also part of this chapter. Limitations and delimitations which were part of this research have been reported as well. Overall, this research attempted to explore the predictor variables of burdensomeness and marital status with self-reported suicide ideation after the data was obtained and analyzed. The results are discussed in Chapter 4.

Chapter 4

Introduction

As mentioned earlier, in this study I aimed to examine how marital status and level of disability (independent variables) were associated with suicide ideation (dependent variable) in a national sample of adults who have had a CVA (both ischemic stroke and hemorrhagic stroke) in the past 12 months.

The following research questions were addressed and examined:

RQ1: Is marital status associated with suicide ideation among adult stroke patients?

RQ2: Is level of burdensomeness associated with suicide ideation among adult stroke patients?

RQ3: Does burdensomeness moderate the relationship between marital status and suicide ideation in stroke patients?

Selection of Study Sample

This study involved secondary data analyses of the OASIS database. A request was sent to CMS in October of 2016, and after review, the request was forwarded in June 2017. CMS sent the data on a CD in an .exe file and included software to decrypt the data as well as a password. The data was saved onto a secure computer. IBM SPSS version 21 was used to analyze all data.

Human Subjects Protection

One of the main obstacles that I faced was that I was not allowed (by CMS) to host and store the data on my own personal computer. After the appropriate legal and logistic requirements, the data was obtained and stored at MedStar (my current

employer). The CMS data files are protected health information and subject to the MedStar Health Insurance Portability and Accountability Act (HIPAA) Security Policy (Medstarhealth.net, n.d.). All MedStar employees must adhere to the MedStar HIPAA Security Policy. All employees receive mandatory HIPAA and data security training annually. I was the sole user of the CMS data.

Sample Demographics

A data sample of 1,596,962 records was obtained. This data sample included 5% of the Home Health Outcome Information and Assessment Set for the year 2008. Of those, 86,381 (5.4%) individuals had suffered a stroke. The following ICD-9/ CPT4 / HCPCS codes for stroke or transient ischemic attack were used to extract this number : DX 430, 431, 433.01, 433.11, 433.21, 433.31, 433.81, 433.91, 434.00, 434.01, 434.10, 434.11, 434.90, 434.91, 435.0, 435.1, 435.3, 435.8, 435.9, 436, 997.02.

The most frequently observed category of race was White (*n* = 62,588, 72%). The most frequently observed category of marital status was married (*n* = 32,984, 38%). All frequencies and percentages for demographics of the sample and study variables are presented in Table 1.

Table 1

Descriptive Statistics for Study Variables

Variable	*M*	*SD*	Min.	Max.	*N*	*%*
Ethnicity						
Am. Indian or Alaskan	-	-	-	-	369	0
Asian	-	-	-	-	1576	2
Black or African Am.	-	-	-	-	13105	15
Hispanic or Latino	-	-	-	-	5490	6
Native Hawaiian or Pacific Islander	-	-	-	-	183	0
Unknown	-	-	-	-	1683	2
White	-	-	-	-	62588	72
Missing	-	-	-	-	1387	2
Marital Status						
Not Married	-	-	-	-	7814	9
Married	-	-	-	-	32984	38
Missing	-	-	-	-	45583	53
Ideation						
Ideation	-	-	-	-	389	0
No Ideation	-	-	-	-	85992	100
Missing	-	-	-	-	0	0
Age in Years	87.23	10.86	28.00	121.00	58639	-
Burdensomeness	13.97	4.68	0.00	26.00	86381	-

Normality of Burdensomeness

Burdensomeness ranged from 0.00 to 26.00, with an average of 13.97 (*SD* = 4.68). Skewness and kurtosis values for burdensomeness were -0.12 and -0.11 respectively. When the skewness is greater than or equal to 2 or less than or equal to -2, then the variable is considered to be asymmetrical about its mean. When the kurtosis is greater than or equal to 3, then the variable's distribution is markedly different than a normal distribution in its tendency to produce outliers (Westfall & Henning, 2014. The skewness and kurtosis values did not exceed these values, therefore the data seemed to be normally distributed.

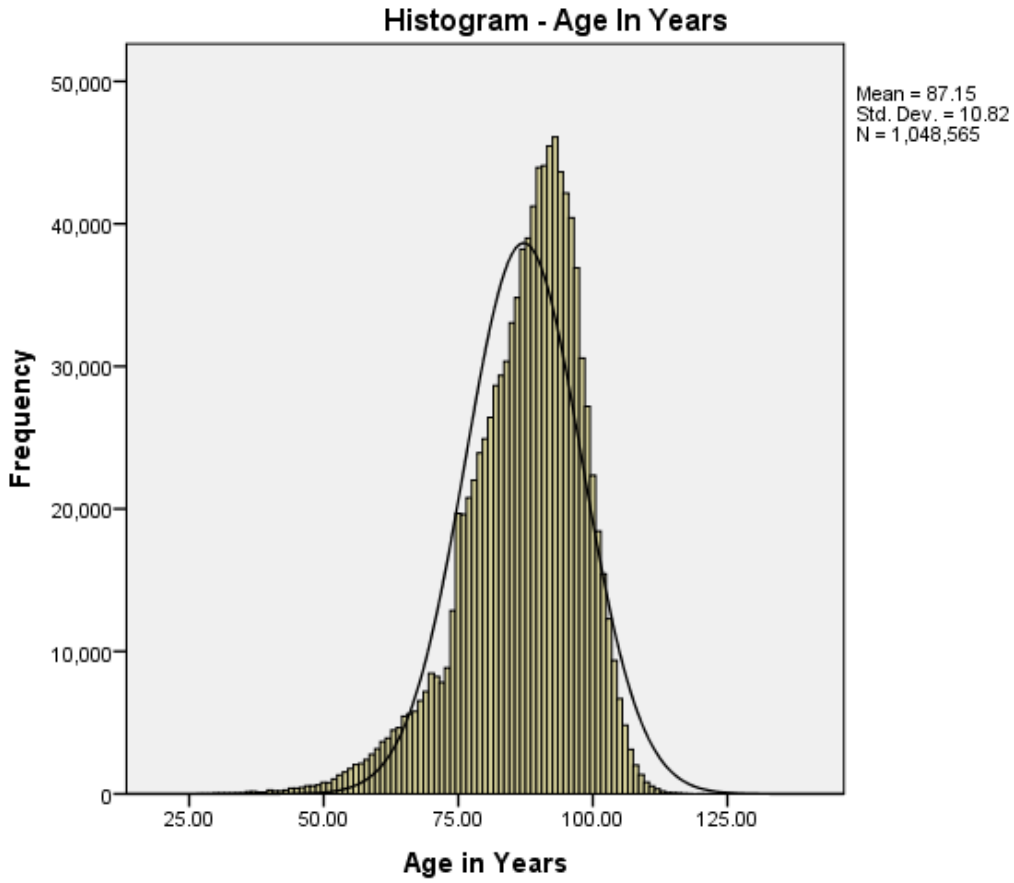

Figure 2. Histogram: Age in years.

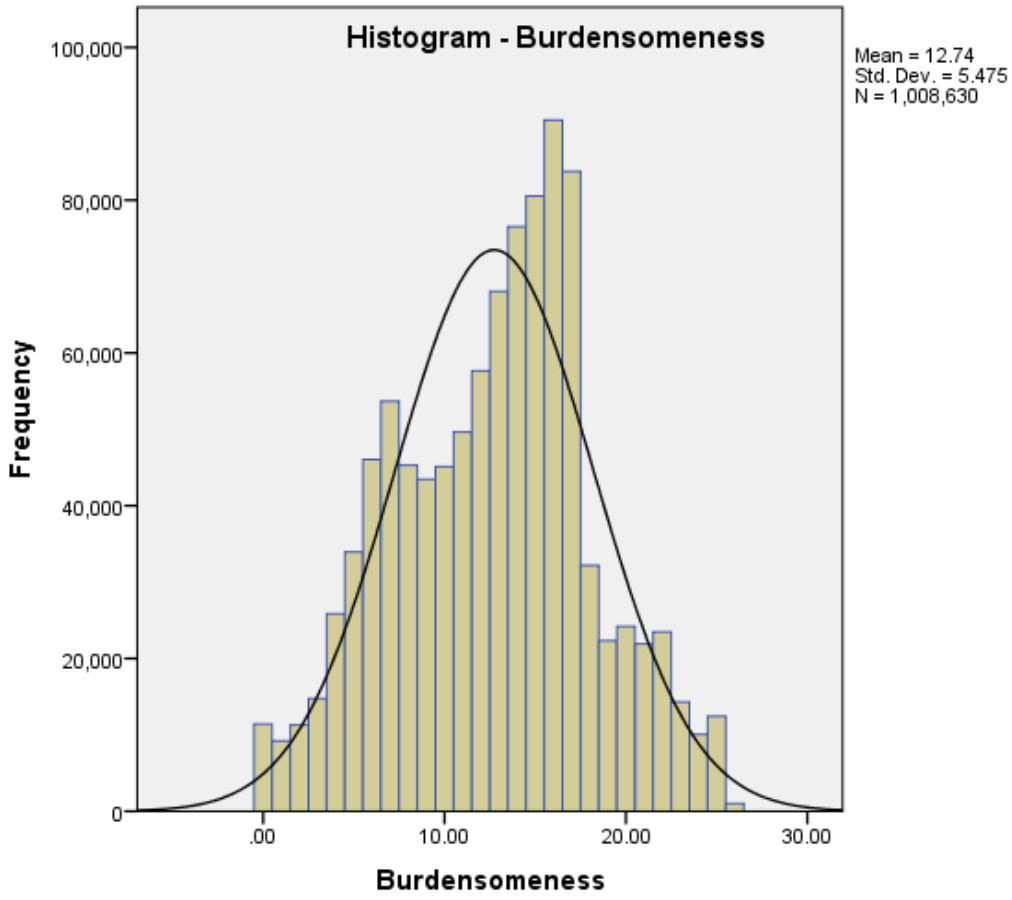

Figure 3. Histogram: Burdensomeness.

Statistical Results

Research Question 1

RQ1: Is marital status associated with suicide ideation among adult stroke patients?

A chi square test of independence was conducted to examine whether ideation and marital status were associated. Prior to conducting the analysis, I assessed the assumption of adequate cell size, which required all cells to have expected values greater than zero and 80% of cells to have expected values of at least five (McHugh, 2013). All

cells had expected values greater than zero, indicating the first condition was met. A total of 100.00% of the cells had expected frequencies of at least five, indicating the second condition was met.

The results of the chi square test were not significant, $\chi^2(1) = 0.35$, $p = .555$, suggesting that ideation and marital status were not associated. Table 2 presents the results of the chi square test.

Table 2

Observed Frequencies by Ideation and Marital Status

	Marital status	
	Not married	Married
Ideation	31(17%)	147 (83%)
No ideation	7783 (19%)	32837 (81%)

Note. $\chi^2(1) = 0.35$, $p = .555$

Research Question 2

RQ2: Is level of burdensomeness associated with suicide ideation among adult stroke patients?

Binary logistic regression was used to examine the relationship between burdensomeness and suicide ideation. In order to conduct a binary logistic regression, the dependent variable must be dichotomous (i.e., there are only two possible outcomes, suicide ideation or no suicide ideation), the observations must be independent of each other, and the relationship between the independent variables and the logit-transformed dependent variable must be linear. There were only two possible outcomes (ideation or

no ideation), and the observations in the dataset were independent of each other, so these assumptions were met.

The overall model was not significant, $\chi^2(1) = 2.76$, $p = .096$, suggesting that burdensomeness was not associated with suicide ideation. McFadden's R-squared was calculated to examine the model's fit, where values greater than .2 are indicative of models with excellent fit (Louviere, Hensher, & Swait, 2000). The McFadden R-squared value calculated for this model was < .001. Table 3 summarizes the results of the regression model.

Table 3

Logistic Regression Results with Burdensomeness Predicting Ideation

Variable	*B*	*SE*	χ^2	*p*	*OR*	95% CI *OR*
(Intercept)	-5.65	0.16	1179.85	< .001		
Burdensomeness	0.02	0.01	2.75	.097	1.02	[1.00, 1.04]

Note. $\chi^2(1) = 2.76$, $p = .096$, McFadden $R^2 < .001$.

Research Question 3

RQ3: Does burdensomeness moderate the relationship between marital status and suicide ideation in stroke patients?

A binary logistic regression was conducted to examine whether the association between burdensomeness and suicide ideation was moderated by marital status. To test for moderation an interaction variable was added to the model. The model included the following independent variables: Burdensomeness, marital status, and burdensomeness x marital status.

To test for assumptions for logistic regression, variance inflation factors (VIFs) were calculated to detect the presence of multicollinearity between predictors. High VIFs indicate increased effects of multicollinearity in the model. VIFs greater than 5 are cause for concern, whereas VIFs of 10 should be considered the maximum upper limit (Menard, 2009). All predictors in the regression model had VIFs less than 10. Table 4 presents the VIF for each predictor in the model.

Table 4

Variance Inflation Factors for Marital Status and Burdensomeness

Variable	*VIF*
Marital status	1.04
Burdensomeness	1.04

Table 5 summarizes the results of the regression model. The overall model was significant, $\chi^2(3) = 10.10$, $p = .018$, suggesting that marital status, burdensomeness x marital status, and burdensomeness had a significant effect on the odds of observing the ideation category. The McFadden R-squared value calculated for this model was < .001. The regression coefficient for marital status was not significant, $B = 0.28$, $p = .254$, indicating that marital status did not have a significant association with Ideation. The regression coefficient for Burdensomeness was not significant, $B = -0.07$, $p = .084$, indicating that burdensomeness did not have a significant association with ideation. The regression coefficient for burdensomeness x marital status was significant, $B = 0.12$, $p = .008$, indicating that for a one-unit increase in burdensomeness x marital status, the odds of observing the ideation category would increase by approximately 12%.

Table 5

Logistic Regression Results with Marital Status, Burdensomeness x Marital Status, and Burdensomeness Predicting Ideation

Variable	*B*	*SE*	χ^2	*p*	*OR*
(Intercept)	-5.73	0.23	615.58	< .001	
Marital status married	0.28	0.25	1.30	.254	1.32
Burdensomeness x marital status	0.12	0.04	7.11	.008	1.12
Burdensomeness	-0.07	0.04	2.99	.084	0.93

Note. $\chi^2(3) = 10.10$, $p = .018$, McFadden $R^2 < .001$.

To examine the interaction effect, burdensomeness scores were converted into three categories by grouping the burdensomeness score distribution into thirds, and labeling the categories as low burden (n = 29,758), mild burden (n = 3,2219), and high burden (n = 24,404). Figure 1 demonstrates the interaction effect. Suicide ideation increases when married only for those people who have high levels of burdensomeness. Those with lower levels of burden showed decrease in suicide ideation when married.

Summary of the Results

The aim of the current study was to examine if suicide ideation in stroke patients was associated with marital status and if this can be explained by burdensomeness. It is known from the previous literature that marriage usually protects against suicide ideation, but burdensomeness increases suicide ideation. Given that stroke patients are often dependent on their spouses for many daily tasks such as clothing and bathing, it was predicted that marital status would be a risk factor for suicide ideation in these patients due to their increased sense of burdensomeness towards their spouse. The results suggested partial support for the hypotheses presented in this study. First, there was no

indication that marital status alone is indicative of suicide ideation. Thus, the primary hypothesis for this study that marital status is associated with suicide ideation among adult stroke patients was rejected. Additionally, the second hypothesis of whether the level of burdensomeness was associated with suicide ideation among adult stroke patients was not supported. However, a significant moderation was found: As burdensomeness is increased, suicide ideation increases in patients who are married. Marital status protects against suicide ideation only when levels of burdensomeness are low or moderate. However, high levels of burdensomeness increase suicide risk for those who are married, which may show that the person feels that they are a burden on their partner. Implications, limitations, and conclusions of these findings are discussed in Chapter 5.

Chapter 5 Discussion

Introduction

As mentioned in earlier chapters, existing data support that marriage acts as a protective factor against SISAS (Zhang, 2010). According to the Office for National Statistics (Sigman, 2009), the protective effect of marriage against suicide has persisted for over 25 years, regardless of the fact that marriage patterns are changing. Between 1983 and 2004, suicide rates in Britain were three times higher among single people as compared to married people (Sigman, 2009). In Japan, a study of 94,000 single individuals revealed that not being married constituted adverse health effects. Similar results in Denmark revealed that individuals who lived alone experienced increased mortality when compared to individuals who lived with another (Sigman, 2009). It is then of no surprise that disruption of marriage, such as divorce, can then have a strong association with higher suicide rates (Umberson, 1992).

SISAS have been found to increase after a stroke, yet not everyone who has suffered a stroke is at risk for SISAS. Currently, it is not well understood who is at greater risk for SISAS (Pompili et al., 2012). While existing data suggest that being married protects against suicide poststroke, being married or partnered also suggests an increased level of burdensomeness towards the spouse. Burdensomeness can, and has been shown to, increase SISAS. As such, the current study examined whether marital status may affect suicide ideation in poststroke patients by increasing burdensomeness. The association between stroke, disability, and risk factors for SISAS was examined by further investigating how marital status and level of disability are associated with suicide ideation in a national sample of adults who have had a CVA in the past 12 months,

including both ischemic and hemorrhagic strokes. Identifying a vulnerable population can provide a basis for future research in support of program implementations to reduce suicide rates. This study filled the gap in the literature about whether marriage acts as a protective factor for SISAS. It has also added to the limited data about whether by increasing burdensomeness, marital status can affect suicide ideation in stroke patients.

Chapter Preview

This chapter begins with a summary of the study findings. I interpret the findings and analysis in the context of existing literature as well as within a theoretical and conceptual framework. I also explore limitations of the study and recommendations for further research. Finally, I state the potential impact for positive change at the individual, family, and societal levels.

Research Questions

Research Question 1

RQ1: Is marital status associated with suicide ideation in stroke patients?

In RQ1 I examined whether marital status is associated with suicide ideation among stroke patients. The study did not find a reduction in ideation in stroke patients who were married. These results are not in line with past research in healthy populations. O'Connell et al. (2004) observed that marriage can be seen as a protective factor against suicide ideation, especially in the elderly population. Individuals who reported that they were living alone—hence, not married—as opposed to having family connectedness were more likely to report suicide ideation (Purcell at al., 2012). Hintikka et al. (2009) also identified that living alone and suicide ideation are associated. Lower levels of suicide completions were found in married individuals when compared to individuals with other

marital statuses (Zhang, 2010). As indicated in earlier chapters, married couples provide support to each other under stressful events (Zhang, 2010), and sharing problems or being responsible towards a spouse lowers the risk for suicide mortality (Denney et al., 2009). Married individuals also tend to be more integrated into a larger supportive network (e.g., family) than nonmarried persons, and this could also protect against SISAS (Smith et al., 1998).

The above mentioned studies have shown how marital status is related to SISAS, but they did not take into consideration chronic illnesses such a stroke and therefore are not a true representation of the relationship between marital status and SISAS among stroke patients. Many stroke patients deal with physical limitations that make them dependent on their loved ones for daily tasks such as bathing and eating. In this study, I hypothesized that marital status plays a role in suicide ideation, but only if burdensomeness levels are high. These findings do not support this hypothesis. In stroke patients, marriage is neither protective nor a risk factor for suicide ideation. An alternative explanation of the findings may be that patients who are married but have low burdensomeness may find marriage is a protective factor for SISAS, while patients who are married and have high levels of burdensomeness may find being married is a risk factor. These two opposing effects may cancel out an effect of marriage on SISAS. My next step was to examine the role of burdensomeness in suicide ideation.

Research Question 2

RQ2: Is suicide ideation associated with burdensomeness in stroke patients?

With RQ2 I examined if the level of burdensomeness is associated with suicide ideation among adult stroke patients. In this study, burdensomeness was measured

indirectly by level of disability. Many stroke patients depend on others for help with activities of daily living such as dressing, bathing, feeding, toileting, grooming, transferring, and mobility (Astrom & Asplund, 2003). Most adults in this sample had functional limitations that made them fully dependent on others for the daily tasks of living. These impairments may lead to a feeling of being a burden to others, especially if patients have to rely completely on others to have their basic needs met.

Burdensomeness in itself is a risk factor for SISAS (Astrom & Asplund, 2003). However, my hypothesis was not confirmed: burdensomeness was not associated with suicide ideation. In contrast with these findings, Joiner et al. (2003) supported the association between being a burden to others and lethality after suicide attempts. Van Orden et al. (2010) further supported Joiner et al.'s (2002) findings that individuals with perceived burdensomeness were more likely to attempt suicide. Of note, the current study examined suicide ideation, and not suicide completion or suicide attempt. It may be that burdensomeness is only a predictor of the latter. In addition, burdensomeness is not a stable concept, as it tends to vary greatly over time, even within the individual (Hill & Pettit, 2014). This may be one of the limitations of the current study. Longitudinal studies are needed to examine the fluctuation of burdensomeness and suicide ideation. However, disability may not lead to feelings of burdensomeness unless the patient is dependent on family members such as their spouses. Therefore the interaction of marriage with burdensomeness was examined next.

Research Question 3

RQ3: Does the association between marital status and suicide ideation vary by levels of burdensomeness?

With RQ3 I investigated whether burdensomeness moderates the relationship between marital status and suicide ideation in stroke patients. The findings support that marital status plays a role in suicide ideation among stroke patients depending on the level of burdensomeness. Suicide ideation increases when individuals are married, but only for those who have high levels of burdensomeness. Those with lower levels of burden show a decrease in suicide ideation when married. Marital status' main effect was statistically significant in both high and low levels of burdensomeness. In the latter, there was an inverse relationship (i.e., results on suicide ideation and marital status showed decrease when burdensomeness was at a low level). The interaction effect may also explain why being married was not found to be a significant effect in the whole sample: the higher and lower groups have opposite effects and that cancels out the effect.

Theoretical Interpretation

The interpersonal theory of suicide (Joiner et al., 2005) supports that some factors are necessary in order for an individual to experience suicidal behavior or suicide. These factors include feeling that a person does not belong with other people and acquiring the capability to deal with fear and pain that are associated with suicide. It has been suggested that burdensomeness can also contribute to a person's desire to commit suicide.

Likewise, Durkheim (Pope, 1975) linked burdensomeness to SISAS. Durkheim posited that when the individual feels more a part of the society and part of social groups at large, then suicide decreases. Durkheim further linked weak integration into society to a lack of meaning in life (Pope, 1975). Hence, Durkheim's theory indirectly indicates the

role of feeling one is a burden rather than a contributing member of society is an important predictor of suicide.

Along with societal integration as a protective factor for decreased suicide, marriage can also serve as a protective factor for decreased suicides. Married couples provide support to each other under stressful events (Zhang, 2010), and are more integrated in a larger supportive network (e.g., family) than nonmarried persons (Smith et al., 1998). Both Durkheim's (1951) theory of suicide and Joiner et al.'s (2005) interpersonal theory of suicide suggest that social exclusion is a predictor for SISAS. Poststroke patients may engage in suicidal behavior when they feel the need to escape from their situation (Baumeister, 1990). Meaning in life can tend to take a downward shift for an individual who has suffered a stroke and is homebound and thus less integrated into society. It is then a safe speculation that social isolation can bring similar results, that is, an increase of SISAS. This study's results are in partial agreement with both Durkheim and Joiner et al. (2005) in that marital status plays a role in suicide ideation, but only when burdensomeness is at high levels.

Limitations and Delimitations of the Study

This study consisted of a secondary analysis of the OASIS data set collected by the CMS for the purpose of measuring patient home health care outcomes. A limitation of using secondary data is that data were not collected for the current study's aim. This may have, in turn, created several additional limitations. First, SISAS is only one question out of 100 included in OASIS. The patient and caregiver, as well as the clinician who conducts the OASIS do not necessarily focus on SISAS. Added to this, the initial gathering of this data is typically conducted by a registered nurse, a physical therapist, or

a speech-language pathologist. These are all qualified professionals with rich educational backgrounds who have all received extensive training on the protocol of asking and obtaining information from the patient as well as the caregiver. Yet, they are not qualified as mental health professionals. As such, the clinician may not feel comfortable around the topic of suicide and the patient may not feel comfortable about sharing suicide ideation to anyone other than a mental health professional. Self-report bias may have affected the validity of those answers; individuals may have overestimated or underestimated how they felt about suicide ideation on that particular day. In spite of this, the measures used for this study have been widely used and validated.

Secondly, the OASIS data were collected from individuals who have just been discharged from the hospital and are homebound. A patient who is just discharged from the hospital may answer the OASIS questions differently after a few days posthospitalization, as opposed to a month or so posthospital discharge. The OASIS assessment is to be conducted within 48 hours of referral or returning home from an inpatient facility or when the physician orders the 'Start of Care.' The emotional state of the patient when first discharged from an inpatient facility may be different after 48 hours versus a week, 3 months, or even 6 months after discharge. This timing issue poses a potential problem in that the data collected may not be an accurate representation of the levels of burdensomeness or suicide ideation.

Patients who suffered a stroke are at increased risk for depression (National Institutes of Mental health, 2015) and depression is a major risk factor for SISAS (NIH, 2015)). The current study did not control for depression, as these diagnoses were not part of OASIS. However, previous studies have suggested that burdensomeness may mediate

the association between depression and suicide ideation (Jahn et al J Aging and Mental Health 2011). Future studies are needed to examine the role of depression in the association between marriage and suicide ideation in those with increased burdensomeness.

Another important limitation is that cause and effect cannot be determined from the cross-sectional design of the study. The analysis and conclusions are restricted to describing the characteristics of the sample population in terms of disability, level of burdensomeness, and suicide ideation. Associations and relationships can be examined, these data do not allow for the determination of whether level of burdensomeness causes suicide ideation or vice versa.

In addition, the current findings may not apply to suicide attempts or completion. Risk factors for suicide ideation may not be the same as those for suicide attempts or completion. There is evidence that burdensomeness and suicide attempts may also be connected. Those who perceived burdensomeness were more likely to attempt suicide (Van Orden et al.,2010). Joiner et al. (2003) further support the association between being a burden to others with lethality of suicide attempts; even when age, gender, and hopelessness were controlled, a sense of burdensomeness remained significant. Hence, it is important that the role of marriage and burdensomeness in stroke patients is explored for suicide attempts as well.

One of the delineations of this study is that the data utilized are from 2008, the last year that item M590 (suicide ideation questions) was included in the OASIS form. Another delimitation of this study is the population selected. The fact that the participants are homebound may not be a true representation of stroke patients in general. Results

may have varied if the participating stroke patients were in the hospital setting, for example. An assumption could be made that when the patient is at the hospital or any other inpatient setting, or if she pays (whether privately or via insurance) for the medical care. This crucial fact may decrease the level of burdensomeness.

In this study, level of burdensomeness was assesses by physical limitations. An assumption was made that the higher the disability, the greater the levels of burdensomeness. Future studies should obtain self-reports of burdensomeness directly from the individual. Due to the large sample, as well as the anonymity factor, it was not feasible to gather data from the primary source. Having the patient identify burdensomeness on a scale level may be of importance in relating disability and burdensomeness.

Implications of Social Change

A shift in conventional thinking that being married protects against suicide ideation warrants changing based on the findings of this study. The findings suggest that stroke patients who have extensive disabilities and are married may be at increased risk for suicidal ideation which may be due to patient's heightened sense of burdensomeness exists. Even though the results of this study are not intended to be used as part of a recipe for specific approaches in the reduction of suicide ideation, they serve to stimulate awareness within the health care culture that suicidal ideation may increase poststroke where there are high levels of disability among married individuals.

To reduce the chances of suicidal ideations, both patient and caregiver should be provided crucial and vital resources and support as they transition from hospital to home,. Easing this transition is the healthcare system's responsibility. In this manner, both

caregiver and patient would be more prepared to face the potentially scary journey. Resources such as transportation, meal delivery, and respite care for the caregiver, are a few of the necessary tools in the transition. .Even though adding services and expanding resources to address the overwhelming process of stroke recovery may initially increase costs, the ultimate result would likely prove otherwise. For instance, having in place a mental health monitoring system could identify high risk patients. More importantly, early intervention is essential once the high risk patient is identified.

Addressing the caregivers' needs as well could ultimately decrease the risk of suicide ideation in the stroke patients. Providing services to alleviate the spousal burden of taking care of the patient is an indirect way to decrease the risk of suicide ideation in the stroke patient. Health care professionals should be able to guide the caregiver towards stress reduction and care giving resources available to them. Bringing caregivers together and implementing respite care programs, on a volunteer basis, among themselves, can not only create a sense of unity and belongingness but allow the caregiver to function in other roles besides care giving. When intervention is geared towards the caregiver of the stroke patient, it has been found that it not only showed a reduction in health care costs, but when the caregiver's burden decreased, an increase was seen in the psychosocial outcome of the patient (Kalra et al., 2004)

As mentioned throughout this document, this study used OASIS B1 data that were obtained from CMS. This dataset's primary purpose is clinical care rather than research. The data chosen were from the year 2008. This year was selected because it was the most recent year where suicide ideation questions were included. It was eliminated from OASIS B1 when it was updated to C1 in 2009. The current study findings suggest that

ongoing screening for suicide ideation at different stages of the patients' recovery, not only during admission, is important and should be reinstated in the OASIS data collection process.

Through a chain of social changes, propelled by increased societal awareness, suicide ideation among stroke patients would diminish. Having found that burdensomeness exists when the patient has a high level of disability and is married, special awareness and attention is to be placed on that population. The ultimate goal is to reduce suicide ideation that could potentially lead to suicides, and increase the quality of life of the patient. Early detection and prevention measures may accomplish this goal. Identifying and treating at-risk populations will also contribute to a quicker recovery of the stroke patient.

Recommendations for Intervention and Dissemination of the Results

A clinical recommendation is to create and utilize a screening tool for levels of burdensomeness when married stroke patient is admitted to homecare. Having shown a link between levels of burdensomeness and suicide ideation in married patients, initial screenings have the potential to assist in early identification of the high risk patients towards suicide ideation. Results of the screening can then be followed by proper implementation of more in-depth evaluation and proper treatments by the appropriate mental health professionals.

Another clinical recommendation that could reduce rates of suicide ideation is to speed up the process of rehabilitation immediately after the stroke in married patients. For this study, burdensomeness was determined by level of physical disability which, in turn, was found to increase suicide ideation. It is beneficial, then, if more time and

resources are spent at the initial stages of stroke occurrence in order to improve physical function. A more rigorous and intense focus should be provided by the rehabilitation team in assisting the patient with functional status. It is thus assumed that levels of burdensomeness may decrease, thus suicide ideation rates would drop as well.

Replicating the current study controlling for different cultures could further expand our understanding of the mental health impact of burdensomeness. Taking care of an ailing family member is a compulsory commitment in many cultures, with some cultural opposition to family members living in institutional homes (Noroozian 2012). An assumption can then be made that ailing loved ones expect to be taken care of and that levels of perceived burdensomeness may be lower. Examining cultural differences as a separate variable can provide clarity of the role of burdensomeness and further validate the findings of the current study. In any culture, caring for a stroke patient can result in caregiver strain (Bugge, Alexander, & Hagen, 1999). It is recommended that the Center of Medicare and Medicaid Services, healthcare educators, clinicians, and insurance administrators continue to study ways of supporting caregivers who provide care to stroke patients so caregiver stress does not negatively impact the ailing spouse. Caregivers have been found to be influenced by perceived stress in the spousal relationship (Godwin, Swank, Vaeth, & Ostwald, 2013), and other research suggests that depression among caregivers can be predicted by the stroke survivor's functional disability (Hamid, Dalir, Marhamat, & Fatemeh, 2012). Further research should focus on caregiver stress reduction as part of the patient recovery process.Ultimately, providing support to both spouses can affect the trajectory of the patients' rehabilitation.

Conclusions

SISAS have been found to increase poststroke, yet not everyone who has suffered a stroke is at risk for SISAS. At this time it is not well understood who is at greater risk for SISAS. The findings of the current study suggest that marital status, in combination with high burdensomeness, may increase the risk of suicide ideation in poststroke patients. The majority of poststroke patients have a disability that may require help from a family member, likely a spouse. The spousal help may involve basic functions, such as dressing and bathing, and this can increase the sense of burdensomeness which may increase suicide ideation.

This study is the first to provide evidence that level of burdensomeness plays a role in suicide ideation in married individuals. In order to fully understand SISAS as it relates to marriage and burdensomeness in stroke patients, it is important to continue to examine how it affects stroke patients in different clinical settings as well as different time frames within the recovery process. The study's findings further suggest the need for psychological support, well as support to reduce the impact of disabilities during the poststroke recovering stage in order to reduce SISAS rates.

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