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The Relationship Between Depression and Cognitive Deterioration in Older Adults

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Abstract

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Dissertation Submitted in Partial Fulfillment

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Abstract

The population structure of the United States is changing; the older age group is increasing in size relative to the younger generation. The trend is expected to continue, especially starting in 2020, when the baby boomer population—estimated at 80 million—will be reaching their 65th birthday, a time associated with increasing health complications, including depression and dementia. The study employed a holistic paradigm as the conceptual framework to examine the association between depression and dementia in older adults, and generated a grounded theory to illuminate the relationship between depression and dementia. This theory was then used to assess the efficacy of stimulation, a nurturing environment, and treatment provided by an adult day health care (ADHC) in ameliorating the symptoms and progression of both dementia and depression. The sample consisted of 60 clients from a California ADHC center who were diagnosed with depression and dementia and who had received at least 6 months of services at the center. Paired *t* tests tested the validity of the hypotheses on depression among older adults and its correlation with their cognitive abilities. The results of paired *t* tests indicated a significant reduction in the client's level of depression between the time of their admission and the time of their reassessment 6 months later. This study can provide data for the larger social change discussion as to what resources should be allocated to meet the quickly escalating health, economic, and humanitarian pressures of the baby boom cohort.

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Chapter 1: Introduction to the Study

Introduction

Demographic Context of the United States

The demographic structure of the United States, like any other developed country, has dramatic shifts to a significant proportion pertaining to the aging population significant proportion. This trend is expected to remain in the foreseeable future as are the health challenges that characterize an aging population (Smith & Bielecky, 2012). Based on1990s statistics, the highest growth rates in all age groups occurred among the old age group. For instance, those aged 85 years and above experienced the highest growth of 38%, from 3.1 to 4.2 million; those aged 75-84 grew 23%,and those aged 65-74 grew less than 2%, from 18.1 to 18.4 million (Alzheimer's Fact Figures, 2011).

Because the prevalence of every major illness increases with age, the elderly are overrepresented among the population at risk of adverse health conditions (Cook, Dranove, & Sfekas, 2010). Depression and dementia are common disorders of people over 65 (Birditt, Fingerman, & Almeida, 2005). The aging of the U.S. population has been accompanied by a dramatic rise in the prevalence of both these disorders, (Alzheimer's Fact Figures, 2011). Depression is often misdiagnosed in this population (Tuncel, Orhan, & Karaaslan, 2009) because the health care provider my recognize its symptoms in the presence of other medical and functional disabilities, such as memory issues and dementia. In fact, the two conditions commonly coexist (Tuncel, Orhan, & Karaaslan, 2009).

The 75 million babies born between 1945 and 1964 - the baby boom generation began to reach the age of 65 in 2010 (Sundelöf et al., 2009). This has had a profound effect on the growth of the relatively aged population of the United States. The situation is such that the ratio of elderly to caregivers has been increasing at an alarming rate. For instance, between 1950 and 1993, the ratio of those aged 85 and above to those between 50 and 65 (caregivers for the elderly) tripled (Alzheimer Report, 2011). The projection is that the ratio will triple again over the next 6 decades. According to Fisher et al. (2011) it is a clear implication of a caregiver crisis for the elderly (Fisher et al., 2011). A severe shortage of caregivers was already apparent in 2010 (Vernooij-Dasssen et al., 2009).

According to Birditt et al. (2005), 69% of Americans aged 65 years and above suffer from at least one chronic ailment. In addition, those aged 85 years and above have higher chances of living alone compared to the younger persons (Birditt, Fingerman, & Almeida, 2005). The elderly people above 85 may require assistance with various activities of daily living (ADL). A study by Hall, Hoe, Barber, & O'Bryant (2011) revealed that, 25% of men and 57% of women live alone. This is despite the fact that approximately half of these people require assistance with ADLs. This assistance may be in personal care responsibilities, such as getting in or out of bed, or getting out of a chair, or dressing and bathing. They may also require assistance with an *instrument* (IADL), such as preparing a meal, paying bills, taking medication, and shopping.

When it becomes necessary for these aged people to leave their homes and move to a residential facility, they feel an acute sense of loss, privacy, and independence

(Carlander, Sahlberg‐Blom, Hellström, & Ternestedt, 2011). Most people prefer to stay in their own homes as long as they are physically or cognitively able to take care for themselves (Carlander, Sahlberg‐Blom, Hellström, & Ternestedt, 2011). The experience of a semiprivate room with adjustable beds, medications dispensed on a rigid schedule, meals at the convenience of the institution, and life with strangers hold little appeal (Anderberg & Berglund, 2010). The next part of this study will dwell on age-related complications of dementia and depression in an attempt to explain how they fit into the current health care challenge of an aging population.

Depression

Depression is defined in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV-TR*; American Psychiatric Association, 2000) as a disorder that affects a person's mood, physical function, and social interaction. According to Tuncel, Orhan, & Karaaslan (2009), depression is characterized by deterioration of cognitive functioning and occurs mainly in clients with dementia. It may also be present as a stand alone pseudo-dementia. In general, geriatric clients who suffer from dementia develop clinical depression. However, more than half of the clinically depressed geriatric clients suffer from one or more symptoms associated with depression, such as anxiety, irritability, apathy, sadness, sleep problems, agitation or psychomotor retardation, loss of interest or dimished social activities (Hollingworth et al., 2006). Overlap of the depression-related symptoms makes it difficult to make a diagnosis. It becomes difficult to tell whether a particular case is depression, dementia or even both. For instance, apathy

is a depressive symptom, but about 60% of those who suffer from dementia are apathetic, but not depressed. At the same time, approximately 44% of clients with dementia are not apathetic. Thus an accurate diagnosis by clinicians is difficult to make.

Here is another example. Depressive symptoms, such as loss of interest, diminished social activities, and apathy may be associated with depression, but at the same time, they may indicate a cognitive deficit. There is also the challenge of memory lapse in the early stages of dementia that may undermine the patient's personal report of depressive symptoms. The later stages of dementia are also associated with difficulties in communication, which may influence the expression of depressive symptoms. As a result of these complexities in the dementia population, discrepancies have been reported in the rates of prevalence of depression. Hollingworth et al. (2006) associated this problem with the inadequacy of appropriate medical and social services elderly.

The aging population in the United States is heterogeneous and demonstrates different abilities. For instance, one can move with the help of wheelchair due to physical disability while the other plays golf or tennis. Nevertheless, a 90-year-old person is significantly different from a 60-year-old person in both mental and physical abilities. This necessitates a clinical trial on the mental and physical capacities for the elderly suffering mainly from depression, which must be conducted in elderly people.

Though various follow-up studies have been conducted, the extent to which cognitive deficit is experienced by the elderly suffering from depression remains

unknown. Studies indicated that depression may represent the initial stages of progressive dementia.

According to the *DSM-IV-TR* dysphonic mood or loss of interest in normal activities and pass time are among the symptoms that characterize depression to a great extent. Some symptoms, if they are frequent for a period of at least 2 weeks nearly on a daily basis, mainly indicate depression. These symptoms could be insomnia or hypersomnia, or psychomotor retardation. They are accompanied by symptoms such as the feeling of excessive guilt or sense of worthlessness, loss of energy, recurrent thoughts of suicide attempt, death and suicidal ideation, and loss of ability to think and concentrate. According to *DSM-IV-TR* the disorder cannot be superimposed on schizophrenia, schizophreniform or paranoid disorder and cannot be associated with any uncomplicated bereavement.

Although the *DSM-IV-TR* criteria for major depressive episodes were validated in a sample of predominantly younger to "middle aged" adults, the signs and symptoms of depression appear to be similar between younger and older adults. There appears to be no difference in inter-rater reliability when using the Diagnostic Interview Schedule (DIS) to identify depressive signs and symptoms in younger and older patients (Balsis & Cully, 2008). Depression at older age of onset has been reported to be similar to that observed in younger patients on the following variables: premorbid personality characteristics, response to antidepressant medication, incidence of suicidal thoughts, psychomotor retardation, and and sleep disturbance. Older patients, however, demonstrated greater

weight loss and decreased sexual drive in comparison with younger people (Balsis & Cully, 2008).

Baron and Kenny (2006), however, cautioned that special considerations are needed when the criteria are applied to elderly patients: (a) medical illness and drug effects should be considered as possible contributors; (b) sleep changes that accompany normal aging overlap with those observed in depression; (c) psychomotor retardation and reports of decreased sexual activity by the elderly may reflect normal, age-related changes or cohort effects rather than a depressive illness.

Dementia

According to Korchounov, Zhukova, Epifanova and Bertschi (2011), dementia of alzheimers type (DAT) depression and dementia are prevalent conditions among the elderly. It is also difficult for clinicians and physicians to diagnose DAT and depression because the two conditions share some symptoms. The importance of accurate differential diagnosis is emphasized by the fact that depression is a disorders with available treatments and positive prognosis, whereas DAT is considered an irreversible condition that has no known treatment (Winter, Korchounov, Zhukova, Epifanova, & Bertschi, 2011). On the other hand, misdiagnosing a depression as dementia threatens the patient with therapeutic neglect and/or inappropriate intervention.

Dementia is the medical term for the loss of mental or cognitive abilities (Foster, 2011). Most researchers agree that dementia is a symptom of a disease process that is not a natural and normal part of aging. The symptoms of dementia may be caused by more

than 70 known diseases, but Alzheimer's disease alone accounts for more than half of the cases (Tuncel, Orhan, & Karaaslan, 2009). As the older adult population increases, the number of diagnosed cases of dementia continues to rise.

Dementia is a clinical syndrome characterized by deterioration in intellectual ability of sufficient severity to interfere with usual social or occupational functioning. According to the clinical criteria established in *DSM-IV-TR* the cognitive manifestations of dementia must include impairment in short-term and long-term memory in association with impairment in abstract thinking, impaired judgment, and other disturbances of higher cortical function or personality change. The diagnostic criteria for dementia also require a specific organic factor be either demonstrated or presumed relating etiologically to the cognitive and behavioral disturbance.

According to the United States Alzheimer Report (2011), the total cost associated with the care of those suffering from Aizheimer disease was estimated at $1.7 trillion. Due to the increasing aging population in the United States, the cost is projected to rise 85% by 2030 (World Alzheimer Report, 2010). This is expected to put more pressure on public financial resources and may result in increased demand for formal and informal care.

Indeed, dementia has been described as the most significant health and social care crisis of the 21st century (World Alzheimer Report, 2010). All countries will need to prioritise spending on dementia while balancing other needs, wants, and public values.

Policy has a particularly important role to play with regard to early diagnosis, prevention and investment in research and development (World Alzheimer Report, 2010).

Basically, dementia is a global condition that is not for intellectual malfunctioning. In most cases, it affects several cognitive processes. A cardinal feature of dementia is memory impairment, and it is the most prominent patient complaint in the initial stages. The various forms of dementia are also characterized by defeciencies in problem solving, abstract thinking, and the capacity to maintain and shift cognitive set. Therefore, these symptoms need to be closely assessed while conducting a dementia evaluation (Foster, 2011). The main diagnostic criteria for dementia *DSM-IV-TR* are apraxia, aphasia, and agosia. These are summarized below.

Apraxia is one of the identification criteria used for dementia. In this diagnostic approach there is direct coordination of movements: parietal robes are implicated in the loss of skilled movements. It is specifically used in those problems that are not attributable to muscle coordination and the motor system. A case of ideomotor aparaxia exists when the individual has knowledge of desirable actions but lacks capacity to execute them accurately. Ideational apraxia is a situation in which the individual falls short of understanding the action and finds it difficult to recognize and make use of the ordinary objects. This kind of impairment is commonly observed at the later stages of dementia (*DSM-IV-TR;* American Psychiatric Association, 2000).

Humans are social beings and the use of speech to communicate is their unique feature. Expression ability, repetition, and reception are some components of language

ability. Sometimes, one may lose the language function and can be identified through impaired comprehension and expression or both of them (Katz, McNeil, & Garst, 2010). This condition is called aphasia. For those, who suffer from dementia, difficulty in writing, reading, speaking, and identifying objects by names or comprehending what is said by others is a sign of aphasia. The deficits relating to language may magnify the underlying memory difficulties.

At times, individuals suffering from dementia may experience loss in the ability to identify and recognize persons and objects, features and characteristics of which they knew previously. People with agnosia may not be able to tell the geometric characteristics of an object when they look at it, or they may not find the object familiar or even know how it is used. Agnosia may refer to only one sensory modality, such as hearing or vision. For instance, an individual may fail to recognize the sound of cough or the sight of the object such as a plate. This condition may also emanate from development disorders, stroke or other neurological conditions. Agnosia results from the damage of specific areas of the occipital or parietal lobes of the brain.

Some clients suffering from dementia may experience impairment in their executive functioning—the high-level cognitive capability that enables a person to structure a framework for independent goal-oriented behavior. It is reflected in guided complex behavior over time through such activities as decision making, planning, and self-monitoring of judgments and impulses (Sebastián & Hernández-Gil, 2010). It is also linked to the frontal cortex. Executive functioning is fundamental in understanding

dementia. Deficits in executive functioning, or dysexecutive states, are found coincident with damage to the frontal lobes in the same regions that play a role in procedural memory (Sebastián & Hernández-Gil, 2010). The basal ganglia interface, which detects patterns of cortical inputs critical to many features of executive functioning, is the focus in several current models. Research findings implicate the entire frontostriatal loop, with consequences for individuals with dementia (Sebastián & Hernández-Gil, 2010).

There are two main types of dementia: multi-infarct dementia, which results from stroke damage, and Alzheimer's disease. Each of them is discussed in more detail below.

Cerebrla infraction relates to dementia; about 15% of strokes are caused by cerebral hemorrhage, which is a rupture of a blood vessel with subsequent destruction of brain tissue. Cerebral infarction is usually caused by atherosclerosis, but may result sometimes from a sudden fall in blood pressure that reduces blood supply through a narrowed vessel to a level insufficient in order to keep that particular part of the brain alive (Grady, Springer, Hongwanishkul, McIntosh, & Winocur, 2006). Cerebral infarction has been identified as increasing risk of depressive illness (Rao, Venkatasubramanian, & Gangadhar, 2011).

Multi-infarct dementia patients typically have a history of previous strokes. Age of onset is typically between 50 and 70 years of age, with an average age of 66 years, and appears more commonly in men than women. The main risk factors for a stroke are high blood pressure, obesity, and heavy alcohol use. Smoking, diabetes, and raised blood cholesterol are also considered to be risk factors, while depression may be an underlying

risk factor through a chain of effects on body functioning (Klimkowicz, Dziedzic, Polczyk, Pera, Słowik, & Szczudlik, 2004).

People who are recovering from a stroke and who also develop dementia, are frequently described as being apathetic, having a lack of will, and unable to make decisions. It is estimated that 40-50% of patients in the acute phase of post-stroke illness will have the symptoms of clinical depression, and the diagnoses of depression and dementia are increased in those patients (Jaillard, Grand, Le Bas, & Hommel, 2010).

The spread of Alzheimer's disease mainly depends on age. The chances of getting the disease increases with age. Studies have shown that the disease also depends on gender. Alzheimer's disease is more prevalent in women than men. However, Viña and Lloret (2010) noted that prevalence based on gender may not be conclusive because there can be some errors due to high subjectivity. The explanation is that there are more elderly women than men; elderly women are likely to live alone; they are more likely to visit physicians for diagnosis than elderly men. Therefore, the magnitude of the gender difference may be a source of more errors (Viña & Lloret, 2010). Alzheimer's has a progression of symptoms similar to those of other primary degenerative dementias. According to O'Donnell and Kaszniak (2011), clinical manifestations Alzheimer's disease suggest a particular role for biologic dysfunctions in the etiology of depression in late life. Genetics, lifestyle, and environmental factors that are more prevalent in those with dementia should be identified as the risk factors. Alzheimer's type dementia starts with impairment of abstract thought and learning ability, loss of initiative and

concentration, and proceeds to failure of memory that is initially short-term but later progresses to long-term failure (O'Donnell & Kaszniak, 2011).

Differential Diagnosis

One of the most daunting diagnostic challenges in geriatric medicine is differentiating between depression and dementia (O'Donnell & Kaszniak, 2011). It may be progressive, static, or remitting. When the dementia syndrome appears in an older adult, physicians should pursue an in-depth search for underlying its etiology. In up to 20% of patients, there is some reversible contributing cause. Some cases of dementia are potentially treatable or reversible, and other cases are associated with chronic medical problems. Even when no specific treatments are available to reverse the cognitive decline, symptomatic treatment, such as the use of an antidepressant, can reduce the suffering of the patient. However, whether the condition is treatable or not, it is important to identify patients with dementia to plan for future care (Nelson & Devanad, 2011).

Depression experienced in the elderly can be associated with early or recent life events, such as the loss of a family member or retirement. Depression poses a unique diagnostic problem to physicians and may end up underdiagnosed or undertreated in the general population. When the elderly experience one or more health conditions get depressed, they may end up developing other conditions (Nelson & Devanad, 2011).

There is a need to establish whether a relationship exists between dementia and depression based on the fact that each contributes to the other through a positive loop. The discovery of such a relationship would inform the approach of diagnosing and

treating depression (Cho, Lavretsky, Olmstead, Levin, Oxman, & Irwin, 2010). It would also guide the conduct of follow-up testing after the depression is reduced or alleviated. Individuals frequently develop an explanation for their depression and reason that, in time, the depression will dissipate on its own, while family members are often quick to dismiss the seriousness of a diagnosis of depression.

A study by Cho et al. (2010) was designed to evaluate the extent to which depression comorbidly exists and predicts a higher likelihood of dementia. If, at a later age of onset, depression accelerates the development of dementia, then physicians often choose to pay closer attention to older adults who present with sad mood and somatic complaints. Similarly, clients and families need to know that there is a link between the severity of depression and dementia, and that early intervention is important. Health professionals can also emphasize the importance of learning how to cope with life stressors so as to reduce the risk of developing clinical depression in later life.

Detection and diagnosis of depression and dementia in a timely manner assits to attain better medical results and intervention. When symptoms are detected among the elderly, timely assessment of cognitive function and emotional disorder is of great significance. Effective screening and treatment of individuals with depression and dementia may prevent or delay hospitalization and costly nursing home placement (Milne, 2010).

Diagnosis is complicated by the fact that dementia may affect patient complaints. Patients' self-report of depressive symptoms is compromised by co-morbidity with

dementia and the complex relationship between them (Chamberlain et al., 2010). The precision of adopted diagnostic process depends on the ability of the patient to aid the physician inn articulating the problem. Nevertheless, communication and language difficulties experienced at the later stages of dementia inhibit the expression of depressive symptoms.

Apathy is among the most prominent behavioral changes in dementia clients (Anderberg & Berglund, 2010). It refers to a condition, when individual loses the sense of emotions and passions including pain, fear, pleasure, or desire. In the neuropsychiatry literature, apathy refers to a deficiency in feelings, concern, emotions, motivation or interest, not attributable to the decreased level of cognitive impairment, consciousness or emotional distress (Anderberg & Berglund, 2010). Apathy is linked to functional limitations and cognitive deficits. It may be adopted as a criterion for the diagnosis of depression. Despite being used for the diagnosis of depression, the study indicates apathy as a discrete syndrome. Here is an example. A study by Lam, Chiu, and Lui (2007) perceived apathy in the context of brain damage as opposed to the symptoms of cognitive impairment of emotional distress. Their suggestion is that apathy results from neuropsychiatric diseases such as Parkinson's disease, Alzheimer's dementia, Huntington's disease or even stroke.

The ability to distinguish between apathy and depression is vital because they respond to different interventions. Antidepressants may treat a depressed patient while an acetylcholinesterase inhibitor can be used for intervention in the case of apathy.

According to Rucci et al. (2011), Selective Serotonin Re-uptake Inhibitors (SSRIs) used in the treatment of depression may cause apathy. Apathy is dominant among the depressed elderly, but it can be provoked outside. Lam, Chiu, and Lui (2007) claim that the diagnostic criteria for apathy are based on the distinction from the overt behavioral, cognitive and concomitants of goal oriented behavior. These are lack of motivation relative to the patient's previous level of functioning or the standards of his or her age and culture as indicated by the subjective account or observation by others. The presence, with lack of motivation, of at least one symptom belongs to each of the following domains:

- Diminished goal-directed behavior
- Lack of effort
- Dependency of others on structure activity
- Diminished goal-directed cognition
- Lack of interest in learning new things or new experiences
- Lack of concern about one's personal problems
- Diminished concomitants of goal-directed behavior
- Unchanging affect
- Lack of emotional response to positive or negative events

The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning. They are not due to the diminished

level of consciousness or the direct physiological effects of a substance (e.g., a drug of bus, a medication) (Rucci et al., 2011).

Different types of sleep disruption may also be used to distinguish depression from dementia. Sleep patterns are controlled by an internal clock in the brain that senses day and night, telling when to rest and when to be active. This clock is often damaged in dementia, which is consistent with known neuronal pathways in the diencephalic structures that contain the brain region responsible for the sleep/wake cycle (Nelson & Devanad, 2011). The person may be awake and overactive at night thinking it should be daytime and trying to get dressed and out of bed. This type of confusion, disorientation, and agitation is often called *sundowning* because it usually begins in the early evening and affects a person who might otherwise be fairly clear-headed when awake during the daylight hours. If a patient is demonstrating symptoms of sundowning, dementia may be the problem, not depression (Nelson & Devanad, 2011). A thorough assessment of sleep architecture is necessary to determine causation in the elderly (Motivala, Levin, Oxman, & Irwin, 2006).

Normal Aging and Dementia

In general, when an individual gets older, some changes in cognitive functioning occur. This complicates the distinction between early indicators of dementia and changes due to normal aging (Aries et al., 2010). Research in the accuracy of diagnosis of dementia indicated that 10-30% of diagnoses by general medical practitioner's are

inaccurate. A recent review (Page, Hope, Bee, & Burns, 2008) attributed the high rate of false negatives to inadequate assessment of intellectual functioning.

There has been advancement in understanding the boundaries between dementia and normal aging. Researchers have tried to draw a line between normal and abnormal aging by identifying a group of people given their cognitive deficits, which lie on the continuum between dementia and normal aging. However, the study of the continuum poses a challenge in the domain of functioning (Lanting, Crossley, Morgan, & Cammer, 2011).

In any population of elderly, aging is incremental and decremental (Mock, & Eibach, 2011). Neurogenesis studies indicate regenerative potential in the adult human brain and possible neural recruitment. This may be attributed to successful cognitive aging or recovery from previously experienced brain insults.

Multiple research work in studying mild cognitive impairment (MCI) has proved that the disorder is not homogeneous (Ellison, Harper, Berlow, & Zeranski, 2008). For instance, a study by Eling, Kastrup, and Hildebrandt (2010) identified two different types of MCI: nonamnestic MCI and amnestic MCI, the variant that progresses to DAT.

Some aspects of aging are a primary expression of the organic deterioration of brain structures. Others reflect more psychological, secondary, existential responses (cultural, social, family, individual), and attempts at adaptation (Tatulian, Vasiliev, Yavorskaya, & Zheltyakova, 2005). Neuronal loss, the reduction of connections inter-neurons, and changes in neurotransmitters have direct repercussions for cognitive

functioning. The concepts of redundancy and neuronal plasticity have dropped the simplistic theories consequent depopulation on the deterioration of neurons adaptation (Tatulian, Vasiliev, Yavorskaya, & Zheltyakova, 2005). The current view is relatively more dynamic and complex: It recognizes the fact that the genetic program in the life of a neuron, but also considers the importance of a series of acquired factors (vascular, toxic, metabolic) and especially the decisive intervention of stimulation (Spitzer, 2006). The latter is critical to psychological interventions. Social stimulation can facilitate organic and psychological factors related to both dementia and depression (Spitzer, 2006).

There is considerable converging evidence of a close correlation between cognitive deficits and emotional and interpersonal factors, such as lowering of mood and the narrowing of interpersonal relationships. Somatic factors also have an impact on the aging mind, both cognitively and psychologically. For example, weakening of the sense organs, common in old age, contributes to cognitive decline through lack of stimulation (Krendl, Heatherton, & Kensinger, 2009). Deficits in visual function have a direct bearing on psychic life: think of the elderly person who can no longer read the newspaper or watch television (Porat, & Iecovich, 2010). Even more important are hearing deficits, both in terms of frequency and psychological consequences: They produce embarrassment, shame, and frustration, as well as suspicion, hostility and impatience on the part of others.

Finally, the somatic problems experienced by subjects can be humiliating and shameful. An unattractive appearance can lead to withdrawal or avoidance by others. In

an assisted living facility, interpersonal relationships can be compromised if elderly residents neglect their appearance and/or hygiene as a result of decreased motivation or motor and sensory deficits; for instance, they may fail to see stains on their clothing or smell their body odor, or may resist bathing for fear of slipping or catching cold (Porat, & Iecovich, 2010). Hence, it is important to examine the cause of any such deficiency.

Personality factors play an important role in mental aging (Porat & Iecovich, 2010). On a clinical level, it can be hypothesized that subjects with neurotic, depressive, or asthenic tendencies are predisposed in old age to an impoverished existence and, therefore, to greater intellectual decay. The personal scale of values has a great influence on the way an individual ages, positively or negatively. To some, the loss of youthful attributes, such as physical strength and beauty, may trigger an existential crisis (Porat, & Iecovich, 2010). For others, whose values revolve around duty, religion, or culture, older age may be experienced in a more balanced and serene way.

Multisensory Stimulation in Dementia and Cognitive Deterioration

Researchers have found that increasing environmental stimulation leads to increased energy levels, higher motivation and participation in activities, and improved functioning (Nelson & Devanand, 2011).

Monti and Owen (2010) studied the effect of multi-modal, unimodal, and multi-familiar stimulation on 24 patients with brain injury who were in a critical state. Each participant received three types of stimulation for 3weeks, with a 1-week baseline between-treatment periods. The stimulants were multimodal, unimodal, and multifamiliar (i.e., stimulating multiple senses using familiar stimuli).There were significant changes in behavior with all three types of intervention, but the multifamiliar intervention was associated with the most improvement, while the unimodal stimulation produced the least change.The frequency of body and eye movements was measured after each intervention.These movements are not necessarily indicative of change in behaviors. No statistical analysis was reported for comparison. Some of the participants responded best to the unimodal stimulation, which suggests that sensory therapy is individualized.

Sensory stimulation has also been used among populations with mental disabilities. As previously indicated in studies by Monti and Owen (2010), the following results reinforce their findings; they indicate that participants were assessed prior to the program, 6 months into the program, and then after the last 6 months of the treatment period. After the first 6 months, client's were noted to be smiling and beginning to initiate movement. After 12 months, the experimental group showed improvements in social interaction, affect, and confidence. In comparison, control group became more regressed and was unable to cope with environmental changes, such as renovations to the building. Changes in behaviors such as aggression and agitation among the patients on the ward were also observed. The staff attributed this change to the noise and dust, and

the presence of strangers associated with the renovations, but there is the possibility that the change was correlated with the treatment (Monti & Owen, 2010). The participants' psychotropic medications were changed during the study and the increased attention may have influenced the results. This study would be very difficult to replicate because the program was individualized, that is, the amount of stimulation was tailored to suit each patient's tolerance level. Furthermore, differences between data may reflect changes in programming during the summer, in which the treatment time was reduced and therapy involved trips to the beach (Monti & Owen, 2010).

Meaningful Activities

In evaluating the well-being of individuals with dementia, several researchers emphasized the importance of meaningful activities. In their book on enhancing the quality of life for this population, Haslam, Jetten, Haslam, and Knight (2012) identified medical, psychological, and meaningful activities as three domains that should be addressed. Richeson (2003) used the Need-Driven Dementia-Compromised Behavior (p.354) model to explore agitation in older adults with dementia and concluded that many nursing home residents become agitated because they have an unmet need that could be ameliorated through meaningful activities, such as animal-assisted therapy. Similarly, Vein and Cline (2006) argued that Montessori-based dementia care can reduce challenging behaviors by involving the individual and bringing meaning to her/his life. Recreational activity and music therapy have also been identified as ways to bring

meaning and enhanced quality of life to nursing home residents with dementia (Vein & Cline, 2006).

Accordingly, the literature was searched using the term meaningful activities. The CINAHL data base produced four matches up to 2010. Psyc INFO produced seven matches up to 2000, while a search of PsycArticles resulted in a single article from 2003. The Medline data base produced nine matches up to 1994. A search of social work abstract identified seven matches when the single search term meaningful- activities was used, but only one match when all three of the search terms were used. The relatively low number of matches in this search is attributable to the "meaningful activities" search term. Unlike medical, psychological, psychosocial, and behavioral considerations, this is not an attribute or domain that is commonly evaluated in nursing home residents with dementia. As the name suggests, it is an activity rather than a personal characteristic or medical condition. Most of the articles identified in this search were descriptive, theoretical, or exploratory in nature. There were very few randomized control trials or quasi-experimental research studies. As a result, most of the articles summarized in this section were identified in the course of the literature review that was conducted for the preceding sections.

In general, studies selected for this section concerned attempts to activate, engage, and mobilize residents through activity. None contained the term meaningful activities in their title, but several authors talked about meaningful activities as a theoretical touchstone that influenced their thinking about nursing home residents with dementia.

Finally, all of the articles that were selected for this section involved randomized control trials or quasi-experimental research designs.

In 1999, Hopman-Rock, Staats, Tak, and Dröes conducted the study in a group of 92 cognitively impared residents within 11 homes for the elderly in Netherland. They assessed the effect of a Psychomotor Activition Program (PAP). This program was concentrated on using recreational activities, daily living activities, and hobbies to maintain and improve communication, resocialization, reactivation, and effective functioning.

The PAP protocol was implemented at least twice a week for 6 months in the experimental groups, while the control groups received the usual care. Whenever possible, the homes randomized groups of participating residents into experimental or control conditions. Behavioral, cognitive, and disability measures were administered at pretest and at posttest. Cognitive measures showed a significantly ($p <. 05$) beneficial, stabilizing effect on the cognition of residents receiving the PAP intervention compared to the control group. In addition, some behavioral measures revealed a significant ($p <. 05$) increase in positive group behavior among PAP residents with mild cognitive impairment.

Research Questions and Hypotheses

The research questions are followedby the hypotheses:

1. Is depression related to cognitive deterioration in elderly?
2. Do ADHC services reduce deterioration of dementia in elderly?

H_0^1 Elderly will show no deterioration in dementia over a 6-month period of receiving ADHC services and thus there should be no difference in their cognitive functioning scores.

H_0^1 Elderly receiving services at ADHC will have a lower score on the depression scale and a higher cognitive score than elderly who are newly admitted to the ADHC.

Nature of the Study

This study used the quantitative statistic approach in the data analysis. In specific, the study is aimed at examining the efficacy of stimulation, treatments, and nurturing environment for the ADHC in ameliorating progression and symptoms of both dementia and depression. Secondly, the study assesses the extent, to which depression can account for cognitive deterioration in the elderly. It uses secondary data from the brief neuropsychological assessments of 60 participants in Monterey Peninsula Wisdom ADHC Center, who received the diagnosis of dementia and depression. Two dependent t-tests were conducted to test the hypothesis that the participants' depression improved over the six months, and that their dementia did not get worse over those six months. To obtain converging evidence regarding the efficacy of ADHC services, in addition to time being an independent variable, the number of days of attendance was second independent variable. Correlation between the number of treatment days and score from dementia and depression were taken for the efficacy of treatment.

Statement of the Problem

The complexity of late life depression arises from entangled developmental, social, and biological factors. The social support systems for the elderly weaken with time due to such factors as retirement, death of spouse and/or siblings or relocation. For therapist, physician, psychologist, and social workers, the above variables of causing depression must be known. From a biological perspective, variations exist between individuals in body composition, immunological responsiveness, regulation of homeostasis, cognition, and organ system reserve. The variations predict the range of causes. For instance, a professional diagnosing apathy may associate it with dementia, depression, or both. This was the first study regarding the outcomes of Adult Day Health Care on dementia and depression. As such, the outcomes would need replication to ensure the robustness of these effects. The present research was done to: (1) provide a protocol for assessing depression in geriatric individuals who are diagnosed with dementia, (2) assess whether the known direct relationship between depression and cognitive deterioration exists in a older adults, (3) determine the efficacy of Adult Day Health Care in providing a stimulating, nurturing environment and treatments that can ameliorate the symptoms and progression of both depression and dementia, (4) evaluate whether seniors with high levels of depression demonstrate greater cognitive deterioration over 6 months than seniors with low levels of depression.

Additionaly, the cost of inappropriate treatment is also a significant concern. Hanlon and Miller (2000) estimated the cost of inappropriate drug treatment in the

geriatric population to be between $4 billion and $7.6 billion annually, although it is difficult to define the true cost due to the many collateral methods of treatment currently used and inability to identify all effects of both appropriate and inappropriate treatment.

Accurate assessment plays a key role in screening the elderly population for psychopathology, treatment planning, and monitoring symptom change over time. Accurate assessment is most appropriately reached through the use of valid assessment instruments and agreement among diagnostic and treatment algorithms in all healthcare specialties. Currently, symptom confusion, uncertainties about the quality of diagnostic tools, and variations across methods of diagnostic algorithms constitute major limitations in the study and treatment of depression in the elderly dementia population.

Purpose of the Study

The purpose of this study was to (a) provide a protocol for diagnosing depression in geriatric patients who are diagnosed with dementia, (b) assess the relationship between depression and cognitive deterioration, and (c) determine the efficacy of ADHC in providing a stimulating, nurturing environment that can ameliorate the symptoms and progression of both depression and dementia.

Assumptions and Limitations of the Study

It is assumed that all assements data were accurate and were administered accourding to American Psychological Association (APA) and HIPPA guidelines. Although the study has high ecological validity because the treatment group came from an ADHC center, findings from a single center may well not generalize to the geriatric population as a

whole. The center itself was not randomly selected from among the 300 ADHC centers in California or the thousands of centers nationwide. The assessments used to evaluate the level of depression and dementia has high levels of validity and reliability, and arewidely used in the field. They are, nonetheless, only single measures. Use of additional measures of these constructs would provide converging evidence about the validity of the findings. The study did not cover elderly who were below the age of 65 although they had memory problem but not related to depression and dementia. The researcher limited this research to older adults who were 65 years and above and who were diagnosed with depression and dementia. This researcher also limited this research to ADHC participants only to measure the treatment outcomes.

The study was limited to the methodology such as research design that was employed by the investigator. The validity of the findings, both internal and external such as the accuracy of the finding limited the approach that was used to gather and analyze these findings. The biasness of the investigator such as attitudes towards elderly would have influenced the findings. The limitations of the study would be overcome by application of a objective approach in research so that the main goal of the study will be towards meeting its purpose.

Theoretical Foundation

This section discusses the theoretical models that inform the study: holism, and grounded theory. The different models overlap and are eventually used to develop a theoretical foundation or the study.

Holistic Paradigm

According to holism, the whole is better than the sum of its parts (Colley & Diment, 2001). According to Strauch (2003), the entire system provides a concrete basis of understanding the parts of the system. The basic ontological assumption (fundamental mode of being) of holism is that the individual is cannot be separated from the environment. A paradigm shift is underway in the medical model. The complex interrelationship between body and mind makes the perception of health from reductionist model insufficient. The theoretical framework that was employed within the study involves the secondary data on depression and mental deterioration among elderly or the elderly and the relationship between the two. The primary data that was collected was authenticated by the consistence with which it had with secondary research and its congruency in answering research questions. The methodology that was used in the study was also aimed at validating the theory on the topic by backing up with the evidence which was gathered during the process of data collection. Through both theory and primary data therefore the researcher was able to answer the research questions in a comprehensive manner.

Grounded Theory

This study may be experiential or intersubjective in nature. The single way of conducting experiential study requires the use of phenomenological methods. In order to explore patterns and generate theory, data analysis makes the use of an inductive approach (Strauss, & Corbin, 1990). Grounded theory helps unveil the theory implicit in

the use of collected data (Glasser, & Strauss, 1967). There are diverse perspectives on reality, but a phenomenological approach of grounded theory explores these differences. The theory is based on the epistemological assumption that there is a need for collaboration between researchers and respondents if the phenomenon is to be understood and reported accurately (Creswell, 2005). The phenomenological approach recognizes the individual's perspective as relevant in understanding human experiences.

The application of grounded theory was a suitable approach through which the primary data of the study would be used to ascertain the theoretical framework related to the study. The theory that formed the basis of the study was therefore applicable as a guideline through which the researcher would focus solely at employing the most appropriate approach in answering the research questions. The relationship between theory and primary findings of the study and their congruence with the research questions is an effective way through which the study would be deemed credible. The approach of the study and theory used in the investigation were in line with the purpose of the study.

Operational Definition of Terms

Memory difficulty is among the most common cognitive complaints from patients and caregivers alike when describing patients' cognitive difficulties. Because memory provides us with context and enables us to guide our behavior using past experience, the loss of memory produces anxiety in the person affected. Extensive memory loss causes extreme disability, while mild loss is associated with disorientation and depression.

Memory: is said to involve at least two separate systems: declarative memory and

procedural memory. These memory systems are distinct, dissociable and involve independent neural systems (Deffler, & Halpern, 2011).

Declarative memory: involves conscious awareness of events, objects and general recollection or recognition (Grandjean, & Collette, 2011). Declarative memory is highly dependent on an intact hippocampal formation, and damage, neuronal loss or loss of input to the hippocampal formation are correlated with severe dementia. Recent memory refers to events that happened within a short time period relative to recall. This includes events within the last few weeks, and memory for information learned within the testing situation.

Remote memory: refers to events occurring long ago, usually in childhood or early adulthood. Both can be impacted in dementia. Encoding, storage and retrieval all need to take place within the declarative system in order for accurate recall to take place. Encoding involves initial registration and learning of the material.Material that is not accurately encoded cannot be recalled.

Storage: involves retaining a representation of the encoded material for future recall.

Memory storage: involves physiologic changes at the neuronal level, including dendritic branching and neurotransmission, with particular dependence on the cholinergic system (Grandjean & Collette, 2011).

Memory retrieval: is the ability to access stored information when needed. Free recall involves remembering the material unaided, whereas recognition involves correctly

selecting the stored information from choices. Poor recall with good recognition implies a retrieval deficit rather than a storage deficit.

Procedural memory or "how to" memory: is less sensitive to deterioration from dementia (Faw, 2003). This includes motor memory for things like riding a bicycle or remembering a sequence of actions or movements. Procedural memory does not necessitate conscious awareness of an activity, action or the steps required to accurately perform a task (Sheridan& Reingold, 2011). Procedural memory involves the dorsolateral prefrontal cortex and efferent to the associated striatal region, and is thus likely to be impaired in individuals with basal ganglia or prefrontal cortex dysfunction. It has been well established that damage to the medial temporal lobe, including thehippocampus or midline diencephalic structures, produces deficits in declarative memory, but not in non-declarative memory.

Working memory: includes both a storage component and a simultaneous processing component, this concept has been an attractive choice as an explanation for age-related decline in cognitive performance. The term 'working memory' has not been in active use for very long. Welford was perhaps the first researcher to note that it was just this problem of simultaneously storing information and performing processing operations that was a particular problem for the elderly (Grieve, Clark, Williams, Peduto, & Gordon, 2005).

Significance of the Study

In the U.S., the old people have a higher risk of cognitive deterioration associated with dementia. The results of this study will answer questions in areas that can guide approaches to cognitive deterioration associated with dementia can be mediated.

This study is expected to be significant by

1. Providing protocols for assessing depression in geriatric clients who are diagnosed with dementia.
2. Confirming regardless of the relationship that exists between depression and cognitive deterioration.
3. Determining the effectiveness of ADHC in providing a nurturing setting, stimulating treatments that ameliorate symptoms and the development of dementia and depression.
4. Evaluating the relationship between cognitive deterioration over 6 months, in the presence of a high or low level of depression. The data from this study creates the basis for (a) adopting treatments in ADHC centers and (b) the way depression relates to dementia across a diverse population.

This study added much needed data on the outcomes of ADHC and the effects depression has on dementia in a diverse, senior population. It also provided data for the larger social discussion as to what direction resources should be allocated to meet the quickly escalating health, economic, and humanitarian pressures of the baby boom tsunami. The complexity of late life depression arises from entangled developmental, social, and biological factors. The social support systems for the elderly weaken with

time due to such factors as retirement, death of spouse and/or siblings or relocation. For therapist, physician, psychologist, and social workers, the above variables of causing depression must be known. In order for therapists to comprehend and apply appropriate care interventions for the elderly individuals with both depression and deterioration in cognition, the relationship between the two conditions must be ascertained. This is in line with the current practices in medical care where evidence based practice is the core approach to health care which is defined by the quality of services. Past literature have concentrated to effective care interventions without the need to establish how the understanding of related conditions or symptoms influences the quality of care that is provided to the elderly.

Summary and Transition

In summary, the present study helps understand better the elderly population's health issues that are prevalent in their age group. This is particularly important due to the rate, at which the size of the old age-group increases, especially with the projection of even further increase as the 80 million baby population cohort will get progressively to the degree of 65 by 2020.

The aged people will prefer only to stay at home given that they are physically or cognitively able to take care of themselves. However, they may require more assistance as they age-up and may end up leaving their homes to a residential facility. This makes them feel an acute loss of home, privacy, and independence.

Depression is a disorder that affects a person's mood, physical functions, and social interactions. On the other hand, dementia may have symptoms associated with depression such as anxiety, irritability, apathy, sadness, sleep problems, agitation, and even loss of interest. These overlapping symptoms make difficult to administrate a diagnosis. Additional difficulty arises from the heterogeneity of the old population. For instance, a 90 year old person is significantly different a 60 year one in terms of mental and physical ability.

The symptoms of dementia may be caused by more than 70 known diseases with Alzheimer accounting for more than half of these cases. The cases of diagnosed dementia are growing as the old adult population increases.

The main diagnostic criteria for dementia are apraxia, aphasia, and agnosia. It is necessary to detect and diagnose depression and dementia in time. Effective screening and treatment may prevent or delay hospitalization and costly nursing home placement. This is despite the challenge of changes in cognitive functioning, which occur in normal aging, and their similarity with the initial indicators of dementia. The study will proceed in the next chapter to review literature in the area and thus, guide the results of this study to a firm academic grounding.

Chapter 2: Literature Review

Introduction

The purpose of this study was to (a) provide a protocol for diagnosing depression in geriatric patients who are diagnosed with dementia, (b) assess the relationship between depression and cognitive deterioration, and (c) determine the efficacy of ADHC in providing a stimulating, nurturing environment that can ameliorate the symptoms and progression of both depression and dementia. This chapter presents a review of literature on the symptom otology and diagnosis of depression and dementia in the elderly, and the potential relationships between them.

The criteria of selection for literature were relevance to the research topic and year of publication. Academic Search Premier, Education Resource Information Center, SocINDEX Full Text, Health and Medical Complete (ProQuest) Cumulative Index to Nursing and Allied Health Literature (CINAHL), ResearchNow, ProQuest Central, MEDLINE with Full Text, Government Collection, IEEE Xplore Digital Library, Infosci Journals and academic textbooks. Online public and private libraries were accessed to gather the data. Some of the online databases that were accessed are Ebsco (Elton B. Stephens Company), Questia, Emerald, and Phoenix, Science Direct, Sage, Proquest and PubMed. These sources were extensively searched to retrieve articles**.** As these data bases have plenty of peer-reviewed journal articles that have addressed the issue at hand. Also these articles provide meaningful insight into the issue with detailed as well as comprehensive studies that take into account the phenomenon of youth smoking, the

causatives and the awareness that the youth has about smoking. In addition, a supplementary search and initially identified papers were carefully examined and this process provided further relevant articles.

The following keywords were utilized for these extensive searches which included depression and dementia, elderly, elderly, major depression, early dementia and dementia of Alzheimer's type. The searches for Boolean system were also used for combining words with the connectors such as "and" or "or". Here is an example. When Google database was used to search the depression it generated 2,400,000 hits while the for keywords dementia, it generated 1,110,000 hits. When I combined depression and dementia there were less than one million hits. Also, most of these hits were repetitions which were reposted many times.

Depression

The problem of depression is prevalent among the elderly in American society. About 27% of community-dwelling adults over the age of 60 are affected by depression. The situation is projected to get worse, when the 80 million baby population, which experiences a higher rate of emotional disorder than the present cohort, turns to the amount of 65 in 2020 (Josi, 2011).

The elderly who suffer from depression are experience higher outpatient charges, significantly more emergency room visits, and poorer health. A serious problem associated with depressed people of this cohort is the high rate of suicide, which is twice as high as any other age group. But less than 20% receive appropriate interventions, such

as psychotherapy and pharmacotherapy. The recovery rates for the elderly with depression are as good as those for other age groups (Balsis & Cully, 2008).

It has been observed that those who experience initial improvement in cognitive functioning and mood after receiving treatment for depression often develop progressive dementia. This indicates the need for a periodic reevaluation of clients with the associated memory impairment. Those diagnosed with both primary dementia illness and depression remained cognitively impaired after they received effective treatment for depression. Sometimes, some clients may show improvement in both cognition and impact after effective intervention. Eventually, these clients develop cognitive impairment secondary to depression. According to Bigio et al. (2010), when these clients are tracked over time, they end up manifesting clear progressive dementia.

Depression and Memory

Longitudinal research has attempted to measure the predictive power of memory complaints for future cognitive decline or dementia in people with subclinical impairment without dementia at baseline. In people with baseline impairment without dementia, evidence of a relationship between memory complaints and future performance is inconsistent. Reilly, Peelle, Antonucci, and Grossman (2011) found that people with baseline impairment and complaints had a greater decline in memory at one-year follow up than did both people who complained and had normal cognition and people who did not complain. They examined 55 patients with mild cognitive impairment where a single question was used to assess memory complaints and this predicted decline on mini-

mental status exam (MMSE) scores over 2years. Interestingly, when multiple items of memory complaints were used, there was no significant correlatation with MMSE decline in the same sample.

By contrast, another study found that, in the group with cognitive impairment at baseline, complaints did not significantly predict future decline (Tatulian, Vasiliev, Yavorskaya, & Zheltyakova, 2005). A third study first found that people with complaints at time one but not at time two had a higher incidence of Alzheimer's disease at time two. However, after excluding those with baseline cognitive impairment, the authors found that this significant association disappeared. This might suggest that people who are in the early stages of impairment are able to identify their problems accurately. It is possible that the discrepant findings result from the use of different methods of identifying impairment and measuring complaints. Overall, longitudinal studies of people with baseline impairment show discrepant findings, but tend to suggest that memory complaints accurately predict future decline. Similar methodology has not been used to study people with diagnosed dementia.

There is robust evidence of a positive correlation between depression and memory complaints (Joormann & Gotli, 2008). People who have more depressive symptoms generally have more complaints.Some studies deal with depression by statistically adjusting for it in their analyses.In normal and impaired samples, these studies find similar associations between complaints and cognitive performance before and after controlling for depression, suggesting that accuracy of complaints does not only reflect

depression. An interesting question is whether depression would moderate the association between complaints and performance, since controlling for depression does not provide adequate information regarding its moderating effect. Depression might moderate this relationship, as it can produce negative cognitions that highlight negative events or filter out positive information (Carter & Garber, 2011). Despite many studies, the majority of them have ignored the moderating effect of depression on these relationships. Depression is observed to affect association between memory, complaints, and performance among the cognitively normal elderly. In a cross-sectional study, a group of cognitively normal, depressed older adults complained more than a cognitively normal, non-depressed group, even though they did not differ on measures of cognition. Thus, the normal, non-depressed group was more "accurate" and depression was a moderator between complaints and performance (Carter & Garber, 2011).

A study examining the effect of depression on awareness in cognitively normal people found that the cognitively normal depressed group had worse awareness than non-depressed normal controls. These results suggest that depression does indeed correspond with decreased accuracy in people without cognitive impairment. In addition, two longitudinal studies found that only people with less depression or no depression had an association between memory complaints and future dementia. Because baseline cognitive impairment levels were not considered in these two studies, it is unclear whether subsamples of more or less impaired people would have differences in association. None of these studies includes people with diagnosed AD at baseline.

Other studies, however, have reported correlation between depressive symptoms and awareness in AD patients. These studies have used dissimilar methods of measuring awareness. Greater depressive symptoms are frequently associated with greater awareness (Mock & Eibach, 2011), which suggests that depression is associated with greater subjective complaints among people with dementia. As it was noted earlier, one possible explanation for this is that depression is associated with the presence of negative cognitions. These negative cognitions can result in an increased focus on negative aspects of one's life or thinking abilities. Depressed individuals are also less able to inhibit negative information. For both cognitively normal and demented older adults, greater depressive symptoms could lead to an increase in complaints. For cognitively normal older adults with greater depressive symptoms, however, this could result in a decrease in accuracy if cognitive deficits are minimal (i.e., an overestimation of deficits). For people with AD, greater depressive symptoms could lead to more accurate perception as people would be more likely to complain and have deficits, simply because of the nature of the disease. Due to the relative dearth of literature on these moderating factors in the same study, more work is needed in this area.

The relationship between complaint and performance seem to worsen among cognitively normal individuals with depression. According to conducted studies, the history of depression and dementia frequently coexist (Mascherek, Zimprich, Rupprecht, & Lang, 2011). However, this association is based on controversial mechanism. According to the study by Jorm (2001), who conducted a meta-analysis, it is suggested

that the history of depression almost doubles the risk of dementia. He founded this on case-control studies (RR = 2.01, CI = 1.16-3.50) and prospective studies (RR = 1.87, 1.09-3.20). Contrary to the finding of Jorm that depression was a risk factor for dementia, many studies conclude that depression acts as a risk factor, predominantly if it has developed for the first time closer to the onset of dementia. In these studies, the authors concur that depression is a prodromal feature of dementia. This means that depression manifests itself as an initial symptom of dementia (Schoevers, Beekman, Deeg, & Tilburg, 2000; Geerlings & Bouter, 2000). Among older adults with dementia, depression is a common co-morbid condition. A depressed moon is common among the AD clients, and it is estimated that about 40-50% of them experience it while 10-20% of them meet the clinical criteria for depression diagnosis.

A study by Bassuk, Berkman, and Wypij (1999) found that depression did not precede cognitive impairment, but instead was present in the participants who had already experienced a reduction in cognitive abilities. They concluded that depression was likely to be a reaction to an individual's insight about decline in cognitive functioning, which may precede an actual diagnosis of dementia by several years. Research into the phenomenology of late-onset depression (LOD) has suggested that, while LOD and early-onset depression (EOD) symptom profiles are similar, etiology of these disorders is different. In a review of research on depression in AD and other dementias, Boland (2000) concluded that the co-morbid depression found in dementia differs from classic depression. Rather than comorbid depression being a reaction to

cognitive decline, he suggested, the depression arises from anatomical damage to the brain caused by the neuropathological course of dementia. In other words, the depression is caused by the pathology in the brain that leads to cognitive impairment and eventually dementia, rather than depression being a reaction to the actual manifestation or diagnosis of dementia. Cho, Lavretsky, Olmstead, Levin, Oxman, & Irwin (2010) measured depressive symptoms both before and after an individual was diagnosed with dementia and found that there was no increase in depressive symptoms post-diagnosis. Boland's conclusion is further supported by studies looking at the neuroanatomical features of depression and dementia. Compared to non-depressed patients with dementia, patients with dementia and depression have different histopathological and neurochemical characteristics, suggesting a specific pathogenesis rather than a reactive phenomenon.

Chamberlain conducted a review of the biological and clinical differences existing between the LOD and EOD in 2011. He attributes the white matter changes that are common in individuals with LOD to cognitive impairment. He notes that these changes indicate prodrome to dementia, mostly of vascular type. A prospective study by Hedden and Gabrieli (2004) investigated the association between the extent of white matter brain changes and clinical outcomes in older adult depressed patients. They found that white matter hyper intensities were associated with a poorer outcomes both cognitively and with respect to the course of the depressive illness. Thus, it is possible that the brain changes that accompany late-onset depression may have effects beyond their contribution to the development of a depressive disorder. In fact, in a recent review, Thompson,

Gallagher, and Thompson (2005) concluded that there is ample evidence that the neurocognitive impairment seen in individuals with late-onset depression persists even after the depression has remitted.

Cognitive Performance

It is well established that dividing a subject's attention during a task often results in a decrement of performance on that task. For example, during presentation of a word list, dividing attention of the subject results in decrement in free recall of the words. A possible explanation for reduced performance under divided attention conditions is that there is a reduced amount of attentional resources necessary to carry out elaborative and deep (semantic) processing. That is, there is less formation of new connections between items due to a lack of attentional resources.

Many cognitive aging researchers assume that older adults are at a particular disadvantage under divided attention conditions. For instance, probe reaction time dual task procedure in examining the capacity demands for letter matching task was used in the study of Hovius, Kellenbach, Graham, Hodges, and Pattersos in 2003. They found that the latter matching was demanding for all subjects, but even more demanding for the older adults, and this difference was greater in a categorical matching task as opposed to a physical matching task. They concluded that elderly adults have particularly pronounced performance decrease when categorical information is required.

Apart from deficiencies in performing tasks under divided attention conditions, there are many other cognitive declines associated with age. These include (Siedlecki, Honig, & Stern, 2008):

1. The elderly show particularly poor performance on tasks that involve free recall. Performance declines are not as pronounced in a cued recall or recognition situation.
2. Older adults have difficulty on intentional memory and categorical clustering in free-recall.
3. The elderly show poorer incidental recognition and recall of words presented in lexical decision tasks.
4. The elderly show slowing in a wide range of cognitive processes.

The cognitive resources hypothesis in aging has several variants. Speed can be considered a resource available to us as we perform cognitive tasks.It is possible that there is a general loss of conceptual speed with age that accounts for the variety of performance decrements. The cognitive slowing hypothesis predicts that age differences should be eliminated in slow or self-paced tasks and conditions, and exacerbated by very fast presentations rates. It has been shown that fast rates of stimulus presentation can lead to age-related performance decline. Mathias and Burke (2009) provide support for the slowing with age theory in their findings that elderly adults had problems integrating information when it was presented rapidly.

Levy, Parasuraman, Greenwood, Dukoff, and Sunderland (2000), on the other hand, found no support for the slowing hypothesis when they attempted to reduce the poor performance of an older group by slowing down presentation rates. Only the young adults benefited from the slower rate; the elderly group did not benefit at all. Rehearsal rates have been suggested as the most sensitive to any time parameter. Mathias and Burke (2009) measured rehearsal speed in older adults and has reported age-related slowing.

Another theory to explain cognitive decline with age is analogous to the "use it or lose it" principle in physical performance. According to the disuse hypothesis of aging, if one does not continue to use one's cognitive resources and stay active, then they will deteriorate. If one stays healthy and active, and enjoys plenty of intellectual stimulation, then no (or at least less) mental degradation should occur (Mathias & Burke, 2009).

Etiology

As observed in the American aging population, depression and dementia are among the most common psychological disorders. Siedlecki, Honig, and Stern (2008) enquired whether a history of depression was an indicator for the development dementia and found that older adults who were severely depressed exhibited subsequent improvement in cognitive function. Later, this was compared to the depressed elders, who had memory complaints. It was also observed that those with reversible dementia not only complained memory problems concurrent with depressive symptoms, but also had real cognitive difficulties in a depressive episode.

The prevalence of depressive symptoms varies across different age cohorts. This is least observed in the middle age group, but reaches the highest level at the age of 80 and above. The highest psychiatric impairment rate (25%) appears among unskilled employees across most of their occupational life. Clerical and sales workers show the next highest rate (22%), followed by rates of 17% among machine operators and semiskilled workers, 12% among skilled manual employees, and 11% in the group of all white-collar occupations.

Social circumstances and critical life events seem to play an important role in depression. The perceived quality of relationships and their perceived adequacy are key factors. Lifelong personality adjustment and the capacity to form good social relationships affect vulnerability. Affective disorders occur more commonly in elderly individuals with self-reported disabling conditions, loneliness, perceptual impairment and organic disorders (Shankar, McMunn, Banks, & Steptoe, 2011). Depression is also frequently preceeded by life events such as death of spouse. It may also be a result of lack of confidance in front of adverse circumstances.

A consistent association has been observed between depression and the onset of physical illness or disability (Shankar, McMunn, Banks, & Steptoe, 2011). The correlation may grow stronger over time, which possibly contributes to functional deterioration in the disabled elderly who are depressed. Among the important intermediaries between exposure to stress and the development of depression and cognitive impairment is the reduced immune function.

Self-reported memory decline may be an early indicator of incipient cognitive problems associated with dementia. Individuals who rate their memory more poorly have lower performance and higher depression scores than those who rate their memory highly. Though small in magnitude, self-evaluations of memory functioning may predict later cognitive and functional declines. Self-reports cannot substitute for objective cognitive assessment, but it may be possible to use self-reports of decline to identify at-risk individuals who may then be targeted for intervention. The early detection of cognitive problems remains an important goal for research aimed at identifying risk factors and treatments that can retard the dementing process, or improve the quality of life for older individuals (Girardi, MacPherson, & Abrahams, 2011). Research to date yields evidence of the prospective relation of memory self-evaluations to subsequent memory decline as measured by objective tests and by diagnosis of dementia.

Study results suggest that, as individuals decline cognitively to dementia, a loss of complex and fine motor control occurs before the deficits of gross motor performance become evident (Girardi, MacPherson, & Abrahams, 2011). Performance on complex motor tests can identify non-demented individuals with mild cognitive decline who are at risk for dementia. The instability of milder forms of depression raises the question of whether depression continues at some level throughout an individual's life once an episode of depression is experienced. As previously discussed, the individual's cognitive functioning may also be continuously affected on some level by the depressive symptoms.

Depression in the Elderly

According to Seirmarco et al. (2012), the first time depressive symptoms for the elderly may be mild. They may also frequently occur as a rective depression secondary to events such as loss of social contacts, social isolation, physical illness, grief, and bereavement. The physical, functional, and social losses frequently contribute to or compound the reactive depression of old age. This suggests that genetics play a less vital role than situational or illness-related biological factors. As observed in many studies, clients diagnosed with late-onset depression are less characterized with family history of affective disorder.

Different psychological mechanisms exist for early-onset and late-onset depression. Early-onset depression frequently originates from an inward turning of hostile feelings toward the self, while late-life depression more often arises from a loss of self-esteem. Low self-esteem results from an inability to supply needs and fulfill drives, leading to a decline in health, social functioning, and financial resources.

The two important foci in geriatric psychiatry are (a) identifying individuals in whom major depression causes significant cognitive impairment, and (b) distinguishing between treatable cases of pseudo-dementia and irreversible dementias, such as Alzheimer's disease (Blazer & Steffens, 2009). The term pseudo-dementia has been criticized by some investigators, who note that severe depression can cause real cognitive impairment. The term dementia syndrome of depression has begun to be used instead, in order to emphasize the fact that although these conditions are treatable, there is nothing

pseudo about the disability resulting from severe depression (Stroud, Davila, Hammen, & Vrshek-Schallhorn, 2011).

Studies of depressed individuals with memory impairment show that the majority will develop dementia within the next one to two years. According to Fischer, Sandblom, Gavazzeni, Fransson, Wright, and Bäckman (2005), recent research suggests that individuals with depression associated with reversible cognitive impairment are at increased risk of developing dementia over the subsequent few years.

In the prediction of chronic non-biological depressive symptoms, current and past experiences are better than age. In addition, the cognitive impairments frequently fluctuate along with fluctuations in depression. Many individuals suffer from both depression and a structurally based intellectual impairment (Mossello et al., 2011). History may reveal that cognitive impairment was not evident until the onset of depressive symptoms.

It was realized as early as 1883 that severe depression could lead to cognitive impairment (Rucci et al., 2011). Numerous studies have shown that memory disturbances and deficits in processing result from depression. One study investigated whether a prior history of depression and its age of onset might increase the likelihood of developing dementia (West, Thorn, & Bagwell, 2003). If this was the case, these factors could be further investigated as possible risk factors. This is important, since the identification of early indicators would afford an opportunity to intervene and prevent or slow what can often be a rapid degenerative process.

Depression has been observed in 15-20% of early dementia clients. The existence of depression in individuals with dementia complicates and worsens their functioning. In these cases, treating the depression is necessary. Medication is also available to treat the dementia. The angiotensin-converting enzyme inhibitor physostigmine has been shown to enhance the ability to assimilate new information into long-term memory (Lee, Chatila, Ram, & Thompson, 2009). The use of vasodilators, such as cyclandelate, has resulted in improvements in orientation, communication, and socialization in clients with vascular dementia. In both cases, improvements have been observed only in the early stages of dementia, which highlights the importance of early diagnosis and intervention.

Diagnosing Depression and Dementia

According to Kohler, Thomas, Barnett, & O'Brien, (2010), there are high chances of confusing the current symptoms with those of psychological and physical sequelae of normal aging and dementia. This makes difficult diagnose depression among older adults. The situation is even further complicated due to the relationship existing between depression, apathy, slowing, and memory performance. Hence, it makes difficult distinguish between depression and dementia. Pseudo-dementia was once viewed as a benign entity, but it now appears that many cases result in an irreversible disorder. The annual rate at which dementia develops in the general population is 2%, compared with 15% among clients who had initially recovered from pseudodementia.

Clients may be diagnosed with dementia when the cause of behavioral change may actually be depression. In general, major depression occurs in the elderly as the

continuation of a process of recurrent mood disorders, which began earlier in life (Frodl et al., 2012). Occasionally, the disorder begins in old age, but there is usually a history of previous episodes and often a family history of depression (Dunne, Wrosch, & Miller, 2011). Symptoms characteristic of a depressive disorder include a dysphoric mood with a change in attitude towards self feelings of hopelessness, and changes in the vital senses (Duman, 2005). Individuals report a new and unpleasant sensation in the body, with a draining of energy and interest. The sensations and feelings usually afflict the person "out of the blue," but are sometimes precipitated by life events. The symptoms are accompanied by a change in appetite, bowel function, and sleep pattern (Duman, 2005).

Behavior, however, is not the only factor that researchers need to consider. They also need to take into account how the patient feels. A self-report inventory is an assessment tool that seeks to measure what individuals think or feel based on their subjective views of their condition (Walters & Geyer, 2005). Scale values may show dramatic shifts, depending on the time at which the inventory is taken. There are hundreds of self-report psychological inventories, which vary in size, complexity, and orientation (Walters & Geyer, 2005).

Among the self-report psychological inventories is the Beck Depression Inventory. It is normally used for rapid assessment of depressive mood. It was used by Hamilton and Abramson (1967) in their study of maladaptive attitudes of clinically depressed and normal people. In this method, the self-report scale is used for measuring the number of negative attitudes on the subject in the acute depressive episode and after

recovery. A quantitative model was used to analyze the data, with the participants' psychological status (i.e., depressed vs. not depressed controls) serving as the between-subjects variable and the time of testing as the within-subjects variable. The depressed population exhibited more maladaptive attitudes during depressive episodes. Following these episodes, their thinking did not differ significantly from that of not depressed individuals. The depressed individuals' attitudes remained relatively consistent throughout the study.

Affective status, particularly when there is suspicion of depression, is an important influence in the link between self-reported memory complaints and memory performance when assessing for dementia (West, Thorn, & Bagwell, 2003). Physicians need to exercise caution in the use of subjective reports of memory loss for the early detection of Alzheimer's disease, or as an indication of the aging process. Those who report memory difficulties often have higher depression scores than those who deny memory problems, and would benefit from treatment for their depression.

Individuals with cognitive difficulties, who are less aware of their symptoms, may have more untreated illnesses. The contributory factors in dementia must be considered not only at the initial presentation, but at intervals throughout the course of the dementia. Some older individuals with depression have prominent symptoms of cognitive dysfunction. Although they had no recognized cognitive deficit prior to the depression, they never fully recovered, and remained somewhat cognitively impaired. Some

individuals were found to have developed dementia when followed over time (Villarejo et al., 2011)

The cognitive impairment caused by the initial depression may be a manifestation of the vulnerability of a brain that is ultimately going to succumb to Alzheimer's disease. Increasing knowledge about the neurochemical changes in the brains of older individuals with depression is consistent with the idea that a cognitively impairing depressive illness leaves a permanent physical mark on the brain. The National Institute of Aging Task Force (2002) found that depression in older individuals may be accompanied by a mild-to-profound reversible dementia.

Misdiagnosis is common due to the difficulties in distinguishing dementia from depression cases caused by the progressive degenerative dementia. Research indicates that depression and dementia coexist in approximately 25% of cognitively impaired older adults. Differentiating those with depression alone from those with coexisting depression and dementia is extremely difficult (Villarejo et al., 2011).

People with dementia appear to develop depression more often than those without dementia. Depression, along with other medical causes, should always be considered in an individual whose dementia abruptly worsens. When one starts to feel paranoia and depression, it is a reflection of discomfort caused by diffuse memory loss and cognitive slowing. Such personality alterations are likely to indicate the initial stages of primary degenerative dementias. In the early stage of cognitive impairment, when a diagnosis of dementia is premature, individuals may be forgetful and experience difficulty with higher

levels of problem solving and abstraction. They may have trouble reading, writing, and solving mathematical or financial problems. Identifying depression in late life is often problematic because of the difficulty in distinguishing between changes commonly associated with aging and those associated with depression. Older individuals may suffer from memory and concentration problems, psychomotor slowness, and declining social involvement. These same problems are associated with depression. Somatic complaints associated with depression, such as insomnia and fatigue, are also expected concomitants of normal aging. These similarities between problems associated with both aging and depression may explain in part why depression among older individuals often goes untreated.

Another possible explanation is that individuals are often unwilling to admit to an illness, like depression, that can be socially stigmatizing. Our society, with its bootstrap mentality, does not view mental or emotional problems as acceptable forms of illness, equating them instead with personal weakness or character flaws. Medical treatment for mental health issues may be sought only after the development of somatic problems that provide a "legitimate" medical reason to visit a physician (Richardson, Sullivan, Hill & Yu, 2007).

A third, and more disturbing, possibility for lack of treatment is that individuals suffering from depression who do seek treatment may receive inadequate care. Although primary care physicians are the most likely source of treatment for older individuals suffering from emotional and psychiatric problems, studies have shown that physicians

traditionally do a poor job of recognizing depression in their older patients. After evaluating the records of 171 males aged 70 or older consecutively admitted to a VA medical center, Kohler, Thomas, Barnett and O'Brien (2010) found that only 20% of those identified with major depression by a geriatric consultation service had any prior documentation to that effect in their chart. They also reported that, of the 84 men and women at an outpatient clinic who were over the age of 62 and who scored positively on a depression screening tool, only one-third had previously been identified by a geriatric team as being depressed. Even if one makes allowance for the 80% specificity rate of the selected screening tool, this does not alter the clinical significance of these results.

Variation in the reported prevalence may also reflect the use of different criteria to diagnose depression in the elderly. The use of strict criteria, such as those in the DIS, may result in a relatively low (two to five percent) rate of diagnosed depression. More liberal criteria, such as self-report instruments, may produce higher (10-40) prevalence rates.

Knowledge of Aging among Professionals

A large number of studies has investigated knowledge of aging in general, mostly using Palmore's Facts on Aging Quiz. Raynor (2007), for example, evaluated 170 physicians representing 28 medical specialties to determine their level of knowledge and aging bias using the Facts on Aging Quiz. The knowledge scores of the physicians (68%) were compared with those of 87 undergraduate students studied by Urry (2006) (65%correct), t `d no significant difference was found. When subjects were divided into

four age cohorts (30 – 39 years, *n* = 54; 40 - 49, *n* = 52; 50 - 59, *n* = 39; 60 - 76, *n* = 25), however, significant differences were noted. The youngest age cohort scored significantly lower (65%) than any of the other three groups 40 - 49: 69% correct; 50 - 59: 69% correct; 60 - 76: 70% correct). No knowledge differences were observed between medical specialties. The study also showed that members of all specialties were negatively biased, except for internists, who were neutral. Each age cohort was also negatively biased, with the exception of the 60- to 76-year-old cohort, which was positively biased.

When discussing the lack of significant difference between physician and undergraduate knowledge scores, Raynor (2007) failed to explain the large discrepancy between the standard deviations of the two groups, 2.42 vs. 11.20, respectively. Although mean scores were similar between physicians and undergraduate students, this finding suggests that the physicians were a much more homogenous group than were the undergraduate students (Raynor, 2007).

In one of the earliest studies involving medical personnel, Snyder and Zweig (2010) used the Facts on Aging Quiz and Rosencranz and McNevin's (1969) Aging Semantic Differential to evaluate knowledge of and attitudes toward the elderly of 279 dental and medical students. The average correct response rate on the Facts on Aging Quiz was 66.8%, with no significant gender differences.Upperclass students had fewer errors than did freshmen. No significant differences in attitude scores were noted between freshmen and upperclassmen, although there was a significant positive relationship between overall knowledge and attitude scores. These findings suggest that medical and

dental students' knowledge of aging is roughly equivalent to that of the undergraduate students.

Tinetti (1986) used the Facts on Aging Quiz to evaluate the effectiveness of inservice training for 20 providers of geriatric recreational services. Using 16 students in an undergraduate class on outdoor resource management as a control group, comparisons were made between groups on pre and posttest scores. The experimental group had a greater increase between pre-test scores and post-test scores (74% and 94% correct) than did the control group, even when controlling for differences in the pretest scores. Individuals who had less contact with elderly individuals, as measured by their responses to questions regarding how much involvement they had with seniors, showed greater gains in knowledge than those with a higher initial level of contact.

Wegner (2003) used Palmore's Facts on Aging Quiz to measure changes in college student perceptions about aging. Pre and posttest responses by 61 undergraduates in a human development life-span class, which included specific instruction regarding aging, were compared with those of 61 undergraduate students in a child development class. For the life-span class, there was a significant difference between the pretest score (66% correct) and posttest score (74% correct), but no difference was found among child development students (65% and 68%, respectively). No significant relationship was found between knowledge of aging and age, major field of study, year in school, or gender. Contact with the elderly, measured by comparing subgroups of students (those who did volunteer work with seniors, those who did volunteer work with nonelderly

individuals, and those who enrolled in discussion sections) was not found to be significantly related to knowledge.

In summary, physician knowledge of aging is roughly equivalent to that of medical and dental students, undergraduate students, life-span students at the beginning of the semester, and direct service workers; better than that of community dwelling seniors; but worse than that of geriatric recreation service providers. The findings of Weissman (1998) support those of Villergo et al. (2010), who found that knowledge is positively associated with education, even when that education is not specifically focused on gerontological issues.

Treatment of Depression in Older Adults

Older individuals who are found to be depressed have been characterized as being anxious, preoccupied with physical symptoms, fatigued, withdrawn, apathetic, inert, disinterested in their surroundings and lacking drive (Barbour & Blumenthal, 2005). There are several forms of successful treatment for depression and mood disorders (Ramasubbu et al., 2012), but the most widely tested and trusted are structured forms of therapy such as cognitive behavioral or interpersonal psychotherapy. These therapies have been proven successful in the treatment of competent individuals with mild to moderate depression (Beck, 2002).

Cognitive behavioral therapy (CBT) requires active involvement by the patient and the clinician. The clinician's role is to help the patient focus on his or her current problems and how to solve them. Throughout this process, the patient learns how to

identify distorted or unhelpful thinking patterns, recognize inaccurate beliefs, relate to others in more positive ways, and change behaviors accordingly (National Institute of Mental Health, 2009).

Interpersonal therapy is often used successfully to treat depression. Interpersonal therapy (IPT) focuses on improving communication patterns in the patient. Emphasis is also placed on the ways in which the patient relates to others in his or her surroundings. The clinician uses IPT to help the patient identify troubling emotions and their triggers, learn to express appropriate emotions in a healthy way, and examine relationships in his or her past that may have been affected by distorted mood and behavior. Once these patterns of interaction and problem causing behaviors have been identified, patient and therapist work together to change the negative cycle.

For more severe depression, a combination of psychotherapy - or talk therapy - and pharmaceutical medications is more successful. Treatment goals for this population should focus on a basic recognition and understanding of common symptoms, prevention of relapse and recurrence, and improvement of functional capabilities for the individual. Many people suffering from depression manage to reduce the intensity of their pain without the use of pharmaceutical medications or psychotherapy (Ramasubbu et al., 2012). Alternative forms of natural and holistic therapy have become increasingly popular throughout the world. Art thereapy, for example, has proved to be a successful alternative therapy for the treatment of depression.

Summary and Transition

Cognitive performance among elderly has a direct correlation with depression. Depression and its relationship with cognitive deterioration have psychological and social cultural factors such as ability to form relationships and psychological wellbeing which determine the level into which the elderly get depressed. Depression among the elderly is a common occurrence which has been attributed to various factors including reduction in cognitive abilities and inability to cope with the social cultural and psychological challenges that is faced by elderly. Dementia is one of the commonest disorders of cognition in which memory functions of the elderly deteriorate causing psychological state of depression. Aging professionals are therefore mandated to have adequate knowledge of the relationship between cognitive deterioration and depression among the elderly. This is necessary in allowing them to implement the most appropriate interventions of care for high quality of services to be achieved. Effective treatment was found to be based on the understanding of etiological factors and relationships of the conditions that affect the elderly.

The next chapter describes and justifies the methods of scientific investigation that were used during the investigation. This includes the design of the study, the methods of gathering and analysis data and the selection of the participants of the study. The methodology section is essential because it determines the accuracy and relevancy of the gathered data and its application within the processes of care for the elderly.

Chapter 3: Methods

Introduction

The methodology that has been adopted for performing the research study is the quantitative research methodology. The data for the literature review has been collected from different websites. Similarly, information dementia and cognitive deterioration has also been taken from different online resources. Secondary data was used from Adult Health Day Care Center for this research. methodology. The purpose of this study was: (1) to examine the efficacy of the stimulating, nurturing environment and treatments of adult day health care in ameliorating the symptoms and progression of both depression and dementia and (2) assess the extent to which depression can account for some of the cognitive deterioration in this population. The data from brief neuropsychological assessments was analyzed from 60 participants at the Monterey Peninsula Wisdom Adult Day Health Care (ADHC) Center who were assessed and diagnosed with depression and dementia. This chapter presents the research questions and hypotheses, describes the study sample and research design, and discusses ethical and quality considerations.

Research Questions

1. Is depression related to cognitive deterioration in elderly people?
2. Do ADHC services reduce deterioration of dementia in elderly?

Hypotheses

(1) Elderly/ elderly people will show no deterioration in dementia over a 6 month period of receiving ADHC services and thus there should be no difference in their cognitive functioning scores.

(2) Elderly receiving services at ADHC will have a lower score on the Depression scale and higher Cognitive score than those newly admitted to the ADHC.

Study Sample

The subjects of this investigation were 60 clients, aged 60+ years, who attended the Monterey Peninsula Wisdom Adult Day Health Care Center in California and who had a dual diagnosis of depression and dementia. The sample comprised males and females from diverse ethnic backgrounds (Hispanic, American Indian, Asian, Indian, Samoan, African, and others).

The treatment group (n=30) consisted of existing clients of the Center, while the other group consisted of new admissions with no history of treatment. It was predicted that client's receiving ADHC services over 6 months would demonstrate significantly less depression and cognitive deterioration than clients at admission with no history of treatment. It was further predicted that clients demonstrating greater depression would also demonstrate greater cognitive deterioration.

Research Design

A one-group, within-subjects, and pretest–posttest design was used. The independent variables were time (admission, 6 months after admission) and the number of days of attendance during those 6 months. The dependent variables were depression and dementia.

Archival data already existed at the Center for all clients who had been assessed for both depression and dementia upon admission and re-assessed after 6 months of attendance. Because a control group was not included in the design, it was not necessary to wait 6 months to compare the outcomes of a treatment group with those of a control group, so the available archival data of outcomes over 6 months were used for analysis.

Procedure

Two dependent *t*-tests were conducted to test the hypothesis that clients' depression scores would decrease over 6 months attendance at the Center, and that their dementia would not worsen over that period. To obtain converging evidence regarding the efficacy of ADHC services, the number of days of attendance was also correlated with depression and dementia outcome scores. It was predicted that the total number of days clients attended the ADHC Center over a 6 month period would be positively correlated with their change scores on depression—that is, more days of attendance would be related to greater difference (reduction) in scores. It was also predicted that the number of days clients attended the ADHC Center over a 6-month period would be negatively correlated with dementia scores: that is, more days of attendance would lead to less deterioration of dementia.

An additional prediction was that there would be a positive correlation between the levels of depression and dementia deterioration. Moreover, there would be a positive correlation between the absolute scores of depression and dementia on admission and 6 months later. Another correlation conducted in this study was between the change scores of depression and dementia from the time of admission to 6 months later. The prediction was that if a lower depression led to lower dementia, there would be a positive correlation in that case.

Materials

The different aspects of functioning were assessed using the following measures:

1. The MMSE was used to assess cognitive impairment (Appendix E).

2. The Geriatric Depression Scale (GDS) was used to assess severity of depressive symptomatology (Appendix F).

Each of these tests is explained in more detail below.

Geriatric Depression Scale

Yesavage and Brink (1983) developed the GDS. They investigated whether the existing depression scale were in a position to ascertain depression in geriatric population. Among the assessed scales were the following ones: Hamilton Rating Scale for Depression, the Beck Depression Inventory, the Zung Self-Rating Depression Scale, the Phenomena of Depression Scale, the Psychiatric Judgment of Depression Scale, the Grading Scale for Depressive Reactions, the NIMH Collaborative Depression GDS, the Verdum Depression Rating Scale, the SAD-GLAD, the CES-D, the MMPI Depression

Scale, and the SCL-90 Profile of Mood States. Out of the list is only the Zung Self-Rating Depression Scale, which was validated for the elderly population. However, it was found a limited ability to discriminate between non-depressed and depressed elderly.

The argument by Yesavage and Brink (1983) was that many used depression screening tools were complicated for the elderly population. The response systems including Likert scales scale, which require the elderly to make complex choices end up with disappointment for those, who are taking the test. In this regard, it is imperative to keep the test short and simple without compromising reliability and varidity. The used Geriatric Depression Scale is constructed with the elderly clients in mind and consists of 30 yes or no questions, which put little emphasis on somatic complaints. In this study of Yesavage and Brink (1983), the initial test consisted of 100 questions and was administered to 47 elderly, who were either hospitalized because of depression or had no psychiatric history. Of the 100 questions, the 30 highly correlated to the total scores were used in the final version of the GDS. In this study, the range of correlation was ranged from 0.47 to 0.83 with a median of 0.675.

Mini -Mental State Examination

Among the highly used and simple to administrate nethod is the Folstein test or MMSE. It has been widely used over the last three decades to assess cognitive imparement among the older adults. There are many studies that have been conducted to evaluate the consistency, accuracy, and efficacy of this assessment. Despite the debate over its usability, it has been widely practiced (Hosford, 2009).

According to Bowden & Meade (2005), the MMSE was created to provide brief and identical assessment of psychological state of a psychiatric patient. However, it is currently used in detection and tracking of cognitive disorders like Alzheimer's disease. It is used to screen and assess the severity of mental impairments and their severity, and it controls changes through the serial testing (Ridha & Rossor, 2010). It is widely used in many health settings in the world and is available in different languages to facilitate its usage. MMSE has been perceived as brief and well-proven screening instrument for cognitive impairments that measures orientation, language, immediate recall, calculation, short-term verbal memory, and constructional ability by Caritas Health Group (Ridha & Rossor, 2010). The questions include asking them to identify season, date, year, month and even the separate day. They are also asked to state some healthcare issues and perform some simple arithmetic doings. Others may contain the spelling of words such as the word 'world'. The ability to recall is evaluated by asking them to repeat the names of the objects. For every correct answer, respondents get one point.

Ethical Considerations

In research on human subjects, ethical and legal considerations are not always easy to identify because it is not always apparent what negative effects may result from experimentation or observation. The fundamental principles undermining the ethical conduct of research are the following ones: the participants should be the standpoint for investigation, and foreseeable threats to the participant's well-being, values, and dignity should be eliminated, as well.

The American Psychological Association (APA) (1994) has developed guidelines to ensure that research is designed and conducted in a way that takes ethical and legal implications into account and protects participants' rights. In the present study, the main considerations were informed consent and confidentiality.

Confidentiality

According to Burns & Grove (2005), Creswell (2005), and Neuman (2005), confidentiality is consideration significant factor in any research process. In order to ensure confidentiality in this study, only the aggregated data for the group was reported, and it was practically impossible to identify responses or scores belonging to a particular subject. The accessibility of data was limited to the researcher by the use of locked files. Furthermore, only the principal researcher had access to the master code used to code the consent forms for the subjects.

Informed Consent

According to Burns & Grove (2005), Creswell (2005), Neuman (2005), and Polit & Beck (2006), informed consent forms intengral part of any research process. The researchers are expected to educate participants in the research, their roles, and possible implications in order to have them make informed decisions about their participation. According to Creswell (2005), and Neuman (2005), participants should make their decisions freely without coercion with the understanding that participation entails. In this study, data of the agreement was obtained as an assurance of compliance with all ethical concerns.

Quality and Verification

Realiability and validity of any study is vested in the design of the study. All conducted studies must set standards for assessing the quality of work. As observed by Long and Johnson (2000), the quality of the study is evaluated by the soundness of its method, the accuracy of the findings, and the integrity of the assumptions and conclusions from the study.

Reliability

According to Noblit, Rogers, and McCadden, reliability is the ability of instrument to measure what it is supposed to measure. According to Noddings, reliability is the consistency or constancy of measuring instrument (Long & Johnson, 2000, p. 258). The main idea of showing the importance of reliability in the research is to see how consistant the results of the data are. In the present study, realiability was achived by analyzing two sets of secondary data to see how much their scores changed over time criteria. The current study showed reliability since the scores abtained from secondary data were highly correlated with one another.

Validity

While reliability indicates the consistency of measuring instrument, validity, on the other hand, as observed by Long & Johnson (2000), describes the ability of instrument to represent the characteristics of the phenomenon. Because of the natural setting, ecological or external validity was maximized, but internal validity was compromised to a certain degree due to the absence of control group, random selection or

random assignment. The goal was to investigate initial outcomes in the natural setting of the actual ADHC Center, upon which future researchers can build with increased internal validity. The above chapter has guided the reader on how this paper will endeavor to answer the research questions; the following chapters seek to present the analysis of the results of data gathered.

Summary and Transition

The hypothesis of the study was presented in this chapter in relation to the age at which the elderly show the symptoms under investigation and its importance in understanding their condition. The study sample is also justified and the focus of the study evaluated within the methodology section. A study design of one-group, within-subjects, and pretest–posttest design was used in the study. The materials of the study included the MMSE which was used to assess cognitive impairment of the elderly and the Geriatric Depression Scale (GDS) which was used to assess severity of depressive symptomatology. The ethical considerations of the study involved confidentiality of the information that was presented by the study subjects and its use for the purposes of the study alone. The consent of participants was also obtained before they would be involved in the study. The data that was gathered was tested for validity. The quality of findings was also verified. It was ascertained that the findings were reliable in answering the research questions and meeting the purpose of the study.

Chapter 4: Results

Introduction

The purpose of the study was to find out the relationship between depression and Cognitive deterioration in older adults. This chapter provides the outcome of the analysis of the study data. The relationship between depression and cognitive deterioration is examined using quantitative techniques. Two exploratory hypotheses are tested using various statistical techniques.

Demographic Characteristics of Study Sample

All 60 clients were aged 65 and above and had diagnoses of depression and dementia. The sample comprised 25 males and 35 females of whom the majority (70%) were of Hispanic background. The remainder was White (20%), Black (3.3%) and Asian (6.7%) as summarized inTable 1:

Table 1

Demographic Characteristics of Study Sample (*n*=60)

Age bracket	*N*	%
65-70	20	33.3
70-80	25	41.7
80-90	13	21.7
90-100	2	3.3
Ethnicity		
African American	2	3.3
White	12	20
Hispanic	42	70
Asian	4	6.7

Hypotheses

Hypothesis 1: Elderly receiving services at ADHC will have a lower score on the depression scale and higher cognitive score than elderly who are newly admitted to the ADHC.

Before proceeding with the main effect analyses—which explore whether changes in both dementia and depression, taken separately, are related to changes in neuropsychological functioning—it was first necessary to investigate whether depression and dementia, taken together, demonstrated any combined effect over time on these same aspects of neuropsychological functioning.

As predicted, there was a significant reduction in the clients' level of depression between the time of their admission and the time of their re-assessment 6 months later: $t\ (29) N = 30$, $p<.005$. The mean score on the GDS at admission was 14.9; 6 months later, the collective mean score on the GDS was 11.4, representing a 24% reduction in depression. This finding confirms (from secondary data) that receiving 6 months of services at an ADHC center is effective in significantly reducing the magnitude of depression as indicated in the table below:

Table 2

*Group 1 with No Depression versus Group 2 with 6 Months of Treatment; Summary for P-Value for t Test Depression (*n=*30)*

Scale	M	SD	P	r
Depression G1	14.9	6.64	0.11	0.314
Depression G2	11.4	5.85	0.18	-0.23

A trend was also found (p = .18) in the negative correlation (r = - .23) between the number of days clients attended and the reduction in their level of depression. The greater the number of days clients attended the center, the lower their depression score on the GDS. This suggests that clients with a diagnosis of depression would benefit from increased attendance. Although this correlation value did not reach statistical significance, the trend suggests a likely relationship. Future studies should include a larger sample to better evaluate this particular relationship. Figure 1 below summarizes

the correlation between depression and number of service days at the ADHC.

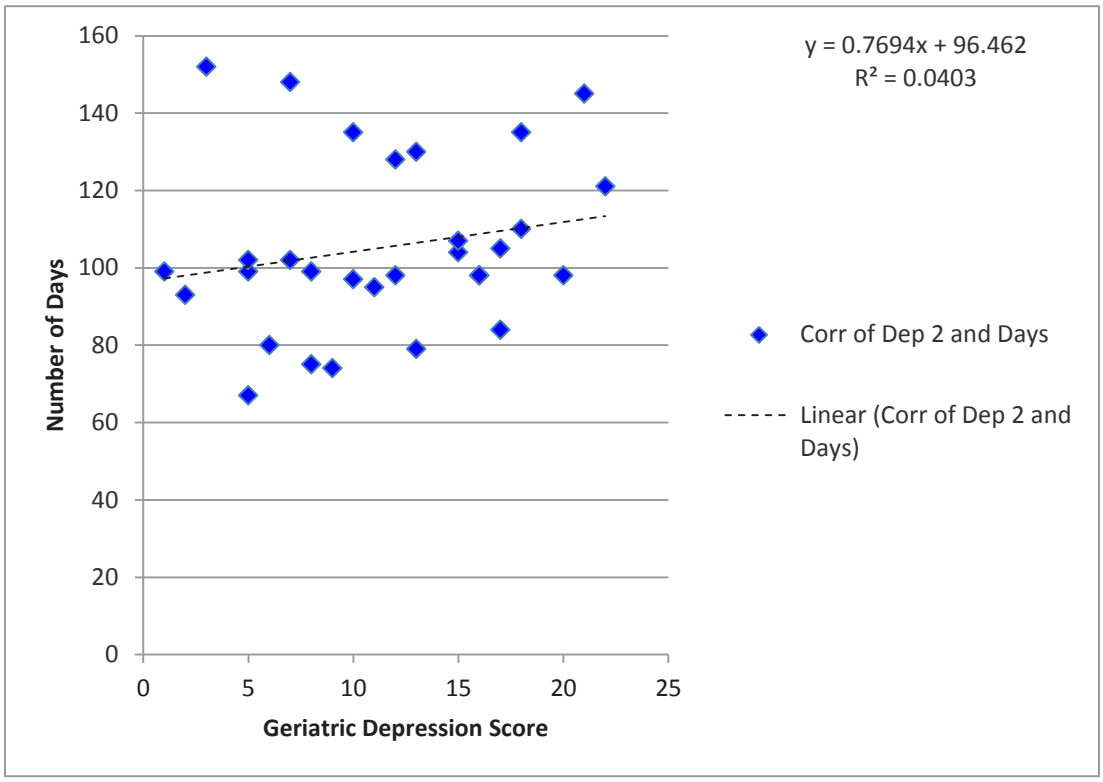

Figure 1. Correlation between depression and service days

Hypothesis 2: Elderly will show no deterioration in dementia over a 6 month period of receiving ADHC services and thus there should be no difference in their cognitive functioning scores.

As predicted, there was evidence that clients with a diagnosis of dementia as measured by the SLUMS score who engaged in 6 months of ADHC services demonstrated no significant deterioration in cognitive functioning, t(29) N= 30, p=.49. Clients' mean score on the SLUMS at admission was 15.9. At re-assessment 6 months later, the cognitive functioning mean score was slightly higher, though the difference was not statistically significant, at 16.3. This suggests that the cognitive stimulation provided

by ADHC services maintains current levels of cognitive functioning and increases resilience by preventing cognitive deterioration over a 6 month period. This result has significant medical and policy implications that are described in more detail in the following chapter. Future research could usefully replicate this study using a non-ADHC control group over a 6 month period and beyond. A summary of correlation between dementia and the service days is shown Figure 2 below:

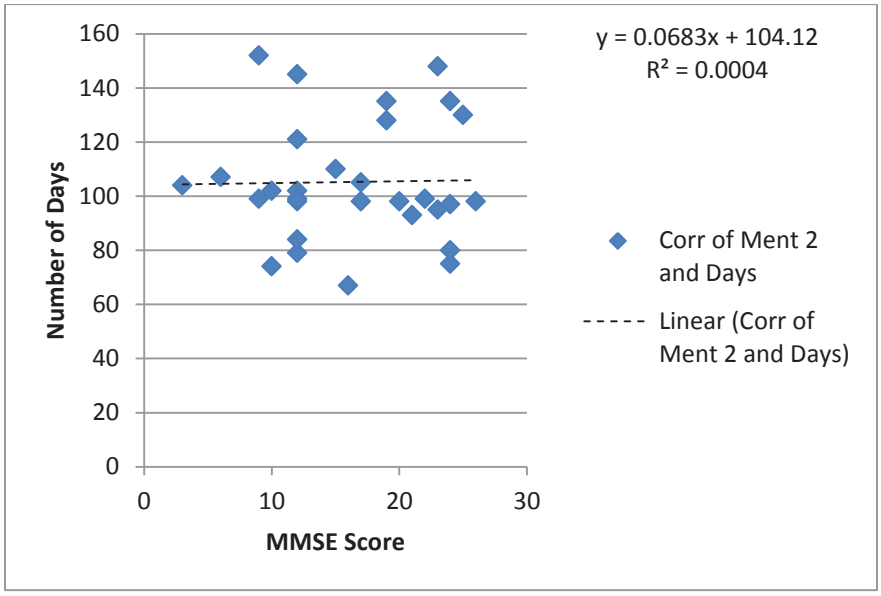

Fig. 2: Correlation between Dementia and Service Days

The hypothesis that depression exacerbates the cognitive deterioration associated with dementia was supported from secondary data. As predicted, clients' levels of depression (GDS score) and dementia (SLUMS score) were significantly correlated at admission, $r(29) = .31$, $p<.05$. It thus indeed seems that depression can exacerbate the rate of cognitive deterioration for those suffering from dementia. An alternative explanation is the reverse causal relationship, namely, that it is the cognitive deterioration

that is exacerbating the depression. A third explanation is that the two mutually exacerbate each other in a positive feedback loop.

An interesting and surprising finding was that the scores on the SLUMS and the GDS from secondary data were not significantly correlated 6 months later, r (29) = -.13, p = .27. At admission, cognitive abilities were predictive of depression and vice-versa, but that relationship was no longer evident after 6 months of services at the ADHC center. One explanation is that, regardless of their cognitive level of functioning, clients developed resilience to depression over a 6 month period by attending the stimulating social and health-supportive environment of the ADHC center and learned to adapt to activities of daily living, regardless of their cognitive abilities.

Table 3

Group 1 with no History of Treatment vs Group 2 with 6 months of Treatment

*Summary for P-Value for t test Depression (*n=*30)*

Scale	M	SD	P	R
Dementia G1	15.9	6.65	0.49	0.314
Dementia G2	16.33	6.38	0.28	-0.25

Although, overall, there was no significant cognitive deterioration, for those who did show some decline in cognitive functioning, there was - as predicted - a significant negative correlation, r (29) = - .14, p<.005, between their change score in depression and their change score in dementia. This further supports the hypothesis that depression has a

deleterious effect on the cognitive deterioration associated with dementia. An alternative explanation is the reverse causal direction, namely, that as cognitive deterioration worsens, depression increases. It is likely that both are occurring in a positive feedback loop, whereby increases in cognitive deterioration contribute to depression, which further exacerbates the cognitive deterioration, leading to worsening depression and so on. Future research is recommended to evaluate this possible cycle.

There was no significant correlation between the specific number of days attending and the score on the SLUMS, r (29) = - .19, p = .28. This suggests that even attending ADHC a few days a week (rather than the specific number of days of attendance during that week) are sufficient to mediate the typical decline of dementia. The table below shows the change of scores in depression and dementia.

Table 4

Change Score of Depression and Dementia (*n*=30)

scale	R	P
Depression and dementia G1	0.312	-0.13
Depression and dementia G2	11.4	0.246

Consistencies and Inconsistencies of the Findings

This study found out the existence of significant reduction in the clients' level of depression between the time of their admission and the time of their re-assessment 6 months later: t (29) *N*= 30, p<.005. The mean score for the Geriatric Depression Scale (GDS) was 14.9 at admission and reduced to 11.4 6 months later indicating a 24%

decline. This finding confirms that 6 months of services at the ADHC are effective for reducing the magnitude of clients' depression significantly.

This is consistent with the finding by Cho, Lavretsky, Olmstead, Levin, Oxman, & Irwin (2010) measured depressive symptoms both before and after the individual was diagnosed and found that there was no increase in depressive symptoms post-diagnosis. The finding is also consistent with those of Seirmarco et al. (2012), who found that depressive symptoms for the elderly were mild and, hence, low GDS.

The finding in this study also proves that when the clients are diagnosed with dementia as measured by SLUMS, there is no significant deterioration in the cognitive functioning. Before diagnosis, the mean score of the SLUMS was 15.9. Six months later, the mean SLUMS increased to 16.3, a value that was not statistically significant from 15.9. This means that the stimulation received from ADHC services was effective in preventing cognitive deterioration.

It is also found that depression may exacerbate the rate of cognitive deterioration for those suffering from dementia. This is consistent with Rucci et al. (2011) in the point that, depression may lead to cognitive deficit. It is also consistent with the finding made by Schoevers, Beekman, Deeg, & Tilburg (2000), and Geerlings & Bouter (2000) that depression is manifested as an initial symptom of dementia. An alternative explanation is the reverse causal relationship, namely, that it is the cognitive deterioration, which enhances depression. The third explanation is that the two sides mutually exacerbate each other in a positive feedback loop.

Summary and Transition

In conclusion, the study found out that ADHC center was effective in reducing the level of depression. There was a 24% drop in GDS between the time of admission and 6 months later. Therefore, the finding fails to reject the hypothesis that clients will have lower depression score at the end of 6 months than the level at the time of admission. There was a positive effect on depression made by offered ADHC services.

Additionally, the study found that when the diagnosis is administered to the clients with dementia, there is no significant deterioration of their cognitive functions between the time of admission and 6 months later. It is also unable to reject the hypothesis's statement that there will be no deterioration in dementia within the 6-month period, when clients will receive services at the ADHC Center.

There were also observed negative effects of depression and dementia on each other. The a bit surprising result that the relationship between depression and dementia existed at admission, but not 6 months later, suggests that the support, skill building, and joy accumulated at the ADHC center for 6 months also creates resilience and decouples the impact of these variables on each other. However, the findings are not conclusive in the relationship between depression and dementia. Depression may cause dementia, but both of them may also affect each other through a positive feedback loop. The above chapter gives an analysis of the data collected; the subsequent chapter gives a summery, recommendations and conclusions upon inferring from the analysis done above.

Chapter 5: Summary, Recommedations, and Conclusions

Introduction

The purpose of this study was to provide a protocol for depression in geriatric clients, who are diagnosed with dementia, assess the relationship between depression and cognitive deterioration. The purpose was also to determine the efficacy of ADHC in providing a stimulating and nurturing environment that can ameliorate symptoms and progression of both depression and dementia. The purpose of this chapter was to offer directions from based upon the analysis done in chapter 4.

Depression among the elderly was found to be a common problem among the elderly which was faced with challenges in the care process. These challenges are attributed to the limited understanding of the relationship between cognitive impairment and the depressed state of elderly. It is in this regard that the research findings are applicable in the modern care centers for the elderly in which quality of service is valued and these clients are focused at getting the most appropriate care. Qualitative studies on the factors which influence the quality of care for the elderly with depressive states and symptoms are recommended. This is based on the need to improve quality of care and ensuring that evidence based practice is implemented in the care processes of the elderly clients. The training needs of care professionals through the determination of skills and knowledge that care providers require for high quality of care should also be investigated upon. This is aimed at filling gaps on the topic which are evidently depicted in current research on the topic under investigation.

Depressive disorders are the most common type of mental disorder found in the elderly (Ginsberg, 2005). Some events that can precipitate or exacerbate depression are poor health, recent retirement, loss of a loved one or close friends, declining memory functioning, and relocation (Cho et al., 2010). Such depression causes a loss of personal happiness and constrains an elder person's living circumstances, often leading to a shift from home to a residential facility (Ginsberg, 2005).

Among the elderly, as observed by Cho et al. (2010), depression creates complex health concern in comparison to younger clients; this pertains to its effect on the quality of life. It deprives them of their happiness, well-being, and leads to poor physical health. Due to the isolation from friends and family that may result in depression, older adults may lack the comfort and support required to derive utility from instruments such as the social networks (Cho et al., 2010).

Summary and Interpretation of Findings

This study confirmed that 6 months of attendance at an ADHC center that provides health, supportive, recreational, and stimulating services is effective in reducing the magnitude of its clients' depression and halting the cognitive deterioration of their dementia. It provided compelling evidence that depression may contribute significantly to the cognitive deterioration observed in clients with dementia.

The fact that cognitive deterioration was halted for dementia clients who participated in ADHC centers—at least over a 6-month period—has significant medical and policy implications. First, it adds to the body of evidence that the cognitive

deterioration associated with dementia can be mediated, and that medical professionals should exercise caution when conceptualizing the trajectories of dementia and the interventions that try to mediate those trajectories. Second, if ADHC centers significantly alleviate depression and slow the progression of dementia, this has significant implications for policies that seek to reduce the $1.7 trillion dollars expected to be spent on them by 2030 (Alzheimer's Report, 2011).

A trend was observed between the number of days clients attended the center and the reduction in their depression. This trend supports the value of increased funding for ADHC services and suggests that clients should be encouraged to attend on more days and that states should subsidize those additional days.

The lack of significant correlation between the number of days attended and the level of cognitive deterioration is a little harder to explain, but may indicate that the benefits of ADHC services have a threshold, such that several days produce most of the effects and more days after that may yield diminishing returns. Future research is warranted to examine clients' attendance and the possible existence of such a threshold of efficacy.

Nonetheless, this study has provided meaningful and valuable findings that help us to better understand a complex and widely disputed topic. The relationship between dementia and depression remains unclear, but the results suggest that the disorders change independently of one another. While depression and dementia are significantly correlated over time, the relationship is largely accounted for by the relationship both

share with time. No interaction between depression and dementia was found that accounts for changes in functioning on a variety of neuropsychological measures, but, independently, dementia, and, to a lesser extent, depression, are related to neuropsychological functioning. This provides a state and national model for effectively addressing the baby boomers silver tsunami that started in 2010 and which will involve a dramatic increase in depression and dementia among the elderly. The accompanying financial cost presents a significant – perhaps the most significant – challenge to our health care system.

Implications

Informal Care giving

While the progression of dementia is highly variable between clients, with some experiencing rapid decline in functional status while others plateau for extended periods of time, Caregivers provide vital assistance to clients in such as clients' ADLs and IADLs (Weening-Dijksterhuis, Kamsma, & van Heuvelen, 2011). Eventually, these caregivers are involved in every aspect of daily life for the demented person, as these clients require more hours of support and greater levels of care than physically disabled elders without cognitive impairment (Feld, Dunkle, Schroepfer, & Shen, 2011). Primary caregivers and family members are often involved in managing behavioral problems, other chronic health conditions, preventative care and medications for the demented patient. While some of these clients live in institutional settings such as assisted living facilities or nursing homes, more than half of them live at home, where three-quarters of their care is

provided by an informal caregiver (Alzheimer's Report, 2011). These caregivers are usually spouses or children of the patient and may also be living with their own compromised health and other life stressors (Feld, Dunkle, Schroepfer, & Shen, 2011).

This study's finding that depression affects performance on different measures of neuropsychological functioning at all levels of cognitive impairment supports the claim that the treatment of depression remains important in clients whose cognitive abilities are deteriorating. Furthermore, indications that dementia and depression are discrete disorders suggest the need to provide comprehensive assessment of both depression and cognitive impairment in the elderly, in order to diagnose and treat the correct illness. Though there is significant symptom overlap between dementia and depression, it is inappropriate to assume that simply treating one of these disorders will affect the progression of the other.

Social Change

Positive social change results in the improvement of human and social conditions (Lepore & Kernan, 2009). With the coming silver tsunami created by the aging of the baby boomers, it is critical to find interventions and settings that can meet the humanitarian and fiscal challenges posed by depression and dementia in this population. An important emphasis of this research was to recognize how depression impacts dementia, that treatment for depression can mediate the cognitive deterioration of dementia, and that ADHC centers offer a practical setting for implementing those treatments and facilitating a culture-wide positive social change.

The change would be imperative in reducing cognitive disorder currently facing the old adults in America. Permanent cognitive impairment may result from the onset of depression (Grümer & Pinquart, 2011). Most psychopathology found in the aged, including depression, has not been directly linked to the physiological processes of aging. Other factors play a certain role. These include pre-existing maladaptive personality traits and inadequate coping skills, as well as health, genetic predisposition, and life stressors (Grümer & Pinquart, 2011).

Recommendations

Future Research

Replication of this study may be relevant through the use of larger samples of elderly people, who suffer from depression. This will facilitate detection of any differences that may arise. A control group could be used to investigate the relationship between such factors as participation in recreational activities and bereavement coping strategies and the risk of developing dementia.

A study should be conducted on a national level to examine various psychosocial factors in more depth. For example, the effect of geography, social class, or gender could be examined to determine if these factors influence whether depression increases the likelihood of developing dementia. The heritability of dementia following a diagnosis of depression could also be examined using behavioral genetic methodology.

Finally, although this study has high external validity, follow-up studies should aim to increase the internal validity through random selection and by randomly assigning

a control group to a wait-list in comparison with the treatment group, who received the ADHC services. When the internal validity is enhanced, the researcher is able to draw causal conclusion about the relationship between depression and cognitive deterioration.

Policy and Practice

Dissemination of these results to clinicians is important, because primary care physicians are most likely to treat depression in the elderly. Thus, the current findings should be reported in relevant professional journals.

Information about the importance of follow-up care after treatment for depression should be disseminated to the public. There needs to be increased community awareness of the permanent effects that depression can have on cognitive functioning.

The results of the study should be considered for inclusion in coursework for programs in clinical psychology and medicine, to enhance future practitioners' knowledge of depression.

Besides, policy makers should allocate more resources to the establishment and operation of ADHC centers as considerable part of the overall strategy to address the escalating economic and human costs associated with the aging population. This will allow those with dementia to live a more meaningful life and impact clients, their caregivers, and the whole society.

Conclusion

Accumulation of lifetime depressing events such as bereavement, coupled with the effects of physical illness, decreasing mental capacity, and deminished physical

energy as people age up make depression be closely related to the aging process. The American old adults are at a higher risk of developing depressive symptoms than the lower age cohorts (Stuart-Hamilton, 2000). The etiological factors are very common for the elderly to an extent of appearing to be normative.

As observed by Anderson (2002), a normative perspective of depression may be of the idea that treating depression among the old is a waste of time. However, a more comprehensive understanding of causes and symptoms of depressive conditions may prove other pint of view. There is evidence that treatment of this group through the use of available therapeutic intervention strategies can be effective and enhance life.

As observed from this study, the participation of clients in the ADHC Centers reduces the magnitude of clients' depression effectively. When the attendance becomes higher, the depression scores on GDS lower. The evident showed that there is no cognitive deterioration among clients with diagnosis of dementia within the 6 months at ADHC. This means that the services offered in ADHC are vital in maintaining and increasing resilience for cognitive capacity of the elderly. There is still the ability to help the elderly and mitigate the risks associated with the future facilitating and enhacing the available therapeutic intervention strategies.

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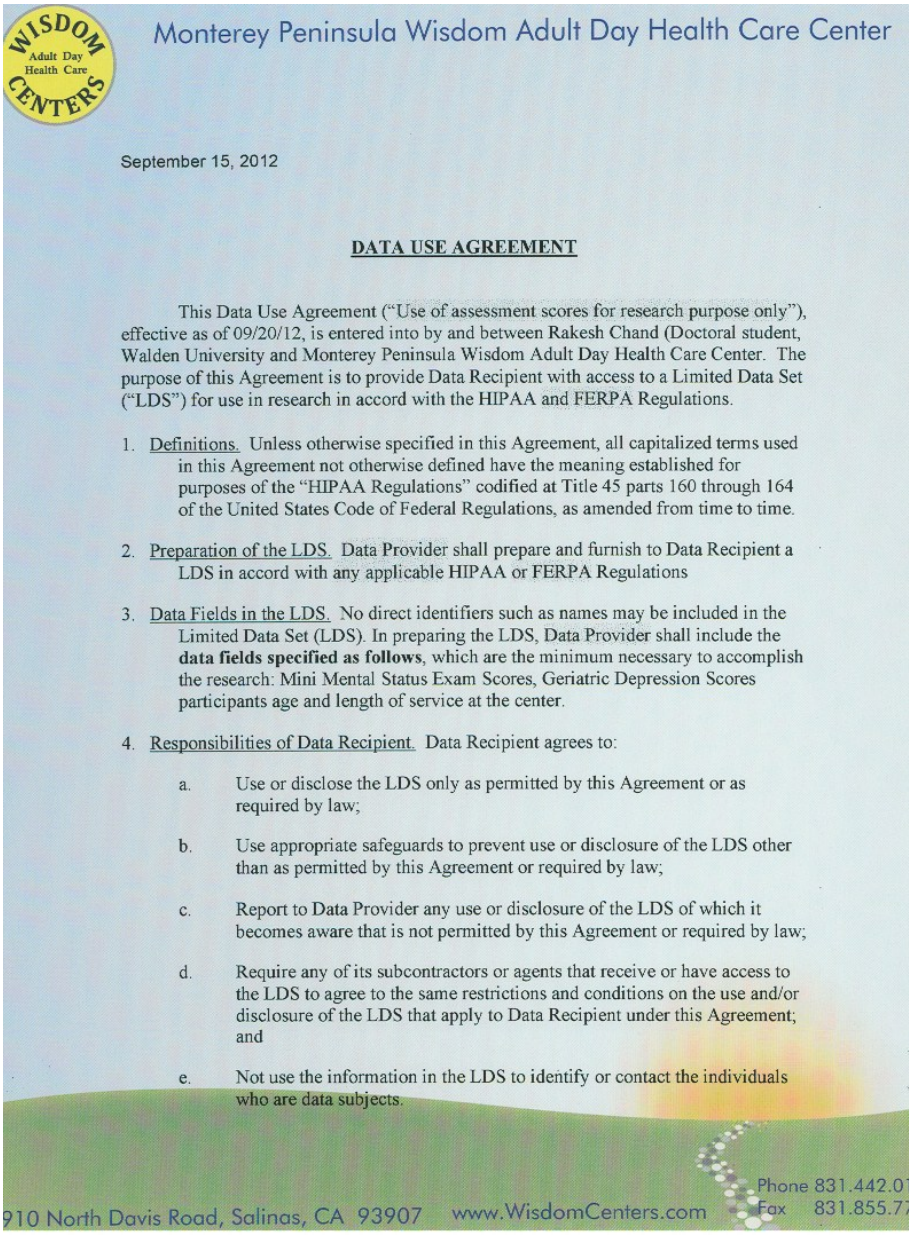
Appendix A: Raw Data: Depression and Dementia Score from Secondary Data

PTPS	Dep 1	Dep 2	Demt 1	Demt 2	Days Atnd	Demt Chg Score	Demt Chg Score
P1	5	13	20	25	130	8	5
P2	15	15	7	3	104	0	-4
P3	12	10	23	24	135	-2	1
P4	13	12	21	19	128	-1	-2
P5	22	18	21	19	135	-4	-2
P6	19	21	16	12	145	2	-4
P7	19	18	19	15	110	-1	-4
P8	22	22	10	12	121	0	2
P9	26	20	15	12	98	-6	-3
P10	21	8	24	24	75	-13	0
P11	19	13	17	12	79	-6	-5
P12	21	17	10	12	84	-4	2
P13	21	11	18	23	95	-10	5
P14	3	15	5	6	107	12	1
P15	2	5	19	16	67	3	-3
P16	13	3	10	9	152	-10	-1
P17	18	16	13	17	98	-2	4
P18	22	17	25	17	105	-5	-8
P19	15	16	18	20	98	1	2
P20	18	8	20	22	99	-10	2
P21	9	9	10	10	74	0	0
P22	14	7	21	23	148	-7	2
P23	13	7	5	12	102	-6	7
P24	4	1	5	12	99	-3	7
P25	24	10	21	24	97	-14	3
P26	9	6	25	24	80	-3	-1
P27	17	12	26	26	98	-5	0
P28	4	5	9	9	99	1	0
P29	14	2	17	21	93	-12	4
P30	13	5	6	10	102	-8	4

Appendix B: Data Use Agreement



Monterey Peninsula Wisdom Adult Day Health Care Center

September 15, 2012

DATA USE AGREEMENT

This Data Use Agreement ("Use of assessment scores for research purpose only"), effective as of 09/20/12, is entered into by and between Rakesh Chand (Doctoral student, Walden University and Monterey Peninsula Wisdom Adult Day Health Care Center. The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set ("LDS") for use in research in accord with the HIPAA and FERPA Regulations.

1. Definitions. Unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the "HIPAA Regulations" codified at Title 45 parts 160 through 164 of the United States Code of Federal Regulations, as amended from time to time.

2. Preparation of the LDS. Data Provider shall prepare and furnish to Data Recipient a LDS in accord with any applicable HIPAA or FERPA Regulations

3. Data Fields in the LDS. No direct identifiers such as names may be included in the Limited Data Set (LDS). In preparing the LDS, Data Provider shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research: Mini Mental Status Exam Scores, Geriatric Depression Scores participants age and length of service at the center.

4. Responsibilities of Data Recipient. Data Recipient agrees to:

   a. Use or disclose the LDS only as permitted by this Agreement or as required by law;

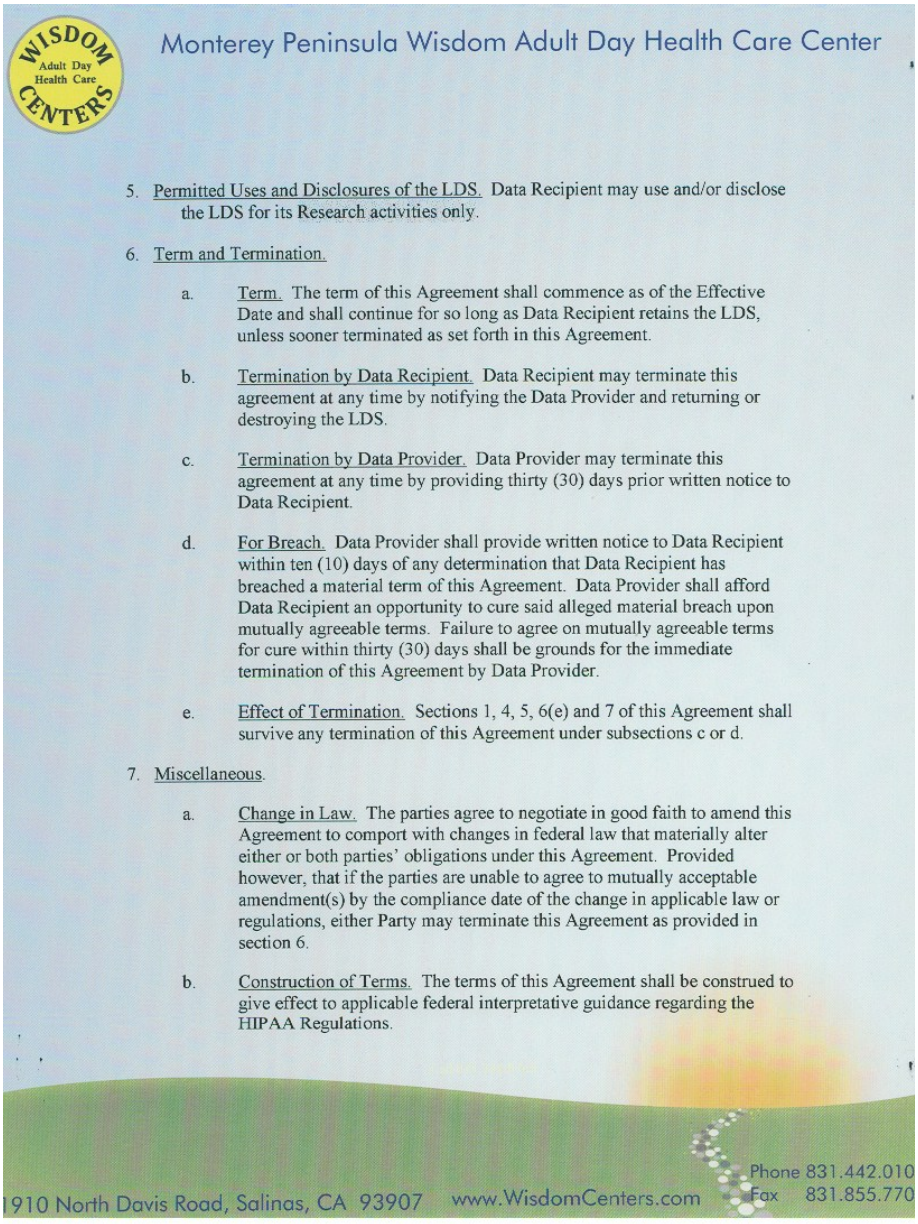
   b. Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

   c. Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

   d. Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement; and

   e. Not use the information in the LDS to identify or contact the individuals who are data subjects.

910 North Davis Road, Salinas, CA 93907 www.WisdomCenters.com Phone 831.442.0 Fax 831.855.7


WISDOM
Adult Day
Health Care
CENTERS
Monterey Peninsula Wisdom Adult Day Health Care Center
5. Permitted Uses and Disclosures of the LDS. Data Recipient may use and/or disclose the LDS for its Research activities only.
6. Term and Termination.
a. Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.
b. Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.
c. Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.
d. For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.
e. Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.
7. Miscellaneous.
a. Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.
b. Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.
1910 North Davis Road, Salinas, CA 93907
www.WisdomCenters.com
Phone 831.442.010
Fax 831.855.770

Appendix C: Data use approval

Monterey Peninsula Wisdom Adult Day Health Care Center

Mr. Rakesh Chand
Doctoral Student (Walden University)
875 Dearborn Pl
Gilroy, CA.

September 15, 2012

Dear Mr. Chand,

Based on my review of your research proposal, I give permission for you to collect data of the study entitled To Examine the Relationship between Depression and Cognitive Deterioration in seniors within the Monterey Peninsula Wisdom Adult Day Health Care Center. As part of this study, I authorize you to collect assessments scores for Mini Mental Status Exam, Geriatric Depression Scale and participant's age for depression and dementia participants only. Individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include: Provide you with personnel who will supervise you and help you collect the required data (one-week advance notice is required). We reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the research team without permission from the Walden University IRB.

Sincerely,

Dr. Shani Robins
Administrator/Owner

910 North Davis Road, Salinas, CA 93907 www.WisdomCenters.com Phone 831.442.010 Fax 831.855.770

Appendix D: Release of Information

Monterey Peninsula Wisdom Adult Day Health Care Center by the Sea
Release of Information

I _____ understand that Monterey Peninsula Wisdom ADHC Center by the Sea (the "Center") may need to obtain the below checked records and related information from physicians and other health care professionals in order to ensure continuity of care and proper treatment. I also authorize the center to release medical records and related information to others for purposes of my health care including the administration and management of my health care, research and utilization review. I understand and agree that this authorization specifically includes my permission and consent to release any information regarding a diagnosis of AIDS or results of Human Immunodeficiency Virus (HIV) tests. A photocopy of this authorization shall be as valid as the original.

(Client or client representative to initial each)

_____ Medical _____Psychological/Psychiatric _____Neurological _____ Consultation
_____Psycho – Social History _____ Lab Results _____ History and Physical ____ Radiology
_____ Other _____
I understand that _____ ADHC will utilize this information with the utmost confidentiality.

_____ _____
Client Signature Legal Representative if client is unable to Sign

_____ _____
DATE Center representative

*If client is unable to sign or able to mark "X" only, please state reason:_____

Appendix E

Mini-Mental State Examination (MMSE)

Patient's Name:_____
Date:_____

Instructions: Ask the questions in the order listed. Score one point for each correct response within each question or activity.

Maximum Score	**Patient's Score**	**Questions**
5	"	What is the year? Season?Date?Day of the week?Month?"
5	"	Where are we now: State? County?Town/city?Hospital?Floor?"
3		The examiner names three unrelated objects clearly and slowly, then asks the patient to name all three of them. The patient's response is used for scoring. The examiner repeats them until patient learns all of them, if possible. Number of trials: _____
5	"	I would like you to count backward from 100 by sevens." (93, 86, 79, 72, 65, …) Stop after five answers. Spell WORLD backwards." (D-L-R-O-W)
3		"Earlier I told you the names of three things. Can you tell me what those were?"
2		Show the patient two simple objects, such as a wristwatch and a pencil, and ask the patient to name them.
1		"Repeat the phrase: 'No ifs, ands, or buts.'"
3		"Take the paper in your right hand, fold it in half, and put it on the floor." (The examiner gives the patient a piece of blank paper.)
1		"Please read this and do what it says." (Written instruction is "Close your eyes.")

1	"Make up and write a sentence about anything." (This sentence must contain a noun and a verb.)
1	"Please copy this picture." (The examiner gives the patient a blank piece of paper and asks him/her to draw the symbol below. All 10 angles must be present and two must intersect.)
30	TOTAL

Instructions for administration and scoring of the MMSE

Orientation (10 points):

- Ask for the date. Then specifically ask for parts omitted (e.g., "Can you also tell me what season it is?"). One point for each correct answer.
- Ask in turn, "Can you tell me the name of this hospital (town, county, etc.)?" One point for each correct answer.

Registration (3 points):

- Say the names of three unrelated objects clearly and slowly, allowing approximately one second for each. After you have said all three, ask the patient to repeat them. The number of objects the patient names correctly upon the first repetition determines the score (0-3). If the patient does not repeat all three objects the first time, continue saying the names until the patient is able to repeat all three items, up to six trials. Record the number of trials it takes for the patient to learn the words. If the patient does not eventually learn all three, recall cannot be meaningfully tested.
- After completing this task, tell the patient, "Try to remember the words, as I will ask for them in a little while."

Attention and Calculation (5 points):

- Ask the patient to begin with 100 and count backward by sevens. Stop after five subtractions (93, 86, 79, 72, 65). Score the total number of correct answers.

• If the patient cannot or will not perform the subtraction task, ask the patient to spell the word "world"
backwards. The score is the number of letters in correct order (e.g., dlrow=5, dlorw=3).

Recall (3 points):

• Ask the patient if he or she can recall the three words you previously asked him or her to
remember. Score the total number of correct answers (0-3).

Language and Praxis (9 points):

• Naming: Show the patient a wrist watch and ask the patient what it is. Repeat with a pencil. Score
one point for each correct naming (0-2).
• Repetition: Ask the patient to repeat the sentence after you ("No ifs, ands, or buts."). Allow only one
trial. Score 0 or 1.
• 3-Stage Command: Give the patient a piece of blank paper and say, "Take this paper in your right
hand, fold it in half, and put it on the floor." Score one point for each part of the command correctly
executed.
• Reading: On a blank piece of paper print the sentence, "Close your eyes," in letters large enough
for the patient to see clearly. Ask the patient to read the sentence and do what it says. Score one
point only if the patient actually closes his or her eyes. This is not a test of memory, so you may
prompt the patient to "do what it says" after the patient reads the sentence.
• Writing: Give the patient a blank piece of paper and ask him or her to write a sentence for you. Do
not dictate a sentence; it should be written spontaneously. The sentence must contain a subject
and a verb and make sense. Correct grammar and punctuation are not necessary.
• Copying: Show the patient the picture of two intersecting pentagons and ask the patient to copy the
figure exactly as it is. All ten angles must be present and two must intersect to score one point.
Ignore tremor and rotation.

Interpretation of the MMSE

Method	**Score**	**Interpretation**
Single Cutoff	<24	Abnormal
Range		
	<21	
	>25	
		Increased odds of dementia
		Decreased odds of dementia
Education		
	21	
	<23	
	<24	
		Abnormal for 8th grade education
		Abnormal for high school education
		Abnormal for college education
Severity		
	24-30	
	18-23	
	0-17	
		No cognitive impairment
		Mild cognitive impairment
		Severe cognitive impairment

Appendix F

Geriatric Depression Scale

Date: _____

Please read each question and select the best answer that describes how you.ve been feeling in the past **week**.

Make check mark (□) in appropriate column.

Yes Or No

1. Are you basically satisfied with your life?
2. Have you dropped many of your activities and interests?
3. Do you feel that your life is empty?
4. Do you often get bored?
5. Are you hopeful about the future?
6. Are you bothered by thoughts you can't get out of your head?
7. Are you in good spirits most of the time?
8. Are you afraid that something bad is going to happen to you?
9. Do you feel happy most of the time?
10. Do you often feel helpless?
11. Do you often get restless and fidgety?
12. Do you prefer to stay at home, rather than going out and doing new things?
13. Do you frequently worry about the future?
14. Do you feel you have more problems with memory than most?

15. Do you think it is wonderful to be alive now?
16. Do you often feel downhearted and blue?

17. Do you feel pretty worthless the way you are now?

18. Do you worry a lot about the past?

19. Do you find life very exciting?

20. Is it hard for you to get started on new projects?

21. Do you feel full of energy?

22. Do you feel that your situation is hopeless?

23. Do you think that most people are better off than you are?

24. Do you frequently get upset over little things?

25. Do you frequently feel like crying?

26. Do you have trouble concentrating?

27. Do you enjoy getting up in the morning?

28. Do you prefer to avoid social gatherings?

29. Is it easy for you to make decisions?

30. Is your mind as clear as it used to be?

Appendix G: Resume

Rakesh Chand
e-mail: rakesh_fijian@hotmail.com

ACADEMIC EXPERIENCE

2009-Present Candidate for Doctor of Philosophy – Clinical Psychology,
Walden University, *Minneapolis, Minnesota*

2003-2005 Master Business Administration
New York Institute of Technology*, New York*

RELEVANT PROFESSIONAL EXPERIENCE

2007– Present ***Christian Counselor (part-time)***
Assemblies of God Church, Fairfield, CA

Responsible for Christian counseling; individual counseling with children, adolescents and adults; crisis intervention; marriage counseling, family therapy for children with ADHD, ADD and Asperger's Syndromes, Stress management training, relaxation techniques and counseling with chronic pain clients.

ASSOCIATED PROFESSIONAL EXPERIENCE

2010-2011 Practicum Student

Monterey Peninsula Adult Health Day Care Center.
Salinas, CA

Responsible for intakes; diagnosis under supervision; individual counseling with adolescents and adults; development and facilitation of groups adolescents and elderly; Services Board, custody cases and Social Security Administration; supervision and administration of all personality and achievement testing and consultations with caregivers referring clients to other resources as needed; administration of intelligence testing under

supervision and development and administration of a parenting assessment instrument.

August 2011-August 2012 Psychology Intern

Wisdom ADHC Center
Salinas, CA

- *Conduct psychological services including crisis intervention, community outreach and individual, couples, family, and group therapy.*
- *Participate in multidisciplinary consultation/liaison in order to coordinate care and develop treatment plans.*
- *Intake Interviews, abbreviated assessment including ADHD screening, and the provision of feedback and recommendations to families of adults with behavioral difficulties.*
- *Provide cognitive rehabilitation and assessment services using the following measures: Wechsler Adult Intelligent Scale (WAIS-IV) Saint Louis Mental Status Exam (SLUMS), BDI-II, and Geriatric Depression Scale (GDS) PHQ12, Dementia Rating Scale-2 and Repeatable Battery for Assessment for Neuropsychology Status (RBANS).*
- *Client population consists of monolingual Spanish-speaking, low income populations with dementia, severe mental illness, developmental disability, depression, bipolar and other mental illness.*
- *Receive training in the use of empirically supported treatments and other issues related to health psychology and neuropsychology.*

Supervisor: Kelly Yi, Ph.D.

PROFESSIONAL ORGANIZATIONS

American Psychological Association, Student Membership
American Association for Counseling and Development
California Psychological Association

HONORS AND AWARDS

2008 Recognized as Christian Counselor of the Year
Assemblies of God Church
Stockton, CA

CLINICAL/RESEARCH INTERESTS

Pain and Disability Management; Child and Adolescent Abuse and Self-Esteem; Factors involved in the development and maintenance of prejudicial attitudes; Role of attribution styles in the development of learned helplessness in adult students identified as high-risk

PROFESSIONAL PRESENTATIONS

2010 Poster Presentation – APA Conference - San Diego, CA. Disruptive child behavior causes affective distress and exacerbates negative parenting among parent couples with and without ADHD children: An experimental demonstration.

REFERENCES

Dr. Robin Joines, UC Berkeley, (614) 203-3145

Tonita Whrooli, Stanford University, (650) 799-9342

Other Experience

Hotel General Manager 1999 to 2008, Hampton Inn, Laquinta Inn & Suites, Red Roof Inn.