THE EFFECTS OF THERAPEUTIC ART THERAPY ON COGNITIVE FUNCTION IN POST STROKE OLDER ADULTS AT THE UNIVERSITY TEACHING HOSPITAL

BY

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DECLARATION

I…….. hereby declare that this is wholly my own work, and that the work of other persons utilized in this dissertation has been duly acknowledged. The work presented here has not been previously presented at this university or any other university for similar purposes.

Signature: ……..…… Date:…….

CERTIFICATE OF APPROVAL

This dissertation of Alice Ng'uni has been approved as partial fulfillment of the requirements for the award of the Degree of Master of Science in Clinical Neuropsychology by the University of Zambia.

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ABSTRACT

The population of older adults with stroke in Zambia is rapidly growing and reports of cognitive impairments such as that caused by stroke are becoming more prevalent. There is evidence that as people get older their cognitive abilities gradually deteriorate. Aging is said to have diverse effect on cognitive function especially in older people as it is associated with relatively little cognitive decline. This review presents available evidence regarding the benefits of art therapy and therapeutic arts interventions for post stroke survivors with cognitive impairment. Whilst available evidence is very limited, it suggests that art therapy may address many of the diverse cognitive, emotional and functional needs of people disabled by stroke. Attention, spatial processing, sequencing and planning seem to improve among those who persist with art therapy. Use of the stroke-affected limb may increase. Several studies report improvements in social interaction, and emotional expression. Most published reports offer single case examples, which are idiographic and illuminating. Art therapy a form of psychotherapy involving the encouragement of free self expression through painting, drawing, or modeling used as a remedial or diagnostic activity. (Kim, 2008:130). Aim: This investigation explored whether art therapy could provide cognitive benefits among the population of older adults which is often excluded from research on aging and cognition. Methods: A randomized controlled trial was used. A sample of 100 participants was recruited aged 55 to75 years old. Results**:** In order to evaluate cognitive functioning two tests were administered as pre and post intervention. Results showed that the mean change in scores among interventional group members was significantly greater than that of the control group ($p< 0.05=.048$ $t=1.68$, $p=.048$). There was significant improvement of cognitive performance among interventional group members as compared with the control group. This indicates that art therapy as a treatment modality provided a medium effect size ($d=.064$). Conclusion: The aim of the study was to evaluate the efficacy of art therapy as an intervention to improve cognitive functioning among older adults with stroke. The results suggested that art therapy may positively affect cognitive performance. Additionally the results suggested that art therapy may be culturally competent therapeutic approach.

Keywords: Art Therapy, Alzheimer Disease, Older Adults Cognitive Functioning, And Stroke.

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ABBREVIATIONS

AD: Alzheimer disease

ADL: Activities of Daily Living

CDT: Clock drawing test

CFQ: Cognitive failures questionnaire

CT: Cognitive Training

ETC: Expressive Therapies Continuum

FMRI: Functional Magnetic Resonance Imaging

MCI: Mild Cognitive Impairments

PET: Position Emission Tomography

CHAPTER ONE

INTRODUCTION

1.1 Background

Long-term disabling conditions threaten a person's identity and well-being in many ways, through loss of function and discomforting symptoms, changes in roles and occupations, altered social relationships, and a disquietening sense of liminality (Hammell, 2006). There is limited but increasing research into the benefits of creative arts therapies (including art, music, dance and movement, and drama) for people living with various long-term physical conditions, but stroke has largely been neglected (Michaels, 2007).

The prevalence of post- stroke cognitive impairment ranges from 20% to 80%, which varies for the difference between the countries, the races, and the diagnostic criteria. The risk of post-stroke cognitive impairment is related to both the demographic factors like age, education and occupation and vascular factors. The underlying mechanisms of post-stroke cognitive impairment are not known in detail. According to the Canadian study of Health and Aging (2000), it is estimated that 5% of all people over the age of 55years have evidence of cognitive impairments. There is evidence suggesting that the prevalence of cognitive decline after stroke would increase exponentially as age increases after 65 years old. Black et al 2011).

Stroke prevalence studies are very difficult to do and most of the ones that are done have inaccuracies as they may fail to identify those patients who die and those who recover completely (Connor and Bryer, 2005; Bonita et al., 1997). Stroke was considered to be the sixth leading cause of death in 1997 (Murray and Lopez, 1997) but is now thought to be the fourth leading cause of the global burden of disease (Lopez et al., 2006).

Stroke is one of the leading causes of morbidity and long term disabilities worldwide and post stroke cognitive impairments is a common and serious psychiatric complication of stroke. The World Health Organization (2008) defines stroke as the

dysfunction of the brain due to a disturbance of cerebral blood flow. It is caused by interruption of the flow of blood to the brain (ischemic stroke) or the rupture of blood vessels in the brain (hemorrhagic Stroke). The interruption of blood flow or the rupture of blood vessels causes brain cells (neurons) in the affected area to die.

Therapeutic Art therapy "is a form of therapy which involves forms of expressive therapy that uses the creative process of making art to improve a person's physical, mental and emotional well being." More also, it is a relatively new field, yet studies have shown overall improvement in patients who tried art therapy. Patient's feedback has included increased feeling of worth, feeling more in control, feeling more interested in life, more relaxed and sociable. The goal in therapeutic art therapy is for the patient to regain a sense of their ability to combine the physical motion with their thought. The field of therapeutic art therapy has been described as dynamic in both its delivery and treatment outcomes, and although the clinical practice of art therapy primarily deals with emotional expressivity, cognitive rehabilitation has been a documented goal with populations such as older adults (De Petrillo & Winner, 2005; Malchiodi, 2006).

Art therapy is thought to help participants gain insight into the psychosocial consequences of their disabling condition, to express their feelings about change and loss, and to make known their wishes for the future. Changes that are created in the art image may help to enhance perceived control and transform feelings about self and illness (McNiff, 1992). Creative arts therapies also offer empowering experiences for people, who are otherwise faced with profound powerlessness, not only associated with illness and disability but with medical treatments, the patient role, and altered social relationships. The choices experienced when engaging in creative arts therapies 'contribute to feelings of autonomy and dignity when other aspects of life seem out of control' (Malchiodi, 1999).

It has been reported that approximately, 15 to 30% of stroke survivors live with permanent disability Impairments after Stroke. This includes physical, social and cognitive impairments.

Cognitive impairments affect about 80% of stroke patients stoke statistic (2003). They are more common in the acute phase but many problems persist over time. The most common cognitive impairments among stroke survivors are memory, concentration, language and attention, executive dysfunction (initiation inhibition, mental flexibility) and aphasia. (Sturn,2002). Cognitive impairments are changes in thinking like difficulty solving problems. This also includes dementia and memory problem as well as many kinds of communication challenges.

Within this study, the term cognitive impairment refers to amnestic mild cognitive impairments (MCI). Language disturbance (for example, difficulty with sentence formation), attentional deficit (e.g., difficulty following conversations), and deterioration in visuospatial skills (e.g., disorientation and an inability to appropriately utilize fine/gross motor skills) are all associated with amnestic MCI and were addressed within this study (Gauthier et al., 2006).

Memory problems are some of cognitive deficits post stroke. People with stroke may experience memory problems. They tend to forget things, sequence or misinterpret or confuse information. An individual after stroke may mix up the details surrounding an event. Usually can recall events but get confused about when they happen or who was involved. For example, they may think a family member visited this morning rather than last night.

Executive function involves the ability to sequence, plan, organize, initiate and shift between tasks. The characteristic cognitive profile of sub cortical ischemic vascular disease includes early impairment of attention and executive function, with slowing of motor performance and information processing.

Executive dysfunction is an umbrella term for the range of cognitive, emotional and behavior difficulties which often occurs as result of stroke. People with executive problems have trouble organizing material, setting schedules. They may often misplace papers, reports and other materials for school or work.

Most people after a stroke find it difficult to concentrate or remember certain things. It can also found it difficult to work out how to do something or know how to respond to what is going around them. For instance, follow a television program or read a book.

Communication problems include aphasia, a condition affecting the ability either to understand or process language. Communication deficits may include decreased attention, distractibility and the inability to inhibit to read people, for instance not understanding the emotional context of a message or not understand body language.

Cognitive training (CT) is increasingly used to address cognitive performance among the elderly; in a concerted effort to reduce growing rates of cognitive dysfunctions after stroke. Researchers and clinicians have developed techniques for cognitive training programs to include puzzles, reading and verbal drills, and reasoning exercises (Elias & Wagster, 2007; Sitzer, Twamley, & Jeste, 2006). CT is beneficial in the improvement of cognitive performance (e.g., memory, concentration, and/or coordination) and is a regimented therapy that usually takes place in a clinical or laboratory setting. Research shows that CT has improved cognitive abilities for up to five years following the initial training with up to 40% of individuals returning to normal cognitive functioning (Willis et al., 2006).

Cognitive impairments make patients have more severe deficits in activities of daily living, a worse functional outcome, more severe cognitive deficits and increased mortality as compared to stroke patient without depression. Therefore, to prevent cognitive dysfunctions of poststroke patients, psychological treatment should be recommended. Therapeutic art therapy is one form of psychological therapy that can treat cognitive dysfunction and anxiety in stroke patients. Therapeutic art therapies are said to be highly effective psychological treatment for stroke patients. Stroke patients can express their internal conflicts, emotions and psychological status through art works or process and it would be a healing process of mental problems. In addition, therapeutic art therapy has been shown to have positive effects on various disease groups such as cancer, brain injury, dementia and cerebral vascular accident. However there is a significant lack of research into therapeutic art interventions in relation to

stroke. The use of artistic methods to treat psychological disorders and enhance mental health is known as Therapeutic Art therapy.

Therapeutic Art therapy integrates psychotherapeutic techniques with the creative process to improve mental health and well-being Chausson and Olinda (2010). Therapeutic Art Therapy is a mental health technique that uses the creative process of art making to improve and enhance the physical, mental and emotional well-being of individuals of all ages. It is based on the belief that the creative process involved in artistic self-expression helps people to resolve conflicts and problems, develop interpersonal skills, manage behavior, reduce stress, increase self-esteem and self-awareness, and achieve insight. Therapeutic Art therapy can be used to treat a wide range of mental disorders and psychological distress. Therapeutic Art therapy is not about what a great artist one is but rather it's about expressing your personal voice, finding joy in the process and exercising in our brains. For example, art therapist believes anyone no matter what age or ability can create masterpieces.

For example, a case study in which therapeutic art therapy was used primarily to address cognitive deficits after stroke was described by Kim et al (2008). A 59 year old woman, who had experienced a stroke one year previously, took part in art therapy alongside other forms of rehabilitation. Assessment from different art therapies she received revealed the client to have multiple cognitive deficits as well as difficulties in movement.

The use of art therapy is limited, and as a result, outcome research on art therapy with diverse older adults is lacking (Calisch, 2003; Hamilton, Hinks, and Petticrew, 2003; Linesch and Carnay, 2005). Previous art therapy research on cognitive performance and older adults has been further limited by reliance on anecdotal evidence, non-randomized designs, and small sample sizes (Slayton, Archer and Kaplan, 2010). In addition, Studies of post stroke cognitive performance and their management using therapeutic methods after stroke are limited by a lack of standardized definitions of what constitutes stroke and what determines cognitive impairment. By using an a randomized controlled trial study design with a moderate sample size of older adults with stroke, this study

sought to address this gap in research within the field of art therapy by looking at the effectiveness of art therapy in improving cognitive functioning among post stroke older adults.

1.1 Statement of the Problem

Current research suggest that African Older adults underuse available mental health services because such services often are not culturally compatible (Dinfelder, 2005 and Coon and Area, 2003). A modality of Art therapy is nontraditional in format may offer adults a more accessible venue for cognitive rehabilitation. Studies done elsewhere indicate that stroke can have damaging effects on the Neuro-cognitive domains that include cognitive, behavioral and motor skills are that mostly affected. (Ward, Lallemand and Witte, 2009). There is evidence that art therapy is effective at treating cognitive dysfunctions in primary care setting like clinics, with older adults with stroke yet most of research done on stroke have focused mainly on the physical therapy and pharmacotherapy aspect however, the aspect of cognitive rehabilitation if it is neglected tend to have great impact on the quality of life and might lead to devastating effect of such individuals. In attempt to fill this gap in knowledge, studies have proposed that more research should be done on the cognitive rehabilitating using therapeutic art therapy as it is rehabilitative because it involves experiences that are relevant and appropriately matched developmental needs. By doing so, it will help improve understanding of stroke determinate and burden worldwide to establish the characteristics of cognitive and behavioral outcomes. Changes in trends in stroke burden between countries of different income levels.

1.2 Rationale of the Study

Less expensive

As the cost of healthcare in Africa continues to rise, cost-effective prevention and rehabilitation programs are becoming increasingly important (Hinton et al., 2010). In general, the cost of implementing a rehabilitative intervention such as art therapy is less than the cost of administering psychotropic drugs on an ongoing basis (Stewart, 2004).

When given the choice, many minorities are more likely to want counseling and less likely to want medication (Miranda and Cooper, 2004).

Aging Demographics

Researchers estimate that more than 20% of the 39 million individuals in the Zambia over the age of 65 are afflicted with cognitive impairment (Plassman et al., 2008; Rodgers, Ofstedal, and Herzog, 2003; U.S. Census Bureau, 2009). Although severe cognitive impairment is not a part of the normal aging process, age is a risk factor for the types of post stroke cognitive impairment. (Manly et al., 2008). At early stages, cognitive impairment is reversible. Preventative therapy and/or early intervention therapy can delay the onset of cognitive symptoms, and have the potential to reduce post stroke cognitive impairments prevalence by one-third (Larrieu et al., 2002). Conversely, studies show that individuals with untreated cognitive impairment are 2.8 times more at-risk for AD (Manly et al., 2008) In a recent study, one-third of older patients receiving medication were reading at or below the sixth grade level (i.e., low literacy), resulting in difficulty understanding prescription medication warning labels (Davis et al., 2006). Additional research on non-pharmaceutical interventions with older adults and cognitive performance outcomes is needed. Minority older adults are a largely neglected segment of the population in terms of mental healthcare (Zuckerman et al., 2008).

Non-Traditional Format

Illiteracy is highest among older adults, yet is also a criteria commonly used to exclude participants from cognitive-training-affiliated research, even though illiteracy and low educational achievement have been shown to be strong risk factors for AD (Kim & Chey, 2010; Sitzer et al., 2006). Such factors hinder minority older adults‟ access to cognitive rehabilitation (Hinton et al, 2010). The creation of therapeutic art may be a culturally inclusive, non-traditional approach to providing cognitive stimulation. While traditional CT requires literacy for word drills and puzzles, art therapy does not. Educational, historical, cultural, and other contextual factors do not rule out “neural

processes that arise in the empathetic understanding of visual artworks" (Freedberg & Gallese, 2007).

It's quick to administer.

Art therapy is easy to administer and does not require literacy skills (Kim & Chey, 2010). Consequently, recent CT research has emphasized the need for more "user-friendly" interventions with, and results suggest that researchers need to develop effective collaborations with diverse communities so that interventions can be designed and implemented within homes and minority communities (Gallagher-Thompson et al., 2003). Psychotherapy has an associated stigma among elderly minority groups; however, in previous research, art therapy was described by older adults as "art classes," regardless of in-depth explanations of the therapeutic nature of the session (McElroy, Warren, & Jones, 2006). This association to "art class" rather than to "therapy" may make art therapy a more appealing option for cognitive rehabilitation (Alders, 2009; Hocoy, 2002), and the creation of art may facilitate the communication of feelings that older adults hold about their aging experiences (Abraham, 2004; Basting, 2006; Mendez, 2004; Miller & Hou, 2004; Rhoads, 2009; Silver, 1993).

Research suggests that therapeutic art therapy may additionally increase social support and address cultural concerns, both of which are relevant goals when treating older adults (Malchiodi, 2006; Wadeson, 2000). These characteristics of art therapy may be beneficial to diverse older adult cognitive performance outcomes (Hass-Cohen &, 2008). Art products created during art therapy can be taken home to share with family members, and art shows can be hosted in communities to encourage family unity rather than perpetuate stigma and family division as a result of cognitive impairment (Calisch, 2003).

Cognitive Plasticity

Plasticity Technology has enabled researchers to verify that cognitive impairments in aging populations may be caused by the deterioration of brain cells (Stern, 2009). Through the use of positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) machines, researchers have realized that cognitive

functioning can be positively influenced by a number of factors, and especially through mental stimulation (Stern, 2009). The hippocampus area of the cortex is responsible for the formation of new brain cells, and with stimulation, its density and mass may be increased or preserved, thereby continuing cell generation well into old age (K. Diamond, 2000). This capability of the brain to regenerate is referred to as neuroplasticity (Alzheimer‟s Association, 2010; K. Diamond, 2000; Grady, 2008). CT is founded on research demonstrating that the brain is "plastic" and able to undergo neurogenesis in a process of "sprouting" new connections between brain cells, particularly within the hippocampus (Stern, 2009).

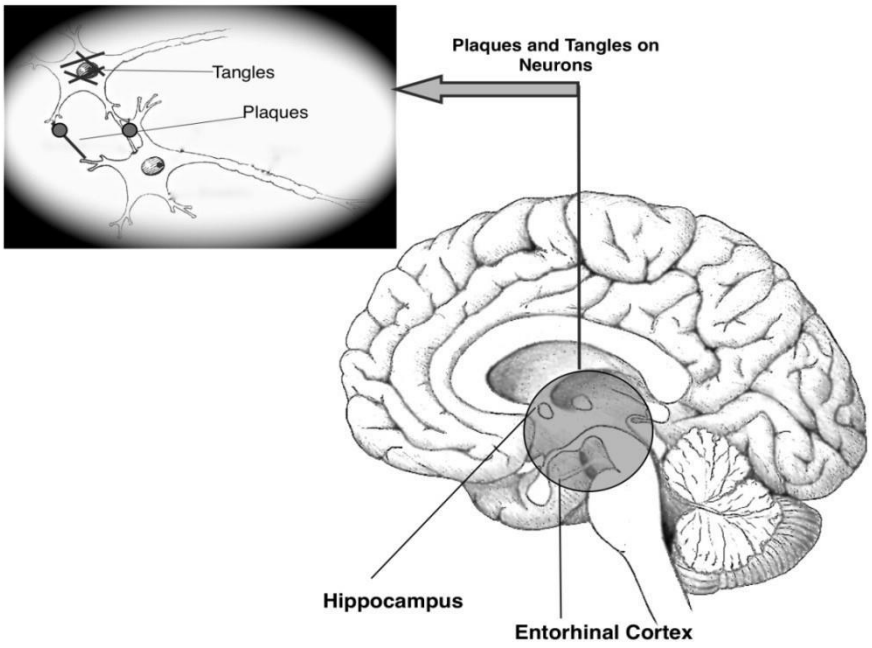

Figure1. Plaques and Tangles on Neurons within the Entorhinal Cortex and Hippocampus.

Exposure to an enriched environment (e.g., a reference to the promotion of physical activity, socialization, and problem solving) leads to an increase in new neurons, or neurogenesis, and a substantial improvement in cognitive performance (Kempermann, Gast, & Gage, 2002; Studenski et al., 2006). Physical activity (e.g., manually creating art), problem solving (e.g., deciding on color), and socialization (e.g., describing artwork made) are all naturally incorporated into art therapy sessions, creating an

enriched environment that increases the likelihood of neurogenesis (Alders, 2009; K. Diamond, 2000; Guillot et al., 2009; Riley, 2004).

The increase in socialization resulting from art therapy can be explained as follows: (a) art objects aid in communication and provide a point of reference during socializing (Abraham, 2004; Malchiodi, 2006; Østergaard, 2008); (b) older adult art therapy participants can show friends and family their artwork, increasing discussions that may in turn increase interest and motivation for continued socialization (Thoman, Sansone, & Pasupathi, 2007); and (c) social interaction engages diverse cognitive resources and distinct brain areas, and facilitates improved cognitive functioning (Glei et al., 2005; Ybarra et al., 2008). By stimulating various regions of the brain and simultaneously enhancing mood, art therapy may provoke such plasticity reactions within the brain (Hass-Cohen & Carr, 2008). According to Perry (2008), an internationally-recognized authority on brain development, art therapy is rehabilitative because it involves experiences that are: (a) relevant and appropriately matched to developmental needs; (b) pleasurable and therefore rewarding; (c) repetitive in creative tasks as well as rhythmic in the technical movements required, thus resonating with and stimulating neural patterns; and (d) respectful toward people, their families, and cultures through the creation of art that elicits cultural expression (Perry, 2008).

Philosophical Assumptions

Numerous philosophical stances describe art as a cognitive process. However, this research highlights philosophical viewpoints which propose that art serves the purpose of integrating diverse aspects of cognition while also serving as a "barometer of culture...reflecting the sum of a society's deepest philosophical values" (Marder-Kamhi & Torres, 2000; Rand, 1971, p. 129). The related philosophical assumptions presented herein propose that images in artistic depictions represent first-level concepts across all cultures and can therefore stimulate mental faculties (Campbell, 1999; Torres & Kamhi, 2000). This perspective provides a framework for this study since art therapy was investigated as a means to enhance cognitive capacity and improve cognitive performance.

Art as Cognition

Philosophical perspectives relevant to this research drew on 1950s studies of perception, memory, and concept-formation which took place during the cognitive revolution in psychology (Campbell, 1999). The ideas formulated during this revolution ultimately changed professional beliefs about cognition (G. Miller, 2003). Like cognitivists of the past and present, philosophers during this time contended that individuals can improve cognitive functioning through predetermined strategies (Campbell, 1999). Such philosophers shared with psychologists an interest in human knowledge and thought and addressed cognitive capacity (i.e., the amount of information the brain is capable of retaining) in much the same way that cognitive training studies do today (Campbell, 1999).

The philosopher, Ayn Rand wrote on the relationship between art and cognition, and believed in the concept of cognitive economy. She argued that art provides an efficient means for processing and conveying information (Campbell, 1999). In Rand‟s view, art demonstrates an instinctual human cognitive and emotional need to concretely perceive reality, and thereby provides dynamic mental stimulation. She argued, much like cognitivists of today, that insufficient mental stimulation impairs the brain‟s efficiency (Rand, 1966). Modern CT programs are based on a similar theory of the importance of mental stimulation and typically structure therapeutic sessions in order to enhance levels of mental stimulation (Sitzer et al., 2006).

Today, CT typically includes a set number of sessions (e.g., 10) that incorporate cognitive strategies aimed at stimulating the brain in ways that elicit verbal/episodic memory, inductive reasoning, and visual search and identification (Boron, Turiano, Willis, & Schaie, 2007; Willis et al., 2006). These three areas of stimulation are believed to be most effective for enhancing cognitive capacity and cognitive performance. Table 1 draws a parallel between CT, philosophies on art as cognition, and art therapy.

Table 1 *Overview of Parallels between CT, Philosophy on Art as Cognition, and Art Therapy*

Stimulated Area	Cognitive Training	Art as Cognition	Art Therapy
Episodic memory	Remembering details of stories	Identifying/embedding autobiographical information in art	Discussing details of and life experiences related to artwork
Inductive reasoning	Solving problems in a serial pattern	Solving problems of "concept-formation" by isolating and integrating content within images	Deriving meaning from images through interpretation, and meaning construction
Visual search and identification	Locating visual information	Locating intelligible subjects/objects in art	Deciphering and choosing images that include visual self-references

Verbal episodic memory Episodic memory directly relates to factual information, such as events, times, places, and emotions (Tulving, 2002). Episodic memory is an ability valued within society and includes autobiographical information; older adults with an intact episodic memory system are able to answer questions such as: Where are you right now? Where were you yesterday in the afternoon? (Tulving, 2002) During CT, episodic memory is stimulated through reading, drills, and structured tasks (Sitzer et al., 2006). When evaluating cognitive performance and diagnosing AD, clinicians (e.g., doctors, psychiatrists, and therapists) evaluate an older adult's episodic knowledge regarding person, place, time, and situation (Becker, 2000).

From a philosophical perspective, visual art may facilitate a heightened consciousness of autobiographical information and make the information directly perceivable (Marder-Kamhi & Torres, 2000; Torres and Kamhi, 2000). Art makes abstract but meaningful information from memories tangible and provides a source for "constant [mental] activity, [through] a constant stream of changing sensory stimuli" (Campbell, 1999, p. 111).

Inductive reasoning

Inductive reasoning involves the cognitive process of making Inferences based upon observed patterns; it is associated with higher order executive functioning and is considered to be an indicator of levels of intelligence and fluid information processing (Boron et al., 2007). The earliest declines in cognitive ability among the elderly are usually associated with reasoning (Singer, Verhaeghen, Ghisletta, Lindenberger, & Baltes, 2003). CT programs place emphasis upon inductive reasoning because it is a skill needed during daily living, problem solving, and learning (Boron et al., 2007; Van Gerven, 2002). To train inductive reasoning in clinical sessions, older adults are asked to form a conclusion based on incomplete or partial information (Sitzer et al., 2006). For example, an older adult may be asked to list the next item in a series of items or to anticipate what will happen next in a storyline (Boron et al., 2007).

Visual search and identification

Visual search and identification exercises are common aspects of CT; for example, a participant may be shown an object for a very brief period and then asked to find that object among several objects (Ueno et al., 2009; Willis et al., 2006). Learning - such as in CT - is enhanced through visualizations, and visual associations have been found to improve encoding and recall capacities, as well as speed of processing (Caine & Caine, 2006; Van Gerven, 2002; Willis et al., 2006).

Philosophical viewpoints relevant to this research hold that visual perception is the foundation of cognition (Binswanger, 1988). For Ayn Rand, identifiable visuals, which appeal to perception, are a basic requirement in art. Rand believed that a work of art has to be representational: “if art does not present an intelligible subject, it ceases to be art” (Rand, 1971, p. 45). Rand argued that a state of heightened consciousness facilitates the visual identification of meaningful characteristics in art, and contended that art “teaches man how to use his consciousness” (Rand, 1971).

1.3. Aim

The study explores evidence regarding the effectiveness of therapeutic Art therapy in improving Cognitive Functioning in older post stroke patients

1.4. Specific Objectives

i. To evaluate how cognitive performance among post stroke older adults improve significantly following 10 weeks of art therapy.
ii. To establish how Art therapy attendance can positively be correlated with cognitive test scores. (Clock Drawing Test and the Cognitive Failures Questionnaire)
iii. To determine how cognitive performance outcomes scores for each of the two tests are correlated (the Clock Drawing Test (CDT) and the Cognitive Failures Questionnaire (CFQ)).

1.5. Research Question: Will cognitive performance among post stroke older adults improve significantly following attendance in 10 weeks of Therapeutic art Therapy?

The demographics of the aging population in Zambia are rapidly changing as ethnically diverse groups continue to grow. The incidence rate of stroke increases with age, and cognitive dysfunction is higher among older adults; neither CT research nor art therapy research has adequately included groups of older adults. By providing art-based interventions tailored to diverse older adults, this study aimed to present a CT intervention that was culturally competent.

Previous literature indicates that art therapy can enhance the cognitive well-being of older adults. This research sought to improve upon previous art therapy studies by including minority older adults and exploring whether Therapeutic Art therapy could improve cognitive performance among post stroke older adults. It was hypothesized that cognitive performance would improve as a result of 10 weeks of art therapy sessions.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Although evidence has been collated about the benefits of art therapy (Slayton, D'Archer & Kaplan, 2010) and therapeutic art-making (Perruzza & Kinsella, 2010) for people living with many different health problems, stroke has been neglected. This literature review information related to the use of Therapeutic Art therapy as a cognitive training method with post stroke adults is presented. It equally seeks evidence regarding the Therapeutic benefits of Art therapy for post stroke survivors, interventions for cognitive impairment, post stroke and future research. First, post stroke cognitive impairment is described in terms of the population at highest risk (e.g., individuals over 65) and prevalence rates. The cognitive impairments (memory, concentration, executive function and coordination). Although the prevalence and trajectory of cognitive impairment are alarming, there is still much to be learned about post stoke cognitive impairment; a historical perspective on cognitive impairment definitions is provided to illustrate the development of scientific understanding.

2.2 Post-stroke cognitive impairment and stroke

Cognitive impairment is a spectrum of intellectual decline with mild to severe cognitive functional deterioration, Tatemichi and Desmond (1994). Some of the researchers used the term mild cognitive impairment (MCI) and dementia to represent cognitive impairment. Busse and Riedel-Heller (2006). MCI is a transitional phase between health aging and dementia. It involves impairments in memory domains that was reported by stoke survivors or their caregivers. Other cognitive domains normally remain intact and stroke survivors have the ability to perform activities of daily living ADL.

Post-stroke cognitive impairment occurs frequently in the patients with stroke. The prevalence of post- stroke cognitive impairment ranges from 20% to 80%, which varies for the difference between the countries, the races, and the diagnostic criteria. The risk of post-stroke cognitive impairment is related to both the demographic factors like age,

education and occupation and vascular factors. The underlying mechanisms of post-stroke cognitive impairment are not known in detail. However, the neuroanatomical lesions caused by the stroke on strategic areas such as the hippocampus and the white matter lesions (WMLs), the cerebral microbleeds (CMBs) due to the small cerebrovascular diseases and the mixed AD with stroke, alone or in combination, contribute to the pathogenesis of post-stroke cognitive impairment. The treatment of post-stroke cognitive impairment may benefit not only from the anti-dementia drugs, but also the manage measures on cerebrovascular diseases. In this review, we will describe the epidemiological features and the mechanisms of post-stroke cognitive impairment, and discuss the promising management strategies for these patients.

The prevalence studies focus on the whole population who show the cognitive impairment after stroke. Although these studies in community or hospital settings always fail to exclude the patients who have suffered the cognitive decline before the stroke, they have shown the seriousness of the problem. The cross-sectional study widely proceeded in ten countries suggests that about 30% ischemic stroke survivors show a cognitive impairment which is determined by the MMSE score is lower than 27, but the results of the studies vary for the difference between the countries, the races, and the diagnostic criteria. In Europe, such as Britain and Sweden, the prevalence of the cognitive impairment 3 months after stroke ranges from 24% to 39% according to the MMSE, while the prevalence in the same population is up to 96% according to the comprehensive neuropsychological test batteries. And In Netherland, the Maastricht CODAS which examined the cognitive function of 176 subjects with the first-ever stroke after 6 months by MMSE has suggested that the prevalence of cognitive impairment is up to 70%.

One study on patients with a first-ever stroke and TIA admitted to the hospital in Norway suggested that 57% stroke patients suffered from the cognitive impairment during the first year after stroke. Recently, a study based on the cohort of first-ever stroke patients without pre-stroke dementia in France suggested that the frequency of the cognitive impairment 3-month after stroke was 47.3%. In Australia, the studies have shown that cognitive impairment prevalence 3 months after stroke is 50% to 58%

according to a series of neuropsychological tests. What's more, the study also suggests that the cognitive impairment on the stroke survivor exist on any single domain such as attention, spatial ability, language and executive ability more frequently than the multiple domains. In America, the study on 212 subjects from the Framingham Study suggested that 19.3% of cases developed into the dementia in 10 years after stroke.

In a study by sachdev etal (2012) it was found that 58% of stroke survivors had cognitive impairment with a quarter of them diagnosed with dementia. It has also been reported that a stroke will double the risk of dementia. Leys (2005). In a Latin American study, 66% and 61% of stroke survivors were cognitively impaired at three and 12months of the study (39% cognitive impairment with no dementia; 22% demented) Delgado and Orella (2010). The prevalence of cognitive impairment remains 21% at 3months after stroke and 14years of follow up period. There is higher cognitive decline after lacunar stroke due to pathological causes where small vessel disease SVD affects wide region of the brain compared to nonlacunar stroke that involves extra cranial region.

In Asia, the study conducted by Yu *et al.* in South Korea suggested the highest result of all. Proceeding in 12 hospitals in South Korea which enrolled 620 patients with ischemic stroke, it proposed that the prevalence reached up to 69.8% 3 months after stroke as measured by Korea MMSE (24). The study on 252 Singaporean patients within 6 months post-stroke showed that 44% patients suffered from the cognitive decline, while the prevalence declined to 34% in 1-year follow-up.

The later prospective study in India showed that the prevalence of cognitive impairment was about 20% in total stroke survivors. In China, the study on 179 cases with 3 months after stroke in Hong Kong suggested that the prevalence of cognitive impairment after stroke was 21.8% as measured by MMSE, which would decline to 18% after the removal of previous stroke cases from the sample Zhou *et al*. examined the cognitive function of 434 patients with stroke by 1-year follow-up in Chongqing. The study suggested a 37.1% of cognitive impairment prevalence3 months after stroke and In Netherland, the Maastricht CODAS which examined the cognitive function of 176

subjects with the first-ever stroke after 6 months by MMSE has suggested that the prevalence of cognitive impairment is up to 70% .

One study on patients with a first-ever stroke and TIA admitted to the hospital in Norway suggested that 57% stroke patients suffered from the cognitive impairment during the first year after stroke. Recently, a study based on the cohort of first-ever stroke patients without pre-stroke dementia in France suggested that the frequency of the cognitive impairment 3-month after stroke was 47.3%.*Table 2: the studies on post-stroke cognitive impairments.*

Table 1 The studies on post-stroke cognitive impairment

Location and year	Population	Measured duration after stroke	Sample size	Outcome measure	Results	Reference
Sweden, 2011	Patients admitted to a geriatric stroke unit at Sahlgrenska University Hospital in Sweden after a stroke	38 days	Stroke: 74, control: 49	MMSE; neuropsychological test battery	39% with cognitive impairment as measured by MMSE; 96% with cognitive impairment as measured by neuropsychological test battery	Gutierrez Perez *et al.* (13)
Britain, 2013	Patients from South London Stroke Register	3 months; annual follow-up	271, 817 individuals with 63% white, 28% black	MMSE; abbreviated mental test	24% with cognitive impairment 3 months after stroke; 22% with cognitive \impairment relatively unchanged and at annual follow-up	Douiri *et al.* (14)
Netherland, 2004	Patients with a first-ever brain infarct from cognitive disorders after stroke	1 month; 6 months; 12 months	176	MMSE; neuropsychological test battery	10.8% with dementia and 71.1% with MCI at 1 month; 7.7% with dementia and 61.3% with MCI at 6 months; 7.7% with dementia and 51.5% with MCI at 12 months	Rasquin *et al.* (15)
Norway, 2011	Patients with a first-ever stroke or TIA, transient ischemic attack admitted to the stroke unit of Asker and Bærum Hospital	12 months	206	MMSE, the clock drawing test, TMT A and B, 10-word test, ADAS-Cog	19.6% with dementia and 37.5% with MCI	Ihle-Hansen *et al.* (16)
France, 2014	Patients with the first-ever stoke and no pre-stroke dementia from Neurology Department of Dijon, University Hospital	3 months	220	MMSE; MoCA	47.3% with the post-stroke cognitive impairment, including 7.7% with dementia	Jacquin *et al.* (17)
Australia, 2004	Patients with and without mild-to-moderate first-ever stroke from North East Melbourne Stroke Incidence Study	1 year	Storke: 99, control: 99	S-MMSE; IQCODE; IDA; DSM-IV	12.5% with dementia and 37.5% with cognitive impairment no dementia at 12 months	Srikanth *et al.* (19)
Australia, 2006	Patients from Sydney Stroke Study	3-6 months	Stroke: 169, control: 103	MMSE; NART-IQ; ADL; IADL; IQCODE; SOFAS	21.3% with dementia and 36.7% with MCI	Sachdev *et al.* (18)

Table 1 (*continued*)

2.3 Factors that affect the cognitive performance of stroke patients

There are many factors believed to affect the onset and progression of cognition among post stroke older adults fall into two broad categories lifestyles and genetics. Dembo (2015).The risk of the cognitive impairment after stroke is associated with the overlap of the frequent cerebrovascular disease and the dementia. According to the demography, the age, the education level, limited socialization, depress, stress and emotions are related to the post- stroke cognitive impairment risk.

- **Low education and mental stimulation.**

Before 1960, the brain was considered immutable and incapable of new cell growth. However, by 1964, researchers realized that the brain responds to enriched environmental input, such as education (Mungas et al., 2009). Individuals with low levels of education are more likely to experience cognitive impairment with an earlier onset of symptoms (Lievre, Alley and Crimmins, 2008). Education and learning have been found to produce a cognitive reserve (Stern, 2009) within the brain that better enables individuals to cope with the aging process (Roe, Xiong, Miller and Morris, 2007).

Environmental enrichment can affect the structure of the brain at any age; as a result, physiological differences are noticeable within the brain among lesser educated versus highly educated individuals, such as in the hippocampus (Diamond, 2001). Research shows that a more educated individual has larger hippocampus than a lesser educated individual. Without consistent stimulation, the hippocampus region deteriorates, losing mass and density as well as the ability to generate new brain cells (Czeh and Lucassen, 2007). When this occurs, individuals are at a greater risk for showing signs of cognitive decline, especially in language abilities and short-term memory (M. Diamond, 2001). Currently, a growing body of research suggests that active cognitive stimulation may inhibit the age-related cognitive decline associated with AD (Perneczky et al., 2009; University of California, 2007). Within the brain, cortisol levels are a well-known marker of stress (Gauthier et al., 2006). In low levels, cortisol works with norepinephrine (i.e., brain adrenaline) to create memories connected with emotional

events; with long-term exposure, however, cortisol has a neurotoxic effect and impairs learning and memory recall (Caine and Caine, 2006; Gauthier et al., 2006). Research indicates that high levels of stress can lead to loss of neurons, particularly in the hippocampus region of the brain (Rothman and Mattson, 2010).

- **Age**

Stroke affects people of all ages. But the older you are, the greater your stroke risk. In addition, the age is the risk factor of not only the stroke but also the cognitive decline. There's evidence suggesting that the prevalence of the cognitive decline after stroke would increase exponentially as age increases after 65 years old.

- **Emotions and socialization**

Stress is related to emotional expressivity; the concealing of emotion in ongoing social settings (e.g., home environments with family) has been identified as a stressor that can trigger cognitive impairment and is linked with degraded memory, communication, and problem solving among older adults (Richards, 2004). Studies show that emotional gratification, feedback, and expressivity, as well as enhanced mood during group settings, may protect against cognitive impairment (Gray, Braver, and Raichle, 2002). Mood and socialization are interconnected; for instance, older adults experiencing depression are less likely to socialize (Gilley, Wilson, Bienias, Bennett, and Evans, 2004). Studies have shown that socializing has a protective influence on cognitive function among the elderly (Crooks, Lubben, Petitti, Little and Chiu, 2008; S. Cummings, 2003). Social interaction engages diverse cognitive resources and distinct brain areas, and thereby facilitates cognitive health as well as substantial improvement in behavioral and cognitive performance (Kempermann et al., 2002; Ybarra et al., 2008). However, with aging often comes the loss of loved ones, which can demotivate older adults to join in social situations as well as provoke bouts of depression. Although socialization can promote cognitive performance, psychosocial factors such as depression can impede an older adult's desire to socialize and are therefore a significant problem (S. Cummings, 2003).

2.4. Therapeutic Art therapy and post stroke

The evidence located, whilst very limited, suggests that Therapeutic Art therapy may address multiple objectives with people affected by post stroke and other trauma to the brain (Barker & Brunk, 1991; Wald, 1999). As with art therapy practiced in other contexts (Perruzza & Kinsella 2010), its psycho-social objectives for stroke survivors include facilitating emotional processing and self-insight, social support, perceptions of control, and identity transformation. Art therapy has been described as helping stroke survivors to experience "renewed purpose and joy in living" (Wald, 1999; p.41). Unlike most descriptions of art therapy with people affected by other illnesses and disabling conditions, authors report its value for promoting stroke survivors' skills of physical coordination, attentional control, language recovery and visuo-spatial processing (Kim, Kim, Lee, & Chun, 2008; Wald 1999).

Clay work is presented as having particular therapeutic value for stroke survivors, in terms of promoting visuo-motor skills (Yaretzky & Levinson, 1996; Leonard 1993). The use of art therapy to address multiple objectives was illustrated in a case study by Wilson (2001). The case patient, David, was 65 years old. His stroke had affected the right side of his body, so forcing the use of the non-dominant hand. It had also resulted in expressive aphasia and attention difficulties. David was receiving regular occupational therapy, physiotherapy and speech and language therapy, in addition to art therapy. Wilson noticed that David sustained attention for longer whilst drawing during art therapy. Cognitive benefits ensued, such as improved attention, sequencing, planning and integration of form, as shown by the improving organization of images over the whole page and their more recognizable content.

In common with other post stroke survivors (as reviewed later in this paper), David also used his drawings to express his feelings. The art therapist observed how he responded intensely to a child-like drawing of a human figure, likening the image to his wife, and seemingly accessing memories and feelings that had been unavailable up to that point. The therapist considered this to be 'a pivotal event in his psychological recovery' (Wilson, 2001; p.46). Whilst this specific emotional experience clearly occurred within

art therapy, the multi-faceted contributions of the multi-professional rehabilitation program to his progress could not be isolated. Inter-relationships between the client's cognitive and emotional functioning were not clarified.

Yaretsky and Levinson (1996) used a form of art therapy to promote functional rehabilitation, as well as social interaction, in a group of hospitalized older people. The group met over a course of 5 weekly meetings and engaged in clay-work. Three of the group members were stroke survivors. The therapy included themes of home, assisting in patients' self-expression of feelings about their discharge from hospital. The authors noted how participants increasingly used their stroke-affected limb over the course of the therapy, and engaged in more social interaction. Longer-term benefits were not assessed, although the most of the participants expressed enjoyment of the group.

A further case study in which art therapy was used primarily to address cognitive deficits after stroke was described by Kim et al (2008). A 59 year old woman, who had experienced a stroke one year previously, took part in art therapy alongside other forms of rehabilitation.

Assessment revealed the client to have multiple cognitive deficits as well as difficulties in movement. Goals for art therapy primarily addressed cognitive domains of functioning, being described as "improving spatial perception capability, color recognition, shape recognition, size comparison of objects, induction of expressed internal emotion, and improved socialization" (Kim et al, 2008; p.130). The art therapy process appeared directed by the therapist, who encouraged the client to draw familiar images such as tree, house, self, and family. Over time, the drawings revealed improvements in spatial awareness, symmetry, and manipulation of shape. In addition, the client also appeared to express herself symbolically through drawing, although limited examples were given. The client's attention, memory and conceptualization are said to have improved over time, as did various measures relating to movement and upper limb function. The authors described the art therapy experience as highly motivating. They thought that it was likely to have been responsible for the changes seen in the client, as previous rehabilitation programs (that lacked art therapy) had not

resulted in clear improvements. Nevertheless, it remains uncertain whether the gains described could be attributed specifically to art therapy rather than to the other aspects of the rehabilitation program, or even the passage of time itself.

Horovitz (2005) presented an account of art therapy that addressed functional rehabilitation objectives as well as emotional recovery post-stroke. This account revealed a complex intertwining of therapeutic benefits, and also, like Kim et al (2008), difficulties in isolating the effects of art therapy within a multi-professional rehabilitation program. The case study concerned Bob, a 71 year old man who had experienced a left hemisphere stroke four years previously. This had left him with right side hemiparesis, expressive aphasia and severe apraxia (disordered movement). The objectives of art therapy included improving his expressive language, increasing his self-esteem and enabling him to express his emotional responses to the stroke. In some of his early artwork, the patient appeared to express feelings about his loss of function in nonverbal symbolic terms, through for example, presenting a figure with no hands, feet or ears. Art seemed to open up new ways of being for Bob, enabling identity transformation. He engaged in art therapy for three and half years and began creating art at home, acquiring progressively higher levels of skill. Bob drew much self- esteem from having his artwork framed and displayed in the clinic. Horovitz suggested that the support of the art therapy group as well as the art therapist helped to facilitate these transformational changes, together with the input of a speech and language therapist. The author also described the considerable benefits of art therapy for other patients living with aphasia following stroke. Many had flourished creatively, and had developed artistic skills despite having little or no interest in art before their stroke

Further case examples have primarily illuminated the ways in which art therapy facilitates self-expression of deep-seated negative feelings, leading to self-insight and improved adjustment to the consequences of stroke. The benefits of art therapy for assisting expression of anger, loss and abandonment was described in a case study of a 57 year old stroke patient by Carmi & Mashiah (1996). Nonetheless, communication may not solely discharge negative feelings. A creative arts program for frail older people was described by Johnson & Sullivan-Marx (2006). These authors provided a

brief case example of an older woman living with high levels of frustration associated with expressive aphasia and paralysis of her dominant hand following a stroke. In art therapy, the client was said to have felt able to express herself positively through her use of color and to have enjoyed the recognition of her artistic abilities by family and centre staff. She also experienced choice, the positive enjoyment of absorbing attention to color, and mutual social support within the art group.

2.5 Interventions for Post Stroke Cognitive Impairment

The goal of cognitive rehabilitation following stroke is to enhance the person's ability to process and interpret information and improve the person's ability to perform mental functions. Cognitive rehabilitation consists of diverse intervention. Studies have divided cognitive rehabilitation therapy in two components Pharmacotherapy and Non Pharmacotherapy**.**

- **Art Therapy**

Art therapy is an emotion-focused treatment and a growing field in the care and maintenance of persons with cognitive impairment (Mihailidis et al. 2010). In an overview of non-pharmacological approaches to dementia, art therapy was described as a treatment expected to improve the cognitive functioning of older adults by stabilizing their emotions (Yuko and Shin, 2004). Activities such as drawing and painting provide individuals with the opportunity for self-expression, decision-making, and other cognitive skills (Harlan, 1993; Kaplan, 2000; Serrano, Allegri, Martelli, Taragano, & Rinalli, 2005; Silvia, 2005). Furthermore, art therapy in clinical settings has been thought to bring a sense of humanization and emotional comfort to modern healthcare institutions (Pratt, 2004).

Art therapy is thought to help participants to gain insight into the psychosocial consequences of their disabling condition, to express their feelings about change and loss, and to make known their wishes for the future. Changes that are created in the art image may help to enhance perceived control and transform feelings about self and illness (McNiff, 1992).

Creative arts therapies also offer empowering experiences for people who are otherwise faced with profound powerlessness, not only associated with illness and disability but with medical treatments, the patient role, and altered social relationships. The choices experienced when engaging in creative arts therapies 'contribute to feelings of autonomy and dignity when other aspects of life seem out of control' (Malchiodi, 1999; p16). Furthermore, the person may reclaim aspects of self and identity through their creative self-expression, finding it possible 'unfold the cramped self, uncover losses and strengths, and gain the courage to begin a process of reclamation of story and life' (Ferris & Stein 2002, p.47). Identity loss is now being recognized as a great challenge for stroke survivors (Ellis-Hill, Payne and Ward, 2000), and the contribution of art therapy to identity reclamation and transformation is an important issue to explore.

Seventeen emotion-focused art therapy articles were reviewed as a part of the current study that included qualitative, case study, and quantitative designs. In one such article, a descriptive study, the non-verbal communication, sensory exploration, and self-reflective activity in art therapy were documented as allowing older adults with cognitive impairment to become emotionally expressive and thereby bypass some of their cognitive deficits (Kahn-Denis, 1997). Outcome-based and case study reports on art therapy interventions with nursing home residents indicated that participants showed significant improvement in measures of self-esteem as well as reduced depression and anxiety (Doric-Henry, 1997; Jonas-Simpson & Mitchell, 2005). Similarly, in a case study, the benefits of group art therapy were evaluated during 15, 90-minute, weekly sessions in a nursing home. The participants all faced a variety of physical and cognitive challenges. The emotion-focused approach, which also addressed cognitive performance, was described as addressing cognitive and emotional needs simultaneously (Tramer, 2008).

In a quantitative research study conducted by Rusted, Sheppard, and Waller (2006), emotional and cognitive needs improved as a result of art therapy. The researchers used a multi-center, pretest/posttest design and implemented art therapy for one hour per week for 40 weeks to a randomized experimental group that comprised individuals with dementia. The principal aim of this study was to test the premise that participation in art

therapy groups would lead to positive changes in both mood and cognition. Measures of depression, mood, sociability, and physical involvement were evaluated six times throughout the 40 weeks. In order to isolate the impact of art therapy, the researchers compared art therapy with activity groups (e.g., recreational therapy). The art therapy interventions were not described in detail, but some techniques were highlighted through vignettes; with access to a variety of art materials, participants created artwork with therapeutic connections to previous life experiences. Although time spent in art therapy sessions versus activity groups was comparable, art therapy sessions produced longer lasting and more dramatic cognitive performance benefits (e.g., significant correlation between emotional expressivity and enhanced cognition and mood) as compared to recreational activities (Rusted et al., 2006).

- **Cognitive Training**

Interventions such as cognitive rehabilitation and CT have yielded encouraging results (Elias and Wagster, 2007). CT has proven capable of cognitive enhancement (e.g., improved memory and a sense of personal control) that can continue for up to five years following the initial training intervention (Willis et al., 2006; Wolinsky et al., 2009). In a recent large-scale randomized control trial, results indicated that CT delayed cognitive and functional decline in older adults (Ball et al., 2002). Similarly, most of the research on the effects of CT on MCI has reported increased performance following training on objective measures of memory (Sitzer et al., 2006). However, randomized methods are not the standard in CT research, the majority of studies have limited power, and much of the research to date includes uncontrolled studies. Art-based, creative, and cognitive tasks may include techniques from counseling and other psychological contexts (Rubin, 2001). For instance, older adults in art therapy may use memories from their past to create art during sessions. Practitioners (i.e., art therapists) may ask older adult clients to visualize and describe a specific positive memory from their childhood; afterwards, clients may be asked to recreate the memory using the art materials present, emphasizing their favorite aspects of the memory with vibrant colors (Huitt, 2003; Rubin, 2001; Smucker, 2010). By incorporating positive emotional information,

research shows that creative tasks benefit cognitive performance (Labar and Cabeza, 2006; Scheibe and Blanchard-Fields, 2009; Silvia, 2005).

- **Creativity and Aging**

Creativity is a way in which older adults can engage in routine day-to-day activities in novel ways (Weisberg, 2010); some theorists believe that creativity is a repetitious process wherein the "world [is] mentally constructed in many different ways" (Schunk, 2007, p. 287). Through the combination and reorganization of previous experiences, creativity enables the mind to engage in multiple knowledge domains (Bracey, 2001). Through the manifestation of technical skill, divergent thinking, and original achievement, creative behavior is said to epitomize adaptability, an essential skill for today's older adults (Fisher, 1999; Jung et al., 2010; Weisberg, 2010).

Creativity and aging have been the focus of research at George Washington University. In a community-based multisite national study, Cohen (2006) investigated the impact of cultural programs (e.g., painting, jewelry making, and pottery) on the general and mental health of persons aged 65 and over. With a sample of over 300 older adults, this was the first large-scale creativity and arts study to use an experimental design. The study demonstrated that creative behavior enhances overall functioning, health, and quality of life among older adults (Cohen, 2006).

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- **Medication**

Although clinical trials are still being conducted globally, no pharmaceutical interventions have demonstrated conclusive effectiveness for MCI (Gauthier et al., 2006; Petersen, 2005); consequently, the Food and Drug Administration has not approved the use of drugs to treat cognitive impairment. Drugs known as acetylcholinesterase inhibitors (AChIs) have been demonstrated to improve concentration symptoms (Mehta, and Yaffe, 2005; Petersen, 2005). Physicians who are convinced that an older adult with stroke is showing signs of cognitive impairment may initiate therapy early through prescription medication (Petersen, 2005).

- **Compensatory strategies**

Cognitive training strategies fall into two categories: compensatory and restorative. Compensatory strategies teach new ways of working around cognitive deficits, such as mnemonic devices to remember forgotten words or phrases (Sitzer et al., 2006). Compensatory interventions often parallel education approaches and seek to enhance three areas of cognitive performance: memory (verbal episodic memory), reasoning (inductive reasoning), or speed of processing (visual search and identification; Sitzer et al., 2006). Selection of these targeted areas is based on the following: (a) the early decline of memory, reasoning, and speed of processing (e.g., by the age of mid-60); (b) the association of these abilities with activities critical for independent living (e.g., taking medications, managing finances, shopping, telephone usage, household management, transportation, driving, and meal preparation); and (c) the demonstrated effectiveness of interventions on these areas (Jobe et al., 2001; Willis et al., 2006).

2.6 The role of Therapeutic Art therapy on psychological effects of post stroke patients

Art Therapy. Art therapy is an emotion-focused treatment and a growing field in the care and maintenance of persons with cognitive impairment (Mihailidis et al. 2010). In an overview of non- pharmacological approaches to dementia, art therapy was described as a treatment expected to improve the cognitive functioning of older adults by

stabilizing their emotions (Masazumi, Yuko and Shin, 2004). Activities such as drawing and painting provide individuals with the opportunity for self-expression, decision-making, and other cognitive skills (Harlan, 1993; Kaplan, 2000; Serrano, Allegri, Martelli, Taragano and Rinalli, 2005; Silvia, 2005). Furthermore, art therapy in clinical settings has been thought to bring a sense of humanization and emotional comfort to modern healthcare institutions (Pratt, 2004).

In a quantitative research study conducted by Rusted, Sheppard, and Waller (2006), emotional and cognitive needs improved as a result of art therapy. The researchers used a multi-center, pretest/posttest design and implemented art therapy for one hour per week for 40 weeks to a randomized experimental group that comprised individuals with dementia. The principal aim of this study was to test the premise that participation in art therapy groups would lead to positive changes in both mood and cognition. Measures of depression, mood, sociability, and physical involvement were evaluated six times throughout the 40 weeks. In order to isolate the impact of art therapy, the researchers compared art therapy with activity groups (e.g., recreational therapy). The art therapy interventions were not described in detail, but some techniques were highlighted through vignettes; with access to a variety of art materials, participants created artwork with therapeutic connections to previous life experiences. Although time spent in art therapy sessions versus activity groups was comparable, art therapy sessions produced longer lasting and more dramatic cognitive performance benefits (e.g., significant correlation between emotional expressivity and enhanced cognition and mood) as compared to recreational activities.

Similarly, in a Korea-based case study conducted in 2008 by Kim, Kim, Lee, and Chun, art therapy was used as a means to address stroke-related cognitive impairment in an Asian female participant. The study included twice weekly 40-minute art therapy sessions for 10 weeks. Tasks included drawing common objects, such as clocks, houses, and trees, as well as self-portraits or drawings of family members. Other tasks included drawing figures after viewing pictures of houses or portraits, finding hidden or different figures in a drawing, drawing with a three-point perspective, and making objects out of clay. Researchers sought to improve spatial perception, color recognition, shape

recognition, size comparison of objects, induction of emotion, and socialization. Results from psychological tests conducted before and after art therapy treatment showed improved scores in visual perception, cognition, and emotional functioning.

In a related study by Musha, Kimura, Kaneko, Nishida, and Sekine (2000), 41 Asian older adults were chosen out of a group of 118 experiencing cognitive impairment. They received one year of art therapy treatment. The researchers used EEGs during art therapy to track changes in state of mind, such as mental stress, depression, joy, and relaxation, to see how the patients responded to the therapy. Joy was the most common response to the sessions. The study demonstrated that joy in art therapy was associated with stabilization or improvement in cognition (as determined by MMSE scores) in 85% of participants.

The use of art therapy to address multiple objectives was illustrated in a case study by Wilson (2001). The case patient, David, was 65 years old. His stroke had affected the right side of his body, so forcing the use of the non-dominant hand. It had also resulted in expressive aphasia and intentional difficulties. David was receiving regular occupational therapy, physiotherapy and speech and language therapy, in addition to art therapy. Wilson noticed that David sustained attention for longer whilst drawing during art therapy. Cognitive benefits ensued, such as improved attention, sequencing, planning and integration of form, as shown by the improving organization of images over the whole page and their more recognizable content.

2.7 Pathophysiological Basis of Art Therapy

One theory shaped the art therapy method used in this investigation: Vija Lusebrink and Noah Hass-Cohen. Lusebrink, a prominent theorist in the field of art therapy, developed the Expressive Therapies Continuum (ETC), which has been applied as a fundamental art therapy theory (Hinz, 2009; Kagin & Lusebrink, 1978). This theory aims to facilitate art therapists‟ clinical decision-making by providing an understanding of cerebral activity during creative experiences, and helps to explain why older adults may benefit cognitively from art therapy (Hinz, 2009; Kagin & Lusebrink, 1978).). In her 2004 publication, Lusebrink explained that: Art therapy is an action- oriented

therapy. Visual expressions involve complex sensory information from the parietal lobes that is forwarded, along with emotional input from the limbic area, to the prefrontal cortex with its regulatory functions.

Almost all programs related to art therapy, even those addressing cognition, prioritize expressivity, emotional regulation, and mood. One underlying assumption of art therapy is that art-making enhances mood by way of facilitated emotional expressivity (De Petrillo & Winner, 2005). Art therapy has been shown to increase clients‟ experience of comfort during therapy sessions, and participants who completed artwork during treatment reported more enjoyment, a higher likelihood to continue with the treatment, and a desire to recommend the treatment to family and friends (Pizarro, 2004; Riley, 2004). Additionally, in a study by Herman and Larkey (2006) targeting the Latino population, art-based activities resulted in a statistically significant increase in motivation to enroll in psycho-educational mental health services.

During art therapy, the use of colors, textures, and malleable materials stimulates areas of the brain located within the limbic system (Hass-Cohen and Carr, 2008), which is associated with the hippocampus and emotional regulation (Stern, 2009). Artistic expression in a therapeutic environment can potentially improve memory by providing opportunities for emotional regulation and increased mental activity (Riley, 2004). Through art-making, art therapy requires an integration of higher cortical thinking, such as planning, focused attention, and problem solving, and increases the likelihood of cognitive health (Hass-Cohen and Carr, 2008). Researchers and theorists now believe that engaging mental activities such as in art therapy may stimulate the brain in a way that increases an individual's cognitive reserve, allowing that individual to compensate for and overcome neural changes associated with cognitive decline (Calero and Navarro, 2007; Craik et al., 2007; Hass-Cohen and Carr, 2008).

2.8 Problems with Art Therapy Research

Art therapists argue that creating emotion-based artwork has the combined benefit of providing mental stimulation and alleviating emotional stressors (Hass-Cohen & Carr, 2008; Malchiodi, 2006). Although there have been attempts to test the effects of art

therapy on cognitive performance among the elderly, there remains a dearth of solid research (De Petrillo & Winner, 2005). Art therapists are said to "lack the practical, theory-building, and institutional research foundations which would enhance, clarify and build the theoretical underpinnings of art therapy' (Deaver, 2003, p. 26). Currently, there is only a small body of quantifiable data to support the claim that art therapy is an effective treatment method (Reynolds, Nabors, & Quinlan, 2000; Slayton et al., 2010). Table 3 highlights the characteristics, methodology, and design aspects of each article. Problem area(s) as described by Slayton et al. (2010).

Table 3: The characteristics, methodology, and design aspects of each article that needs improvement

Outline of Studies: Areas for Improvement

Author; Year	Sample	Length	Characteristics	Problems
Doric-Henry (1997)	*N* = 20 19-F, 1-M Ethnicity- no report.	1hr, 1x a wk, for 8 wks	Setting: Nursing home. Material: Pottery. Focus: Self-esteem, depression, and anxiety. Assessments: Self-evaluations and case progress notes. Outcome: Significantly improved measures of self-esteem and reduced depression and anxiety, relative to a comparison group.	Biased measures. Demographics not reported. Predominantly female.
Wikstrom (2000)	*N* = 40 Females Ethnicity- no report	1hr, 1x a wk, 4 mo.	Setting: Assisted Living. Materials: Art images- Dialogues on images. Focus: Communication. Assessment: Subjective measure. Controlled intervention study. Outcome: Significantly improved communication as a result of art images relative to a control group.	No art therapist. Biased measures. Female only. Demographics not reported.
Sezaki and Bloomgarden (2000)	*N* = 3 2-F, 1-M Ethnicity- no report	60-80 min, 1x a wk, 10 mo.	Setting: Community-based homecare. Material: 2-D; Squiggle Game, Visual Conversation. Focus: Communication skills. Assessment: Self-report (unspecified) by the families and the agency. Outcome: Evidence for art therapy as a home-based service.	Demographics not reported. Unspecified self-report used. Small sample/Case study.
Musha et al. (2000)	*N* = 41 Asians Gender - no report.	1 year frequency- no report	Setting: Community workshops. Material: Multi-modal, 2-D and 3-D. Focus: Enhanced emotional state. Assessments: Emotion Spectrum Analysis Method, MMSE and family questionnaire. Outcome: Majority of art therapy participants demonstrated neuronal responses of joy and enhanced cognitive functioning.	Demographics not reported. Art therapy intervention not described in depth. ESAM validity questionable.
Seifert and Baker (2002)	*N* = 7 6-F, 1-M Ethnicity- no report	1hr, 2x a wk, 3 yrs	Setting: Residential facility. Material: 2-D. Focus: Exploring complexity and symmetry. Assessment: Formal elements of artwork analyzed and recorded; Qualitative. Outcome: Significant correlations suggest art therapy products can provide valuable information about changes in perceptual and cognitive function.	Demographics not reported. Conclusions drawn from small sample. No art therapist.

Previous literature indicates that Therapeutic art therapy can enhance the cognitive well-being of older adults. This research sought to improve upon previous art therapy studies by including older adults post stroke and exploring whether Art therapy could improve cognitive performance among post stroke older adults. It was hypothesized that cognitive performance would improve as a result of 10 weeks of art therapy sessions

CHAPTER THREE

RESEARCH METHODOLOGY

In this chapter, an overview of the methodology employed during the current study is provided.

3.1. **Study Design**

The study utilized a Randomized controlled trial study design. Controls and intervention groups were established through randomizing. A technique aimed at giving participants the opportunity to be assigned to treatment conditions at random that is, they have an equal probability of being assigned to any group. In addition, it enables to test whether an intervention works by comparing it to a control condition.

3.2 Study Site

The study was conducted at the Medical Out-Patient Clinic (clinic 5) at the University Teaching Hospital. Therapeutic art Therapy was done in Clinic 6 with the help of other therapists. The University Teaching Hospital in Lusaka is the biggest hospital in Zambia. In addition, it serves as the country's specialist centre receiving referrals from over the country.

3.3 Study Population

The study population included all patients at Out- Patient Clinic at the University Teaching Hospital. The target population included post stroke adults' patients with cognitive impairments aged 55 to 65 attending the outpatient physiotherapy department from urban areas of Lusaka province at the University of Teaching Hospital and with at least five (5) years of education. This age range was chosen because these individuals are prone to cognitive impairments as their age's progresses and are the segments of the society that is usually neglected when it comes to research. Approximately, a total of 72 post stroke older adults with cognitive impairments adults were recruited for the study.

3.4 Variables

Independent- Age (older Adults), Gender and Art therapy access

Dependent- Cognitive Performance and Stroke

3.5 Study Sample

The ideal sample size for this study was calculated using G*Power, a general analysis program used to estimate sample size. Information for the analysis was based on the pilot study. Given the results of the analysis, the study sought to include approximately 100 total participants to account for attrition. G*Power estimated that approximately 72 participants would be needed.

A total of approximately72 participants were to be recruited in the study comprising of individuals aged 55 to 65 years old from the university teaching hospital. Participants were required to have attained 5years of education.

3.6 Recruitment

Participants were recruited by the nurses at the outpatient clinics (Clinic 5) initially; all consented interested individuals were randomly assigned to either the control or experimental group. Randomized sampling was used to select the participants who met the inclusion criteria. The Research Nurses would visit hospital Neurological wards to provide information about the research to potential participants and seek their permission to be contacted by the research team in the future (and therefore, permission for their contact details to be passed on to the research team). The questionnaires were completed at their convenient times and when they are able to discuss potential future participation in the research. The participants were then referred to the researcher who obtained the informed consent after administering the a screening form which was used to collect key demographic and contact information from all willing, consented patients, who will then be contacted by the local therapist three months from the date of consent to be contacted.

After the two groups were created that's Controls and Interventional groups. The patients had to undergo Therapeutic art therapy which was provided to them in Clinic 6 with the help of therapists.

3.7 Inclusion Criteria

The study enrolled participants who met the following criteria

- Aged between 55 and 65 years both male and female, because this is the age group for which norms have been established.
- Level of education above 5 years.
- Ability to speak and understand English. This was determined by use of the academic skills questionnaire.

3.8 Exclusion Criteria

The study sample excluded:

- Individuals with active psychiatric conditions as determined by the Beck Depression Inventory and neurobehavioural medical screen, because they might be out of touch with reality or the condition may interfere with their neurocognitive functioning
- Those who abuse substance as determined by the Chinese substance abuse questionnaire because it has Zambian norms.
- Physical handicap of the upper limbs which may interfere with the performance on the tests.
- Neurological conditions such as epilepsy unrelated to HIV status which was assessed using the neurobehavioural medical screening.

3.9 Instrumentation

The instruments that were used for the data collection included two instruments and a demographic form was to be given to participants at pretest. Participants were asked to

complete a demographic form indicating gender, age, highest level of education completed, the frequency with which they created art, and with whom they lived. In order to evaluate cognitive functioning, two tests will be administered as pre- and post-intervention evaluations: the Clock Drawing Test (CDT) and the Cognitive Failures Questionnaire (CFQ) to assess cognitive impairments. The diagnosis of stroke will be confirmed by CT and MRI scans. Below is the procedure that was used for the data collection.

3.10 Patient Recruitment Procedure

- In the first week of the investigation, the research will ask all participants to complete three forms: (a) a demo- graphic form that will collect data on gender, age, highest level of education completed, the length of time lived in the country, the frequency with which the participant created art, and with whom the participant lived.
- The Cognitive Failures Questionnaire; and (c) the Clock Drawing Test to assess for cognitive impairment. Throughout the 10-week intervention phase of the study, all participants had the choice of attending a weekly 2-hour art therapy session or one of five other activities: creating art or crafts on their own, playing dominoes, playing bingo, socializing, or watching television
- Art therapy will be provided and documented attendance in the art therapy sessions and in other daily activities chosen by the participants in lieu of art therapy. Four volunteers(therapist) assisted with collecting pretest and posttest CFQ and CDT scores in weeks 3 and 12
- Therapeutic Thematic Arts Programming for Older Adults was selected for the art therapy intervention because it was specifically developed for older adults. The TTAP Method systematizes the therapeutic use of music, guided imagery, painting, movement, poetry, sculpture, photography, themed. In this method, nine steps (discussion(1), mediation/music(2),2-D art making(3),3-D art making(4), movements(5),writing(6), use of food(7), themed event(8) and phototherapy(9)) would be used throughout the 10 weeks of art therapy sessions

- Group discussion (Step 1) was most frequently utilized in combination with two-dimensional therapeutic art making (Step 3). The only step of the TTAP Method that is omitted was the use of food as a focus for activity (Step 7).
- The intervention group was to be provided with therapeutic art therapy once a week for 12 weeks that included a combination of expressive art-making, art education, learning about art materials, group socialization, and reminiscence and in addition to usual care.
- The control group will continue to be involved in recreational activities (will receive usual care). Participants in the control group socialized or not as they saw fit. Following the 10 sessions, all participants will be asked to complete the CFQ for the second time.
- Also following the last session, a second CDT will be administered to all of the participants. In the last session, a debriefing will take place that will review the purpose and results of the study.

3.11 Therapy Sessions (Intervention and Monitoring)

- The researcher had to provide 90-minute sessions and to follow a weekly protocol so that the therapy was provided consistently
- Information was pretested from participants and collected necessary information for the demographic form.
- Participants were randomly assigned to either the control or interventional group.
- The interventional group was provided with art therapy once a week for 10 weeks that included a combination of expressive art-making, art education, learning about art materials, group socialization, and reminiscence.
- The control group continued to be involved in recreational activities. Participants in the control group socialized or not as they saw fit.
- Attendance was taken at every session. . Following the 10 sessions, all participants were asked to complete the CFQ for the second time.

Table 3 includes the protocol that was implemented to ensure consistency. Goals in line with cognitive rehabilitation were used when developing the directives. Research methods from seven art therapy resources on older adults and cognitive performance were consulted to create the protocol (Alders, 2009; Bermudez & ter Maat, 2006; Couch, 1997). The directives included were those that previous research found to be effective. A variety of materials, techniques, and processes were prepared in order to provide diverse opportunities for cognitive stimulation using a combination of compensatory and restorative CT strategies.

Table 3: Session Protocols by Week

Week	Directive	Goal
1	Pre-test: CFQ; CDT; Demographic Questionnaire	Assessment
2	Make a collage of gratitude. Use images to represent experiences and aspects of your life that you are grateful for. Show group members and describe your images.	Visual search and identification, socialization, promote positive mood
3	"Pick an object" exercise, "what does this object remind you of?" Reminiscence time. Depict that memory with color pencils on paper.	Reminiscence, visual search and identification
4	Get to know your neighbor: Visual Conversation activity (Liebmann, 1986). In groups of two, select a colored marker. Without talking create an image. Respond in silence to your partners drawing. Discuss the experience.	Increase socialization, practice creative decision-making
5	Name animals and their characteristics, compare humans/animals, draw an animal that shares a characteristic with you or someone you know. Refer to animal figurines to assist in drawing (from observation).	Inductive reasoning, verbal memory, exercise motor skills
6	Name types of love, discuss experiences, meditate on a positive memory of love, draw the memory,	Verbal/episodic memory, managing emotions

	write a letter to a loved one or make a card with images.	
7	Create an autobiographical timeline of your life. Draw a line and list years associated with important memories. Use collage images. What major life events have you experienced? Share in groups of two.	Episodic memory, life review, socialization, visual search and identification
8	Using plastilene, create a representation of at least one of your family members. Include as many details of your family member as possible. Show your figure to the group. Why did you include the details you did?	Inductive reasoning, exercise motor skills, verbal/episodic memory
9	After learning about the history of mandalas, use pastels to color a mandala. Use colors that are calming and soothing. Listen to music while creating the mandala.	Encourage creativity, promote enhanced mood, provide learning opportunities
10	Use sand, shells and watercolors to allow your feelings of a special day you spent at the lake or beach to emerge. What are your memories of this day? What did you do at the beach? Who did you go with? Express these feelings in your art.	Managing emotions, Visual search and identification
11	On a square piece of cloth glue or sew fabric shapes and designs. Create a representation of your choice. Attach your cloth to other group members to create a quilt. Create a haiku poem about interconnectedness.	Verbal/episodic memory, exercise cognitive skills through multi-step instructions
12	Posttest: CFQ; CDT	Assessment

3.12 Data Analysis

- Statistical Package for Social Sciences (SPSS) was used for data analysis. The CDT and CFQ test scores will be evaluated by Standard statistical software (SPSS) version 20
- Descriptive Analyses was used to obtain means and standard deviation for the independent and dependent variables.
- Standard multiple regression analyses was used to evaluate the relationship between variables of interest, namely attendance and change in cognitive performance test scores.
- One tailed T-tests was used to analysis the data by comparing the results of both tests to determine whether a positive change was experienced by participants.

3.13 Data Management

Upon obtaining consents and administering the demographic questionnaire and pretests, art therapists made secondary copies of the documents and sent the original materials to this researcher. The materials were managed and stored in hard copy, and the data were entered into Excel spreadsheets. Each participant was assigned a number (e.g., 1-133) and a lettered site (e.g. A-E) in order to keep his or her identity confidential in the digital records.

The data corresponding to attendance were handwritten into an attendance chart weekly by the therapists. This attendance record was then e-mailed to the researcher once a week. During each session, photographs, videos, and artwork were digitally documented and stored on a memory card by each of the therapists. At the end of the study, the memory cards were mailed to this researcher along with the posttests.

3.14 Ethical Considerations

The research was submitted to Ethical clearance and approval was sought from ERES-Converge Research Ethics Committee. After the approval, permission was sought from Ministry of Health (MOH) and management of the University Teaching Hospital

Lusaka (Outpatient clinics) to obtain permission to collect data. The participants were informed of the study objectives both orally and in written so that they could make an informed decision regarding their participation. The participants did not materially or financially benefit from the study, but there will be long term benefits as the study findings will be used to inform policy and improve patient care. Potential risks that could have arisen from the questions asked about cognitive impairments after stroke that might have evoked emotional reactions, were explained to the participants. And in case of this occurrence, arrangements with the clinic medical officer and nurses were made before hand to attend to any participants who may have had this experience.

Participants were informed that the participation is voluntary and that they were free to withdraw from the study at any time and that no punitive action would be taken against them such as withdrawal of medical services. They were not coerced into participating in the study. Participants were asked to sign a consent form and the researcher counter signed. Confidentiality was maintained regarding the data collected. Names and codes were used and kept separately from the data to avoid it being linked to the participants. The names were used for follow up purposes only to ensure anonymity. All the collected data was kept in a locked cabinet and key kept by the researcher. Privacy was maintained during the assessments; rooms were secured from the selected clinic management.

3.15 Limitations of the Study

The population of the study is limited to patients with outcomes of cognitive dysfunction and older adults this means missing out on information that could have been obtained from a general overview from other outcomes of stroke. In addition, few of the literature accessed explicitly deals with adequate information on cognitive performance after stroke.

CHAPTER FOUR

RESULTS

This chapter outlines the results that were obtained in the study. It shows the various analyses that were carried out. The results will be presented in relation to the research questions which were to identify if cognitive evaluation test scores among post stroke older adults improve significantly following 10 weeks of art therapy sessions, will art therapy attendance be correlated with cognitive evaluation test scores, will cognitive performance outcome scores for each of the two tests be correlated?

4.1. Demographics

This section reviews the demographics of the sample included within the study. Factors such as age, education, medication use, location, level of functioning, attendance, and attrition all affected the outcome of this study. These factors are described throughout the following sections in order to outline the characteristics of the sample.

Characteristics of Participants

The sample had a higher percentage of female participants than the males. The participants consisted of 58 (58%) females and 42 (42%) males. Participants' educational level ranged from 5 to 20 years. A total of 49 (38%) participants had attained secondary education. 30% (30) had primary education and 21 % (21) had attained 13 and above years of education. The mean education was 9.565 and SD was 2.91. The ages of participants ranged from 55 to 65 years old. The majority of the participants were in their fifties 38.4% (101). 10.3% (27) were in their early sixties, 34.2% (90) were in their late sixties. The mean age was 40.78 and SD was 8.9 as shown in the table below.

Table 4 to show participants Characteristic Number of Years of Education were noted.

Variables	Frequencies	Percent
Gender(N=100)		
Males	42	
Females	58	
Education Level (N=100) Mean=9.565 SD=2.91		
Primary(1-7years)	30	30%
Secondary (8-12years)	49	49%
Tertiary (13-20years)	21	21%
Age Group(N=100) Mean=40.2 SD=5.2		
Fifties (55-65years)		
Early sixties(60-65years)		
Late sixties(65-70years)		

- **Education**

Participants' educational level ranged from 5 to 20 years. A total 100 (76.8 %) participants had attained secondary education. 16% (42) had primary education and 7.2 % (19) had attained 13 and above years of education. The mean education was 10.02 and SD was 2.23. The ages of participants ranged from 55 to 65 years old. Education was found to be a factor significantly correlated with cognitive performance outcome scores.

- **Age**

To be eligible for inclusion in the art therapy research, adults were required to be over 55 years of age. Table 8 presents the age demographics of the participants. The mean age for the control and experimental groups was comparable, and there were no significant differences between the two groups. In the experimental group, the

average age of participants was 78: the youngest participant was 57 and the oldest was 95. In the control group, the average age was 76: the youngest participant was also 57 and the oldest was 96. Age was found to be a factor significantly correlated with cognitive performance outcome scores during the study.

Table 5 Summary Statistics Regarding Age

Group	*N*	Average Age	Youngest	Oldest
Control	36	76.44	57	96
Experimental	54	77.56	57	95

- **Medication**

Participants were asked at the onset of the study whether they took medication for cognitive impairment symptoms. Comparable numbers of participants in the both the experimental and control group reported taking medication (24.5% in the experimental and 21.6% in the control), the majority (76%) of participants did not report taking medication for cognitive impairment. There was a significant and negative correlation between medication use and independent status (r = -0.366; p = .000), meaning a significant number of participants taking medication were no longer independent. Medication use was not found to be a factor significantly correlated with cognitive performance outcome scores in this study.

- **Attrition**

Before the onset of the study, the ideal number of participants needed for the study was calculated using G*Power, a general analysis program used to estimate sample size. The analysis yielded an estimate that 72 participants would reach statistically significant results based on the effect size of the pilot study. To ensure that at least 72 participants would complete the study, an additional 30% greater number of participants were sought. In total, therapists reported access to 110 older adults, which was 53% higher than the goal of 72 participants. At pretest, the number of

included participants surpassed expectations, and 133 participants completed the necessary documentation to be included. In this study there was a 32% attrition rate, at posttest, 91 participants remained in the study.

Attrition by Site

Site	Anticipated	Pretest	Post test	Attrition	Control Attrition	Experimental Attrition
Total	110	133	91	32%	24/42, 57%	18/42,43%

Overall, the control group experienced a higher attrition rate (37%) than the experimental group (27%), leaving 54 of 74 older adults in the experimental group and 37 of 59 older adults in the control group. Education, age, and ethnicity were comparable among the older adults who contributed to attrition and those who remained in the study.

After attrition, women accounted for 76% of all participants; but there was a comparable attrition rate among men (10/32 or 31%) and women (32/101 or 32%). Of the participants who were absent at posttest and therefore considered in the attrition pool, a higher number were men from the control group. There were 32 men at pretest (16 in each group, control and experimental). Seven men from the control group (44%) and three from the experimental group (19%) were absent at posttest. After attrition, nine men were in the control group and 13 men were in the experimental group for a total of 22 men in the study at posttest. Being male was not found to be a factor significantly correlated with cognitive performance outcome scores in this study.

Table 6 Participant Numbers per Group

Group	*N*
Experimental	54
Control	37
Total	91

Overall, the control group experienced a higher attrition rate (37%) than the experimental group (27%), leaving 54 of 74 older adults in the experimental group and 37 of 59 older adults in the control group. Education, age, and medication were comparable among the older adults who contributed to attrition and those who remained in the study.

Differences in treatment approach.

Within the study included the Therapeutic Art therapy approach preferred incorporated an art-as-therapy approach, combination approach mixing art-as-therapy and art-psychotherapy was employed. The choice of art therapy approach was significantly correlated with cognitive performance outcomes; this will be discussed within the section addressing the research questions. The researcher (therapists) reported that reminiscence art processing, art education, emotion processing, and socialization were incorporated into their sessions; however, these five aspects of the sessions emphasized with a different frequency. Figure 8 illustrates the overall frequency with which the therapists incorporated reminiscence, art processing, art education, emotion processing, and socialization over the course of the 10 weeks. On average, socialization was most frequently emphasized, followed by reminiscence and art processing. Emotion processing and art education were emphasized the least, according to the therapists.

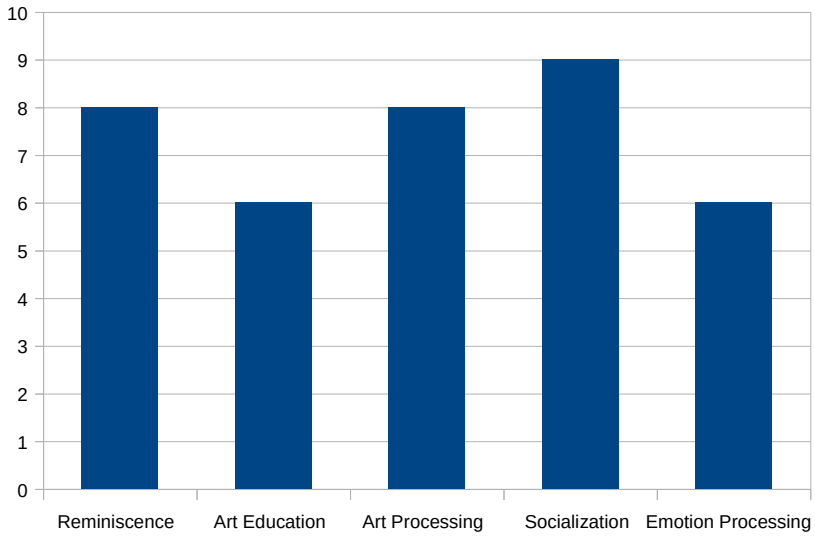


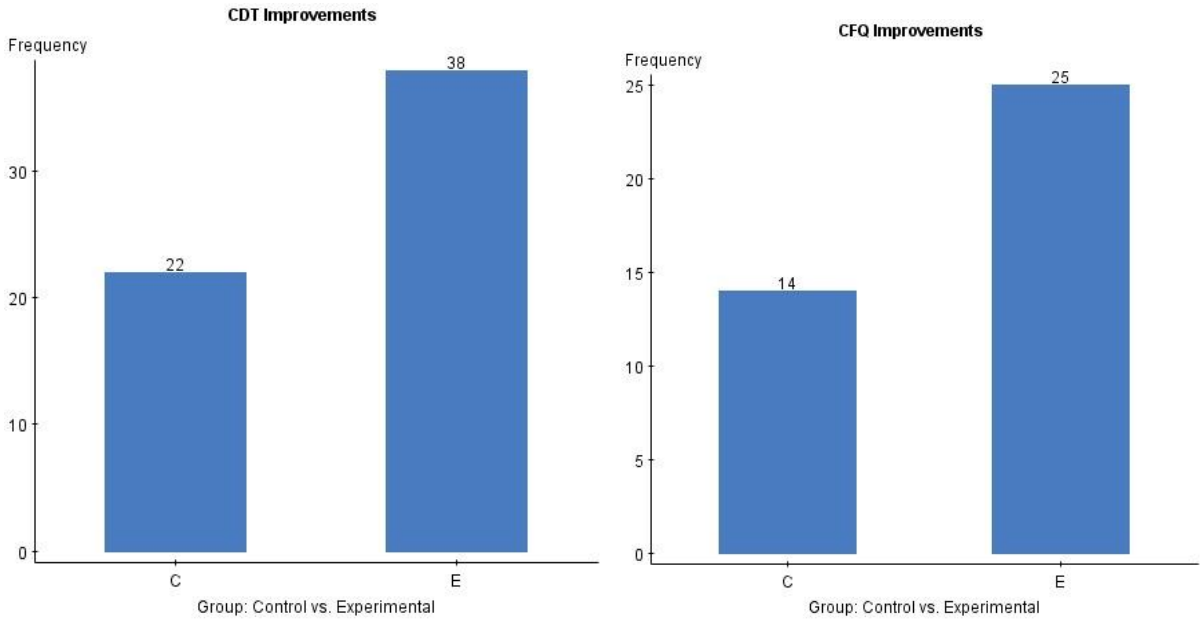
Figure 2 Frequency of content incorporated by therapists.

Duration of sessions: Therapists (researcher) reported varying session durations even though the protocol specified 90-minute sessions. When asked for the average session duration over the course of the study, therapists selected the time frame that best matched: 45 minutes, 60 minutes, or 90 minutes each week. Duration of therapy was significantly correlated with cognitive performance. This will be discussed within the section addressing the hypotheses and research questions as well.

Research Question One

The first research question was: Will cognitive evaluation test scores among post stroke older adults improve following attendance in art therapy sessions over the course of 10 weeks? On average, participants in the experimental group demonstrated improved cognitive performance more frequently than control group for each of the two tests (See Figure 9).

Figure 3: Improvements in score by group



C = control group; E = experimental group

The CDT scores were significantly higher within the experimental group (t = 2.44; p = .017); CFQ scores were higher but not significantly (t = .85; p = .40). Below are examples of the CDTs from selected participants who showed notable improvements. These clocks were chosen based on the clarity of improvement, however, all of the examples. Summary statistics revealed that attendance status was significantly and positively associated with improvements in CDT scores among the experimental group members (r = .429; p = .001).

Figure 4. Client "M" in the experimental group improved: pretest score: 4; posttest:5.

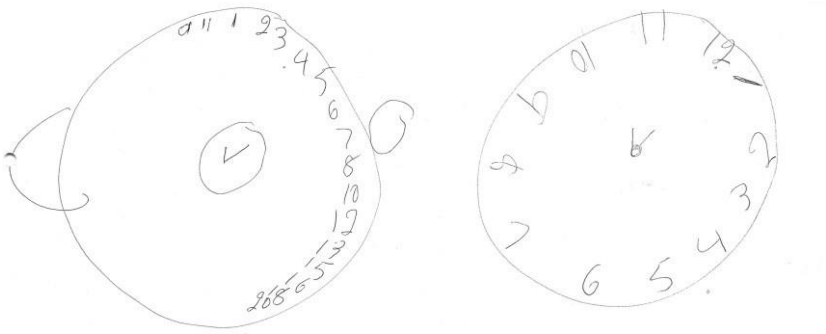
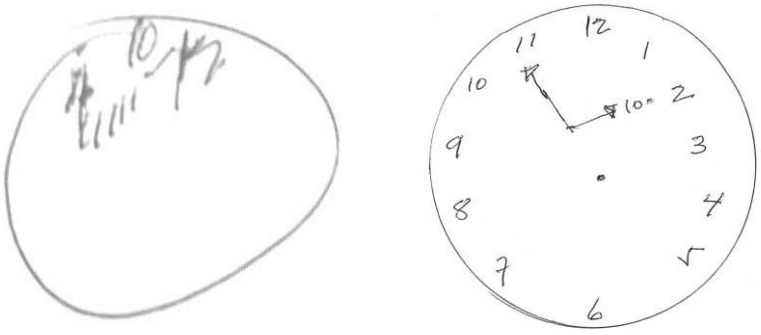


Figure 5. Client "M" in the experimental group improved: pretest score: 4; posttest:5.



In contrast to the CDT, which was a rated cognitive performance measure, the CFQ was a self-report and is considered important for understanding the perceptions and beliefs of older adults regarding their cognitive performance. On average, the experimental group outperformed the control group on CFQ reports, as shown previously in Figure 9, though the scores were not significantly higher.

As with the CDT, a *t*-test for self-reported cognitive performance (CFQ) evaluated the difference in scores between the experimental and control groups (μ_1 = mean of experimental group; $\mu 2$ = mean of control group; H0: $\mu 1 - \mu 2 = 0$; HA: $\mu 1 - \mu 2 < 0$).

Results showed that the experimental group's scores for the CFQ were not significantly greater than the control group's scores (t = .614; p = .729). The 10 weeks of art therapy sessions did not significantly impact self-perception of cognitive performance.

Education: At pretest, there was a positive and significant correlation between CDT scores and education (r = .336; p = .001) among all participants. After treatment, the correlation between education and CDT scores, regardless of age, was significant, but negative (r = -.218; p = .039). In contrast to the CDT, there was no correlation between education and CFQ scores at pretest (r = -.005; p = .962). After treatment, there was a positive and significant correlation between education and CFQ scores among post stroke older adults (r = .486; p = .004).

Age: When considering all group members, regardless of ethnicity, age was not found to be significantly correlated with CDT pretest scores (r = -0.194; p = .0659). The CDT pretest scores were negatively and significantly correlated to age among older adults (r = -0.408; p = .0224). At post-treatment, age was found to be negatively correlated with improvements in CDT scores (r = -.209; p = .048). There was a positive correlation between age and CFQ scores; however, this correlation was not significant (r = .191; p =.070).

Research Question Two

The second research question was: Will art therapy attendance be positively correlated with cognitive evaluation test scores? Attendance and performance scores were not significantly and positively correlated (CDT and attendance: r = -0.05; p = .697; CFQ and attendance: r = 0.05; p = .702).

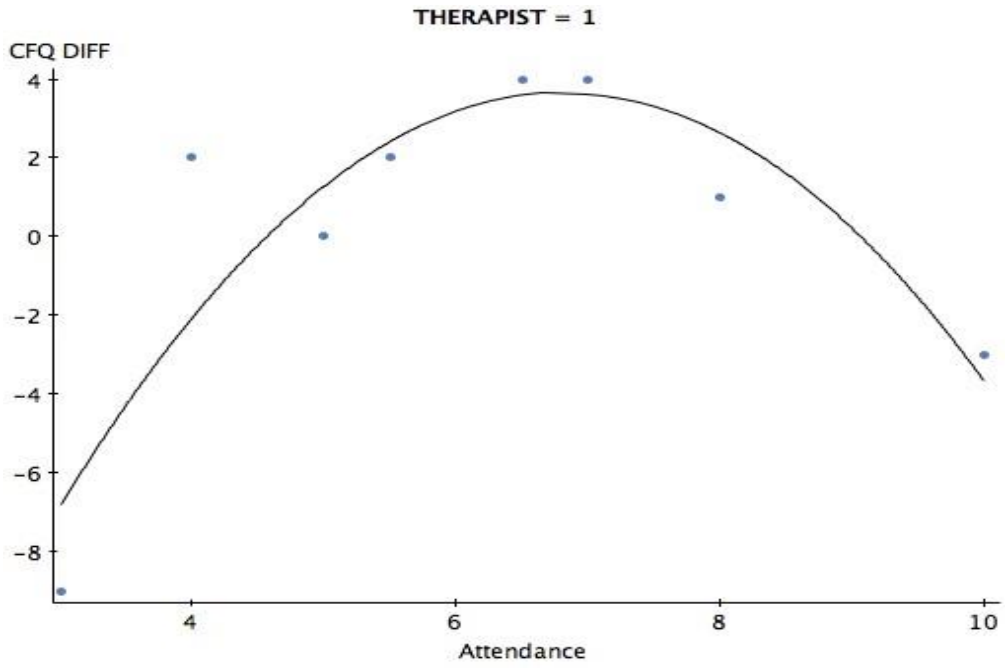


Figure 6 CFQ and attendance: polynomial regression. Site A, experimental group: N = 7.

The results of the univariate regression suggested that attendance affected cognitive performance optimally between three and six sessions, and the therapeutic approach employed by therapists (researcher), along with the duration of therapy, affected improvement in cognitive performance more than frequency of attendance. In this study, more sessions did not necessarily yield better performance, but longer session duration and combination approaches did. The correlation between therapy duration and CDT difference scores was significant and positive (r = .555; p < .000); however, this correlation was not seen with CFQ scores (r = -.153; p = .267).

According to summary statistics, therapeutic approach also affected CDT difference score: a combined art therapy approach, which incorporated both an art-as-therapy and art-psychotherapy approach, resulted in improved CDT scores (r = .568; p < .000), but not improved CFQ scores (r = -0.164; p = .236).

Research Question Three

Will cognitive performance outcome scores for each of the two tests be correlated?

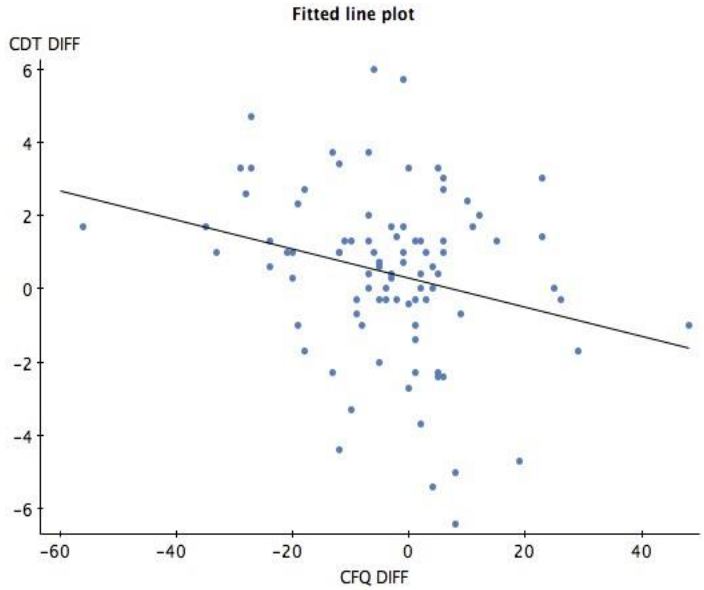


Figure 7 negative correlations between the two tests.

Considering all participants in both the control and experimental groups, the findings suggested that the better the participants performed on the CDT, the worse they rated their memory on the CFQ subjective measure of cognitive functioning (r = -2.521; p = .013). When the data were converted into a binomial variable, expressing 1 for improvement in score and 0 for a decline, the findings showed a distinct relationship (See Figure 15). The experimental group did not show significant scores for a negative correlation (t = -1.556; p = .126); however, the analysis for the control group indicated that the negative correlation was significant (t = -2.410; p = .021).

CHAPTER FIVE

DISCUSSION

4.1 Introduction

In this chapter an analysis of the findings is presented and is divided into four sections: (a) findings from the investigation, (b) implications of results according to literature, (c) (d) suggestions for practitioners. The goal of this chapter is to contribute to the practical, theory-building foundations of art therapy with older adults.

4.2 Summary of the Study

This research study sought to evaluate the ability of Therapeutic Art therapy to improve the cognitive performance of post stroke older adults. The hypotheses of this study were: (a) cognitive performance will improve following 10 weeks of art therapy, (b) attendance will positively and significantly correlate with cognitive evaluation test scores, and (c) each of the cognitive test results will be significantly correlated. Additionally, this study sought to expand upon previous literature by addressing the following research question: Will cognitive performance among post stroke older adults improve significantly following 10 weeks of art therapy sessions?

Additionally, the following secondary research questions were explored: Will art therapy attendance be correlated with cognitive evaluation test scores? Will cognitive performance outcome scores for each of the two tests be correlated?

4.3 Findings

The results suggested that 10 weeks of art therapy positively affected cognitive functioning but did not positively affect self-perception of cognitive abilities. Attrition rates among older adults were comparable, which may suggest that CT infused with art therapy is culturally compatible. Finally, the significant correlation between outcome scores and art therapy approach used by therapist (researcher) suggested that some art therapy approaches (for example, the combination of therapeutic art-as-therapy with art psychotherapy) affect cognitive performance more than others (e.g., art-as-therapy

alone). Each of these aspects of the study, as well as their implications and suggestions for future research, is explored within this chapter.

4.4 Research Questions and Associated Hypotheses.

The results of the study provided evidence in support of the first hypothesis: older adults demonstrated improvement in cognitive performance as a result of 10 weeks of art therapy. Both the t-test and the univariate regression analyses yielded significant results for the CDT measure of objective cognitive performance. This suggests that art therapy provided cognitive performance benefits among post stroke older adults.

While cognitive performance demonstrated improvement, self-perception did not significantly improve. The lack of significance for the CFQ scores suggests that self-perception is still an area for continued investigation. As described within the literature review, self-perception is complex and is affected by factors such as depression and personality (Willis et al., 2006). The reasons for the slight improvement of self-perception in this study are unclear, though possible causes may relate to the treatment and participant demographics.

The results of the study did not provide evidence in support of the second hypothesis. Attendance did not positively correlate with cognitive evaluation test scores, nor was it correlated with improvements in cognitive performance. The heterogeneity of the study with regard to independent status and stroke may have affected this aspect of the study.

Lower functioning post stroke older adults may not have received the treatment as planned due to higher levels of cognitive impairment, and consistently had issues with transportation and health that impeded attendance for the entire session duration; for instance, the post stroke older adults regularly arrived late to the sessions. Equally, post stroke older adults, not all sessions lasted for the prescribed 90 minutes; shorter sessions may have decreased the treatment effect.

The results of the study provided evidence in support of the third hypothesis, which held that pre- and posttest results would be correlated. Self-perception (CFQ) and cognitive ability (CDT) did show a correlation, though it was negative: participants with

higher gains in cognitive performance reported that their cognitive functioning had worsened.

Lower functioning groups (e.g., participants) were only able to effectively self-report if their cognitive functioning permitted self-monitoring. According to therapist (researcher), several older adults with signs of worsening cognitive impairment and more severe MCI reported very little cognitive impairment on the CFQ. This may imply that the older adults with more severe MCI were unaware of their deficits or that their ability to understand the questions was impaired.

4.5 Literature Review and Results

The results of this study paralleled the literature reviewed; they were affected by demographics, location, education, and medication use. These factors, along with their relationship to the literature, are outlined below.

Demographics

The literature showed that among people aged 55 to 64 years old, the individuals are more likely to have cognitive impairment as a result of environmental and lifestyle factors (Alzheimer's Association, 2010a). This was supported by findings in this investigation.

The age of post stroke older adults was negatively and significantly correlated with CDT pretest scores; CDT pretest scores decreased as age increased. The CDT pretest scores were low at both ends of the age range. This parallels the literature reviewed and suggests that the post stroke older adults had an earlier onset of cognitive impairment.

Medication

Research findings have suggested that psychotropic medication is not a culturally compatible approach to treating post stroke older adults (Miranda & Cooper, 2004). One reason is that one third of these participants (patients) read at or below the sixth grade level (i.e., low literacy), resulting in difficulty understanding prescription medication warning labels (Davis et al., 2006). Within this study, when asked whether

medication was taken for memory, many respondents initially answered yes and then explained that their doctor prescribed medication for their diabetes, blood pressure, or other health concerns. Although these health concerns do increase the likelihood of declines in cognitive performance, a prescription for blood pressure, for instance, would not be given by a doctor to treat cognitive impairment. This confusion may indicate limited or low health literacy among the post stroke participants (i.e., the participants‟ ability to understand health information).

Education

Education has been correlated with cognitive performance in later life, and previously published research indicated that lower levels of education were highlighted as a risk factor for cognitive dysfunctions. Older stroke survivors with lower education level had higher prevalence of having cognitive impairments. (Kim & Chey, 2010; Sitzer et al., 2006). In this study, discrepancies in education by race paralleled descriptions found within the literature. On average, older adults were less educated older adults within this study; education positively and significantly correlated with self-reported cognitive functioning among post stroke older adults. The literature suggested that subjective memory complaints in older adults are often linked to stress and depression and that mood is an influential factor determining self-perceived health (Ostbye, Krause, Norton, Tschanz, & Sanders, 2006; Pruessner, Lord, Meaney, & Lupien, 2004).

Low self-report scores of post stroke older adults may have been affected by depression levels or by experienced discrimination and subsequent anxiety. The post stroke older adults were frequently observed criticizing one another with the term, mal-educado, or poorly-educated, insinuating poor social skills and etiquette; mal-educado was a term typically attributed to darker skinned individuals.

At pretest, the more educated an individual was, the higher his or her CDT score. The posttest yielded different results, which related to the literature presented in Chapters One and Two. For example, M. Diamond (2001) found that the brain responds to enriched environmental input, which can modify the structure of the brain at any age and enhance performance. Post stroke older adults improved significantly in cognitive

performance despite lower education levels, as demonstrated by increased CDT scores at posttest. This contrast in education and improvement may have contributed to the reason education was no longer significantly correlated with CDT scores at posttest and why there was a negative correlation between CDT and education after the treatment.

Treatment and Design Fidelity

Art therapy was the treatment within this study. The researcher with the help of his two fellow students trained as art therapists were selected to provide the treatment at the Outpatient at the university teaching hospital of Lusaka. A treatment protocol for each of the 10 weeks was provided. Variations in treatment delivery and receipt, attrition rates, and divergences from cognitive training all affected the study.

Attrition

This study experienced a 32% attrition rate. At pretest, 133 participants completed the necessary documentation for inclusion. The study had 91 participants at posttest. The literature review in Chapters One and Two revealed that older adults with post stroke have the lowest participation rate in mental health outcome research and that attrition rates for these members in traditional therapy are as high as two times the attrition rates of older individuals (Dingfelder, 2005; Rose, 2005; Schuerholz-Lehr, 2007). This was not the case within this study. Attrition rates for older adults with post stroke minority and (i.e., 33%). The reason for this may be related to the active recruitment effort, the employment of informal alternatives to therapy, or the use of art in ways that may have paralleled traditional folk healing approaches.

Other strategies that paralleled the research conducted at the University of California included hiring and training bicultural and bilingual recruiters. Approximately 75% of all participants were women. Only 25% of participants were men, and attrition among men was noteworthy. Although attrition between the control group and the experimental group was comparable for women, more men were absent at posttest from the control group (44%) than from the experimental group (19%). In the experimental group, two men reported that art therapy was their sole source of socialization. Administrators

commented that the art therapy sessions were an incentive for consistent attendance at the community centers, which may explain the higher attrition in the control group.

Approaches

Overall, therapists reported placing the highest priority on socialization and art processing during the sessions. Still, the art therapy approaches (i.e., art-as-therapy approach, art-psychotherapy approach, or a combined approach) were significantly correlated to cognitive performance outcomes. Possible reasons for this are multifaceted.

Emotion-centered approaches are facilitated through art-as-therapy in alignment with the theory presented by Hass-Cohen and Carr (2008) in Art Therapy Relational Neuroscience Principles (described in Chapter 2). From this theoretical perspective, the art-making process facilitates clients‟ abilities to synchronize bodily functioning (e.g., breathing and eye movements) with the creative process, thereby positively affecting emotions and cognition (Hass-Cohen & Carr, 2008). Art-as-therapy may address clients‟ individual emotional needs and help them to self-monitor nervous system responses; an art-psychotherapy approach focuses on inter-group dynamics and structuring sessions in order to optimize cognitive stimulation based on exhibited ability.

Reviewing the artwork during and after each session was one means of evaluating the cognitive stimulation provided during session. An art-psychotherapy approach provides insight into the patient's cognitive world and enables a better understanding and stimulation of visuospatial and cognitive skills. Art-psychotherapy approaches align with the theory presented by Lusebrink (2004) in the Expressive Therapies Continuum (ETC; described in Chapter Two).

The ETC within art therapy describes cognitive stimulation through art therapy. ETC aims to facilitate art therapists‟ clinical decision-making by framing art-making and brain functioning on three hierarchical levels of knowledge: a) kinesthetic/sensory, b) perceptual/affective, and c) cognitive/symbolic. During this study, each of the ETC hierarchical levels was present within the artwork at all of the sites. Although the

frequency of each level differed by weeks attended, and not all therapists consistently used this information to adjust session content, clients responded to art therapy sessions by moving across the hierarchical levels. Examples of the hierarchical levels described in ETC are noted below.

Examples of artwork and corresponding ETC.

The Kinesthetic/Sensory (K/S) level, which represents simple motor expression and corresponding visual manifestations of energy and sensory involvement (Lusebrink, 2010) can be noted in the artwork in Figure 16. In these works, the clients focused on the sensations of colors, the placement of shapes, and the process of forming lines. The directives that corresponded to the artwork focused primarily on mood enhancement and exercising cognitive skills through multi-step instructions.

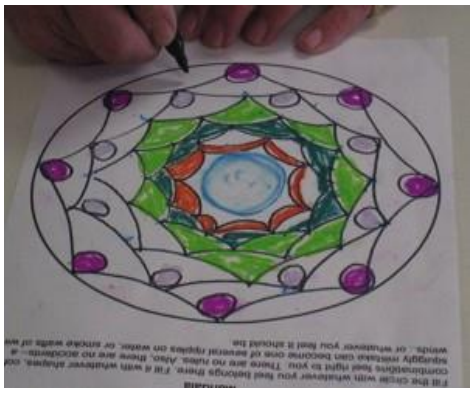


Figure 8 Kinesthetic /Sensory (K/S) level artwork.

The Perceptual/Affective (P/A) level focuses on forms and includes figure/ground differentiation. The P/A level can be noted in the artwork in Figure 17. The goals that corresponded with the creation of the artwork below included visual search and identification and inductive reasoning. According to older adult explanations, the placement of images within artwork contains affective and symbolic meaning.

Figure 9. Perceptual/Affective (P/A) level artwork

The Cognitive/Symbolic (C/S) level emphasizes cognitive operations; during the study participants utilized art-making as a means of symbolic cognitive integration. For instance, during week eight of the study, the clients engaged fully in the directive, which included creating sculptures of their family members. The artwork from that session demonstrated the inclusion of the symbolic component of the C/Sy level by emphasizing global processing of input from sensory and affective sources, autobiographic memory, and symbolic associations (Lusebrink, 2010).

Several participants chose to create a sculpture of a family member who was still living in their country of origin. Three or more group members expressed sadness about not being able to return home to the country of origin because they "would be killed." One member began to cry about not having seen his sister for 50 years. This sharing provoked one female member, who had remained quiet throughout the session, to create an origami boat without directive. She put her tiny figurine inside of the origami.

The group members put the sculptures of their family members in their paper boats and some described wanting to set their boats assail in the ocean. The group member who instructed the origami techniques informed the group members that the paper was strong enough for the boats to be put in water.

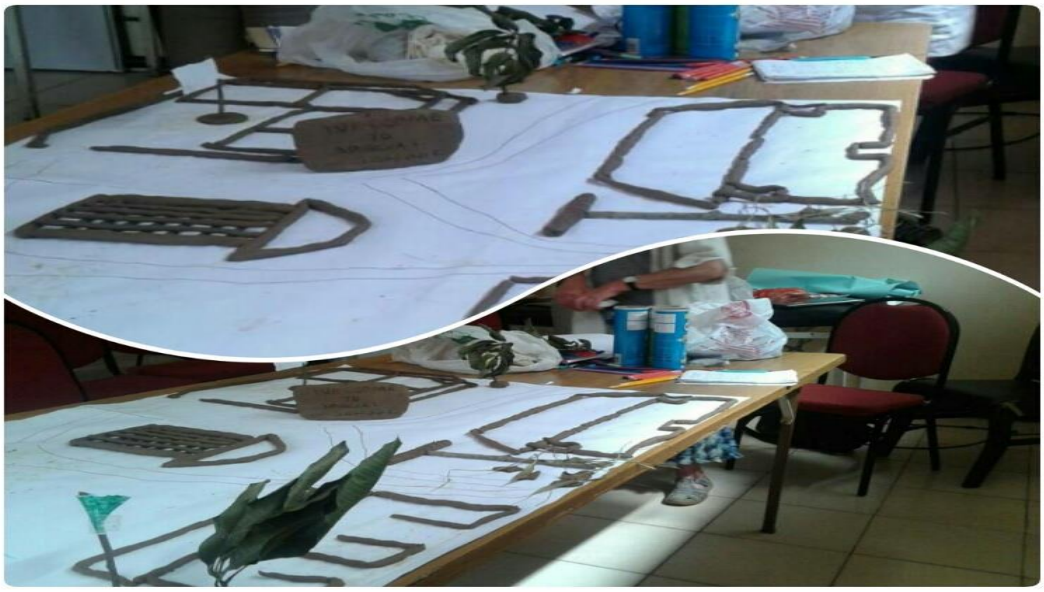


Figure10 Cognitive/Symbolic (C/Sy) level artwork.

All of the older adults included in the research expressed an interested in art therapy. Those participants chosen for the control group verbally expressed to the administration and the therapists that they also wanted to attend sessions. There was some resistance among participants in the control group: because of their desire to attend therapy, they may not have had an incentive to be present at posttest. The control group's reaction may indicate the appeal of the art therapy sessions and the motivation that would be apparent for treatment adherence.

CHAPTER SIX

CONCLUSION

6.1 Introduction

The objective of this study was to evaluate the effectiveness of Therapeutic Art Therapy in Improving Cognitive Function in older post stroke patients. The study utilized a randomized controlled trial was used. The participants were all post stroke older adults. To determine how cognitive performance outcomes scores for each of the two tests are correlated (the Clock Drawing Test (CDT) and the Cognitive Failures Questionnaire (CFQ)). The research questions were explored: Will art therapy attendance be correlated with cognitive evaluation test scores? Will cognitive performance outcome scores for each of the two tests be correlated? Will each of the cognitive test results be significantly correlated? Additionally, this study sought to expand upon previous literature by addressing the research question stated above.

Other outcomes included the findings that age, education, and independent status all influenced participant responsiveness to art therapy as a treatment. Medication use, gender, location, and attendance did not show this same influence within the study. Although attendance in the pilot study was positively and significantly correlated to cognitive performance, such was not the case in this dissertation study. Findings showed that more sessions did not yield more improvement in cognitive performance. Instead, the duration of therapy and the art therapy approach used by the researcher significantly affected outcomes.

6.2 Limitations of the Study

The population of the study is limited to patients with outcomes of cognitive dysfunction and older adults this means missing out on information that could have been obtained from a general overview from other outcomes of stroke. In addition, few of the literature accessed explicitly deals with adequate information on cognitive performance after stroke.

6.3 Recommendations

Based on the findings of this study as regards the effects of cognitive functioning among post stroke older adults with cognitive impairments, it is recommended that further studies be conducted on the identification of the possible factors associated with old individuals

The researcher recommends the following measures:

- Further research is needed into the long term benefits of engaging in Art therapy to enable them gain more fulfilling lifestyles even if their disabilities prevents return to work and other familiar pre-stroke roles.

- There should be training of Art therapist introduced in Universities, colleges and schools to help managing older adults that are prone to cognitive impairments and even children can be given especially abused children to help the be able to express their emotions.

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APPENDICES

APPENDIX A

Information Sheet

University of Zambia

School of Medicine

Department of Psychiatry

PLEASE READ THIS DOCUMENT CAREFULLY SIGN YOUR NAME BELOW ONLY IF YOU AGREE TO PARTICIPATE AND YOU FULLY **UNDERSTAND**YOU'RE RIGHTS. YOUR SIGNATURE IS REQUIRED FOR PARTICIPATION FOR THIS PROJECT, YOU MUST BE BETWEEN **55 AND ABOVE** YEARS OF AGE TO PARTICIPATE IF YOU DESIRE A COPY OF THIS CONSENT FORM, YOU MAY REQUEST ONE AND IT WILL BE **PROVIDE TO YOU**.

Introduction

This study is entitled effects of therapeutic art therapy on cognitive function among post stroke older adults at the university teaching hospital in Lusaka. The aim of the study is to examine the effectiveness of therapeutic art therapy in improving cognitive functioning in older post stroke patients. This research is directed by Alice Nguni a master student in clinical neuropsychology at the University of Zambia. This document defines the terms and conditions for consenting to participate in this study. A total number of 100 participants will be recruited for the study.

Description of the study

You are being invited to take part in the study entitled the effects of therapeutic art therapy on cognitive function among post stroke older adults at the university teaching hospital. You will be asked to complete a few question about yourself, you will be asked to 1.) Complete a few questions about yourself, 2.) Fill out a questionnaire, and 3.) Draw a clock. When participating in this research study, you will be invited to verbally brain-storm themes in a group, listen to music, paint, sculpt, dance, make up stories/poems and create collages from photographs. Some sessions may be photographed. There will be 10 weeks of art therapy sessions provided during this research duration. At the end of the 10 weeks, you will be asked to once again complete the questionnaire and draw the clock. You are encouraged to read this consent form carefully and to ask the person who presents it any further questions that you may have before making your decision whether or not to participate.

Risks of Participation: It is possible that you may experience emotional distress, and uncomfortable feelings or thoughts during the Art Therapy sessions. As in all research, there may be unforeseen risks to the participant. If an accident injury occurs, appropriate emergency measures will be taken.

Economic Considerations: The participants will not receive compensation for participating in this study, however, you will be provided with art materials free of cost to enable you to participate in the Art Therapy sessions. There is no cost to participant in this study.

Benefits of Participation: It is possible that you may experience a more relaxed state after having participated in the art therapy sessions. Alternative to Participation: If you chose not to take part in the art therapy sessions, you will be encouraged to participate in the other activities offered within the facility but which are not part of this research.

Confidentiality of Records: If this research is published, or used in future grant applications, your identity will be kept confidential. I will take all appropriate steps to protect your identity. The results of this research study may be presented at meetings, in

publications, and in applications for further grants. However, your name will be kept private.

Voluntary Participation: Participation in this study is voluntary. You are free not to participate or to withdraw at any time, for whatever reason. In the event that you do withdraw from this study, the information you have already provided will be kept confidential.

Participation Consent: I have read or have had read to me the contents of this consent form and have been encouraged to ask questions. I have received answers to my questions. I agree to participate in this study. I have received a copy of this form.

All personal identifying information will be kept confidential and the data sheets will be kept in secured lockers in accordance with the standards of the University of Zambia Biomedical Ethics Committee. If the results of this study are required for publication as hoped, your identity will still be kept anonymous.

If you have any further questions about this Research please contact:

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APPENDIX B

DEMOGRAPHIC FORM

Demographics

Name _____ Date _____ Age _____

Gender _____ Country of Origin _____

If not the Zambia, how long have you lived in the Zambia?_____

Highest level of education completed:_____

Did you need assistance reading this form? _____

What was your previous occupation? _____

How often do you create art/ crafts? Circle one:

Very Often Often Sometimes Rarely Never

Do currently take medication for memory loss, concentration or focus? Y N

Appendix C

Consent Form

I…… (Name) have read and understood the terms and conditions of this study and I hereby agree to participate in the above-described research study. I understand that my participation is voluntary and that I may withdraw at any time without any consequences. As the participant in this project, my signature under here testifies that I understand the consent process and management of confidentiality as indicated above. I also understand that I can withdraw at any time without any consequences.

Signature of Research Participant:

…….……Date……...

…….Date ……..

Right Thumbprint of participant

Name and Signature of Witness:

……..……/…….Date……

Name and Signature of Researcher:

……/……...Date……

Appendix D

Guardian Consent Form

I…… (Name) have read and understood the terms and conditions of this study and I hereby agree to participate in the above-described research study. I understand that my participation is voluntary and that I may withdraw at any time without any consequences. As the participant in this project, my signature under here testifies that I understand the consent process and management of confidentiality as indicated above. I also understand that I can withdraw at any time without any consequences.

Signature of Research Participant:

…….……Date……...

…….Date ……..

Right Thumbprint of participant

Name and Signature of Witness:

……..……/…….Date……

Name and Signature of Researcher:

……/……...Date……

Table 2. New algorithm method for CDT scoring based on the original criteria of Sunderland et al.[10]

You should mark with an "X" all the items present in the clock drawn			
(a)	Presence of circle.	(j)	Presence of hour hand.
(b)	Presence of 12 numbers.	(k)	Presence of minute hand.
(c)	Numbers entered in the internal limit of the clock.	(l)	Minute hand proportionally larger than the hour hand.
(d)	Number in the correct ascending order.	(m)	One of the hands between 2 and 3.
(e)	Numbers in correct spatial position.	(n)	One of the hands on exactly 9.
(f)	Can you draw a straight vertical line between 12 and 6.	(o)	Wrong use of hands (digital or circling the numbers).
(g)	Can you draw a straight horizontal line between 3 and 9.	(p)	Some evidence of having understood that it is a clock.
(h)	Numbers not concentrated in one part of the clock.	(q)	Did not try or did not represent a clock.
(i)	Presence of two pointers.		
Follow the algorithm for the score, but consider these three points initially			
1. If the item "o" is checked, the score is 6 points.			
2. If the item "p" is checked, the score is 2 points.			
3. If the item "q" is checked, the score is 1 point.			
The score will be 10-6 if the clock and the numbers are drawn correctly			
10	Correct time (no "X" in the items: "o", "p", "q").		
9	Very mild disorder of hands (absence of "X" in at least one item: "l", "m" or "n").		
8	Mild disorder of hands (absence of "X" in at least 2 items: "l", "m", "n").		
7	Severe disorder of hands (absence of "X" in the items: "l", "m", "n").		
6	Wrong use of hands (presence of "X" in item "o").		
The score will be 5-1 if the drawing of the clock and the numbers are incorrect			
5	Numbers in reverse order or concentrated (no "X" in the items: "d" or "h").		
4	Numbers missing and located outside the boundary of the clock (no "X" in items: "b" and "c").		
3	Absence of hands (no "X" in the items: "i", "j", "k").		
2	Only some evidence of having understood that it is a clock (presence of "X" in item p).		
1	Not tried or did not represent a clock (presence of "X" item in q).		