Rebuilding Neural Pathways in Older Adults with Art Therapy

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Facilitating Neurogenesis in Older Adults with Art Therapy

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ABSTRACT

This paper explores scholarly literature regarding dementia, neural pathways, dementia studies, types of dementia, and previous art therapy studies with the aging population. A study was conducted at two aging facilities in a midwestern metropolitan city to determine correlations between quality of life, mood, and art therapy interventions for people with dementia. This grant funded study used a mixed methods methodology which combined both quantitative and qualitative research to provide a variety of data collection measures that can be used to provide a broader understanding of the clients. Two surveys were given to all participants in August and December: The Brunnsviken Brief Quality of life scale (BBQ) and the Geriatric Depression Scale (GDS). In addition to those measures, the researchers collected participant verbalizations throughout the research study. It was determined that the results of this study did not demonstrate a correlation between mood and quality of life in the domain areas studied. Some participants that showed decreased depression and showed a decrease in QoL, while some showed an increase in QoL, and others showed no change at all. An increase in mood across 61% of participants during the art therapy study warrants a deeper look into whether this type of intervention is responsible for decreased depressive symptoms. Based on the findings in the study, formal assessments may not be the most accurate way to gather the benefits with this population due to the presence of cognitive decline and lowered ability to self-report.

Keywords: neural pathways, neural plasticity, dementia studies, enriched environment, leisure, learning, creativity, art therapy
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CHAPTER 1

INTRODUCTION

It has been estimated that every three seconds, someone in the world develops dementia (Dementia Statistics, 2015). This alarming rate has significant impact on the economy and health care system. There is no cure for dementia, and because of this, more in-depth research needs to be conducted on how to slow cognitive decline and improve the lives of those living with dementia. According to Hung et al. (2018), dementia is a condition involving a significant decrease in cognitive abilities, including memory deficits, mood changes, and problems in communication and reasoning. Alzheimer’s Disease is the most common form of dementia but there are many variations of the disease.

According to MedicineNet (2017), neural plasticity is the brain’s ability to reorganize itself by forming new neural connections throughout life. Neural plasticity allows the neurons in the brain to compensate for injury and disease and to adjust their activities in response to new situations or to changes in their environment. This process is fostered by an enriched environment which includes the promotion of physical activity, socialization, and problem-solving (Studenski et al., 2006). Medina (2014) noted that learning a new task or participating in any form of physical activity (even as small as fidgeting), it promotes new neural connections and improved overall cognition.

Studentski et al. (2006) found that neural plasticity occurs as a direct result of exposure to an enriched environment, which includes the promotion of physical activity, socialization, and problem-solving. Research has also discovered that one of the greatest predictors of successful aging is the presence or absence of a sedentary lifestyle (Medina, 2014, p. 25). Marusic (2018)
found that for individuals with limited mobility that non-physical interventions, such as cognitive training, should be practiced from the early stages of cognitive decline onwards.

Throughout their research of art therapy interventions, Galbraith, Subrin, Ross and Riley (2004) linked sensory stimulation with social-emotional connections to improve the overall sense of well-being and quality of life for their MCI/AD patients. Tucknott-Cohen (2016) conducted a 17-week art therapy study of a client with Alzheimer’s disease and found that art making can act as an important means to reinforce the emotional, perceptual, conceptual, and motor systems of people with dementia, while placing an emphasis on their strengths. This research may help us to understand if there is a connection of rebuilding neural pathways through art therapy. Gross (2015) proposed that individuals who are engaged in the world around them experience increased levels of psychological well-being and improved quality of life (QoL).

This grant funded mixed methods study was conducted at two aging facilities in a large metropolitan midwestern city. Many of the clients at these facilities were not able to stay home alone due to certain health conditions such as dementia, multiple sclerosis, Parkinson’s disease, recovering from strokes, or have diagnosed mental challenges. The quantitative data was obtained with the administration of the Geriatric Depression Scale and the Brunnsviken Brief Quality of life scale (BBQ). These surveys were given to the study participants pre-study, mid-study, and post-study. In addition to those measures, the researchers collected program participation data for individual, group, and open studio sessions, as well as material choice, themes, and session directives. The study hypothesized that if participants reported improved depressive symptoms and quality of life along with verbalizations of enjoying art therapy, then art therapy may be an intervention that improves the quality of life in the aging population. The author of this thesis will place an emphasis on utilizing data along with published literature to suggest that participation in this study may also have attributed to a rebuilding of neural pathways.
Operational Definitions

Art therapy: As defined by the American Art Therapy Association (2017), art therapy is a mental health profession that serves individuals, families, and communities through art-making, creative process, applied psychological theory, and human experience within a psychotherapeutic relationship. Art therapy must be facilitated by an art therapist, and the therapist and client work together to support personal growth and relational treatment goals as well as community concerns. Art therapy is used to improve cognitive and sensory-motor functions, foster self-esteem and self-awareness, cultivate emotional resilience, promote insight, enhance social skills, reduce and resolve conflicts and distress, and advance societal and ecological change.

Dementia: According to Hung et al. (2018), dementia is a condition involving a significant decrease in cognitive abilities, including memory deficits, mood changes, and problems in communication and reasoning.

Neural pathway: According to Kim, D. (2010), Neural pathways are the basis of your habits of thinking, feeling, and acting. The more a neural pathway is used, the more strengthened it becomes.

Neurogenesis: According to the Queensland Brain Institute (n.d.), neurogenesis is the process by which new neurons are formed in the brain.

Neural plasticity: According to MedicineNet (2017), neural plasticity is the brain’s ability to reorganize itself by forming new neural connections throughout life. Neural plasticity allows the neurons in the brain to compensate for injury and disease and to adjust their activities in response to new situations or changes in their environment.

Neurocognitive disorders: According to MedlinePlus (2018), part of the U.S. National Library of Medicine, a neurocognitive disorder is a general term that describes decreased mental...
function due to a medical disease other than a psychiatric illness. Conditions associated with neurocognitive disorder are traumatic brain injuries, breathing conditions, cardiovascular disorders, degenerative disorders, dementia due to metabolic causes, drug and alcohol related conditions, and infections.

**Agency**: Agency is defined as acting and making decisions to influence one’s own circumstances (Boyle, 2014).

**Person-centered therapy**: Person-centered psychotherapy was developed by Carl Rogers rooted in principles of democracy and humanism, believing that people are best served when they are helped to find their own best way (Cain, 2010).

**Quality of Life (QoL)**: QoL includes one’s physical health, the capacity to care for oneself, make decision and engage in meaningful social interaction (Gross, 2015).
CHAPTER II
LITERATURE REVIEW

Neural Pathways

According to Kim, D. (2010), Neural pathways are the basis of your habits of thinking, feeling, and acting. The more a neural pathway is used, the more strengthened it becomes. This potentially indicates that the more a client with dementia practices learning new skills related to memory, the more strengthened these neural pathways become, making them easier to be accessed in the future. John Medina states in Brain Rules (2014) that:

When you learn something, the wiring in your brain changes. As neurons learn, they swell, sway and split. They break connections in one spot, glide over to a nearby region, and form connections with their new neighbors. Many others stay put, simply strengthening their electrical with each other, increasing the efficiency of information transfer (p. 86-87).

Researchers have discovered that the brain is “plastic” and able to experience neurogenesis through a growth of new connections between brain cells, particularly in the hippocampus (Stern, 2009). According to the Queensland Brain Institute (n.d), neurogenesis is defined as the process by which new neurons are formed in the brain. It has been found that this kind of plasticity occurs as a direct result of exposure to an enriched environment, which includes the promotion of physical activity, socialization, and problem-solving (Studenski et al., 2006). Research has discovered that one of the greatest predictors of successful aging is the presence or absence of a sedentary lifestyle (Medina, 2014, p. 23). John Medina (2014) states:

A lifetime of exercise results in a sometimes-astonishing elevation in cognitive performance, compared with those who are sedentary. Exercisers outperform couch
Based on this understanding, physical activity is a measurable contributor to improved cognitive functioning. Even people who identify as couch potatoes show increase in cognitive benefits from fidgeting over those who do not fidget (Medina, 2014, p. 25).

When it comes to memory encoding, all of our senses are involved with the encoding process and are stored all throughout the brain (Medina, 2014). The brain also appears to use automatic processing as its encoding strategy in cases where one can visualize the information that is encountered (Medina, 2014). Medina (2014) states that, “When the initial encoding is more detailed, more multifaceted, and more imbued with emotion, we form a more robust memory” (p. 135).

Dementia

Dementia is a condition involving a significant decrease in cognitive abilities, including memory deficits, mood changes, and problems in communication and reasoning. Dementia is not a specific disease. It is a descriptive term for a collection of symptoms that can be caused by several disorders that affect the brain. Symptoms include loss of ability to solve problems and maintain emotional control, personality changes and behavioral problems, such as agitation, delusions, and hallucinations (Hung et al., 2018).

Duan et al. (2018) described dementia as involving synaptic loss, dysfunction, neuronal death, vascular toxicity triggered by deposits of pathologic inducers of lesions in brain tissue, amyloid peptide, and hyperphosphorylated tau protein.

Symptoms of Dementia of the Alzheimer’s Type (DAT) may involve difficulty with remembering names and recent events, impaired judgment, confusion, disorientation, behavioral...
changes, and difficulty speaking (Alzheimer’s Association, n.d.). These symptoms can be a consequence of changes in the brain that include abnormalities in the twisted strands of the protein tau, deposits of the protein fragment beta-amyloid, and death and damage to neurons (Tucknott-Cohen, 2016).

**Types of dementia.** Forms of dementia are categorized in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) (2013) under Major and Mild Neurocognitive Disorders. For Major Neurocognitive Disorder, the diagnostic criteria are as follows:

A. Evidence of significant cognitive decline from a previous level of performance in one or more cognitive domains (complex attention, executive function, learning and memory, language, perceptual-motor, or social cognition) based on:
   a. Concern of the individual, a knowledgeable informant, or the clinician that there has been a significant decline in cognitive function; and
   b. A substantial impairment in cognitive performance, preferably documented by standardized neuropsychological testing or, in its absence, another quantified clinical assessment

B. The cognitive deficits interfere with independence in everyday activities (i.e., at a minimum, requiring assistance with complex instrumental activities of daily living such as paying bills or managing medications).

C. The cognitive deficits do not occur exclusively in the context of delirium.

D. The cognitive deficits are not better explained by another mental disorder (e.g., major depressive disorder, schizophrenia) (pg. 602)
Dementia is a general term for loss of memory and other mental abilities severe enough to interfere with daily life. It is caused by physical changes in the brain. Alzheimer’s Disease (AD) is the most common type of dementia, but there are many kinds, including the following most common forms: Creutzfeldt-Jakob Disease, Dementia with Lewy Bodies, Frontotemporal dementia, Parkinson’s Disease Dementia, and Vascular Dementia (“What is dementia?”, 2018).

**Alzheimer’s disease (AD).** Galbraith, Subrin, and Ross (2004) stated that early AD symptoms include memory loss, language difficulties (aphasia), perceptual impairment (agnosia), and a decline in thinking abilities (Galbraith, 2004). Most commonly, impairments reflect an inability to complete complex instrumental daily activities such as balancing a checkbook, while the ability to complete simple activities of daily living remain intact (Rivas-Vazquez et al. 2004). A person experiencing Mild Cognitive Impairment (MCI) in early AD may notice prominent memory impairments, primarily short-term memory (STM) loss as well as impairments in reasoning, planning, organizing, difficulty with attention, fatigue, apathy and mood changes including irritability, anger and depression (Snowdon, 2001).

**Creutzfeldt-Jakob disease (CJD).** According to MedlinePlus (2018), (CJD) is a rare, degenerative brain disorder. Symptoms usually start around age 60. Memory problems, behavioral changes, vision problems, and poor muscle coordination progress quickly form dementia to coma, and death (MedlinePlus, 2018). Most patients die within a year.

**Lewy body dementia (LBD).** LBD is the second most common form of dementia and is a brain disorder resulting in irreversible cognitive decline and problems with movement (“Lewy Body Dementia,” n.d.). Lewy bodies are alpha-synuclein proteins, associated with thinking and motor control, that build up in the brain. This build-up affects memory, thinking skills, movement, mood, and behavior (“Lewy Body Dementia,” n.d.). Symptoms associated with LBD
include slow and rigid movements, shaking, balancing issues, fainting, difficulty with concentration and alertness, visual hallucinations, daytime drowsiness, fluctuating changes in personality or mood, memory loss, confusion and problems sleeping (“Lewy Body Dementia,” n.d.).

**Frontotemporal dementia (FTD).** FTD is related to AD, but attacks the frontal lobe of the brain (Sahyouni, Verma, & Chen, 2017). This disease is characterized by the degeneration of the frontal lobes in the brain and can expand to the temporal lobe (“Frontotemporal Dementia,” n.d.). There are three main groups of symptoms that are related to this form of dementia: a notable difference in behavior, progressive non-fluent aphasia (PNFA), and semantic dementia (“Frontotemporal Dementia,” n.d.).

**Parkinson’s disease with dementia (PD).** In late-stage PD, symptoms of dementia arise. PD involves the deterioration of dopamine-producing neurons, and this progressive and chronic nervous system disorder is a primary cause of dementia (Sahyouni, Verma, & Chen, 2017).

**Vascular Dementia or Vascular Cognitive Impairment (VCI).** VCI is categorized by a cerebrovascular disease that causes many “micro” strokes within the brain and is also attributed to high cholesterol, high blood pressure, and diabetes (“Vascular Dementia,” n.d.). The damage created by the series of “mini” strokes creates an oxygen and nutrient deprivation due to a blockage or reduced blood flow to the brain resulting in thinking and cognitive skills decline (“Vascular Dementia,” n.d.). Symptoms include confusion, trouble speaking or concentrating, loss of vision, difficulty solving problems or completing tasks, problems with bladder and bowel control, hallucinations, and being easily agitated or upset (“Vascular Dementia,” n.d.).
Dementia studies

A study completed by Li (2013) used systematic searches in peer reviewed journals to review and compare person-centered interventions, measurement, and resident outcomes. Li (2013) selected 24 studies where they aimed to determine the benefits and impact on improving the quality of life in patients with dementia living in care facilities through the use of person-centered interviews (Li, 2013). Person-centered care (PCC), which is viewed as a high-quality approach in residential care settings, requires a significant shift in philosophy from custodial, physical task-oriented care, to care that redirects the control to residents with the goal of facilitating autonomy, independence, and QoL (Li, 2013). It is a care model that upholds the older adults’ humanity and works on the unique needs of the individual rather than institutional and biomedical goals. The study found that person-centered dementia care had significant effects on decreasing behavioral symptoms and psychotropic medication use in residents with dementia in long-term care. Limitations of the study concluded that the effectiveness of PCC on residents’ bio-psycho-social outcomes like sleep, stress, and wellbeing need to be addressed and systematically examined with subjective and objective measures in future studies (Li, 2013). A conclusion from this study pointed to a need for similar studies like this in order to be able to help this population effectively.

A peer reviewed article by Marusic (2018) discussed the move towards non-physical approaches to counteract age-related functional deterioration and to provide rehabilitation for neural mechanisms. Approaches such as cognitive training (e.g. memory, attention training) and mental techniques (e.g. motor imagery) were used to counteract this age-related functional deterioration. This review found that non-physical approaches are highly recommended for individuals with limited or complete inability to perform physical exercises (Marusic, 2018).
Injury and/or prolonged physical inactivity-related reorganization of the corticospinal tract can be counteracted to some extent by applying proper non-physical interventions (Marusic, 2018). The permeation of cognition in gait and postural control (most prominent in older adult population) opens new perspectives for the development of non-physical approaches and their application following injury/surgery, during hospitalization or in the aging process (Marusic, 2018). The review stated that combination of motor imagery and cognitive exercise may provide more benefits than using one or the other modality alone. Cognitive training is aimed at optimizing the cognitive functioning and/or slowing brain aging which generally involves a guided practice on a standard set of cognitive tasks, such as memory or attention (Marusic, 2018). They stated that tasks are often designed to present an increasing challenge to cognitive abilities and thereby induce learning. On the other hand, the use of motor imagery (MI) as a safe and efficient method has also been proposed to counteract age-related motor impairments in simple or automatized tasks (Marusic, 2018). One of the main advantages of using non-physical practices is their easy implementation in rehabilitation programs. Cognitive interventions are divided into various approaches and concepts, such as cognitive stimulation, cognitive rehabilitation and cognitive training (Marusic, 2018). Cognitive stimulation provides training in social and cognitive functions in a non-specific manner. This includes group discussions, organized leisure activities and some targeted therapeutic talks about past experiences and memories (Marusic, 2018).

The review stated that cognitive rehabilitation is implemented through individualized programs for special daily activities for the patient. Patients with a mild-cognitive impairment or early stage of dementia will, for instance, try to remember the name of their caretaker, a widower will aim to independently handle their finances, while a patient suffering from a stroke will learn
to talk fluently (Marusic, 2018). Cognitive rehabilitation is an individualized approach designed for patients and their families to benefit from cooperation with healthcare professionals to jointly identify and attain goals (Marusic, 2018). It was noted that activities in this study were comprised mainly of those aiming to improve cognitive functioning of the patient in activities of daily living.

Cognitive training is a strategy that uses learning processes to improve cognitive functioning in individuals, most often implemented individually or in small groups. It involves guided exercises of standard tasks in the fields of memory training, attention or problem-solving (Marusic, 2018). The review identified that such training is implemented with the intention of improving or at least maintaining current cognitive functioning. The researcher’s goal is to develop trainings that create long-term beneficial results that are measurable several years after completion. To achieve optimal results, difficulty levels of cognitive training are tailored to the abilities of each client (Marusic, 2018). The researchers found that improvement in cognitive abilities during the course of cognitive training points to the high plasticity of the brain in old age. Marusic (2018) stated that although cognitive training and stimulation promise positive results on tasks measuring memory, executive functions, attention and speed-of-processing; the generalization and benefit to everyday life are not usually directly addressed. Marusic (2018) concluded, non-physical interventions should be practiced from the early stages of cognitive and/or physical decline onwards, whether this is related to normal aging, chronic or acute pathologies. The combination of several non-physical approaches; from cognitive (e.g. specifically for tasks involving memory and/or decision-making processes) to the executional stage (e.g. simple tasks that require strength or to the same degree automated tasks), was compared to those expected when using only one modality (Marusic, 2018). It was found that
combining these two modalities produced a more beneficial result in cognitive functioning opposed to using one modality (Marusic, 2018).

**Art Therapy Interventions**

As defined by the American Art Therapy Association (2017), art therapy is a mental health profession that serves individuals, families, and communities through art-making, creative process, applied psychological theory, and human experience within a psychotherapeutic relationship. Art therapy must be facilitated by an art therapist, and the therapist and client work together to support personal growth and relational treatment goals as well as community concerns. Art therapy is used to improve cognitive and sensory-motor functions, foster self-esteem and self-awareness, cultivate emotional resilience, promote insight, enhance social skills, reduce and resolve conflicts and distress, and advance societal and ecological change.

Art therapy involves a creative process, physical activity (e.g., manually creating art), problem solving (e.g., deciding on color, placement, etc.), and socialization (e.g., describing artwork made) creating an enriched environment, which may increase the likelihood of neurogenesis taking place to improve cognitive performance (Alders, 2009).

Galbraith, Subrin, Ross and Riley (2004) are art therapists who have collaboratively worked at adult day centers. Their approach directly integrated the understanding that neuroscience can inform creative arts interventions for early stages of AD and MCI (Galbraith, 2004). Throughout their research, they linked sensory stimulation with social-emotional connections to improve the overall sense of well-being and quality of life for their MCI/AD patients (Galbraith, et al. 2004).

Tucknott-Cohen (2016) conducted a 17-week art therapy study of a client with Alzheimer’s disease. The clinical case description included directives and materials safe for
degenerative stages of DAT. They used thick artist paper, outlined mandalas, pens, pencils, crayons, and bingo magic markers. The clinical case description discussed five sessions with the client. The outcome of the study led to the conclusion that perhaps therapeutic interventions that include reality orientation to address memory and cognitive deficits may be helpful for those with early onset DAT, but it could potentially fuel distress for those suffering from advanced stages, when reality orientation has been more severely compromised. Creating art in a supportive setting seemed to ease and relax the client, as reported in the study, the client appeared calmer and less agitated after art therapy sessions (Tucknott-Cohen, 2016). As seen in the example of the client, creating art provided a range of ways to communicate, such as expressing agitation through the physicality of art making. Art has the ability to imitate and reveal inner feelings, but it also can provide a concrete medium through which one can achieve both conscious and unconscious expression (Tucknott-Cohen, 2016). The study highlighted that art making can act as an important means to reinforce the emotional, perceptual, conceptual, and motor systems of people with dementia, while placing an emphasis on their strengths. Furthermore, art making involves several sensory modalities and engages complex cognitive mechanisms, such as internal imagery and decision-making processes (Tucknott-Cohen, 2016). Based on the literature above, art therapy appears to be a beneficial intervention for the aging population due to its reinforcement of emotional, perceptual, conceptual, and motor systems.
CHAPTER III

METHODS

Study Design

This grant funded study used a mixed methods methodology which combined both quantitative and qualitative research to provide a variety of data collection measures that can be used to provide a broader understanding of the clients. The goal of the study was to determine whether art therapy improves mood and QoL in the aging adult population. It was hypothesized that an improvement in depressive symptoms and quality of life along with verbalizations of enjoying art therapy would be a result of participation in art therapy programming. This hypothesis would support that art therapy may be an intervention that improves the QoL in the aging population.

Location

Site 1 is an adult day facility that works with aging adults or adults with neurodegenerative diseases. Site 2 is a skilled nursing community that houses aging residents. All study participants were current clients at two aging facilities in a large Midwestern metropolitan city.

Time Period

The study began in August of 2018 and commenced in April of 2019. This thesis reviews data from August 2018 through December 2018.

Enrollment Information

The researchers collaborated with the staff to determine which participants would be eligible for the study and able to give their own consent along with consent from their Legal Authorized Representative (LAR). Clients at both facilities were given the choice to not partake in the study or to leave the study at any time. If clients decided not to participate, or decided to leave the study, they were still able to participate in all art therapy programming offered. Also, it
did not result in any penalty or loss of benefits to which they were entitled and did not affect their relationship with the site or Indiana University.

**Subject Type**

Participants from Site 1 are clients who cannot stay home alone during the day due to living with dementia, multiple sclerosis, Parkinson’s disease, recovering from strokes, have diagnosed mental challenges, or other medical challenges. Participants from Site 2 are permanent residents of a skilled nursing facility that aids aging adults in receiving the care they need to carry out an independent life.

**Recruitment**

In order to recruit the participants, flyers were handed out to potential participants and meetings were scheduled with their LAR in order to gather their consent. The researcher read through the study manual with both the LAR and the participant to give thorough and accurate descriptions of what the study would entail. LAR consent was obtained before participant consent. Some LARs were reached by phone or email if they were not able to meet in person to discuss the study.

**Subject Inclusion Criteria and Subject Exclusion Criteria**

Participants for the study were required to be either a guest or resident at the participating facilities. The participants also needed to have the ability to answer the questions of the evaluation surveys give prior to the study. If the guests/residents agreed to be in the study, they agreed to participate in individual, group, and/or open studio art therapy sessions. Sessions were offered three times per week from 30 - 90 minutes. There was approximately twelve hours of art therapy programming per week. All sessions were held on site.
Investigational Methods and Procedures

The quantitative data obtained from this study involved the Geriatric Depression Scale (GDS) and the Brunsviken Brief Quality of life scale (BBQ). These surveys were given to study participants pre-study and mid-study, and post-study. In addition to those measures, the researchers collected participant verbalizations throughout the research study. The researchers also collected data on program participation in individual, group, and open studio as well as material choice, themes, and session directives. The surveys took approximately thirty minutes and were administered in August and December. For the purpose of this thesis, the pre and mid results of the GDS and BBQ were reviewed.

Informed Consent

The informed consent provided information to the participants and their LARs regarding who was conducting the study, any risks that were involved, how risks were being minimized, what the benefits of the study are, if they would receive their results, and how their information would be protected (See Appendix A). When possible, the researcher met with both the participant and their LAR at the same time to review the study manual and the informed consent. Some LARs had to be contacted via email in order to gain consent.

Delimitations and Limitations

Delimitations included obtaining caretaker consent and the time of the art therapy sessions, and working with small groups of participants or individual sessions. Limitations included that the study was required to take place within the hours of operation at the sites and participants must be receiving services at the sites and maintained participant consent due to cognitive decline. Also, the participants were able to elect to engage in art therapy sessions which may affect consistent participation. There were outside also factors that could not be
accounted for in this particular study such as participants’ physical health, stress, social supports, or change in medications.

Risk

There was minimal risk associated with this study. A potential risk of completing the survey was being uncomfortable answering the questions. Additionally, there was a risk of possible loss of confidentiality. To minimize the potential risks during the survey, the participant was able to skip any questions that made them uncomfortable or they were able to stop taking the survey at any time. Additionally, to reduce the potential of loss of confidentiality, each participant was provided a unique identification number that was used for all study documents.

Data Analysis

With the data collected from the surveys, a descriptive analysis was completed which was the first step to being able to do a correlation analysis of the data once it was all collected by the end of the study. The GDS collects nominal data on whether or not a participant is showing signs of depression. There is a rating scale for the facilitator to refer to in order to determine whether or not the participant is showing signs of depression. According to the scale, a score greater than or equal to ten is almost always indicative of depression, and a score greater than five may warrant a follow-up comprehensive assessment. The BBQ is used to determine a participant’s quality of life based from twelve questions and six areas of life. The facilitator reads a statement regarding the satisfaction of the participant’s life and the participant rates the statement on a sliding scale from zero to four: zero meaning they ‘don’t agree at all’, and four being they ‘completely agree’. To analyze the scores of these two different assessments, the researcher found the difference between the pre- and mid-scores and compared them to in-person observations to determine correlations between depression and QoL.
CHAPTER IV

RESULTS

The data analysis reported the responses of the GDS and BBQ. The results of the GDS and BBQ were compared pre to mid study to show any change in mood and quality of life. If the GDS results show a decrease in pre to mid geriatric depression scores, then it is correlated to an increase in mood. The results will show an increase in scores for the BBQ, showing an increase in importance and satisfaction in the six life domain areas.

Geriatric Depression Scale

The Geriatric Depression Scale is a fifteen “yes or no” questionnaire asked to each guest by the person facilitating the study. The questions are based on how the participants have felt over the past week, and the “yes” and “no” answers are either bolded or not bolded depending on whether the answers indicate depression. The rating scale for the facilitator helps to determine whether or not the participant is showing signs of depression. According to the scale, a score greater than or equal to ten is almost always indicative of depression, and a score greater than five should also warrant a follow-up comprehensive assessment (Greenburg, 2019). The following tables show the participants scores pre-study and mid-study.
Table 1

*Site 1: Adult day service facility*

Note: Participant 1 left the study prior to the mid-assessment. Participant 5 exited the study prior to the pre-assessment.
Table 2

**Site 2: Residential nursing community**

<table>
<thead>
<tr>
<th>Participant #</th>
<th>Pre</th>
<th>Mid</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
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</tr>
<tr>
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</table>

Note: Participant 52 left the study prior to the mid-assessment.

**Brunnsviken Brief Quality of Life Scale**

The Brunnsviken Brief Quality of life scale (BBQ) measures how participants experience their quality of life based on 12 questions. It covers six areas assessing how satisfied the participants are with each of these questions, and the importance of each life area. For this study, three areas that coincided with the art therapy program were observed. These three areas were leisure time, the opportunity to be creative, and learning. The participants were asked to rate on a scale of zero to four regarding these three areas. The questions were,

I am satisfied with my leisure time: I have the opportunity to do what I want in order to relax and enjoy myself, My leisure time is important for my quality of life; I am satisfied with opportunities to be creative: to get to use my imagination in my everyday life, in a hobby, on the job, or in my studies, Being able to be creative is important for my quality
of life; I am satisfied with my learning: I have the opportunity and desire to learn new, exciting things and skills that interest me. Learning is important for my quality of life (Lindner et. al, 2016).

For the pre surveys scores, the descriptive analysis reviewed the scores given and calculated the following information on scores. The highest scores for each of the three categories is 4, which means that the participant ‘completely agrees’ with the statement. If all of the participants rated a 4 in all three categories, the highest score would have been 168. The minimum score across all of the participants for the BBQ was 32.00, the maximum was 96.00, and the mean score was 73.3333. For the pre-satisfaction scores in Leisure, the minimum score was .00, the maximum score was 4.00, and the mean was 2.9333. For the pre-satisfaction scores in Creativity, the minimum score was .00, the maximum was 4.00, and the mean was 3.1333. For the pre-satisfaction in Learning, the minimum score was 1.00, the maximum was 4.00, and the mean was 3.1333.

For the mid surveys scores, the minimum score across all of the participants for the BBQ was 36.00, the maximum was 96.00, and the mean score was 76.6429. For the mid scores of the satisfaction in Leisure category the minimum score was 3.00, the maximum score was 4.00, and the mean score was 3.7143. The mean score may indicate that prior to the study on average, participants found 73% satisfaction in leisure time, and by mid study the participants found 92% satisfaction in their leisure time. For the mid-satisfaction scores in Creativity, the minimum score was 1.00, the maximum score was 4.00, and the mean score was 3.2857. The mean score in this category may indicate that prior to the study on average, participants found 78% satisfaction in creativity, and by mid study the participants found 80% satisfaction in their opportunity to be creative. For the mid-satisfaction scores in Learning, the minimum score was 3.00, the maximum
score was 4.00, and the mean score was 3.7143. The mean score in this category may be indicative that prior to the study of participants found 78% satisfaction in learning, and by mid study they found 92% satisfaction in their learning opportunities. The increase in scores across all categories could be supportive of art therapy as a beneficial intervention for this population. There was the greatest increase in Satisfaction in Leisure from pre to mid assessment.
Table 3

*Site 1: Leisure Time: Adult day service facility*

![Bar chart for Site 1: Leisure Time: Adult day service facility]

Table 4

*Site 1: Opportunity to be Creative: Adult day service facility*

![Bar chart for Site 1: Opportunity to be Creative: Adult day service facility]
Note: Participant 1 left the study prior to the mid-assessment. Participant 9 rated pre-satisfaction as a 0.

Table 5

Site 1: Learning: Adult day service facility

Note: Participant 1 left the study prior to the mid-assessment.
Table 6

*Site 2: Leisure Time: Residential nursing community*

![Bar chart showing BBQ rating for participants 51 to 58.](chart1)

- Satisfaction: Pre
- Satisfaction: Mid
- Importance QoL: Pre
- Importance QoL: Mid

Table 7

*Site 2: Opportunity to be Creative: Residential nursing community*

![Bar chart showing BBQ rating for participants 51 to 58.](chart2)

- Satisfaction: Pre
- Satisfaction: Mid
- Importance QoL: Pre
- Importance QoL: Mid
Table 8

*Site 2: Learning: Residential nursing community*

<table>
<thead>
<tr>
<th>Participant #</th>
<th>BBQ Rating</th>
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<th>Satisfaction: Mid</th>
<th>Importance QoL: Pre</th>
<th>Importance QoL: Mid</th>
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<td>58</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**Analysis of Results**

Observing the scores reported from the participants at the two sites, it shows an overall higher occurrence of depression at the residential nursing community. There were three participants at the residential facility who rated greater than a five on the depression scale, and two participants at the adult day service who rated greater than a five on the depression scale. Three participants at the residential nursing community reported decreased depression scores from pre to mid study. There was a decrease in depression from pre to mid study from two participants at the adult day service facility. This decrease in depression scores from those participants at both sites points to a correlation in the increase in mood for those participants. From both sites, Participants 9, 10, 51, 53, 56, a total of 5 out of 13 participants (38%), decreased in their overall depressive symptoms. At Site 1 there were 2 out of 8 participants (25%) who
reported a decrease, and at Site 2 there were 3 out of 5 participants (60%) who reported a decrease. The two participants at Site 1 that reported decreased depression lowered their scores by 53%. The three participants at Site 2 that reported decreased depression lowered their scores by 66%. There were three participants (37%) at Site 1 (Participants 2, 3, and 4) who all showed an increase in depression, and two participants (40%) at Site 2 (Participants 57 and 58) who showed an increase in depression. The score of depression over pre and mid study surveys across all participants decreased by 61%.

Observing the pre and mid survey data collected from the BBQ, it seems to show that study participants from the adult day service facility are overall more satisfied with their leisure time, opportunity to be creative, and learning than the residents at the nursing community. The results of the five participants who showed decreased depressive symptoms (an increase in mood) were compared to their scores on the BBQ. Participant 9 showed an increase in satisfaction and importance of the Opportunity to be Creative, and satisfaction and importance of Learning from pre to mid study surveys. Participant 10 showed no change in scores across the three categories. Participant 51 showed a decrease in satisfaction and importance of Leisure Time; no change in scores for Opportunity to be Creative, or Learning. Participant 53 showed no change in satisfaction but an increase in importance in the Leisure time category; showed no change in satisfaction but a decrease in the importance in the Opportunity to be Creative category; showed an increase in satisfaction and decrease of importance in the Learning category. Participant 56 showed a decrease in satisfaction and increase in importance in the Leisure Time category; an increase in satisfaction and no change for the importance in the Opportunity to be Creative category; showed no change in satisfaction and an increase in importance in the Learning category. The incongruency in correlations between the GDS and
BBQ score for these participants did not demonstrate a correlation between mood and quality of life in the domain area studied.
CHAPTER V

DISCUSSION

The integration of the literature review and the data collection will be reviewed with a focus on how an enriched environment can lead to the facilitation of new neural pathways in the aging population. There is also an emphasis on how participating in leisure activities, using creativity, and learning impacts QoL. The results from the data collected are discussed in relation to the formal assessment tools and their relevancy in rating QoL and depression in the aging and dementia population. Additionally, antidotal examples of verbalizations and observations from several program participants are discussed.

Depression

Husaini (1997) discussed that depression is one of the most common mental disorders among older Americans. Over the past three decades there was an epidemiological study that pointed to three factors that play a serious role in the psychological well-being of the elderly this includes, physical health, general stress, including stressful life events, and social support.

Site 1 is an adult day program which provides services for the duration of a typical work day. The guests live at home with loved ones or caretakers. Two out of eight, 25%, of these participants at Site 1 showed a decrease in the GDS. This could be attributed to increased socialization as a result of participation of the art therapy program. Other factors that can affect the participant’s mood throughout the study are physical health and general stress that are happening in their life outside of the art therapy program. These overall results at Site 1 may reflect lower occurrences of depression overall because these clients have more freedom to engage in leisure activities and maintain their important social connections while living at home.
Studenski et al. (2006) stated that the enriched environment, including socialization, has been found to facilitate occurrence of plasticity in the brain. Therefore, lower depression scores could be directly related to the more enriched environment that the clients at the adult day program experience.

Site 2 is a residential nursing facility where the clients permanently reside. For many, this type of living arrangement can lead to greater isolation from loved ones and less involvement in spontaneous or unstructured activities. These facilities often provide many structured activities throughout the day to promote socialization. Three out of five, 60%, of the participants at Site 2 showed a decrease in depression from pre-assessment.

The differences in reporting and rating of depression between the two sites could be attributed to numerous factors such as their physical health, stress, social supports, and different structure between the two sites. Although it does support Housaini (1997) findings that depression is a prominent issue with older adults.

**Quality of Life**

The Brunnsviken Brief Quality of life scale (BBQ) measures how participants experience their quality of life based on 12 questions within six domain areas. Each area contains two questions that ask about satisfaction and importance (see Appendix B). For this study, three areas that coincided with the art therapy program were observed. These three areas are leisure time, the opportunity to be creative, and learning.

**Leisure.** Participating in more leisure activities can improve overall QoL due to having a sense of control and promoting relaxation. At Site 1, the adult day program, Participant 6, mid satisfaction score within the leisure category doubled although the rate for the importance of leisure in quality of life remained the same. At Site 2, Participant 57 showed an increase from the
pre-satisfaction score of three to the mid-satisfaction score of four. These increases in satisfaction with leisure time could indicate that the participants were having some of their leisure time needs met through the participation of art therapy.

At Site 1, the average score for pre-satisfaction was 3.125 and pre-importance was 3.75. The average score for mid-satisfaction was 3.875 and mid-importance was 3.875. These scores show that there was a 0.75 increase in satisfaction for leisure from pre- to mid- study, and a 0.125 increase in importance to their quality of life. This may indicate that the more participants engaged in art therapy sessions, the more satisfied they were with their leisure time. At Site 2, the average score for pre-satisfaction was 3 and pre-importance was 3.4. The average score for mid-satisfaction was 2.6 and mid-importance was 4.2. These scores show a 0.4 decrease from pre- to mid-study in leisure time, and a 0.8 increase in importance to quality of life. This could indicate that as the participants at Site 2 were finding leisure time to be more valuable to their quality of life, although, the decrease in satisfaction could indicate that needs were not being met in fulfilling leisure time.

**Opportunity to be creative.** Art therapy involves a creative process, physical activity, problem solving, and socialization (Alders, 2009). Research by Galbraith, et al. (2004), linked sensory stimulation (involved in creative process) with social-emotional connections to improve the overall sense of well-being and quality of life for their MCI/AD patients (Galbraith, 2004). Participant 9, had an increase in satisfaction from a zero in the pre-satisfaction score to a three in the mid-satisfaction score. Participant 56 and 58 had a pre-satisfaction scores of one and mid-satisfaction scores of three. These increased scores in the satisfaction to be creative may point to the study participants having an improved quality of life due to increased creative process, physical activity, problem solving and socialization.
While an increase in QoL scores in the area of creativity were not more broadly reported across both sites, the researcher found that the BBQ scale was not equipped to collect data that may better represent the participants’ experiences. The researcher noted that participants at Site 1 were more willing and engaged in the creative process as the study progressed. For example, a program participant, who was visually impaired and only wanted to work with modeling clay began to engage in a wide variety of media and directives including materials such as paint, seashells, sequins, foam balls, and foam stickers. Another example, at the start of the study, a participant seemed distracted in most art therapy sessions and demonstrated minimal investment in projects and completed them quickly, sometimes within a range of five to fifteen minutes. After a few months, the participant began taking ownership of the art therapy sessions and even developed a directive for all of the participants as a group activity. This participant was engaged in art therapy sessions for thirty to forty-five minutes by the end of the study. As a result, this participant’s satisfaction with the creative process showed an increase from the pre to mid study.

At Site 1, the average score for pre-satisfaction was 3.5 and pre-importance was 3.625. The average score for mid-satisfaction was 3.75 and mid-importance was 3.875. These scores show an increase by 0.25 in satisfaction for creativity and a 0.25 increase for the importance to quality of life. This could imply that the more the participants engaged in creative activities through art therapy, the more satisfaction they found in that area of their life.

At Site 2, the average score for pre-satisfaction was 3.2 and pre-importance was 4. The average score for mid-satisfaction was 4 and mid-importance was 3.6. These scores show an increase by 0.8 for their satisfaction in the opportunity to be creative and a decrease in 0.4 in the importance that it has in their quality of life. This could be indicative of the participants finding that the art therapy sessions enabled them to be more creative than previously in their life.
Learning. Medina (2014) discussed the power of learning new information on the strengthening of neural pathways. He stated that every time the brain learns something new, its wiring changes. Neurons swell, sway and split each time something new is learned (Medina, 2014). This is very important when considering the aging population and working to improve their cognitive function or slowing their cognitive decline.

The pre-satisfaction and mid-satisfaction scores of the learning at Site 1, showed an increase in three participants. Participant 3 and 6 had a pre-score of 3 and a mid-score of 4 and Participant 9 had a pre-score of 2 and a mid-score of 3. Site 2 had one participant, Participant 53 rated increased satisfaction from a 2 at pre to a 4 at mid. These change in scores could mean that participating in art therapy program could meet the needs of learning new skills in the aging population.

At Site 1, the average score for pre-satisfaction was 3.5 and pre-importance was 3.875. The average score for mid-satisfaction was 3.875 and mid-importance was 4. These scores show an increase by 0.375 from pre to mid-satisfaction and an increase by 0.125 in the importance to QoL. This may indicate that the participants at this site were more satisfied with their learning new skills as the study proceeded and found that it increased their QoL.

At Site 2, the average score for pre-satisfaction was 3.2 and pre-importance was 3.4. The average score for mid-satisfaction was 3 and mid-importance was 4. These scores show there was a decrease by 0.8 of satisfaction in learning and a 0.6 increase in the importance that learning has to their quality of life. This could indicate that for some participants art therapy did not satisfy their needs and/or interests in learning a skill. Challenges with Rating Manuals

Based on the results of the study, it is evident that there was an improvement in some participants, but the numbers did not accurately reflect the improvement observed in the weekly
sessions. Standardized assessment tools do not always accurately gauge overall experience of the participants. With this study specifically, a general concern of accurate self-reporting from the client’s seemed to be unreliable due to their experiencing cognitive decline. This was evident with behaviors such as not tracking with the survey the researcher was asking questions and forgetting that they were taking a survey altogether. Due to this observation and concern for accurate reporting, it would be beneficial to include an assessment given to the staff and caretakers to note any changes or improvement in participant demeanor.

Alders (2009) stated that art therapy creates an enriched environment through its characteristic qualities that promote overall wellbeing, which may increase the likelihood of neurogenesis taking place to improve cognitive performance. By using a person-centered approach and focusing on art therapy interventions that promoted leisure time, learning, and creativity with art therapy interventions that focused on encouraging clients in decision-making, self-esteem building, and improvement of executive functioning. In each session the clients had the choice of participating and deciding on the length of time, design elements, and materials. It is suggested that this enriched environment may have facilitated new neural connections, and that art therapy is a beneficial intervention for this population.

**Benefits beyond the scores.** At Site 1 at the beginning of the study, a program participant, had limited interactions with fellow participants and did not attend the scheduled activities led by the direct care staff. They kept to themselves and made statements revolving around a lack of purpose and low self-esteem. During art therapy, this participant was hesitant to begin. After five months into the study, they began to open up to the other participants in the group art therapy sessions and asking them about their artwork, lives, and complimenting the art they were making. The participant began to look forward to art therapy and stated that art
therapy made them feel “lighter.” From these observations and verbalizations, that was a strong correlation between art therapy and an improved quality of life for this participant.

In correlation with the literature reviewed, the activity theory proposes that individuals who are engaged in the world around them experience increased levels of psychological well-being and improved QoL (Gross, 2015). For example, another program participant was hesitant to engage in the art therapy sessions. This participant was unable to recall the therapists’ names and seemed to be reluctant each time they were invited to join a session. After a few months of consistent invitation to attend art therapy sessions, this participant became more willing to join and started participating in sessions more frequently. Several times, this participant even walked up to a session and joined voluntarily. Even though the participant was still unable to recall the therapists’ names and role at the site, it seemed as though they became familiarized enough with their faces and the activities they led to continue to participate. Some days, this participant would not participate in the activities as much but would join the group and talk about favorite memories. Observational behaviors explained through this participant example, demonstrates the challenges of using standardized rating manuals with this population. Through increased participation and engagement, the researcher suggests that this individual benefitted from the art therapy program. Although due to cognitive impairments, was not able to participate in the completion of the study assessment tools. It was observed through the study that cognitive decline may interfere with proper self-reporting on mood and quality of life in this population.

Through observation of behaviors, it was evident that neural pathways are strengthened in the aging and dementia population through participation in art therapy. The researcher witnessed that the more a client with dementia practiced learning new skills related to memory, the more strengthened the neural pathways became and were easier to access in the following
sessions. This was evident when one of the participants with mild cognitive impairments continuously remembered materials from home to use in their artwork. The participant was able to recall art work and the thought process and planning of the same projects from session to session, even if the sessions were widely spaced.

Art therapy is used to improve cognitive and sensory-motor functions, foster self-esteem and self-awareness, cultivate emotional resilience, promote insight, enhance social skills, reduce and resolve conflicts and distress, and advance societal and ecological change (Tucknott-Cohen, 2016). The study hypothesizes that if the participants report improved depressive symptoms and quality of life along with verbalizations of enjoying art therapy, then art therapy may be an intervention that improves the quality of life in the aging population. Interpreting informal assessments of the participants such as observations of frequency of participation, engagement in interventions, and verbalizations, may have provided more indicators of the benefits of exposure to an enriched environment for the aging population than the BBQ and GDS assessments. There are many extraneous variables we were not able to assess for such as the participant’s living situation, health and illness, medications, cognitive decline; which all may have played a factor in their mood and QoL.
CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

The literature reviewed rebuilding neural pathways through an enriched environment of learning, creativity, socialization, and physical activity; and points to art therapy being a beneficial intervention for the aging population (Studenski et al., 2006). This study used two quantitative measures to understand the correlation between mood and QoL to support the use of art therapy as a means to rebuilding and strengthening neural pathways in older adults with dementia. This study was conducted at two aging facilities. Two different assessments were given to the participants of the study to determine their QoL and mood. The BBQ rated participants’ satisfaction and importance of quality of life in six life areas, focusing on leisure, creativity, and learning. The participants also completed the GDS assessment regarding their mood to determine whether they had depressive symptoms. The results of the study found that there was an overall decrease in GDS scores across participants at both sites by 61%. The researcher wanted to investigate whether or not participants’ quality of life was tied to lowered depression scores (increase in mood). It was determined that the results of this study did not demonstrate a correlation between mood and QoL in the domain areas studied. Some of the participants that showed decreased depression also showed a decrease in QoL, while some showed an increase in QoL, and others showed no change at all. An increase in mood across 61% of participants during the art therapy study warrants a deeper look into whether this type of intervention is responsible for decreased depression symptoms. There were outside factors that could not be accounted for in this particular study such as participants’ physical health, stress, social supports, or change in medications. Based on the findings in the study, formal assessments may not be the most accurate way to gather the benefits with this population due to the presence
of cognitive decline and lowered ability to self-report. Verbalizations and observations in weekly sessions with the participants gave a clearer insights into the benefits of art therapy.

Cognitive training, assessments given to LARs and staff members, and administration of surveys before and immediately after art therapy sessions should be implemented into future studies. Firstly, cognitive training should have a larger role in the care of the aging population. A study should be conducted that focuses on cognitive training techniques, with a focus on memory tracking, while recording maintenance or improvement of cognitive functioning. A future study could also incorporate assessments given to staff at the study sites and legal authorized representatives (LAR) of the participants to gauge participant improvement from an outside source as well as self-reports from participants. Observation areas for the staff and LARs to note should include fluctuation in mood, number of outbursts at home or on site, occurrences of conflict, ability to participate in site programming and engage in conversation with peers, and to note any changes in the participants’ demeanor before and after art therapy sessions. If formal assessments were given to participants in further studies, they should be administered before and immediately after art therapy sessions. This would be a more informative look into why and how art therapy contributes to an increase in mood and satisfaction with participants’ QoL.
REFERENCES


APPENDIX A

INDIANA UNIVERSITY INFORMED CONSENT STATEMENT FOR RESEARCH

Impact: Art Therapy and Aging Adults
Healthcare Initiative
IUPUI 1805467216

ABOUT THIS RESEARCH
You are being asked to participate in a research study. Scientists do research to answer important questions which might help change or improve the way we do things in the future.

This consent form will give you information about the study to help you decide whether you want to participate. Please read this form, and ask any questions you have, before agreeing to be in the study.

TAKING PART IN THIS STUDY IS VOLUNTARY
You may choose not to take part in the study or may choose to leave the study at any time. Deciding not to participate, or deciding to leave the study later, will not result in any penalty or loss of benefits to which you are entitled and will not affect your relationship with Joy’s House, Greenhouse Cottages of Carmel, or Indiana University.

WHY IS THIS STUDY BEING DONE?
The purpose of this study is to understand the benefits of art therapy for aging adults. The participants will be offered individual and group art therapy and these sessions will be used to identify if the participants found art therapy to be beneficial.

You were selected as a possible participant because you are a guest at Joy’s House or an Elder at Greenhouse Cottages of Carmel.

The study is being conducted by Eileen Misluk, Assistant Professor at Herron School of Art and Design, IUPUI in the Masters of Art in Art Therapy Program. It is funded by Healthcare Initiatives.

HOW MANY PEOPLE WILL TAKE PART?
If you agree to participate, you will be one of 25 at your location for total of 50 participants taking part in this study.
WHAT WILL HAPPEN DURING THE STUDY?
If you agree to be in the study, you will do the following things:

- Participate in individual, group, and/or open studio art therapy sessions.
- Sessions will be offered 3 times per week from 30-60 minutes. There will be approximately 12 hours of art therapy programming per week.
- All sessions are held on site at either Joy’s House or Greenhouse Cottages of Carmel for.
- Complete a pre, mid, and post survey about your current quality of life. These will take approximately 30 minutes and will be administered in August, December, and April.
- Participants who do not participate in the study are able to attend all art therapy sessions offered on their site.
- The study will begin in August and commence in April.

WHAT ARE THE RISKS OF TAKING PART IN THE STUDY?
While participating in the study, the risks, side effects, and/or discomforts include: There is minimal risk associated with this study. A potential risk of completing the survey is being uncomfortable answering the questions. Additionally, there is a risk of possible loss of confidentiality.

To minimize the potential risks during the survey, the participant is able to skip any questions that make them uncomfortable or they are able to stop taking the survey at any time. Additionally, to reduce the potential of loss of confidentiality, each participant will be provided a unique ID number that will be used for all study documents.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THE STUDY?
The benefits to participation in the study that are reasonable to expect are increase involvement in creative activities such as art making, an increase in social activities, and the benefit of participating in an art show.

WILL I RECEIVE MY RESULTS?
We may learn things about you from the study activities which could be important to your health or wellbeing. If this happens, you can decide whether you want this information to be provided to you. This would include if the statistical analysis of the results of the pre/mid/post survey results show significance as a result of participating in the study. If you decide that you want this information, you may need to meet with professionals with expertise to help you learn more about your research results. The study team/study will not cover the costs of any follow-up consultations or actions. Please initial one of the following options:

______ Yes, I want to be provided with this information.
______ No, I do NOT want to be provided with this information.

**HOW WILL MY INFORMATION BE PROTECTED?**
Efforts will be made to keep your personal information confidential. We cannot guarantee absolute confidentiality. Your personal information may be disclosed if required by law. No information which could identify you will be shared in publications about this study nor will databases in which results may be stored. The researcher will maintain confidentiality of the participants by assigning unique identification numbers on the data collection forms which include: material choice, verbalizations, and number and type of sessions attended. Organizations that may inspect and/or copy your research records for quality assurance and data analysis include groups such as the study investigator and her research associates, the Indiana University Institutional Review Board or its designees, and the study sponsor Herron School of Art and Design, Indiana University Purdue University of Indianapolis faculty.

**WILL I BE PAID FOR PARTICIPATION?**
You will not be paid for participating in this study.

**WILL IT COST ME ANYTHING TO PARTICIPATE?**
There is no cost to you for taking part in this study.

**WHAT FINANCIAL INTEREST DOES THE RESEARCHER HAVE?**
One or more individuals involved in this study may benefit financially from this study. The Institutional Review Board (an ethics committee that helps protect people involved in research) has reviewed the possibility of financial benefit. The Board believes that the possible financial benefit is not likely to affect your safety and/or the scientific integrity of the study. If you would like more information, please ask the researchers or study staff.

**WHO SHOULD I CALL WITH QUESTIONS OR PROBLEMS?**
For questions about the study contact the researcher, Eileen Misluk, at 317-278-9460.

For questions about your rights as a research participant, to discuss problems, complaints, or concerns about a research study, or to obtain information or to offer input, please contact the IU Human Subjects Office at 800-696-2949 or at irb@iu.edu.

**WILL I BE CONTACTED ABOUT RESEARCH IN THE FUTURE?**
Information collected from you for this research may be used for future research studies or shared with other researchers for future research. If this happens, information which could identify you will be removed before any information or specimens are shared. Since identifying information will be removed, we cannot ask for your additional consent.

CAN I WITHDRAW FROM THE STUDY?
If you decide to participate in this study, you can change your mind and decide to leave the study at any time in the future. The study team will help you withdraw from the study safely. If you decide to withdraw, tell the researcher and you will be removed from future survey collection procedures. You will still be able to participate in all programming offered.

PARTICIPANT’S CONSENT
In consideration of all of the above, I give my consent to participate in this research study. I will be given a copy of this informed consent document to keep for my records. I agree to take part in this study.

Participant’s Printed Name: ____________________________

Participant’s Signature: ____________________________ Date: ____________

Printed Name of Caregiver: ____________________________

Signature of Caregiver: ____________________________ Date: ____________

Printed Name of Person Obtaining Consent: ____________________________

Signature of Person Obtaining Consent: ____________________________ Date: ____________
APPENDIX B

BRUNNSVIKEN BRIEF QUALITY OF LIFE SCALE

Brunnsviken Brief Quality of life scale (BBQ)
The following 12 questions are about how you experience your quality of life. It covers six areas, how satisfied you are with these, and how important they are to you. Circle the number that best reflects your experience.

<table>
<thead>
<tr>
<th></th>
<th>Don't agree at all</th>
<th>Agree completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I am satisfied with my leisure time: I have the opportunity to do what I want in order to relax and enjoy myself.</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>My leisure time is important for my quality of life.</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>I am satisfied with how I view my life: I know what means a lot to me, what I believe in, and what I want to do with my life.</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>How I view my life is important for my quality of life.</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>I am satisfied with opportunities to be creative: to get to use my imagination in my everyday life, in a hobby, on the job, or in my studies.</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Being able to be creative is important for my quality of life</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>I am satisfied with my learning: I have the opportunity and desire to learn new, exciting things and skills that interest me.</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Learning is important for my quality of life</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>I am satisfied with friends and friendship: I have friends that I associate with and who support me (as many friends as I want and need).</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Friends and friendship are important for my quality of life</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>I am satisfied with myself as a person: I like and respect myself.</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>My satisfaction with myself as a person is important for my quality of life</td>
<td>0</td>
</tr>
</tbody>
</table>

The BBQ may be used freely and without costs by researchers and clinicians. For more information, visit www.bbqscale.com