Examining the Use of Expressive Arts Therapies in Neurorehabilitation Treatment Planning

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Examining the Use of Expressive Arts Therapies in Neurorehabilitation Treatment

Planning

Capstone Thesis

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Abstract

Those undergoing neurorehabilitation after stroke and traumatic brain injury report a diminished sense of overall wellness. This paper examines the conceivable benefits of introducing expressive arts therapies, which is the therapeutic use and combination of the visual arts, movement, drama, music, writing and other intermodal creative processes, into physical therapy and neurorehabilitation treatment planning. Expressive arts therapies have the capacity to engage with an individual’s physical, emotional, social and spiritual states concurrently. They simultaneously offer the ability to promote an increased sense of well-being, address mind-body disconnects, and process trauma non-verbally.

The sections of this narrative literature review focus on the following neurological rehabilitation treatment goals: identity development and building self-esteem; coping with chronic pain and disability; improving communication and motor control; increasing cognition and memory. Qualitative, quantitative and arts-based research articles are included to support the inclusion of expressive arts therapies interventions that support and increase progress in neurorehabilitation treatment completion. The majority of research to date has indicated that a variety of positive outcomes occur, with little negative effect, when expressive arts therapies interventions are employed with stroke and traumatic brain injury survivors. There is a pronounced need for further research about the benefits of pairing expressive arts therapies with physical and neurological rehabilitation and this paper acts as supporting evidence to that statement.

Keywords: Neurorehabilitation, Expressive Arts Therapies, Traumatic Brain Injury, Stroke, Neurological Trauma
Author Identity Statement: This author identifies as a neurodivergent, disabled, non-binary individual from Minnesota and is of Native American and mixed European ancestry. They acknowledge their occupancy on Wahpekute land.
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Introduction

In the United States, more than 795,000 people survive a stroke and approximately 1.5 million traumatic brain injuries of varying severity occur annually (The Center for Disease Control and Prevention (CDC), 2021b; 2022b). As a result of these neurological conditions, there are often debilitating side effects and permanent traumas that impede an individual’s recovery and overall sense of wellness. The concept of wellness is a multidimensional construct that takes into account the physical, mental, emotional, spiritual, social, and environmental aspects of an individual’s life (Global Wellness Institute, 2022). In the fields of neurological and physical rehabilitation, it is more often than not, that the cognitive functioning and physical wellness of an individual are the only aspects of wellness being treated. Physical ailments such as paralysis, aphasia, and chronic pain, often coincide with mental strife. However, the mental well-being of an individual can be overlooked when treatment planning primarily focuses on healing the body.

Those undergoing neurorehabilitation have reported a diminished sense of wellness in areas of physical, emotional, intellectual, social, spiritual, and occupational states after diagnosis (Lo et al., 2018; Michaels, 2010; Reynolds, 2012; Symons et al., 2011). A barrier to accessible mental health care is formed when a physical diagnosis limits an individual’s capacity for self-sufficiency or verbal communication. “Mental wellness is an internal resource that helps us think, feel, connect and function; it is an active process that helps us to build resilience, grow and flourish” (Global Wellness Institute, 2022). These are precisely the attributes necessary for survivors to possess during neurorehabilitation to support positive progress after trauma, yet mental health interventions are infrequently reported as part of the overall neurorehabilitation treatment plan. Rehabilitation interventions designed to optimize the functioning of those
suffering from a diminished capacity to process thought, sound and sensation, to move, to communicate, or to individually support themselves due to a traumatic injury often do not incorporate tasks and activities that address the emotional, mental, spiritual or social impacts experienced by stroke and TBI survivors.

This paper examines the conceivable benefits of introducing expressive arts therapies, which is the therapeutic use and combination of the visual arts, movement, music, writing and other intermodal creative processes, into physical therapy and neurorehabilitation treatment planning (Estrella, 2004). Intermodal arts engagement facilitates the use of imagery, storytelling, music, drama, dance, poetry, and visual arts together, in an integrated way, to foster growth, development, and healing (Prasath & Copeland, 2021). Through the research process, a variety of interventions across creative arts modalities have been determined to mend both mind and body in parallel. Expressive arts therapies have the capacity to engage with an individual’s physical, emotional, social and spiritual states concurrently while simultaneously offering the ability to promote an increased sense of well-being, address mind-body disconnects, and process trauma. Estrella (2004, p. 187) states that “the arts are uniquely beneficial in their capacity to access experience, thought, and feelings that do not depend exclusively on either verbal language or narrative discourse” and further elaborates that the act of creation and arts making generates simultaneous engagement of affective, cognitive, and somatic processes.

This focused narrative and descriptive review of literature, qualitative studies, quantitative studies and arts-based research highlights the value expressive arts therapies have during post-stroke rehabilitation and recovery from traumatic brain injury. A summation of selected knowledge demonstrates how the mental, emotional, social and spiritual wellness of individuals participating in neurorehabilitation may be cared for, in addition to their physical
needs, through the therapeutic use of creative arts making, music engagement, and movement-based creative expression (Stuckey & Nobel, 2010). There are four sections to the literature review, each focusing on a set of neurorehabilitation treatment goals and a variety of corresponding expressive arts therapies interventions available to support and increase progress in treatment completion.

Survivors of stroke and TBI have differing post-trauma experiences and require an individualized rehabilitation team and treatment plan to address their specific needs through a holistic lens (Cicerone et al., 2004). A traumatic brain injury can be categorized as mild, moderate or severe and occurs after impact or penetration to the skull. The severity and location of the TBI can be indicative of how the brain will be affected and altered. The same notion applies to the effects of strokes on the brain. A TBI is caused by an external force enacting upon the brain, while strokes occur from within in the body. An ischemic stroke occurs if blood supply to part of the brain is blocked; the lack of oxygenized blood damages or destroys brain cells (CDC, 2021b). A hemorrhagic stroke happens when there is a leak or rupture of arteries that generates a pressurized pool of blood onto brain cells; the pressure on the brain tissue can cause permanent damage or death of cell tissue (CDC, 2021b). The location of the brain injury will determine the other areas of the body that may also be affected. For example, damage in the right hemisphere of the brain can result in muscular and nervous system malfunctions on the left side of the body.

Common disabilities reported after stroke and TBI involve one or more of the following: paralysis, loss of motor control (ataxia), problems swallowing (dysphagia), chronic pain, a difficulty using or understanding language (aphasia), emotional disturbances, altered touch, sound, and light sensitivity, as well as, difficulties with memory, thinking and processing
information (CDC, 2022b; National Institute of Neurological Disorders and Stroke, 2020). The goal of neurological “rehabilitation is to improve the person’s ability to perform cognitive tasks, cope with affective distress, and increase self-confidence, self-efficacy, and self-awareness” (Tsaousides & Gordon, 2009, p. 173). Through intermodal creative arts use, communication, creation and trauma processing can occur outside of talk therapy. The range of interventions offered in expressive arts therapies allows for an individualized intervention plan with every client regardless of the severity of disability.

My intention is to highlight the need for further research on the beneficial integration of psychology and physical therapy and how they can be combined in rehabilitation to treat the brain, the body and the mind. After experiencing a traumatic brain injury or stroke, it's not just your body that's impacted; it's your lifestyle, your income, your social connections, your ability to communicate, it's everything; so why aren't we addressing everything in post care? As a therapist, my clinical approach stems from a holistic, person-centered, trauma-informed framework. This holistic approach of examining mind, body and spirit has led to the desire to research the mental effects of physical diagnosis. I’ve chosen to focus on the intersectionality of expressive arts therapies and neurorehabilitation based on my personal experiences of recovering from multiple traumatic brain injuries and battling with peripheral neuropathy, vision deficit, light sensitivity, and migraines. The content of this paper provides both personal and professional insights to continuing TBI treatment post-trauma.

**Method**

The following search engines and databases were used to located resources for this literature review: Lesley University Library @LL Search, Ebook Central, National Institute of Health, National Institute of Neurological Disorders and Stroke, ScienceDirect, Google Scholar,
and Taylor and Francis Journals. The keywords used in the online database search engines were: stroke, traumatic brain injury, expressive arts therapies, creative arts therapies, art therapy, music therapy, dance and movement therapy, drama therapy, physical rehabilitation, neurorehabilitation, integrative medicine, neurorehabilitation treatment goals, cognition, affect, self-esteem, depression, memory, chronic pain, aphasia, dysphasia, and hopelessness. The extensive list was necessary in order to retrieve enough adequate data for each section of the literature review. The topic of neurological rehabilitation has a vast array of research and needed to be filtered by the inclusion of various keywords associated with the field of expressive arts therapies.

The research process began by identifying treatment goals for patients undergoing neurorehabilitation due to stroke or traumatic brain injury. Next, the established neurorehabilitation treatment goals were used as keywords in the research process to find supporting literature. The research selected for review investigates how expressive arts therapies interventions can be utilized to improve cognition, affect, memory and self-esteem along with the reduction of stress and depression (Adams & Dahdah, 2016; Beard & Fox, 2008; Kongkasuwan et al., 2016; Lo et al., 2018; Pfeiffer & Sabe, 2015; Reinstein & Burau, 2014; Sohlbergh & Mateer, 1989; Symons et al., 2011; Tsaousides & Gordon, 2009; Vance & Wahlin, 2008; Vickery et al., 2008). Additional treatment goals include improving speech or alternative non-verbal communications, increasing range of mobility, regaining physical strength, and establishing pain management or relief (Boss, 2010; Hass-Cohen et al., 2021; Hinz, 2009; Jungblut, 2005; Kim, 2010; Larsen et al., 2018; Michaels, 2010; Perryman et al., 2019; Plotts et al., 2008; Reynolds, 2000; Reynolds, 2012; Stuckey & Nobel, 2010; Thompson & Schlaug, 2015; Timmons & MacDonald, 2008). All published literature and peer reviewed articles were
surveyed for reliability, as well as, relatability to the topic of utilizing expressive arts therapies in neurorehabilitation treatment planning for survivors of stroke and traumatic brain injuries.

Research progress was tracked by downloading, into categorized document folders, the PDF versions of all articles and book chapters referenced. The folder categories were labeled Introduction, Reducing Stress/Depression, Increasing Attention/Cognition/Memory, Improving Strength/Mobility/Communication, Chronic Pain, and Self-Esteem/New Identity. Additionally, a reference text file, with proper APA citations for the downloaded articles, was consecutively generated throughout the development of the thesis paper. Personal insights, reactions, and questions regarding the literature were processed by the researcher through journaling and mixed-media collage art making.

**Literature Review**

**Identity Development and Building Self-Esteem**

Our disabilities do not define us; however, they do play a large role in how we identify and see ourselves within our world. A common symptom reported by stroke and traumatic brain injury survivors is the sense of loss. The loss of ability, the loss of a role, the altered sense of self, the loss of confidence. Depending on the severity of the brain injury, an individual may no longer be able to assign themselves with a recovery identity (Beard & Fox, 2008). The post-injury symptoms may have a permanent and chronic impact in their daily life. After diagnosis and assessment, a patient is faced with new truths about themselves. Their sense of self, their capacity to engage and their ability to be who they were before injury are all challenged.

Personality changes are frequently self-reported by traumatic brain injury and stroke survivors; this is additionally supported by caregiver report. Adams and Dahdah (2016) developed a phenomenological study consisting of eleven adults with TBI’s and six caregivers to
adult TBI survivors. Although the sample size is small, the study does provide a greater understanding of self-perception post-injury and includes a comprehensive list of personality changes frequently endorsed by TBI and stroke survivors. Not all personality changes are subjectively negative, a greater value towards time, relationships, and personal passions have been noted alongside changes personally deemed as deficits (Adams and Dahdah, 2016).

Over the course of three years, 176 left- or right-hemisphere stroke patients in an acute inpatient rehabilitation hospital provided self-reports of their self-esteem and depressive symptoms (Vickery et al., 2008). The results of this study support that self-esteem is associated with functioning and that a diminished sense of self-esteem may interfere with an individual’s self-regulation, ability to establish goals and engage in goal-relevant behaviors. “Lower self-esteem has also been related to poorer functional status or outcome following treatment or rehabilitation after a medical condition/injury” (Vickery et al., 2008, p. 101). These studies support my claim that addressing self-esteem and identity in neurorehabilitation can be beneficial in completing treatment goals and increasing functioning. Self-esteem and identity can be explored through a variety of artistic modalities both verbal and non-verbal. Some examples of interventions to incorporate are collage, self-portraiture, I am… and acrostic poems, embodied movement, role playing and sandtray work (See Figures 2, 3, 4, 5, 6, & 7)(R. Horner, personal communication, 2018; E. Lyons, personal communication, July 18, 2017; Plotts et al., 2008; Symons et al., 2008). As the field of expressive arts therapies continues to expand, further research is being conducted on the use of artistic modalities in brain trauma care.

Lo et al. (2018) completed a qualitative systemic review of 367 studies involving creative arts therapies with stroke survivors. Ultimately, only 11 studies met the final inclusion criteria and were found credible. Across the 11 studies, common themes were extracted and a variety of
beneficial arts interventions were briefly discussed. Creative arts therapies provide a means for self-expression, relaxation, distraction, encouragement, connection to self, a sense of control, and an enhancement in mood and confidence (Lo et al., 2018). The researchers found that self-confidence in communication can be reclaimed during interventions based in singing and during the verbal sharing of written poetry. An increased sense of self-esteem is fostered both by the act of creation and the positive feedback received from others. The repetitive motions present in painting, clay work and movement can assist in fine motor development and improved mobility status, thus increasing self-confidence and self-esteem (See Figure 1). Interventions such as these demonstrate their specialties and strengths in taking care of the stroke survivors’ psychological issues of losing their self-confidence, diminished motivation, and low enjoyment levels (Lo et al., 2018, p. 8).

Kongkasuwan et al. (2016) facilitated a randomized control trial amongst 113 members of an in-patient stroke rehabilitation program. All participants were over the age of 50, could verbally communicate, and were willing participants. Both groups received a conventional physical therapy program five times a week, for four weeks. The intervention group consisted of 54 individuals who received, additional to their physical therapy, creative art sessions two times a week, for four weeks. Each arts session lasted between 1.5-2 hours and involved between 5-10 members per session. All participants completed a set of baseline and post-treatment evaluations: Abbreviated Mental Test, the modified Barthel Index, Hospital Anxiety and Depression Scale, and a pictorial Thai Quality of Life questionnaire (Kongkasuwan et al., 2016, p. 1017-1018). Brain injury survivors can be left with feelings of stress, depression, low self-esteem and anxiety post-injury and this study aimed to examine the direct effects of arts interventions on mood and quality of life.
The creative art therapy sessions followed a sequence of meditation with music, warm-up activity, main activity accompanied by group singing, and a closing group-healing circle. The pairing of meditation and music aimed to evoke a sense of calmness and encourage concentration, while the following warm-up was used as a way to introduce the artistic mediums involved in the session (Kongkasuwan et al., 2016). The group singing activity was a form of indirect self-expression and seconded as an opportunity to incorporate intermodal arts expression. Participants were encouraged to select a phrase or lyric from the sung songs and share with the group the meaning it holds for them. Communal sharing amongst peers increases one’s sense of belonging, lessens feelings of isolation, and can instill hope. The majority of participants in the intervention group “evaluated themselves as having improved concentration (68.5%), emotion (79.6%), self-confidence (72.2%), and motivation (74.1%)” (Kongkasuwan et al., 2016, p. 1019) and no patients reported feeling worse. This article shows the benefits and need for further quantitative research in regards to expressive arts therapies capacity to reduce depression, isolation, lack of hope and its influence on personal sense of well-being.

Beard and Fox (2008) conducted an 18-month long qualitative ethnography of dementia treatment and collected direct experiences regarding memory loss and identity shifts after diagnosis. All 40 participants were over the age of 65 and provided 2-3 hour long in-person interviews from within their home residence. Interview questions were open-ended and focused on how the interviewee’s life and/or identity may have changed since their memory loss began. The participants share how they have made sense of their new reality and their outlooks for the future. Although this article’s participants are dementia patients, the sentiments of the individuals are a shared experience with fellow neurorehabilitation patients recovering from stroke and traumatic brain injury.
Those recovering from stroke and TBI have to address the impact this trauma has on their daily lives and on the roles they’ve performed prior to injury. Self-esteem can become diminished when responsibilities and tasks are instantaneously taken away from you without your consent. I personally recall my feelings of anger, frustration and listlessness after my doctors listed off all the things I should no longer do due to safety concerns and threat of aneurism. During the six-month recovery period, I was told to limit my reading, screen time, light exposure and exercise. For the first month, I slept and I hoped my symptoms would fade. I sat in fear that my experiences of pain, migraines, sensitivity to light and sound, nausea, forgetfulness, and lack of appetite would never stop. Eventually, the symptoms lessened but they have never left. I had to come to terms with my new self and say goodbye to the dreams my old body held onto. I would no longer be an athlete. I would no longer play the sports I love or be a part of a team again. Through the process of art making, I gained an acceptance of my altered state, which ultimately guided me out of a depression and onto a path of self-healing (See Figures 7, 8, & 9).

Focusing on what can still be done instead of focusing on what has been lost instills positivity and hope, both are essential in the rehabilitation process. A female participant of Beard & Fox’s study shared:

I think this is the kind of thing we just have to deal with. We have this problem and we can’t change that, but we can improve our lives by not letting it just bring us unhappiness twenty-four hours a day. Make the best of it and do the best we can. (2008, p. 1514)

Part of making the best of it is having the capacity to ask for help. The acceptance and admittance of needing the help of others reduces tensions in relational dynamics and promotes a sense of serenity. Participants express their frustrations with co-dependency and share that the
possibility of gaining a greater sense of independence is motivational during rehabilitation. A participant shares:

As for driving the car, I used to like to. But now I have to get in a car with someone else and tell them where I want to go… You can’t just do what you want. You can’t just do it yourself. You have to ask. So, you have to adjust your schedule to some else’s. I guess the best word for it is that it is somewhat humiliating to be in that position when you’re used to running your own life. (Beard & Fox, 2008, p. 1513)

The researchers discovered that although individuals admitted the need for additional support, they did not wish to be seen as “less than” or “needy” by others. They felt that their identities of competent and autonomous individuals were now questionable by family and friends. Survivors found that clear and direct communication of their needs, feelings and desires reduced confrontation between themselves and their caregivers and ultimately removed their notion that their additional need for assistance was a personal shortcoming. “Being communicative was considered an import aspect of “coming to terms” with their circumstances” (Beard & Fox, 2008, p. 1516). The use of arts making can provide an outlet for processing these emotions and a channel to communicate their needs/wants, even when verbal communication is inaccessible.

Symons et al. (2011) examined the use of visual arts in the physical rehabilitation of people with neurological conditions. The qualitative study aims to better understand the art making process from the patient’s perspective and how participants perceive benefits, if any. The study only consisted of 4 men and 5 women, averaging the age of 52.6. They participated in group art making sessions once a week for six months as part of an outpatient rehabilitation program. The small sample size of the study does not make this a reliable source but it does provide insight into the need for further research of arts therapies in rehabilitation. Additionally,
having direct client feedback in the form of interview and questionnaire is beneficial in supporting the claims that arts making improves overall quality of life and successful completion of neurological rehabilitation treatment goals. The direct client experience should be valued as much as quantitative assessment results.

The participants of this study report that art making sessions during rehabilitation provide space for “the development of art and personal skills, a coping strategy for stress, time use, enjoyment, pride, empowerment, widening of opportunities, self-identity and personal expression” (Symons et al., 2011, p. 45). The researchers identified five themes that arose from the incorporation of arts making during neurorehabilitation: meeting rehabilitation goals, enjoyment, using time, regaining confidence, and engagement in future activities (Symons et al., 2011, p. 51).

Art making provides opportunities to improve hand functioning, rebuild stamina, reconnect with people, release stored emotions as well as a providing a space to practice managing frustration and failure (R. Horner, personal communication, 2022; Michaels, 2010; Plotts et al., 2008; Symons et al., 2011; Thompson & Schlaug, 2015; Timmons & MacDonald, 2008). Engagement in expressive arts is possible anywhere and adaptable to any environment. Undergoing rehabilitation takes time and often occurs outside of the home. This can lead to a lost sense of routine and aimlessness, furthering identity issues. Arts programs assist in establishing a routine and can give individuals a time to look forward to in their day. The creative process can also instill a new identity of artist, maker, creator.

**Coping with Chronic Pain and Disability**

The cycle of chronic pain has the capacity to seep into every aspect of an individual’s life and become an all-consuming debilitation. The investigation into non-opioid pain management
treatment is critical for long term pain sufferers. Different expressive arts interventions have been tested to analyze their potential as holistic pain management therapies; however, limited research has been done to date. A common theme across chronic pain and chronic disability research is the necessity for individuals to embody resiliency and hope (Boss, 2010; Hass-Cohen et al., 2021; Larsen et al., 2018; Reynolds, 2000; Reynolds, 2012; Timmons & MacDonald, 2008). Living a life with pain or chronic disability can severely lessen an individual’s quality of life, lead to diminished functioning both mentally and physically and reduce pain tolerance without the presence of positive meaning making, an outlook towards the future and hope (Hass-Cohen et al., 2021).

The experience of pain itself elicits negative emotions, and that there is a narrowing of attention toward pain and negative emotions which becomes a positive feedback loop, continuously increasing focus on pain and negative emotions, while failing to attended to positive emotionality and more positive aspects of the experience. (Larsen et al., 2018, p. 724)

An increase in positive emotion is integral in interrupting the negative pain feedback cycle. The therapeutic process of art-making can offer space for individuals to explore their emotional states, symbolically uncover their experiences of chronic pain, chronic disability and the loss that may be attached to that. Through intermodal arts engagement, things found to be negative, unwanted and undesirable can be challenged. In the context of utilizing art therapy after stroke, Reynolds (2012) states that “changes that are created in the art image may help to enhance perceived control and transform feelings about self and illness”.

As the result of multiple traumatic brain injuries and the resulting nerve damage, I have suffered chronic pain since my early teens. Nerve damage is irreversible, just like my pain. No
amount of physical therapy, massage, chiropractic care or medication will alleviate my continuous dull hot ache. I’ve used strategies such as mindfulness, radical acceptance, body scans, and meditation to transform and rethink my own perceptions of pain. For over a decade, I explored what my pain meant to me through mixed-media art making, journaling, poetry and photography. I now use those same modalities to process moments of intense pain in an attempt to capture the intensity of the sensations in the artwork and symbolically transfer the pain from my body into a new vessel. What keeps me motivated and hopeful is the mantra that emerged: *My pain means I’m alive. Be grateful.* My intentions are to acknowledge the negative, look for the positive and focus on the hope-filled possibilities that lie ahead.

The use of art for pain management can be introduced to stroke and TBI survivors during the first stages of rehabilitation. As expressive arts care is continued in a controlled setting, individuals have an opportunity to develop the knowledge and skill sets necessary to resume arts engagement at home. The more comfortable and accessible an artistic medium is, the more likely an individual is to continue its practice unprompted. Larsen et al. (2018) created an art-based group intervention for chronic pain suffers as part of a larger group program called *Being Hopeful in the Face of Chronic Pain*. The intervention, *Hope Collage*, focuses on the individual’s hopes and strengths and utilizes art therapy’s capacity to promote “positive psychological outcome including hope, engagement, flow, positive emotion, and well-being” (Larsen et al., 2018, p. 725). The work done within this group “does not target pain directly, and research shows no change in participants’ level of pain. Nevertheless, it appears that the program does significantly impact how participants relate to their pain and enhance quality of life, despite the experience of pain” (Larsen et al., 2018, p. 726).
Facilitators provided paper, magazines, scissors and glue. Participants were prompted to look through the magazines as they reflect on hope and select the images that represented hope for them. This intervention can be adapted to span over multiple sessions depending on the dexterity and attention needs of the participant. The collage process provides an open-ended opportunity to process and share positive outlooks, personal strengths, goals and hopes both in group-work and individually at home.

Two other mediums, clay and textile arts, have been shown to offer relief and provide support to those coping with chronic disability and pain. A phenomenological research study was conducted to seek a better understanding of the effects and benefits clay provided to individuals living with chronic disability (Timmons & MacDonald, 2008). Participants of this study revealed that ceramics had the capacity to create an altered sense of time and to reduce their awareness of self as they were immersed in deep concentration. The researchers further posit that

the flow experiences described by the participants when creating a ceramic work appear to have alleviated some of the pain and worry associated with ill health, enabling them to live more positively with an illness or disability and enhancing wellbeing. (Timmons & MacDonald, 2008, p. 90)

“Immersion in artwork may also enhance the experience of control” (Reynolds, 2002, p. 99). It allows individuals the capacity to identify as a creator regardless of their pain, fatigue, or mobile limitations. Through expressive arts creation, stroke and TBI survivors can develop an enjoyable routine that stimulates the mind while simultaneously passing time. Engagement in textile arts and needlework such as embroidery, quilting, tapestry, applique, felting, knitting and crochet, provide positive “outcomes such as filling the day productively, distracting the mind away from illness and providing a sense of accomplishment” (Reynolds, 2002, p. 100).
Needleworking has the ability to incite states of calmness and relaxation. These states can “be derived from either distraction from life’s worries through intense concentration on the needlecraft task, and/or escape” (Reynolds, 2000, p. 110) from the present reality of their surrounding world. The textile arts can also be utilized by individuals as a way to connect via hand-made gift giving or via the establishment as small business selling their creations.

**Improving Communication and Motor Control**

A diminished capacity to access language and communication centers of the brain can occur after suffering from a stroke or traumatic brain injury. Trauma to the left-hemisphere and/or right-hemisphere of the brain will present with different symptoms to focus on in neurorehabilitation. The right-hemisphere is the emotional center of the brain where experiences are held and negative unconscious emotions are processed (Perryman et al., 2019). The left-hemisphere of the brain translates experience into verbal communication; it is responsible for verbal, analytical and rational thought processes (Perryman et al., 2019). “Creative arts offer a unique benefit in promoting communication between the right hemisphere, where images and negative unconscious emotions are stored, and the left hemisphere, which houses logic and language” (Perryman et al., 2019, p. 92).

It is common for post-stroke and TBI survivors to experience disabilities that directly affect verbal communication and motor control. The loss of bodily movement control (*ataxia*), difficulty swallowing (*dysphagia*), and problems understanding or using language (*aphasia*) are focused on when establishing neurorehabilitation treatment plans and interventions (National Institute of Neurological Disorders and Stroke, 2020). Hinz (2009) expanded on the Expressive Therapies Continuum (ETC) framework that was originally developed by Vija Lusebrink and Sandra Kagin in 1978 as a means to assist clinicians in selecting appropriate methods and
materials on a case-by-case basis. The ETC can be used by the therapist to establish interventions that align with the neurorehabilitation treatment goals already documented (Lusebrink et al., 2013). By utilizing the established ETC interventions, nonverbal memories can be activated by stimulating kinesthetic and sensory pathways through music and creative arts activities to process content without the need for a capacity to speak (Perryman et al., 2019; Hinz, 2009). “The flexibility and complexity of art-making, together with its ability to connect physical psychological resources, make it well suited to address the wide range of deficits often experienced by individuals with brain injury, including stroke” (Michaels, 2010, p. 66).

Music therapy interventions are beneficial in the treatment of aphasia, ataxia, and dysphagia. Individuals can learn to control muscle movements of the jaw, larynx, tongue and lips through musical vocalization exercises and singing (Kim, 2010). The incorporation of musical components to muscular strengthening exercises often instills enjoyment into the rehabilitation process and confirms the participants commitment and continued participation.

Applications of the music therapy protocol are desirable not only because music therapy provides enjoyable experiences, but also because it contributes to restoration of the patients’ physiological mechanisms for swallowing by providing auditory timing cues and facilitating voice production that replicates the muscle movements involved in the swallowing process. (Kim, 2010, p. 117)

Similarly, music therapy treatments, such as melodic intonation therapy, have successfully allowed an individual to bypass the left hemisphere and access language through musical neural pathways which assists in aphasia rehabilitation (Jungblut, 2005; Thompson & Schlaug, 2015). Melodic intonation therapy transforms “short propositional phrases into simple, often repeated, melody patterns accompanied by finger tapping” (Jungblut, 2005, p. 190) as a means to bypass
the damaged left-hemisphere speech pathways. Word retrieval and the ability to sing are accessible through right-hemisphere activation and the stimulation of the melodic and emotional components of speech associated with the right brain (Jungblut, 2005).

Expressive arts therapies provide a conduit for communication when verbal speech is unobtainable. Image making, poetry, collage, sandtray therapy and clay work all provide means for conveying communication non-verbally. Working with clay can by a powerful process that facilitates emotional processing through tactile engagement at a somatic level (Reynolds, 2012; Stuckey & Nobel, 2010). It can provide a cathartic release of traumas stored within the body that were unable to be expressed through words (Stuckey & Nobel, 2010). “Occupational therapists have reported that clay offers an opportunity for creativity, imagination and expression, whilst at the same time requiring dexterity and strength, making it useful for improving fine motor control and coordination” (Timmons & MacDonald, 2008, p. 87).

Sandtray therapy provides access to preverbal content that may be otherwise inaccessible and is a technique that does not require a skillset or verbal communication. The ability to understand sandplay instructions from facilitators requires minimal receptive language capacity from the participant and task execution requires zero verbal response; both are beneficial interventions for stroke and TBI survivors with aphasia (Plotts et al., 2008). According to the research of Plotts et al.,

The sandplay method provides clients an opportunity to construct the world as they see it, idealized worlds that they would like to see, or fragmented worlds that they experience. This therapeutic approach might also be useful in exploring the similarities and differences between the client’s world before and after the accident. (2008, p. 141)
Overall, there are a variety of interventions available to assist in the improved muscular motor control needed for communication, whether it be a signed-language or verbally shared. Communication and expression are not exclusively language based and expressive arts therapies promote the capacity to share through all of communications manifestations.

**Increasing Cognition and Memory**

Depending on the location of an individual’s traumatic brain injury or stroke, damage can occur to regions responsible for memory, learning, awareness and cognition. Individuals may present with a decreased attention span, short-term or long-term memory deficit, difficult following instructions (*apraxia*) and/or an overall decrease in processing speed (CDC, 2022b; National Institute of Neurological Disorders and Stroke, 2020). The goal of implementing expressive arts therapies interventions into neurological rehabilitation treatment planning and coordinated care is to provide additional and alternative methods for both the restoration and compensation of cognitive functioning (Cicerone et al., 2004). Injury to the brain cannot be reversed, and some resulting disabilities may be permanent, but the brain has the capacity to rewire and restructure neural pathways, through a process called neuroplasticity (National Institute of Neurological Disorders and Stroke, 2020). However, that rewiring does not occur spontaneously, it is developed through ongoing “carefully directed, well-focused, repetitive practice” (National Institute of Neurological Disorders and Stroke, 2020). During the rehabilitation process, we can encourage increased neuroplasticity through positive engagement in tasks that involve creativity, planning, abstract thinking, repetition and procedure.

Vance and Wahlin (2008) provide insight on the interactions of memory and art through a thorough breakdown of the memory creation, storage and retrieval process along with the corresponding areas of the brain responsible for that functioning. The left-hemisphere of the
brain processes explicit, semantic, and factual memory and is responsible for verbal memory storage. These forms of memory require a conscious effort to access and involve the processes of assigning meaning, labeling and categorization to experiences and sensations (Reinstein & Burau, 2014; Vance & Wahlin, 2008). The right-hemisphere of the brain processes implicit and emotional memory. This brain region accounts for autobiographical information, visual-spatial memory, habitual learning and the process of retrieval (Reinstein & Burau, 2014; Vance & Wahlin, 2008). “Implicit memories refer to somatic/bodily, perceptual experiences, which include memories of how things looked or smelled as well as our emotions and moods at the time” (Vance & Wahlin, 2008, p. 162). “The right hemisphere dominates the processing of information that does not readily lend itself to verbalization” (Reinstein & Burau, 2014, p. 49) and can be stimulated by copying and drawing representational designs, pictures, and geometric patterns.

Identification of the traumatized area of the brain will provide beneficial insights for the rehabilitation team and expressive arts therapist during intervention treatment planning and allows the team to identify interventions based on the individual’s specified functional deficits. Additional to a localized trauma to a memory region of the brain, stress is a contributing factor to decreased memory functioning and can significantly inhibit working memory (Vance & Wahlin, 2008). The incorporation of expressive arts interventions into neurorehabilitation treatment planning would allow for simultaneous stress reduction and cognitive stimulation. “In making art products, clients activate many procedural and autobiographical choices while forming a visual narrative. Therapeutic encouragement reinforces their sense of agency” (Vance & Wahlin, 2008, p. 167) and supports the individual’s internal motivation to continue neurorehabilitation treatment.
Tsaousides and Gordon (2009) established that cognitive rehabilitation is an effective and beneficial treatment for traumatic brain injury survivors at any time post-injury and is vital in improving quality of life.

For example, improvements in memory may facilitate medication compliance, improvements in attention and comprehension may improve understanding of instructions given by medical personnel, and improvements in executive function may facilitate initiating medical appointments or improve decision-making with respect to treatment options. (Tsaousides & Gordon, 2009, p. 173)

Developing a greater understanding of the cognitive impacts of stroke and traumatic brain injury allows for expressive arts therapists to alter and adapt interventions that may initially be too demanding of a participant. If processing speed has been affected, a participant may require increased task completion time and/or have delayed responses to prompts. Additionally, impairments in attention can cause difficulty remaining focused on a task for an extended period of time and potentially the complete failure to complete any tasks involving multiple steps (Tsaousides & Gordon, 2009).

Tsaousides & Gordon purpose that one of the most effective interventions for memory rehabilitation is the use of a memory notebook, which was established by Sohlberg and Mateer in 1989. It is an empirically supported systemic method used to support learning and memory facilitation after traumatic brain injury. The memory book is introduced to an individual and integrated into treatment care in three phases: acquisition, application and adaptation.

During the acquisition phase, the individual with TBI becomes familiar with the different sections and the purpose of the notebook. During the application phase, the individual learns to use the memory notebook in simulated settings. Finally, during the adaptation
phase, the person learns to extend the use of the memory notebook to naturalistic environments, such as household or vocational settings. (Tsaousides & Gordon, 2009, p. 177)

The memory book consists of multiple standardized sections including autobiographical and/or injury related information, a memory log, a calendar, to-do lists, a feelings log, and important names/contact information (Sohlbergh & Mateer, 1989). It also allows for the inclusion of additional sections that may be personally relevant to an individual. These additional sections provide space and opportunity for expressive arts therapists to provide and include daily arts engagement exercises, writing prompts, tracing pages, fillable mandalas, finish-the-image drawings, blank pages for collage/drawing and so forth into a client’s memory book. This intervention tool can be established during in-patient care and continued on an individual level post-rehabilitation depending on the person’s level of self-awareness and self-sufficiency. It is imperative to establish a toolkit of interventions that are adaptable to the severity of impairment and still promote improved functioning.

Music therapy interventions have been recognized for their capacity to affect the human nervous system and improve areas of cognition, communication, sensory perception, and emotion. The specialization of neurologic music therapy (NMT) is a systematic and researched-based treatment method that has been proven to contribute to significant improvement in executive functioning (Pfeiffer & Sabe, 2015). Music making can be utilized as a tool to promote brain plasticity through the implementation of specific NMT interventions by a clinically trained music therapist. Sustained attention can be strengthened by having participants attend to the same task for at least five minutes, such as responding to a single target sound in a music perception activity (Pfeiffer & Sabe, 2015). NMT also offers a technique, auditory perception
training, that assists in improving auditory processing and echoic memory. The technique includes a variety of musical exercises intended to aid in the identification and discrimination of different sound components and retrain echoic memory via the immediate recall of musical sounds (Pfeiffer & Sabe, 2015). “From a neuroscientific perspective, listening to and engaging with music, as well as singing or playing musical instruments are considered to be extremely beneficial cognitive exercises” (Pfeiffer & Sabe, 2015, p. 393).

Discussion

It has been established that mental health impacts frequently coincide with physical ailment and the use of expressive arts therapies within a rehabilitation and recovery unit can concurrently address mental and physical symptoms for stroke and traumatic brain injury survivors. Physical dexterity, strength and motor control are actively promoted when engaging in expressive arts therapies interventions. These treatments also have the potential to stimulate emotional breakthroughs, instill self-worth, initiate memory recall, increase self-esteem, and institute hope. Stroke, degenerative disease, trauma and neural disconnection can lead to social isolation, reduced engagement and a decrease in previous interests. Interventions that incorporate personal creative expression in a group setting are encouraging socialization amongst its members and reducing feeling of isolation amongst participants. Arts programs help establish a routine activity to engage in weekly or daily.

The selected literature explored the experiences of individuals who have recovered from traumatic brain injuries and strokes, their resulting disabilities and how all of it has affected their lives post-trauma. It also features examples of expressive arts interventions that can be incorporated into the immediate and long-term treatment plans of stroke and TBI survivors. Music therapy interventions can assist in increased cognitive functioning, accessing and utilizing
language, and providing a gained sense of confidence. The use of musical instruments can improve hand functioning, rebuild stamina, support memory functioning and strengthen fine motor control of facial muscles such as the larynx, tongue, lips, cheeks, and jaw. Simply listening to and engaging with music provided beneficial neural stimulation and cognitive exercise, in addition to playing an instrument or singing. Creative art making, regardless of the medium being used, is a vessel for self-expression and emotional exploration. The creative process has been described as a means of relaxation, distraction, connection, communication and enhancement. Messages, goals, and emotions can be conveyed non-verbally through painting, drawing, collage, clay working and sandtray therapy. Additionally, the repetitive motions of those mediums promote increased fine motor development and neuroplasticity. Expressive arts therapies interventions provide a safe and controlled way to challenge and confront difficult or unpleasant topics related to living with lifelong disabilities after TBI or stroke.

Throughout this research process, it has been increasingly apparent that there is still minimal research done on the incorporation of any arts modality into the fields neurological and physical rehabilitation. Furthermore, the research that has been done thus far is not inherently exclusive to the field of expressive arts therapies. The resources gathered were all from other arts modalities research, which calls for a greater need of content labeled as expressive arts therapies research, not art or music therapy. The majority of finding regarding the incorporation of arts therapies into neurorehabilitation are arts-based research or have small sample sizes with small time frames. The is a critical need for quantitative and qualitative research trials, with a large sample size over a long period of time, that examine expressive arts interventions effects on the completion of neurorehabilitation treatment goals. There are very few research methods in place that test the intermodal interventions established by expressive arts therapists and how the mind
and body are impacted when they are implemented. Ideally, an in-depth, peer generated diagnostic manual of available interventions will eventually exist that illustrates the ways in which the arts promote healing, as well as, their negative impacts. The manual would list the intervention, its benefits/deficits, potential applications, appropriate populations, along with which bodily and emotional functions it stimulates.

There is a vast disconnect between the medical fields of mental health and physical health. However, an overall sense of wellness or being cared for cannot be derived in pieces. One must look to heal all aspects of themselves to achieve a state of wellbeing. If caregivers and medical staff work without the lens of holistic wellness during recovery, individuals will not be able to experience the best quality of life possible. For the majority of stroke and TBI survivors, their quality of life has already been altered by their condition and does not need to be further diminished due to the exclusion of proper mental health care access when establishing a neurorehabilitation treatment plan. This research serves as an illustration of the expressive arts therapies capacity to address the disconnect in the medical system between mental health care and physical rehabilitation. A holistic medical care team takes into consideration the physical, mental and spiritual wellbeing of its patient and implements the most effective treatments available. Expressive arts therapies interventions in conjunction with traditional neurological rehabilitation exercises, hold the capacity to provide effective and efficient care for stroke and traumatic brain injury survivors.


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Appendices

Figure 1

Painted collage

Note. This image was created using repetitive circular motions with a paintbrush and paint. The swirled paint swatches were then cut from the page and glued together as overlapping images on a separate page. A fine black paint brush was then used to accentuate details. The process stimulated hand-strength increase by implementing a repetitive task that required various hand-grips. Both the act of painting and cutting with scissors increased dexterity and required a focused attention.
Figure 2

Example of I am... poem

I am me, me is I.
Together I’m exhausted.

Figure 3

Example of I am... poem

I am hurting.
In my neck,
In my head,
In my heart.

Figure 4

Example of acrostic poem

Broken
Reverted
Aching
Injured
Non-responsive

Terrifying
Recovery
Able?
Unsure
Maintaining hope
Alive
Figure 5

Example of collage and self-portraiture
Figure 6

Self-Portrait
Figure 7

Coping collage
Figure 8

The cost of it all...
Figure 9

Processing pain

Note. These images are representational of my time spent during my TBI recovery and helped in processing the traumatic experience of hospitalization and being on life support. I enjoyed passing time by creating my own handmade paper. I then used gum arabic and ink to transfer the images of my brain onto my handmade paper. Additionally, an electric typewriter was used to document and retell medical notes made while I was unconscious and my reactions to that information.
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In the judgment of the following signatory this thesis meets the academic standards that have been established for the above degree.

Thesis Advisor: _____ Meg H Chang, EdD, BC-DMT, LCAT