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**The Traumatology of Adverse Childhood Experiences in High Risk Youth:
Examining the Healing Potential of the Neurobiological Processes in Art Therapy-**

Option 1: Development of a Method

Capstone Thesis

Lesley University

May 2, 2022

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Art Therapy

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Abstract

Examining the healing potential of neurobiological processes in art therapy with high risk youth who have experienced adverse childhood experiences (ACEs) vitally needs to consider the neuroscience perspective of trauma. Practicing through a trauma-informed approach, there is a need to further investigate the impacts of art therapy for this population within the field of traumatology. Existing literature provides an understanding of ACEs, the neurobiological changes in functionality of the brain from toxic stress, the impacts on the brain, neurobiological processes in art therapy, prevalence of ACEs in high risk youth, and studies of art therapy with adverse childhood experiences in high risk youth contributing valuable insight in treatment and prevention. This paper examines the literature and discusses a method in a single group of 5 participants, aged 14-16, in a high risk youth setting who have been exposed to ACEs and exhibit problems in functioning impacted by ACEs. Through my experience and learning, results indicated that art therapy has healing potential in treatment for ACEs in adolescents as there are neurobiological properties in art evidenced through regulation and expression, the importance of resiliency, identifying coping strategies tolerating toxic stress, and the emphasis of the need for early intervention for this population. There is a need for further research as literature is limited and given the reality of ACEs as a growing public and mental health crisis.

Keywords: Adverse Childhood Experiences (ACEs); art therapy; neurology; high risk youth; Trauma Informed Care (TIC)

Author Identity Statement: The author identifies as an abled, cisgender, White, young woman using she, her, hers pronouns from Massachusetts of mixed European ancestry. The author practices through a trauma informed approach in her clinical work.

The Traumatology of Adverse Childhood Experiences in High Risk Youth: Examining the Healing Potential of the Neurobiological Processes in Art Therapy -

Option 1: Development of a Method

Introduction

The following paper examines the traumatology of adverse childhood experiences (ACEs) in high risk youth through an art therapy framework acknowledging the underpinnings of art's neurobiological processes. The paper explores my experience delivering a series of art therapy interventions in a group of high risk youth with ACEs and reviews existing literature; results indicated and supported the healing potential of the neurobiological processes in art therapy. Understanding the neurobiological processes of artmaking, neuroscience and the impacts of trauma on the brain contributes to a more holistic understanding of how to best provide treatment for this population. Resources for treating or preventing ACEs in early childhood are scarce and underfunded (Pliske, Stauffer & Werner, 2021), leading to a need for increased advocacy of the topic, reinforcing and motivating my desire to contribute research about ACEs in high risk youth from an expressive therapies lens. Literature shows victimization, trauma and adversities are common, and many children suffer from polyvictimization- having more than one experience (Berliner & Kolko, 2016). Cumulative burden of adversity significantly increases the risk for many negative outcomes including onset of psychiatric disorders throughout the entirety of an individual's life (McLaughlin et al., 2012). ACEs in high risk youth is a growing public health crisis.

This topic is important as it provides advocacy for the art therapist community, and contributes to the treatment and prevention of ACEs in high risk youth by recognizing and implementing art in treatment and healing. Through this experience of examining and reviewing

literature and developing my own method, I hoped to expand my learning while anticipating positive correlations between utilizing art making as a form of expression for the population of high risk youth with ACEs and neurology. I aimed to provide insight into the healing potential of art in treatment for trauma.

Literature Review

Neuroscience & its Terms

As the following paper examines neurobiological processes and healing potential in art therapy through my experience implementing a series of art interventions with high risk youth and support from existing literature, it is important to provide a base understanding of neuroscience. Neuroscience provides validation in the field of art therapy through understanding the mind/ body connection at a fundamental level. Neuroscience, defined in its simplest terms, is the study of the nervous system. The main categories of neuroscience, which are not mutually exclusive, include developmental, how the brain grows and changes; cognitive, the understanding of language, thought and memory; molecular and cellular, focusing on genes, proteins and molecules; behaviors, the processes of animalistic and human behaviors; and clinical, the study of disease and health (King, 2016). With recognition to trauma impacting brain structures and functioning, neuroplasticity, the ability and capacity for neurons to connect forming new pathways reorganizing synaptic connections (King, 2016) is possible and can be attained through art therapy interventions.

Neuroscience and art therapy can inform one another, reinforcing the need for collaboration and connection to provide the best care for our clients. By understanding brain functioning, we are able to further understand neurobiological properties of artmaking. McNiff states: “Neuroscience is the clay, offering an inherent structured medium that art therapists can

then sculpt and develop into form as we forage the liminal space on the way to imago of growth. And just as the complexities of artistic expression float throughout the whole brain, the...mainstream of art's medicine will always flow through the studio. It is through the relationship that we become whole" (McNiff, 2004, as cited in King, 2016, p. 9). Art, neuroscience and trauma can help provide a more holistic understanding within the field of traumatology when interrelated.

Trauma

"Trauma is a biological and wordless event" (King, 2016, p. 6). In treatment of trauma, there is a need for trauma to be viewed as not just the specific event(s) that occurred to the individual, but rather considering the current functioning being impacted through the mind, brain and body in response to the trauma (Van der Kolk, 2015). The body remains in a state of "inescapable shock," emphasizing the need for treatment to reach beyond verbalizing traumatic experiences as the body needs to understand that it is not threatened (Van der Kolk, 2015).

Trauma does not discriminate; there are many different kinds of trauma including ACEs, complex childhood trauma, sexual trauma, physical trauma, emotional trauma, collective trauma, generational trauma, second-hand trauma, vicarious trauma, etc. Effects of trauma include psychological and physiological symptoms emphasizing the importance of understanding trauma through a neurobiological lens. Gold standard treatments for trauma are Trauma-Focused Psychotherapies including Prolonged Exposure, Cognitive Behavioral Therapy, and Eye Movement Desensitization and Reprocessing (NCPTSD, 2018). Literature is scarce regarding specific art interventions in managing traumatic stress. Cohen, Barnes and Rankin, (1995), provide expressive art therapy directives for treatment of trauma described in 3 parts; (1) physical and psychological stabilization, (2) discussion of the traumatic event, and (3)

exploration and management of the aftereffects (Cohen, Barnes & Rankin, 1995). My series of art interventions with high risk youth considers the three part treatment process.

SAMHSA defines trauma informed care (TIC) as an approach that incorporates awareness of trauma and its impact regarding an individual's current adaptive functioning reflected in six general principles of (1) safety; (2) trustworthiness and transparency; (3) peer support; (4) collaboration and mutuality; (5) empowerment, voice and choice; and (6) cultural, historical and gender issues (SAMHSA, 2014). A TIC framework has benefits of raising the quality of care within the overall system of treatment in ACEs by increasing awareness and encouraging professionals to be more empathetic and caring. Practicing with TIC needs to be expanded, contributing to the movement to create systems that effectively help individuals affected by trauma (Berliner & Kolko, 2016).

Adverse Childhood Experiences (ACEs)

Adverse Childhood Experiences (ACEs), a growing public health crisis, are defined as traumatic events occurring in early childhood (0-17 years) including violence, abuse or neglect, witnessing violence at home or in the community, suicidal ideation in a family member, and environmental risk factors of residing in an unsafe and unstable environment. Environmental risk factors include family members with substance use and/or presenting problems in mental health, instability/inconsistency in parental figures due to time in jail or prison, and other associated social determinants of health (Centers for Disease Control and Preventions, 2021). ACEs cause toxic stress manifesting negative change in neurological structures and atypical brain development, with correlations to problems later in life. Through interference with the normative developmental process, patterns of traumatic experiences in childhood are associated with adolescent psychopathology exhibiting internalizing and externalizing behaviors, and juvenile

justice involvement (Grasso, Dierkhising, Branson, Ford & Lee, 2016). Atypical development can manifest into issues that are chronic or evolve throughout an individual's life. ACEs can have significant effects on several domains of development (i.e., cognitive, emotional, and social), leading to emotional and behavioral problems such as posttraumatic stress, depression and conduct issues (Grasso et al, 2016). Problems in adaptive functioning are manifested differently depending on the occurrence of ACEs; early childhood interpersonal victimizations, in comparison to middle or late childhood, correlates more directly with an increase of health-related and psychological risk (Grasso et al., 2016). Consequences of ACEs include possible chronic, negative impacts on health (both physical and mental), and life opportunities such as education and occupation potential, increasing risks of injury, sexually transmitted infections, maternal and child health problems, sex trafficking involvement and a range of serious illness such as cancer, diabetes, heart disease and suicide (Centers for Disease Control and Preventions, 2021). Despite these statistics, resources are limited and underfunded for treating or preventing ACEs in early childhood (Pliske, Stauffer & Werner, 2021); there is a need to increase advocacy for this topic and greater implementations of resources for treatment.

Adversities are harmful or stressful life experiences, with many adversities correlating with traumas. Adversities have connections with trauma including physical, sexual, emotional, and witnessing one's mother treated violently, as well as connections to neglect/ household dysfunction through household mental illness, household substance abuse, parental separation or divorce, and incarcerated household member. Recognition of ACEs and their connections to trauma increase awareness of ACEs being significant risk factors for poor health and mental health outcomes (Berliner & Kolko, 2016).

Neurobiological Changes in the Brain from Toxic Stress/ Trauma

ACEs can impact neurotypical brain development, affecting perception, behavior and cognitive functioning often leading to dysregulation, deficits in attachment, executive functioning, memory, emotional regulation and interpersonal identity problems (Wamser & Vandenberg, 2003). ACEs alter brain functioning by interference with neurotransmitter levels, disruption in brain cell metabolism, impairment in the ability to imprint memories, associations with short-term memory problems, and damage/ destruction to brain cells (Bray, 2016). In regards to the sympathetic nervous system response, ACEs can increase stress hormones in the brain; catecholamines, corticosteroids, opioids and oxytocin. When experiencing heightened levels of catecholamines, damage is observed to memory, rational thought, hypervigilance, and an inability to distinguish danger signals (Bray, 2016). When corticosteroids are chronically low due to the effects of toxic stress, there are correlations with reduced immune functioning, and there is an inability to regulate catecholamines (Bray, 2016). Increased opioid levels translate to flat affect; memory is impaired when oxytocin is increased (Bray, 2016). Trauma physically alters the brain, resulting in impairments of specific areas correlating with difficulties in different domains of functioning.

The field of traumatology has numerous studies contributed by findings in the advancements and developments of neuroscience, leading to a better understanding on the neurobiology of trauma. Excessive activation of the amygdala causes issues in physiological states and areas such as language with limited cognitive processing (Bray, 2016). Underdeveloped areas of the brain correlate with functional domains; Corpus Callosum translates to problems with emotional regulation; Hippocampus relates to learning and memory impairments in the cognitive domain; and Prefrontal Cortex correlates with the impaired ability to plan and make decisions (Bray, 2016). In order to best serve clients in a therapeutic setting, an

awareness of the neurobiological properties of trauma and impact on the brain is needed (Perryman, Blisard & Moss, 2019), understanding posttraumatic growth and neuroplasticity in the brain's ability to adapt. Awareness of how trauma is processed and stored allows therapists to provide psychoeducation to their clients to understand experienced biological effects.

Negative health related outcomes of ACEs result in impairment of multiple brain structures and functions as they parallel the cumulative exposure of the developing brain to the stress response (Navalta & McGee, 2018). There is a need in treatment for ACEs to address the individual's multilayered ecology within a biological, psychological, social, and cultural/contextual framework (Navalta & McGee, 2018). The neurobiological consequences of ACEs are encapsulated in the following: (1) when exposed to high levels of stress, the brain undergoes one or more sensitive periods in postnatal life, which result in alternative and atypical pathways of neurodevelopment; (2) developmental trajectory is adaptive; (3) key in brain development is the exposure to corticosteroids; and (4) different types of ACEs impact contrasting brain systems, which may be involved in perceiving or recalling adversities (Navalta & McGee, 2018). Because of the impacts on the brain, the integration of neurocounseling, learning to use the neuroplasticity in an effort to reorganize deficient brain circuits, is important in treatment models as it provides a heuristic framework for assessing, conceptualizing and counseling individuals with a history of ACEs (Navalta & McGee, 2018).

Correlations with Attachment and Relationships

Individuals with ACEs often exhibit attachment and relational issues due to the absence of safety and intergenerational biological, psychological and social effects of trauma. Negative effects of childhood maltreatment carry into aspects throughout an individual's life, increasing risks of ACEs generationally. Impaired attachment styles are seen in response to a parent's

difficulties with interpersonal relationships rooted traumatic experiences (Otu, 2020). Systemic factors of environmental and genetic risks contribute to attachment and relationship issues.

An adequate support system is needed for recovery for ACEs, increasing feelings of safety, trust and stability allowing for reconnection in relationships. The removal of a child from a home after involvement with Child Protective Services often leads to increased attachment dysfunction (Otu, 2020), requiring trauma informed approaches in social constructs to establish a sense of healthy connections and interpersonal relationships. Literature suggests strong correlations with ACEs and family functioning (Scully, McLaughlin & Fitzgerald, 2020). Positive parenting practices correlate with the decrease in risk of developmental delays in children (Cprek et al., 2020). There is a need for further research regarding attachment and relationships in conjunction with ACEs for practicing mindfulness when working with clients who have experienced childhood trauma. Art therapy can provide further insight in traumatology, offering a way for individuals to process adverse childhood experiences, and fostering a therapeutic alliance increasing regulation with attachment and relationships. Attachment-informed art therapy increases self-awareness, social skills, and coping mechanisms in a safe, creative process allowing for expression of the nonverbal part of the brain. Further exploration of damaged attachment systems as a result of ACEs in connection with art therapy interventions providing avenues to reconstruct relational attachment patterns with context in neuroscience is needed (King, 2016).

Neurobiological Processes in Art Therapy

The creative arts process ignites senses simultaneously, which help connect parts of self and express those parts that are not ready to be verbalized including inner feelings and unconscious thoughts (Malchiodi, 2003). Speaking about trauma can result in retraumatization

(King, 2016). Art can act as a way to reconnect implicit (sensory) and explicit (declarative) memories of trauma (Malchiodi, 2003). From a neurobiological perspective, art can provide valuable insight and expression into different domains of functioning. For example, art and language are both communicative systems dependent on symbolic and referential cognition, but it is language that is greatly impacted through maladaptive changes in the brain of trauma (Zaidel, 2014). Artmaking and its neurobiological processes can have healing properties for ACEs in high risk youth.

Expression through art has interconnections with neuroanatomy, neurophysiology and the integrity of neurotransmitters (King, 2016). Semir Zeki (1999), claims that art is rooted in physiology focusing on the “biological basis of aesthetic experience”; his contributions within this field highlights art as an extension of the functions of the brain (Zeki, 1999) contributing to the concept of neuroaesthetics, reinforcing the neurobiological processes in art making.

Neuroaesthetics uses an integrated methodological approach of aesthetics and neuroscience, examining how aesthetic behavior is underpinned by brain processes (Skov & Vartanian, 2009). By identifying aesthetic functions in behavior, the identification of neurobiological processes is possible. Aesthetic functions refer to the psychological processes that are recalled by the client when engaging with objects. Psychological processes may involve perceptual, sensory, cognitive, emotional, evaluative, and social aspects, as well as others; these processes are conjectured to have a biological neural basis (Skov & Vartanian, 2009). There is a need for further research contributing to neuroaesthetics to provide empirical evidence for the compatibility of the biological frameworks within aesthetics with biological sciences for coherence (Skov & Vartanian, 2009). Biology, neurology and aesthetics can inform one another. It is important to note that neuroaesthetics does not focus specifically on art or therapeutic

treatment; it highlights physiological and psychological aspects of aesthetic expression. King, (2016), notes that further research involving the collaboration between art therapists and neuroaesthetics may help develop a greater understanding of physiological and psychological connections and how to best apply this information in treatment. Neuroaesthetics and art therapy contribute to the understanding of human behaviors and cognition as inherent fundamental collections of levels of the cerebral function (King, 2016). Psychology, psychotherapy and art therapy needs a basis in neuroscience as it provides a greater understanding of human behavior.

The Expressive Therapies Continuum (ETC) further supports the neurobiology processes of art therapy. The Kinesthetic/ Sensory, Perceptual/Affective, and Cognitive/Symbolic levels of the ETC have correlations with different functions and structures in the brain, as well as reflecting the two hemispheres of the brain in how it processes visual and affective information (Hinz, 2010). The ETC helps therapists grasp neuroaesthetics, understanding the connection of multileveled neurologic regions integrated and utilized in creative expressions (Hinz, 2010). The ETC gives a perspective of art making from a neurobiological framework, further supporting the concept of neuroaesthetics and contributing to studies on art therapy and the brain.

Supporting the basis of neurobiology processes in art making, Belkofer, Van Hecke and Konopka (2014), created a method to contribute evidence to support this notion. Utilizing the quantitative EEG (electroencephalogram) on participants prior to engaging in artmaking and following a drawing session in a pre/post design, the study examines and measures residual effects in the brain after 20 minutes of art making investigating how art therapy affects clients' at a neurobiological level through the electrical activity of the alpha rhythm within the brain. The alpha rhythm, a pattern within the brain, is associated with self-regulation, relaxation, memory, visual processing, intelligence and creativity (Belkofer, Van Hecke & Konopka, 2014).

Findings indicate the visual processing networks of the brain's increased alpha post-drawing reflect a self-regulatory behavior as the alpha band is associated with lower cortical arousal and relaxed states, implicating that art therapy may have congruence with neurobehavioral therapies goal oriented to promote relaxation and self-regulation (Belkofer, Van Hecke & Konopka, 2014). Based on this rationale, clients experiencing anxiety disorders and PTSD may benefit from art therapy interventions as art may provide a sense of subsidy from anxiety, hypervigilance and other distressing states (Belkofer, Van Hecke & Konopka, 2014).

Further supporting the neurobiological properties of art, Klorer (2005), examined the usefulness of art therapy with severely maltreated children in conjunction with neuropsychiatry developments utilizing two case studies (Klorer, 2005). The study's goal is to explore current research in neuroscience while providing a rationale for expressive therapy interventions as treatment for trauma, contributing to the understanding of why nonverbal, expressive therapies can be more effective than verbal therapies in use with maltreated children considering the underpinnings of a neurobiological framework. To support this, Klorer references developments in neuroscience providing evidence of traumatic memories being stored in the right hemisphere of the brain, resulting in difficulties with an individual expressing verbal declarative memory of a traumatic event. Klorer's study found art therapy allows for indirect confrontation of trauma; nonverbal expressive therapy has the potential to lead individuals to express repressed emotions and feelings (Klorer, 2005), providing insight to the healing potential of art, as part of the healing process from trauma lies within expression and release. The interrelating and bridging of art and neuroscience contributes to treatment from in traumatology.

High Risk Youth and ACEs

There are numerous studies examining ACEs in the population of high risk youth with implications for trauma informed work. This is a growing public health crisis with youth frequently and significantly experiencing ACEs; 25% in the United Kingdom; and over 50% in the U.S. and Brazil (Riaz & Bano, 2020). A range of 20%-70% of youth experience multiple (3-5) ACEs, with a high prevalence of emotional abuse (29.1%), physical abuse (22.9%), sexual abuse (9.6%), physical neglect (16.3%) and emotional neglect (18.4%) (Riaz & Bano, 2020). Given the high prevalence and statistics of youth with ACEs, there is a need to further investigate treatment plans and interventions to effectively work with high risk youth exhibiting challenging and difficult emotions and behaviors. Given their history and knowledge of the neurobiological changes in the brain resulting from trauma with direct correlations to attachment and relationships, insight can be provided regarding an individual's current adaptive functioning. There is a need to develop art therapy interventions to fit the unique needs of this population utilizing the neurobiological processes existing in the creative arts process.

In terms of brain development, a critical period is birth to five years old, as the brain undergoes significant growth and change affecting cognitive, emotional and social competencies, influencing functioning throughout life. According to a recent study, approximately 40% of children under the age of five are at risk of developmental delay with risk factors of low SES, inadequate prenatal care, and isolation from parents due to divorce or single-parent households (Cprek et al., 2020). Cprek et al. (2020), composed a cross-sectional, phone interview survey utilizing data from the 2011/12 National Survey of Children's Health (NSCH) to assess prevalence of physical, emotional, and behavioral health measures in children from the ages of 0-18 years. Questions in the survey aimed to assess ACEs and the risk of developmental, social and behavioral delay as well as measuring the child's environmental factors. The data supports

significant correlation between ACEs and the development of delay with children experiencing maltreatment to be more likely to assess social skill deficits and academic deficits (Cprek et al., 2020). Long-term impact of ACEs in early childhood needs further research and study.

High rates of ACEs are seen in justice-involved youth including abuse, neglect, and household dysfunction, placing this population at an elevated risk for behavioral health needs including substance use and psychiatric symptoms (Folk et al., 2021). Existing literature regarding ACEs among justice-involved youth focuses on recidivism rather than the associated consequences of ACEs. Folk et al., 2021, examines this association through questionnaires, surveys and scales resulting in the indications that exposure to ACEs, particularly abuse, are predisposing factors for substance use and psychiatric outcomes, highlighting the need for implications of trauma-responsive treatment for high risk youth exposed to ACEs.

There is limited research regarding the connections between high risk behavior in adolescence and ACEs, as studies tend to draw focus on the problems in adulthood. Many serious health risk behaviors surface in adolescence, including substance use, sexual behavior, self-injury and suicidal behavior. Layne et al. (2014), created a study examining the correlation in adolescence with participants selected from the National Child Traumatic Stress Network Core Data Set who had reported exposure to at least 1 type of trauma utilizing logistic regression analysis tests. High risk behaviors and functional impairment in adolescents included attachment difficulties, skipping school, running away from home, substance abuse, suicidality, criminality, self-injury, alcohol use, and victim of sexual exploitation (Layne et al., 2014). Findings indicated with the progression of the number of ACEs, risks were increased for each maladaptive behavior (Layne et al., 2014). For effective early intervention and prevention of behaviors, there is a need for further studies emulating high risk youth and ACEs, as there is scarce research available.

Additionally, contributing to the understanding of ACEs in this age group promoting positive adolescent development would provide advocacy and awareness of this mental health crisis.

Art Therapy with ACEs in High Risk Youth

Art can help reach individuals with confronting issues of trauma, as it offers a non-threatening approach and allows one to create aesthetic distancing between themselves and the trauma, enabling the externalization of internalizing thoughts and feelings. “There seems to be a language barrier we create when confronting issues of trauma. I think, through art, we basically are constructing a bridge to better understand our psychological wounds...I believe [art therapy] to be an excellent medium to reach intangible emotions” (King, 2016, p. 7). Art as media in therapy can help express trauma in a way that language cannot, as it feels more approachable. Expressive arts benefit children who lack the words or vocabulary to express complex feelings (Davis, 2010). When working with trauma, it is important to recognize verbalizations of the trauma can be retraumatizing. Art allows for increased feelings of safety through the physical separation of the trauma and the mind/body. When considering toxic stress from trauma in treatment, an individual has to develop healthy coping mechanisms to tolerate distress, promote compassion and self-empathy and make changes that allow for meaning making (Cohen, Barnes & Rankin, 1995). Engaging in creativity helps with the development of these abilities.

Art can act as a protective factor for high risk youth with ACEs. Art making has the potential to embody stress management, being utilized as a coping mechanism during difficult circumstances (Pliske, Stauffer & Werner, 2021), further evidencing its validity and healing potential for this population. Work with clay can simulate play seen as a regressive material, allowing youth to engage in expression of ACEs. Van Katwyk & Seko (2019), examined the parallel between the discursive construction of youth and resilience, considering deficits, risks

and adversity through 23 youth (aged 16-29) participating in art-making workshops. The purpose was to explore redefining resiliency through the inclusion of youth's own conceptualizations and experiences in collaborative art-making processes. Findings indicated that resilience is congruent with identity management (Van Katwyk & Seko, 2019). There is limited research regarding the arts with ACEs in high risk youth, and a need to understand beneficial interventions and healing properties of art. Van Katwyk & Seko (2019), gave insight into the concept of resiliency in the formation of one's identity, however there needs to be further considerations regarding the neurobiological effects of trauma interfering with multiple domains of functioning. Independent research showed more studies have been conducted with young elementary school children; there is a need to investigate art therapy from a trauma informed perspective with adolescents.

McGann (1999), discusses the use of art therapy as a possible indicator for progressive homicidal ideation with the case of an adolescent girl exposed to ACEs. Art therapy was used to uncover the strategies art therapists have to offer about incidents of adolescent homicide by searching for warning signs, finding ways to intervene prior to violence being committed by or against children by using psychoanalytic theory- stating how trauma or other disturbances impact physical and psychological development with risk factors towards possible pathological adaptations (McGann, 1999). The case of Tina, age 15, examines art therapy interventions in her treatment offering a unique opportunity for expression and assessment of the homicidal rage that she struggled with. Tina experienced ACEs with sexual abuse and having parents who struggled with substance use. Art therapy allowed Tina to express homicidal rages of impulse behaviors without engaging in previously exhibited behaviors (i.e., impulsive assaults on family and peers). McGann (1999) concluded that art therapy is a successful form of treatment for intervening and eliminating problematic behaviors that raise safety concerns about self and others through

expression of regressive transference, demonstrating how art can be utilized as a protective factor for high risk adolescents who have experienced ACEs.

There is a need for further studies focusing on the use of art therapy interventions with high risk youth having been exposed to ACEs, guiding my development of a method. The lack of research for this growing public and mental health crisis propelled and motivated my desire to continue and expand on the existing literature and interventions. ACEs are common, and the consequences are significant. Providing effective treatment options for preventative and early interventions are needed, as the impacts of ACEs and the risks associated remain prevalent throughout an individual's life. Trauma is understood through the impacts on the brain; art therapy can interrelate within the field of neuroscience with increased awareness of the neurobiological properties of art.

Methods

My method involved a series of five, one hour art therapy group sessions within a single group of five participants, with the guiding question: is there healing potential in the neurobiological processes of art therapy working with high risk youth with ACEs? I hypothesized that art therapy and the neurobiology aspects of art would help high risk youth by providing coping strategies for tolerating negative consequences of ACEs present in their current functioning. My hope in developing this method was to provide insight regarding the healing potential of art in regards to traumatology, and to raise awareness.

Participants consisted of five individuals aged 14-16 at a treatment facility for high risk youth exhibiting a range of cognitive, behavioral and social issues. All participants have a history of experiencing one or more ACEs including violence, abuse or neglect, household dysfunction of substance use, mental health problems and instability due to parental separation. Participants

had a range of diagnoses and issues. Overlapping high risk adolescent behavior the participants struggle with in their current functioning included aggression, anxiety, cognitive deficits, disruptiveness, inappropriate sexual behavior, regulation, relationships and trauma. I had a pre-existing relationship with the participants prior to engaging in the interventions as I have worked them throughout the year. I implemented the following group method as an art therapy intern.

The procedure was an abbreviated and adapted version of a previous study focusing on a 14-week art therapy program for at-risk youth (Sitzer & Stockwell, 2015); week 1 focused on building trust and safety through identifying and creating a safe place (Cohen, Barnes & Rankin, 1995); week 2 examined change with an intervention targeted to help clients understand they have control and the capacity for change through coping strategies like breath work (Cohen, Barnes & Rankin, 1995); week 3 focused on anger management/ dysregulation by expressing anger in a safe manner through the use of clay; week 4 placed emphasis on coping skills through focusing on inner strengths through the directive “Paving the Way” (Cohen, Barnes & Rankin, 1995); and week 5 focused on mindfulness, resilience development and integrations with “I Am” collages made by tracing hands. Week 5 consisted of a community aspect as participants worked collaboratively integrating their collages on a poster, fostering connection. Each session closed with a discussion about the experience acknowledging any feelings, emotions, reactions, or bodily sensations that occurred. I kept a record of what I saw, heard, felt, experienced and thought by making a continuous art piece documenting my experience, and through process notes. My artistic reflection embodied the directive for each week. I interpreted the data gathered through referencing past literature and examining how artmaking correlated with a change in their current functioning, relating to the neurobiological processes of art therapy and its healing properties as treatment for high risk youth with ACEs.

Results

Considering the neurobiological treatment of trauma, the method recognized art therapy having healing potential in work with high risk youth with ACEs, as the senses of touch and sight are connected directly to the brain's fear center, making art therapy ideal in work with visually stored traumatic memories. Participants were able to move at their own pace, and have a sense of control, helping with catharsis as art acted as a vehicle for aesthetic distancing reducing dysregulation. The nonverbal aspect of art provided a safety net which seemed to promote more verbal discussion after each experiential.

Week One



Image 1

In week one, the participants were given the directive to establish a safe place through painting. Two of the participants initially struggled to identify a safe space disclosing problems at home (i.e., living in a residential program away from home, conflicts they have with their family, etc.) When prompted that the place can be imaginary, all participants were able to actively engage in the process. I observed feelings of anxiety subsiding into feelings of excitement as they were able to use their imagination and creativity. When sharing with the group, only one participant identified an existing space; the four other participants imagined their safe space as something that does not exist in reality. Participants engaged with one another, asking each other questions and inviting each other into their spaces.

In my artistic reflection (*Image 1*), I reflected on the diminishing feelings of anxiety through color and proceeded to identify my own safe space. The under-layer of the canvas was covered in red paint; I began to diminish this color representing feelings of anxiety with the

yellow paint, as I felt it was symbolic of the manifestation of excitement representative of the strength of imagination. I also added my safe place in the painting, becoming physically part of the process alongside the participants. Practicing with TIC, I wanted to provide a space where participants felt heard, valued and empowered acknowledging that, although their life experiences are unique from one another, they are not alone in this work. Becoming artistically engaged in their process helped me foster a sense of connection and create an external safe space within the room I was facilitating the experientials, constructing feelings of togetherness and acceptance through sharing, empathetic active listening, and unconditional support.

Feelings of safety may be difficult to connect to for those who have experienced trauma. I infer that participants, due to their trauma history and feeling unsafe in areas of their life, prevented them from accessing an existing safe space in their mind- one that they could physically go to. When acknowledging that safe spaces can be real or imagined and emphasizing the importance of being able to access this safe space in our minds when feeling anxious, overwhelmed, triggered, unsafe, etc., I noticed participants becoming more actively involved in the experience, recognizing the value of the experiential and the healing potential this experiential carries, enabling each participant to independently foster a safe space in their minds when needed.

Week Two

Week 2 drew attention to the participants' breath, acknowledging how stress can affect the way we breathe, as outlined by Cohen, Barnes & Rankin (1995). This week focused on how participants have the capacity for changing maladaptive behaviors and thoughts through implementing coping strategies. The participants were asked to draw their breath prior and post of a mindfulness meditation exercise. The results from this week varied, as it was difficult for the



Image 2

participants to maintain regulation throughout the exercise. In the discussion, participants shared personalized coping strategies, leading to an insightful discussion about our innate uniqueness and the various avenues that can work to create positive change in self. Although the session was not successful in what it aimed to do originally, it provided a framework for understanding the importance of implementing coping strategies in response to toxic stress through verbal sharing.

I observed participants struggling to maintain focus and regulation throughout this exercise with resistance and refusal to engage in the mindfulness meditation. I noticed how outside environmental stimuli such as noise in the hall, commotion in the adjoining room, and sensory disturbances that the participants were both experiencing and demonstrating affected my own breath work and meditation. In my artwork (*Image 2*), I reflected on the chaotic energy I was feeling initially, and then a feeling similar to waves gentling ebbing and flowing on a beach as the room began to return to a state of regulation as participants shared their own coping strategies. Participants self-advocated for their own coping strategies as well as provided reason to why these strategies meet their needs. This experience was insightful in a sense that participants learned about one another, and I recognized the healing potential of more targeted art therapy interventions meeting the needs of differing identified coping strategies.

Week Three

Week 3 involved the use of clay with anger management; participants immersed themselves in the clay exploring what anger looks like to them. One participant made a large

sculpture and then smashed it with his fist. Another participant continuously pounded the clay with his fist flattening it like a pancake. Another participant made a volcano. Participants were



Image 3

asked what their experience felt like for them and if they noticed any differences in how they were feeling prior and post utilizing the clay. Although she did not share with the group, one participant who was noticeably dysregulated when entering the session (i.e., talking excessively, in a state of constant

movement and projecting her voice) appeared to be in a more regulated state evidenced through ability to remain in her seat and listen when others were sharing.

With regard to my experience, I noticed the power of clay as participants manifested their own energy into their creations becoming more tactilely involved, physically engaging their body in the clay allowing for Sensory/Kinesthetic release and expression. The clay appeared cathartic as evidenced through the physical presentation of the reduction of hyperactive behaviors. Clay embodies the haptic sense of touch, allowing for sensorimotor awareness. When interacting with clay, the clay documents and has a history of sensorimotor feedback as it takes on the imprint of the act of touch. The experiential helped release anger and feelings of tension, in a safe manner, while recognizing how others are touched through that anger. I noticed myself recognizing how, similar to clay, we can mold, change and sculpt different responses to anger, being cognizant of the impacts of anger on a larger systemic system within each of the participant's biopsychosocial factors. I sculpted a flower to recognize the growth that adapting safe responses to anger can have in regards to biopsychosocial development.

Week Four

In week 4, the experiential, “Paving the Way” (Cohen, Barnes & Rankin, 1995), asked participants to collage a pathway out of scraps of paper, writing on the paper to identify 5-10



Image 4

strengths that they possess. Through my previous work with the participants and my understanding of them, I was able to help participants that were struggling with identifying their own strengths. I witnessed looks of surprise and appreciation when I helped identify strengths of theirs, contributing to a sense of empowerment. This experiential enhanced and gave insight into determination, will, faith, courage, responsibility, creativity, resilience and open-mindedness for the participants.

Through the identification of strengths, I observed the consideration of SAMHSA’s trauma informed principle of empowerment, voice and choice in working through a trauma informed perspective (SAMHSA, 2014). I experienced feeling a sense of empowerment as I identified my own strengths and added to my painting (*Image 4*), recognizing how strength based, trauma informed approaches with high risk youth with a history of ACEs can help individuals look at and examine their protective factors that have helped them survive their past and current experiences. Resiliency is strength that all of the participants possessed. Identifying strengths helped individuals recognize that they have the innate power within themselves to change maladaptive behaviors that are a result or contributed to by the trauma they have experienced. I reflected on how individuals who have experienced trauma may feel out of control in their life as the trauma(s) took away feelings of control and safeness. Through recognizing each participant’s unique strengths, I observed participants combatting trauma through

recognizing, although they cannot change ACEs, they are in control of how they respond to their trauma, impacting their current adaptive functioning.

Week Five

Week 5 expanded on resilience development and inner strengths by creating “I Am” collages. Participants were asked to trace their hands and write or draw representing themselves. As comfortability levels increased and from the experience the week prior, participants were able to quickly identify aspects about themselves that they wanted to include. This was reassuring to me regarding the neurobiological properties of art therapy when considering the struggles



Image 5

initially present at week 1 in comparison to the adaptability and skills acquired by week 5. Participants were actively involved in this session and appeared to enjoy the community/ collaborative aspect as they placed their hands together on a poster board. Words present in their “I Am” collages included “funny,” “strong,” “beautiful,” “kind,” and “a good person.” Results from this week indicated an increase in comfortability in the arts as expression.

I observed peer support, one of SAMHSA’s trauma informed principles as participants exhibited unity creating a collaborative poster of their “I Am” hand collages. I experienced feeling a sense of balance as the experience came to a close, acknowledging the various strategies the participants acquired through the use of the creative arts over the past 5 weeks. My artwork (*Image 5*) shows the hands reaching towards one another in a sense of lifting each other up with peer support through a trauma informed lens. I reflected on the healing potential of art, as well as the insightful verbal conversations that emerged with each discussion after the

expressive arts interventions. The art allowed for safe expression and each participant was able to externalize internalizing feelings of trauma, obtain aesthetic distancing, and become aware of the neurobiological properties and healing potential of art through noticing bodily sensations, responses and a state of catharsis.

Discussion

The results from my method, indicating my experience and learning throughout the process, supported the field of art therapy in correlation and integrated with neuroscience and trauma informed work. The findings that emerged through three themes in the study include; 1) the importance of identifying and building resiliency for high risk youth with ACEs correlating to self-exploration/ identify formation; 2) coping strategies can help tolerate the negative consequences of ACEs; there are neurobiological, healing properties in art; and 3) the emphasis of the need to raise awareness to identify risk factors and treat ACEs through early intervention in this population. Resiliency was a strength that each participant carried as they have survived their trauma and was present within the group. Coping strategies, although unique to meet the needs of each individual, provide high risk youth with the ability to respond appropriately and be in control of their behaviors and current functioning that has been impacted by past and present ACEs. Art has healing properties and underpinnings of neurobiological properties as it allows for the process of aesthetic distancing, with art having interconnections with neuroanatomy, neurophysiology and the integrity of neurotransmitters (King, 2016). Art is essentially an expression of functions in the brain; art therapy with a basis in neuroscience provides a greater understanding of human behavior as evidenced through the participants' changes in current functioning through the 5 week method. Early intervention in high risk youth with ACEs is vital

in aiding the growing public health crisis of ACEs, combatting maladaptive behaviors that can appear in adulthood.

Theme One: Building Resiliency

Resilience in the participants was observed through the willingness and being present throughout the 5 week group sessions. The theme of resilience was brought up each week, as the participants identified their own safe space exhibiting strengths of creativity and imagination, identifying coping strategies with strengths of advocacy for their needs, acknowledging how they have control over how they respond to feelings of anger or aggression demonstrating strengths of empowerment, self-identifying strengths giving insight into the determination, will, faith, courage, responsibility, creativity, and open-mindedness of the participants, and through peer support building a sense of community. Van Katwyk & Seko (2019), further supports the impact of resiliency in trauma treatment defining resiliency as the inclusion of youth's own conceptualizations and experiences in collaborative art-making processes. Resilience is salient in identity management and plays roles in the formation of one's identity, contributing to high risk youth with ACEs current functioning and presentations of behaviors (Van Katwyk & Seko, 2019); findings in previous literature emphasize the need to provide services and care building resilience in children and adolescents who have had adversity early in development (Layne et al., 2014); my results further support this concept.

Theme Two: Developing Coping Strategies

Coping strategies can help tolerate the negative consequences of ACEs in high risk youth as evidenced through the use of art as a coping strategy and identifying other coping strategies. Participants explored coping strategies each week as artmaking allowed for regulation, providing visual stimuli as well as auditory stimuli through the verbal discussion of coping strategies

unique to each individual. High risk youth with ACEs carry toxic stress from trauma; conducive to tolerating distress, promoting compassion and self-empathy and adapting meaning making, an individual must utilize and access healthy coping mechanisms (Cohen, Barnes & Rankin, 1995). Throughout the 5 week creative experience, the creative aspect helped with the development of these abilities seen through the comparison of how participants presented regarding behaviors prior to each intervention and after. Art can be a protective factor for high risk youth with ACEs as it encapsulates stress management and can be a coping mechanism in itself with healing properties (Pliske, Stauffer & Werner, 2021).

Findings showed that there is healing potential in the neurobiological processes of art therapy in high risk youth with ACEs. This was evidenced through my observations and experience implementing my method with this population. I observed the reduction of dysregulated behaviors and the reduction of symptoms due to ACEs as predisposing factors. The understanding of how trauma affects the brain enabled me to document neurobiological changes during the artmaking processes through witnessing subsiding symptoms and through verbal discussions with the participants. The brain physically changes in response to stress, but also can adapt with neuroplasticity and posttraumatic growth, evident through artmaking. In order to treat ACEs, it's important to understand the neurobiological underpinnings and impacts on development, behavior and cognition, providing a more holistic view in treatment. ACEs have a negative correlation with attachment and relationships, which were a struggle for the participants in the study. It is important to consider how their cultural backgrounds, upbringing and experiences impact their current functioning. Art therapy with ACEs in high risk youth contributes valuable insight in treatment and prevention.

Theme Three: Identify Risk Factors

There is a need to identify risk factors and treat ACEs through early intervention in this population. Participants in the study exhibited severe symptoms and complex diagnoses, struggling with mental health issues for much of their life as symptoms emerged early in life for all participants according to their reported histories. All participants engage in high risk behavior in their communities including substance use, legal involvement, aggression to self-and/or others and inappropriate sexual behavior, amongst others. The participants current functioning and presentation of behaviors highlights the need for early intervention in childhood and adolescence, as these behaviors will negatively progress without treatment. Adolescents transitioning into adulthood have significant correlations with mental and physical health, quality of life later in adulthood and other negative outcomes including the risk of developing criminal behavior, emphasizing the need to identify risk factors and treat ACEs through early intervention rather than identifying them later in adulthood (Layne et al., 2014). It is important to treat adolescents exhibiting high risk behavior and functional impairment as their current functioning may pave the way for other negative consequences if left untreated. Negative consequences may include teen pregnancy, development of sexually transmitted diseases, school dropout, substance use and juvenile delinquency.

Limitations and Future Research

More research and studies are needed to explore art therapy in treatment of ACEs in high risk youth, advocating for the importance of this topic as we are amidst a growing crisis. The method and data were analyzed through only my own perspective; there is a need to develop a different methodology to promote the healing potential of art therapy though a more evidence based perspective. Utilizing my own perspective can be seen as biased as I had a pre-existing established relationship with them, and was familiar with their presenting issues, diagnoses and

histories. In addition, I could have unknowingly been biased due to any lack of awareness to an individual's culture or other intersecting identities. Also, due to the group setting, it was not possible for me to provide my full attention to each individual at all times, which increases the risk of missing important data. Exploring different modalities of the expressive therapies in this work, as well as different art interventions would be interesting to further explore, as the expressive therapies with this population is limited in existing research.

Directions for further study include creating art interventions and methods aimed at specific types of adolescent high-risk behaviors and functional impairment to reduce the negative effects of ACEs. "I invite you to contemplate that the conductor is the art therapist, the musicians are our patients, and neuroscience is the manager. Within this metaphor, we together create inspiring and universal concepts of hope and transformation" (King, 2016, p. 221). The integration of art therapy and neuroscience can inform one another; research examining the correlation of these fields can provide insight for the best practices with holistic and quality care, as supported through this research of examining the healing potential of neurobiological processes in art therapy.

Conclusion

This paper examined the neurobiological properties of art therapy in treatment for high risk youth with ACEs from a trauma informed practice. It examined trauma through a neuroscience lens, emphasizing the need for art to be viewed through the same lens creating a sense of cohesion in treatment modules and interventions. The paper then examined the healing potential of art therapy through developing and implementing a method with a group of 5 high risk adolescents who have been exposed to adversity in their childhood, presenting with symptoms that can be connected to ACEs. The results highlighted the importance of resilience

identification and building, gave recognition to how coping strategies can help tolerate the negative consequences of ACEs, indicated that art has healing potential with high risk youth, as its neurobiological properties allow for expression and have symptom reduction properties, and emphasized the need to treat ACEs through early intervention. I hope to continue my contribution to the existing research about how art and neuroscience interrelate throughout my professional career, learning more about the functions of the brain and the impacts of trauma. My continuous learning and growing will inform my clinical practice into being more cognizant of practicing through a trauma informed lens, deepening my understanding of the positive impacts of art therapy through neurobiological discoveries. Through this paper and my future work, I aim to increase awareness and advocacy for the effects of ACEs in high risk youth, hoping to increase conversations within greater societal systems (i.e., art therapists, social workers, therapists, school systems, neuro-aestheticists, neurologists, parents, child protective services, etc.) combating ACEs as a public and mental health crisis.

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THESIS APPROVAL FORM

Lesley University Graduate School of Arts & Social Sciences Expressive Therapies Division

Master of Arts in Clinical Mental Health Counseling: Art Therapy, MA

Student's Name: _____**Marisa Massaro**_____

Type of Project: Thesis

Title: The Traumatology of Adverse Childhood Experiences in High Risk Youth:

Examining the Healing Potential of the Neurobiological Processes in Art Therapy- Option

1: Development of a Method

Date of Graduation: _____**May 21, 2022**_____

In the judgment of the following signatory this thesis meets the academic standards that have been established for the above degree.

Thesis Advisor: _____**Raquel Stephenson**_____