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Neuropsychological Aspects of Coping with Stress in Children and Adults through Art Therapy

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Abstract: *Nowadays, the problem of stress is becoming increasingly relevant for both children and adults. Ongoing social changes, high levels of information overload, and life crises create favourable conditions for the emergence of stressful situations. These situations negatively affect physical and mental health. Children are particularly vulnerable to stress, as their nervous systems are still in an active phase of development. Adults, who often bear complex social responsibilities, are also at high risk. This article explores the neuropsychological aspects of using art therapy as an effective method for coping with stress in children and adults. It highlights how creative activities contribute to emotional regulation, anxiety reduction, and the stimulation of cognitive functions. In addition, the article examines various art therapy techniques, including drawing, musical improvisation, drama therapy, and colour-based work. These methods foster the development of brain neuroplasticity. Emphasis is placed on adapting art therapy approaches to different age groups and the specific needs of individual clients. The article also provides practical recommendations for professionals working in psychology, education, and rehabilitation. The findings confirm that art therapy serves as a universal tool for strengthening stress resilience and enhancing psycho-emotional well-being in the face of current challenges.*

Keywords: *stress, school-related stress, correction, art therapy, emotional distress, anxiety prevention.*

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Introduction

The dynamic development of current civilization has its negative aspects. One of them is the increasing prevalence of stress in people's lives. The ongoing pandemic has further contributed to rising stress levels across all segments of the population. However, a particularly vulnerable group is children, adolescents, and young people. These individuals are especially susceptible to stress and its negative effects. Stress is particularly dangerous for them because they lack the knowledge and experience to cope with it. Additionally, they have not yet developed adequate psychological defence mechanisms.

It is well known that chronic stress is more dangerous than acute stress. This is particularly true for school-related stress, which poses a significant risk to students. Timely prevention and effective correction of its consequences are essential. Stress in school can lead to developmental issues in younger children, such as passivity, low self-confidence, and feelings of inferiority. Over time, these issues may evolve into depression, social withdrawal, and a negative attitude toward others and society. In extreme cases, chronic stress may result in compensatory aggression, contributing to socially harmful behaviours such as bullying, harassment, and susceptibility to extremist ideologies. Aggressive behaviour may also be directed at other national or religious groups, potentially fostering extremism and terrorism. While these are extreme outcomes, in most cases, school-related stress and its accompanying maladjustments block the development of a child's creative potential and self-realization. This can lead to long-term academic difficulties, reducing motivation, and activity, and hindering the development of a student's abilities for years to come.

As noted by Boiko (2014), art therapy is an effective and safe method of stress management that promotes emotional regulation. It relies on creative activities that help reduce anxiety, enhance self-awareness, and develop adaptive behavioural strategies. From a neuropsychological perspective, art therapy activates various regions of the brain, including the sensory, motor, and emotional systems (Han et al., 2024). This allows for a comprehensive approach to stress management.

Sknar (2020) explores the impact of body-centred practices on emotional self-regulation, especially in stressful situations. The researcher considers art therapy techniques to be an effective tool for reducing emotional tension and restoring psychological balance.

This article explores the neuropsychological mechanisms through which art therapy helps individuals manage stress. It examines how art therapy

activates neuroplasticity, forms new neural connections, and reduces cortisol levels. Additionally, it highlights the role of art therapy in stimulating the production of neurotransmitters responsible for emotional balance and motivation.

The article also aims to determine the effectiveness of art therapy as a stress management tool, considering the age and neuropsychological characteristics of children and adults. Furthermore, it presents practical aspects of applying art therapy techniques in working with various groups of people.

Methodology

This theoretical article adopts an interdisciplinary approach to examine the neuropsychological aspects of stress management in children and adults through art therapy. It draws on current research that integrates psychology, neuroscience, and sociology.

The article is both theoretical and analytical, aiming to organize existing knowledge and explore the concepts and models of stress management through art therapy for children and adults.

The methodology includes indirect methods such as literature analysis, data interpretation, information synthesis, knowledge systematization, and critical analysis. While the research is theoretical and does not involve direct interaction with participants, it adheres to ethical standards. Sources are properly cited, with appropriate references to authors, and the interpretation of scientific works is unbiased and transparent.

Expected outcomes include a comprehensive review of scientific findings on the neurophysiological mechanisms of art therapy. The article also seeks to identify the most effective artistic activities for stress management across different age groups. Additionally, it offers practical recommendations for applying art therapy in clinical and educational settings.

Combining a review of current literature, the synthesis of concepts, and critical interpretation, this article lays a solid theoretical foundation for future empirical research and provides practical recommendations for managing stress through art therapy in children and adults.

The concept of stress in children and adults

Stress is an emotional response to demands placed on the body, triggering the mobilization of resources to meet these demands. Boiko (2014) defines childhood stress as situations where a child lacks sufficient resources to cope, potentially threatening their mental and physical well-being. When stress becomes chronic, it depletes resources, leading to exhaustion.

Emotional stress is marked by heightened physiological and psychological activity, with instability being a key characteristic. In unfavourable conditions, stress can transform into nervous and emotional tension, reducing performance and efficiency in bodily systems. More importantly, it rapidly depletes the body's energy reserves (Sknar, 2022).

Stress is an inherent part of today's life, arising from challenges and changes that exceed one's ability to adapt. It impacts emotional state, behaviour, physical health, and cognitive functions in children and adults. Stress in children may manifest as anxiety, decreased academic performance, or reduced social engagement. For adults, stress is often linked to work, social, and family responsibilities.

Stress is the body's physiological and psychological reaction to external or internal stimuli perceived as threatening or overwhelming. Selye's research (2013) identifies three phases of stress: 1) *alarm*, where the body mobilizes resources; 2) *resistance*, the adaptation phase; and 3) *exhaustion*, which occurs from prolonged stress that depletes physical and mental resources.

For children, stressors often stem from adapting to new social situations, such as school, family conflicts, or issues with peers. The main stressors for adults include work challenges, economic difficulties, and interpersonal problems.

Children are highly adaptable, yet susceptible to the effects of prolonged stress. It can manifest in emotional symptoms such as restlessness, anxiety, and irritability; behavioural responses such as aggression, refusal to engage in studies, and social isolation; as well as physical signs including headaches, sleep disturbances, and digestive problems.

Support from adults plays a critical role in overcoming stress. Creating a positive emotional environment and developing adaptive strategies through play, learning, and communication can help.

For adults, stress is frequently linked to ongoing psychological strain and an imbalance between work and personal life. This can result in burnout, depression, and psychosomatic disorders (Joschko et al., 2022). To cope, they may turn to ineffective strategies, such as avoidance, overeating, or harmful habits, which only worsen the situation.

Understanding the nature of stress in children and adults is crucial for developing effective coping strategies. Practical approaches should take into account age, social context, and individual needs. Art therapy, physical activity, and cognitive techniques can help foster the adaptive strategies necessary to manage stress and maintain mental health.

Art therapy: a new area of psychotherapy

The psychoanalytic approach in art therapy focuses on helping individuals recognize their problems through creativity, which is considered essential for overcoming these challenges. It also emphasizes the development of practical skills in artistic self-expression.

In Ukraine, art therapy began about 10-15 years ago, initially focusing on vulnerable groups such as youth, people with special needs, and victims of terrorism. While programmes and projects are being developed, professionals in this field still need comprehensive knowledge and skills in various artistic techniques to implement art therapy effectively (Jackson, 2023).

Art therapy, which uses art and creativity for healing, is widely regarded as one of the most effective methods for addressing psycho-emotional issues. The need to express emotions, feelings, and moods plays a central role in fostering creativity. Activities such as drawing help relieve emotional tension.

Art therapy, as a branch of psychotherapy, involves the creation and analysis of artistic works. Techniques such as drawing therapy help individuals understand and overcome negative emotions while promoting a positive outlook through visual expression. These methods offer an additional approach to addressing psychological challenges. Through drawing, individuals can express their emotions, desires, and dreams, transform their relationships, and process painful or traumatic experiences. This process helps people gain a deeper understanding of themselves, their emotions (including negative ones), and their relationships. Drawing also acts as a means of releasing tension, satisfying unconscious desires, and returning to more primitive forms of expression. This occurs through conscious creative activity and sublimation, allowing individuals to symbolically express internal conflicts and unconscious desires. The process helps bring repressed emotions to the surface, enabling individuals to confront and work through the negative feelings tied to them. This approach is especially important for those who find it difficult to verbalize their emotions, as art offers a more accessible way to express their inner world (Rivers, 2015).

These methods enable individuals to project their inner selves and express their thoughts and emotions. Art therapy helps children communicate

their feelings, hidden problems, and emotional states. It provides them with the opportunity for solitude, helping them achieve inner harmony.

Art therapy is also beneficial for very young children. It helps them overcome fears, anxiety, and psychosomatic symptoms. Moreover, creating art brings joy through self-expression. Drawing allows children to explore their inner world and sense of self. Additionally, creating something themselves boosts self-esteem, fosters a positive self-image, and promotes healthy self-perception. This positive self-perception is essential for effective communication with others.

Importantly, drawing teaches children to focus on their feelings and sensations. They become more aware of and capable of expressing their emotions, including negative ones, in appropriate ways. Art therapy enhances their ability to express themselves and communicate their experiences to adults (Atamanchuk et al., 2020).

Art therapy offers various techniques, such as identifying with what one is drawing, drawing spontaneously, following the hand, or drawing whatever the hand wishes. One particularly effective method is "collective drawing," which is especially useful in the early stages of therapy, as it helps foster group unity and build trust.

Different countries use various models of art therapy. Indeed, art therapy has no contraindications or limitations. It is widely applied in psychotherapy and also extends to fields such as education, social work, and even business. Art therapy offers individuals a valuable opportunity to express their inner world through creativity.

Today, stress is a widespread issue that affects the mental and physical health of children and adults. Chronic stress can disrupt neuropsychological processes, impair cognitive functioning, and impact emotional regulation and social adaptation. Art therapy is a promising approach to managing stress, combining creative expression and therapeutic techniques to stabilize emotional states and enhance cognitive abilities.

Neuropsychological aspects of art therapy for stress reduction in children and adults

Stress arises as a response to external or internal stimuli that exceed the body's capacity to adapt. For children, stress can disrupt the development of neural connections in the brain, impacting cognitive processes, motivation, and behaviour. In adults, it is often linked to emotional exhaustion, reduced productivity, and psychosomatic conditions.

Neuropsychologically, stress leads to heightened activity in the amygdala, responsible for emotional regulation. It also reduces the functionality of the hippocampus, impairing memory and learning. Additionally, stress causes an imbalance in the prefrontal cortex, making decision-making more challenging.

Art therapy has a neuropsychological effect by stimulating neuroplasticity. The creative process fosters the formation of new neural connections, particularly in areas of the brain related to emotions and cognition. It reduces amygdala activity, helping to manage anxiety and fear, while also activating the prefrontal cortex. This improves cognitive functions such as attention, memory, and problem-solving.

For children, art therapy provides a safe space to express emotions, reduce anxiety, and develop social skills. Activities such as drawing, playing, or listening to music help create positive experiences and promote emotional stability. In adults, art therapy helps increase awareness of emotional responses, build resilience to stress, and learn better emotional regulation.

The benefits of art therapy in overcoming stress are numerous. It is suitable for all age groups, requires no special skills, and offers an indirect approach to trauma, avoiding confrontation with difficult events. Art therapy also nurtures personal growth, and self-regulation, and, in group settings, enhances social interaction (Berbets et al., 2021).

Overall, art therapy is a powerful tool for managing stress with a strong neuropsychological impact. It helps restore emotional balance, stimulating cognitive processes, and developing adaptive strategies. For children, it serves as a space for creative self-expression, while for adults, it helps address emotional challenges.

Table 1 presents the neuropsychological aspects of using art therapy to reduce stress.

Table 1. Neuropsychological aspects of using art therapy to reduce stress

Aspect	Children	Adults
Effects of stress	Disrupted development of neural connections; affecting motivation, behaviour, and cognitive processes	Emotional exhaustion; reduced productivity; psychosomatic symptoms
Neuropsychological changes	Amygdala hyperactivity; reduced hippocampal function; imbalance in the prefrontal cortex	Same changes – affecting emotional regulation, memory, learning, and decision-making
Forms of art therapy	Drawing, play, music	Drawing, music, theatre, sculpting, dance
Neuropsychological effects	Enhancing neuroplasticity and supporting the formation of new neural connections	Reducing amygdala activity and improving prefrontal cortex functioning
Psychological benefits	Reducing anxiety; fostering emotional stability and social skills	Increasing emotional awareness; building stress resilience and self-regulation
Therapeutic value	Providing a safe space for emotional expression and developing positive experiences	Offering a space for deep emotional work and stress reduction
Method universality	Requiring no special skills; adaptable to age and condition	Suitable for a wide range of clients; effective in both group and individual settings
Additional advantages	Developing personal resources; stimulating creative potential	Strengthening social connections; supporting the development of adaptive strategies

Source: the authors' own conception

Further research should aim to develop innovative art therapy methods and explore their impact on various client groups.

Creative activity as a tool for regulating emotions, reducing anxiety, and stimulating cognitive functions

Creative activity has long been valued as a means of self-expression and inner balance. Today, in both psychology and neuropsychology, creativity is recognized as a powerful tool for therapy and personal growth. Its proven ability to influence emotional states, reduce anxiety, and enhance cognitive

functions makes it increasingly relevant in psychological practice, education, and rehabilitation.

Creative activities allow individuals to express emotions indirectly, including those they may not fully recognize. From a neuropsychological perspective, this process involves the activation of several brain structures. For instance, the amygdala, which governs emotional responses, becomes less active during creative work, leading to reduced emotional tension. The prefrontal cortex, responsible for reflection and analysis, helps increase emotional awareness. Meanwhile, the sensorimotor cortex supports the integration of emotional and physical experiences, especially during activities that involve movement, such as drawing or dancing.

Creativity helps harmonize emotions and fosters better understanding and expression of feelings, thereby reducing the risk of emotional stress. Anxiety often arises from the inability to cope with challenging experiences. Creative expression allows individuals to process such experiences in a safe, non-threatening environment. Artistic expression also lowers cortisol, the stress hormone, and helps shift attention away from anxious thoughts. It reduces activity in brain areas associated with catastrophic thinking. Moreover, the act of creating something new triggers the release of dopamine, which enhances mood and promotes a positive emotional state (Honchar et al., 2021).

Creative processes also engage key cognitive functions, including memory, attention, thinking, and imagination. These are stimulated and strengthened through creativity, supported by the brain's neuroplasticity.

Creative tasks activate the analytical left hemisphere and the imaginative right hemisphere, fostering interhemispheric communication. Finding new solutions during creative work helps develop adaptive thinking and problem-solving skills. Focusing on detail and repeating certain actions also improves memory retention and cognitive performance.

In art therapy, creativity is widely used with children, adults, and individuals who have experienced trauma. Techniques such as drawing, sculpting, and music offer a safe space for self-expression (Tytarenko et al., 2021).

Creativity also nurtures emotional intelligence and encourages flexible thinking. Playful, artistic methods can help learners absorb material more effectively while regulating their emotional states. In neurorehabilitation, creative tasks support the recovery of cognitive functions that may have been impaired due to injury or neurological conditions.

Overall, creative activity is a powerful resource for emotional regulation, anxiety reduction, and cognitive activation. Its effectiveness is

rooted in neuroplastic mechanisms that not only reduce stress in the short term but also contribute to long-term personal development.

Still, it is important to focus on integrating creative methods into training, rehabilitation, and psychotherapeutic programmes.

Exploring art therapy techniques to enhance brain neuroplasticity

Art therapy is a highly effective method for stimulating brain neuroplasticity, improving emotional regulation, and enhancing cognitive functions. Various techniques, such as drawing, musical improvisation, drama therapy, and colour-based work, all contribute to psychological and neuro-psychological well-being.

Drawing is one of the most popular forms of art therapy. It stimulates the right hemisphere of the brain, responsible for imagination, emotions, and abstract thinking. The process of drawing requires visual-motor coordination, which helps to create new neural connections. Using colours and different techniques allows individuals to express their inner emotions, helping to reduce emotional tension. Additionally, visualizing images activates communication between both hemispheres of the brain (Martin et al., 2018).

Musical improvisation involves creating sounds or music in real time, which activates cognitive processes. This technique engages the auditory cortex, improving memory and focus. Improvisation offers an outlet for emotional expression, leading to the release of dopamine and serotonin, which elevate mood. Creating music also links the brain's logical and creative areas.

Drama therapy allows participants to role-play various scenarios, helping them process emotions and develop empathy. Group activities in drama therapy activate the medial prefrontal cortex, which governs social interactions. Rehearsing new scenarios helps individuals adapt to stress and fosters creative thinking. Role-playing enables participants to reflect on their emotions and gain positive emotional experiences (Kalsched, 1996).

Colour is a powerful tool in art therapy, influencing the psyche. It stabilizes emotions and stimulates cognitive function. Warm colours (yellow, red) have an activating effect, while cool colours (blue, green) have a calming effect on the limbic system of the brain. Working with coloured materials, such as paints and pencils, stimulates areas of the brain responsible for coordination and motor skills. The choice of colours in creative activities helps participants express and structure their feelings.

Art therapy is a versatile tool for emotional regulation, reducing anxiety, and enhancing cognitive functions. Techniques such as drawing, musical improvisation, drama therapy, and colour-based work foster neuroplasticity by creating new neural connections and strengthening

communication between the brain's hemispheres. These effects are summarized in Table 2.

Table 2. Neurological effects of a specific type of art therapy on a target audience

Art Therapy Type	Neurological Impact	Psychological Benefits	Target Group
Drawing	Activating brain areas related to emotional regulation, motor skills, and imagination	Reducing anxiety, enhancing self-awareness, expressing emotions, relieving tension, and processing traumatic experiences	Children, adults
Collective drawing	Activating social neural networks responsible for empathy and coordination	Improving communication, building trust, developing teamwork, socialization	Mainly children
"Uncontrolled" drawing	Engaging the right hemisphere of the brain, responsible for intuition and emotions	Promoting deep relaxation, release of internal experiences, processing unconscious emotions	Children, adults
Identification with the image	Activating mirror neurons, enhancing self-reflection	Deepening self-awareness, strengthening self-identity, addressing internal conflicts	Children, adults

Source: the authors' own conception

Art therapy produces a wide range of effects, from basic stress relief to profound internal transformation. Each method has distinct neuropsychological characteristics and can be tailored to meet the specific needs of individual clients.

Nevertheless, one should focus on the integration of art therapy into medical, educational, and rehabilitative settings, with careful consideration of each client's unique traits.

Practical recommendations for specialists in psychology, education, and rehabilitation using art therapy techniques to stimulate brain neuroplasticity

Art therapy is a powerful tool for developing cognitive, emotional, and social skills. Its capacity to stimulate brain neuroplasticity makes it increasingly valuable in psychology, education, and rehabilitation.

Importantly, art therapy supports neuroplasticity through several key mechanisms:

- It fosters the formation of new neural connections. Creative tasks encourage the brain to build new pathways between neurons.
- It activates sensory systems. The integration of colours, textures, sounds, and movement stimulates multisensory areas of the brain.
- It enhances interhemispheric communication. Artistic activities engage both the analytical (left) and creative (right) hemispheres.
- It contributes to emotional regulation. Art therapy promotes self-awareness and supports the development of adaptive coping strategies (Kalka & Kovalchuk, 2020).

Several techniques can be used to support brain function and emotional well-being: 1) drawing helps regulate emotions by offering a safe way to express them; 2) sculpting and working with clay allows clients to shape objects that represent their feelings, fears, or expectations; and 3) movement-based activities improve cognitive coordination and support emotional balance.

At the same time, music therapy activates memory and attention. Playing instruments or composing simple melodies stimulates the prefrontal cortex and hippocampus, responsible for cognitive processes.

Mandala creation helps reduce anxiety and improve concentration. Colouring or designing geometric patterns encourages focused attention and meditative states. Meanwhile, improvisational theatre strengthens social skills and emotional intelligence.

At the same time, art therapy can be adapted for use in multiple professional settings:

- *Psychology*: It is effective in treating anxiety disorders, post-traumatic stress disorder (PTSD), and depression. The techniques help clients access unconscious emotions and resolve internal conflicts.
- *Education*: In schools and universities, art therapy helps students adjust to the learning process. It also fosters creativity and emotional resilience.

- *Rehabilitation*: For individuals recovering from trauma or illness, creative activities assist in restoring motor functions, cognitive abilities, and emotional stability (Derkach, 2010).

Thus, art therapy is a versatile method that supports emotional, cognitive, and physical recovery. It builds on the brain's natural capacity for neuroplasticity and engages regions responsible for emotional regulation, thinking, and interhemispheric integration.

Conclusions

This article explores the neuropsychological aspects of art therapy as an effective method for managing stress in both children and adults. The analysis reveals key mechanisms by which creative activity supports emotional regulation. These mechanisms include the safe expression of feelings and the creation of a positive emotional environment. Another important aspect is the reduction of anxiety, which occurs through the activation of brain structures responsible for emotional stability. Additionally, art therapy stimulates cognitive functions such as attention, memory, and creativity by enhancing neuroplasticity.

The article reviews various art therapy techniques, including drawing, musical improvisation, drama therapy, and the use of colour. These approaches offer individualized support and are tailored to meet the specific needs of each client.

Emphasis is placed on adapting art therapy methods for different age groups and individuals with special needs. This flexibility makes art therapy a universal and practical approach in psychological, educational, and rehabilitation settings.

The article also offers practical recommendations designed to increase the effectiveness of professionals working in these areas. Overall, the findings confirm that art therapy is a powerful tool for building stress resilience, improving emotional well-being, and supporting mental health in the face of modern-day challenges.

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