



Anxiety and Art Mediums: A Literature Review

How Adolescents Experience Changes in Anxiety When Engaging with Paint, Clay Sculpting, and Pencil Sketching

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Abstract

Anxiety disorders are a growing issue among children and adolescents, and stigma continues to limit access to conventional treatment. Art therapy has been proposed as a more accessible and less intimidating alternative, but most existing research examines a single art medium in isolation rather than comparing mediums against one another. This literature review synthesises evidence on how three art mediums — paint, clay sculpting, and pencil sketching relate to changes in adolescent anxiety, drawing on meta-analyses, randomised controlled trials, quasiexperimental studies, and case studies, and using the Expressive Therapies Continuum as an interpretive framework. Art-making consistently reduced anxiety across all adolescent populations (clinical and non-clinical) with stronger and more immediate effects on state anxiety than on trait anxiety. The mechanism of reduction, however, appears to vary by medium. Paint as a fluid medium is more closely associated with immediate emotional release. Clay helps engage a kinesthetic-sensory pathway. This is especially valuable for adolescents who struggle to verbally articulate their anxiety. Pencil as a resistive and precise medium aligns with cognitive processing and the gradual development of structured coping skills and confidence. Several caveats need to be taken into consideration. Few studies compare the three mediums within the same sample. Sample sizes are generally small. Some outcomes heavily rely on self-report without physiological validation, and adolescent-specific research is concentrated in Western and East Asian clinical populations. Within-subject or between-groups designs that directly compare mediums in general adolescent populations, using validated and physiological anxiety measures, are needed. Until such evidence exists, matching the art medium to the type of anxiety relief sought remains a useful but provisional guideline for families, schools, and counselors.

Introduction

Anxiety is a rampantly growing issue in the modern day. The most common psychiatric disorders in children and adolescents are anxiety disorders (Walter et al., 2020), and prevalence increases during adolescence. The World Health Organization estimates that 4.1% of adolescents aged 10-14 and 5.3% of 15-19 year olds suffer from anxiety disorders (World Health Organization, 2025). Some estimates in the United States suggest that the prevalence of anxiety behaviors could approach one in four (Walter et al., 2020). Early intervention may be more effective for an adolescent before the problem escalates into adulthood. A lack of

treatment for childhood and adolescent anxiety has been shown to be a risk factor for anxiety, depression and substance use problems in adulthood (Walter et al., 2020). Art therapy can be used as treatment and could be an accessible and effective way to decrease these high rates.

In many cultural contexts, stigma remains a barrier to mental health treatment. Social stigma is one of the reasons why young people hesitate to seek mental health care in Southeast Asian countries, including Indonesia (Syafitri et al., 2026). Symptoms can be ignored or treatment may be resisted by parents, peers, teachers and/or the affected teens themselves. As a result, the young person's quality of life may be severely impacted. Art therapy can be helpful in two ways. It can help decrease some stigma surrounding mental health treatment and also provide a more accessible alternative that does not seem as intimidating as traditional talk therapy.

A large body of research affirms that art therapy can reduce anxiety in adolescents. Most of these studies, however, focus solely on one art medium without comparing the effects of multiple against each other. These comparisons can be understood with the Expressive Therapies Continuum, formulated by Kagin and Lusebrink (1978) and later further developed by Lusebrink (1990, 1991, 2004). It suggests that the materials used in art are fluid or resistant and that this aspect of the material will elicit different psychological processes (Hinz, 2020). Fluid materials like paint can be more difficult to work with and elicit emotional and sensory reactions. By contrast, resistive materials like pencils are more manageable and can activate more deliberate and cognitive processes (Hinz, 2020). Clay may fall within the middle of this range. These three media can then affect adolescent anxiety in various ways.

The purpose of this study is to identify the relationship between the three art media — paint, clay sculpting, and pencil sketching — and changes in adolescent anxiety. This review will first examine the general evidence for art therapy as an anxiety intervention among adolescents, before separately reviewing the individual effects of painting, sculpting with clay, and sketching with pencil. Together, the combined literature on these three mediums aims to clarify whether, and how, the specific choice of art medium influences the potential of anxiety reduction of art-based interventions for adolescents.

Art Therapy and Anxiety in Adolescents

There is increasing evidence that art therapy is an effective intervention for anxiety in children and adolescents in general. Using art therapy interventions, a 2024 meta-analysis of six randomised controlled trials, which included 422 participants, reported a large, significant reduction in anxiety symptoms in this population (Zhang et al., 2024). This effect seems to be stronger for state anxiety than trait anxiety, which indicates that art therapy is more effective for anxiety in particular situations compared to being an ongoing personality trait.

This pattern was further confirmed in a study of nineteen adolescent females receiving eating disorders treatment in a residential setting. This treatment followed a structured six-week period

of art therapy sessions. State Anxiety measured using State-Trait Anxiety Inventory decreased significantly immediately following sessions, while Trait Anxiety only significantly decreased from the fourth session onward. This indicates that continued sessions would be needed to impact more stable anxiety traits (Monaco et al., 2025).

In addition, a prominent study on art-making and physiological stress involved thirty-nine adults who were given freedom to choose markers, modelling clay, and collage materials during a forty-five-minute session of unstructured art-making (Kaimal et al., 2016). The amount of salivary cortisol, a biomarker of stress, dropped significantly in participants, regardless of prior artistic experience and material chosen. This suggests that the stress-reducing benefit of art-making is not dependent on participants' skill.

In addition, a randomised experimental study of forty children and adolescents with osteosarcoma (an aggressive type of bone cancer) yielded a reduction in anxiety scores that were much lower than the scores of a control group receiving routine care. After eight group drawing art therapy (GDAT) sessions, they found that the scores of self-acceptance and self-evaluation measured using a validated child anxiety screen tool also improved compared to the same routine-care control group (Liu et al., 2023). Similar findings were reported in a randomised controlled trial of therapeutic art interventions involving adolescents aged nine to eighteen with Type 1 Diabetes. These interventions involved mandala painting and guided drawing techniques as they engaged in a six-week program of therapeutic artistic activities. At the end of the program, the adolescents in the intervention group experienced significantly lower levels of state anxiety and significantly higher psychological well-being compared to the adolescents in the control group who received standard care (Gocen & Ozturk, 2025).

Taken together, this collection of studies offers consistent strong support for the use of art therapy as an anxiety-reducing intervention for adolescents across a range of demographics. However, most of these studies either combine multiple mediums within an intervention or examine a single medium in isolation without comparison to others. The question remains whether there is a difference in anxiety-reducing potential among the various art mediums. The following sections will discuss the evidence of painting, clay sculpting, and pencil sketching individually.

Paint and painting mediums: Acrylic, Watercolor, and Oil

This section considers painting as a single category spanning acrylic, watercolor, and oil paint as one rather than three separate mediums. Only studies in which painting was the primary or sole medium are included. Studies that used it as one option among an unrelated set of materials such as clay or collage are excluded.

Clear quantitative data is provided by a recent 2026 meta-analysis which uses paint-based art interventions (Song & Jang, 2026). The pooled impact on mental health outcomes measured on

scales such as anxiety and depression was substantial and statistically significant. A subgroup analysis of children and adolescents revealed that the impact and benefit of painting were not only confined to adult samples. Across the 15 trials done with children and adolescent samples, painting produced a significant reduction in symptoms. Although this reduction is not as substantial as those for adults, the difference between the two age groups was not statistically significant (Song & Jang, 2026).

Another experimental study offers causal support for the unique contribution of painting over the common effects of any other activity. Ninety-nine Duke University students and staff participated in both an abstract painting activity and a non-creative control activity of maze solving on separate days. They did these two activities while wearing heart rate monitors. Compared to the maze-solving control, painting produced a significantly greater decrease in anxiety (Bellaiche et al., 2025).

Specific evidence for the general adolescent population comes from an adolescent school-based quasi-experimental study involving 128 Chinese middle school students. They were allocated to a mandala-coloring group, a grit-building group, and a control group. Students in the mandala-coloring group experienced a significant reduction in academic stress compared to the control group following the intervention. This provides preliminary support that a brief, structured colouring activity is an effective approach in reducing psychological strain in early adolescents (Fan & Hui, 2025).

These findings align with the previously mentioned Expressive Therapies Continuum: allotted properties of fluid materials such as paint give them a greater ability to elicit an emotional or affective response than structured materials, because less cognitive effort must be invested to control the material and it lies more in the direction of feeling and expression. Despite this positive evidence, painting-specific literature and literature primarily focused on adolescents is still rather limited. There is limited direct evidence of the effect of painting on diagnosed or scale-measured anxiety specifically within a general adolescent population.

Clay Sculpting and Tactile Media

Clay has received relatively more targeted empirical focus than paint. In a controlled trial, 102 adult participants were randomly assigned to one of four conditions after an induction of a negative mood: creating a structured clay pinch pot, free manipulating of clay, tossing a stress ball in a structured manner, or free manipulating of a stress ball. Self-reported mood improved significantly with clay but not stress balls. Clay's particular tactile qualities seemed to be responsible for this improvement, rather than just the hands being engaged (Kimport & Robbins, 2012).

This theory was similarly tested in a study of 41 students aged 15-17 who suffered from mild to moderate emotional problems, randomized to six weekly clay art therapy sessions or a waitlist

control. The clay art therapy group showed significant gains in emotion regulation ability compared to the waitlist group. Hair cortisol concentration as a physiological outcome of chronic stress was shown to rise slightly following the intervention in an atypical manner. The authors interpreted this rise not as evidence of increased distress, but rather as evidence of adaptive engagement and benefit, given the accompanying psychological improvements that were observed (Nan et al., 2023).

A case study of 30 undergraduate students sculpting with VR (Virtual Reality) showed that anxiety scores (measured with the Generalized Anxiety Disorder scale GAD-7) decreased while heart rate variability (HRV) (measured using HRV software) increased. This proved that the benefit of sculpting was not solely due to the tactility of clay. The researchers determined that the movement of sculpting in itself, even without tactile clay, might carry some significant anxiety-reducing benefits (Ding et al., 2025).

Clay is known to engage the kinesthetics-sensory level of functioning. Its resistance and malleability draw attention to touch, movement, and physical sensation over verbal processing, which may make it particularly useful to adolescents who struggle to articulate their feelings of anxiety into words. Nevertheless, the literature focused on clay remains centred mostly on adults and university students. The study by Nan et al. (2023) stood out as one of the few studies conducted specifically with an adolescent sample.

Pencil Sketching and Drawing

High school students, aged sixteen to eighteen, were tracked over an 8-week period of daily, themed drawing warm-up activities, using self-rating scales, journal responses, and interviews to measure change. The study found that drawing activities helped students improve confidence, as well as self-reported lowering in stress and anxiety levels, especially when students were encouraged to explore a range of different drawing materials and techniques (Montgomery, 2018). Another study also found that groups engaging in colouring geometric shapes such as the mandala and plaid design experienced a higher decrease in anxiety levels compared to those groups who used a free-form method (Curry & Kasser, 2025). These findings indicate that structured and more task-oriented drawing activities can be useful in reducing stress and anxiety in a general secondary-school population.

Another study that we previously discussed, which involved children and adolescents with osteosarcoma who were randomly grouped, revealed that group drawing art therapy resulted in lower anxiety screening scores compared with the group that only had routine care (Liu et al., 2023). This study offers notable evidence for the anxiety-lowering effect of drawing within the adolescent clinical population specifically.

A structural equation modelling study of 354 university students revealed that regular practice of drawing was highly associated with both self-disclosure and psychological resilience, which

correlate with better distress tolerance. These findings suggest that drawing may foster enduring coping skills rather than only producing an immediate, or 'state' change in mood. The researchers also suggested that these implications go beyond just university students. Adolescents, especially those in high-pressure academic environments, could benefit greatly from this drawing-based approach, which enhances adolescents' psychological resilience (Lyu et al., 2025).

While mediums like paint offer ease of mark-making, pencil, with its control and precision, which allow for attention to detail, deliberation and planning, is generally classified as a medium suited to the cognitive component of processing. This may explain why several of the studies above emphasize the importance of drawing in the development of structured coping skills and confidence, rather than just producing immediate relief.

The evidence for drawing and sketching as an anxiety-reducing activity is found throughout the literature across both clinical and non-clinical adolescent and young-adult populations, but the most methodologically sound designs, including in randomized controlled trials, remain concentrated in clinical adolescents and youth samples such as pediatric oncology. Moreover, most of the mechanistic and qualitative evidence on pencil-based drawing comes from university students or general secondary-school case studies rather than large-scale adolescent trials.

Discussion

The literature (i.e., meta-analyses, randomized controlled trials, pilot studies, and case studies) reviewed here examined the relationship between art in general and anxiety in adolescents and related populations, as well as between the specific art mediums of painting, clay sculpting, and pencil sketching and anxiety. The literature confirms the consistent benefit of art-making as an anxiety-reducing activity in general. Each of the three mediums examined has been seen to state anxiety in a variety of adolescent populations (including those with eating disorders, osteosarcoma, and Type 1 diabetes) as well as university students and adults. This trend is further validated by two recent meta-analyses, which found a large decrease in anxiety across young people who practiced art therapy (Zhang et al., 2024) (Song and Jang, 2026).

Furthermore, the research suggests that the mechanism of anxiety reduction may differ meaningfully by medium. This concept is based on the Expressive Therapies Continuum, which connects the dynamic or resistant qualities of a material to various levels of psychological functioning (Hinz, 2020). Paint and other fluid media appear most closely tied to immediate emotional release. Clay, as a resistive but malleable and tactile medium, appears to engage a kinesthetics-sensory pathway and offer a non-verbal way to express anxiousness, particularly relevant for adolescents who struggle to articulate anxious feelings verbally. As a more precise and explicit medium, pencil seems more closely aligned with cognitive engagement. Working to

support structured, deliberate movement, as well as the gradual development of confidence and coping skills. It is important to note the general trend in the literature that art-making is found to be beneficial for adolescent anxiety in almost all studies, yet the specific nature of that benefit may vary according to the sensory and cognitive characteristics of the medium used.

However, several caveats need to be taken into consideration regarding the evidence. Few studies directly compare paint, clay, and pencil within the same adolescent sample. The conclusions about their differing anxiety-reducing benefits are based largely on separate, non-comparable studies. Also, sample sizes across the reviewed studies remain small, and many rely on self-reported questionnaires, which might lack physiological or biological validation for anxiety measures.

Additionally, most of the adolescent-specific studies reviewed were conducted in clinical populations, such as those with diagnosed eating disorders, cancer, or chronic illness, and there are only a few studies that included general non-clinical adolescent populations. Furthermore, the literature is mostly focused in Western and East Asian regions. This excludes many other regions such as Southeast Asia, where the stigma around anxiety and mental health treatment remains quite high and is still considered taboo (Syafitri et al., 2026).

For a better and more reliable result, future studies should use within-subject or between-groups designs to directly compare the effects of paint versus clay sculpting versus pencil sketching. It should utilize a large sample of adolescents and use consistent, validated measures of state and trait anxiety alongside physiological markers when feasible. Such study would further help to clarify whether each medium and its unique properties meaningfully predict differential anxiety outcomes in adolescents specifically, rather than only in adults and university students. Studies conducted in general, non-clinical adolescent populations, especially in under-represented regions, would further help determine whether these effects can be generalized across various cultural contexts where art therapy remains unfamiliar and is not widely used.

Families, schools, and counsellors may want to design art-based interventions carefully according to the type of anxiety reduction desired in a specific adolescent population: the fluid media (paint) may be used to facilitate emotional release; clay may be used with adolescents who are less able to verbally express their emotions; and pencil-based drawing can be used to facilitate the creation of structured, longer-term coping skills. But for the time being, a medium-specific distinction will be a helpful but not definitive rule, until more directly comparable research is available.

The connection between art mediums and adolescent anxiety has meaningful implications for designing more accessible, medium-specific interventions to treat anxiety, particularly in settings where stigma continues to limit adolescents' access to and acceptance of formal mental health treatment.

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