

The effect of a visual arts training program on reducing negative behaviors and developing selected skills in children with autism spectrum disorder

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doi: 10.17977/um064v6i32026p377-387

Keywords

Autism Spectrum Disorder, visual arts training, behavior modification, savant syndrome, maladaptive behaviors

Article History

Submitted: March 10, 2026

Revised: April 20, 2026

Accepted: April 29, 2026

Published: April 30, 2026

Abstract

This study examines the impact of a visual arts–based training program on reducing negative behaviors and enhancing selected skills among children with Autism Spectrum Disorder (ASD). An experimental pretest–posttest design was employed with a sample of 20 children: 10 with moderate autism (mean age = 10 years) and 10 with mild autism (mean age = 6.5 years). The intervention included structured visual arts activities such as drawing, coloring, and clay modeling, which served as nonverbal communication tools to support emotional expression, attention, and social interaction. The results indicate that the program significantly reduced maladaptive behaviors, including self-injury, biting, and stereotypical movements, across both groups. In addition, participants showed notable improvements in fine motor coordination and cognitive functioning. Interestingly, one child with mild autism demonstrated exceptional abilities in mathematics and visual art, suggesting characteristics consistent with Savant Syndrome, despite no prior formal training. The study concludes that visual arts–based interventions can be an effective educational and therapeutic approach for behavior modification and skill development in children with ASD.

1. Introduction

Autism Spectrum Disorder (ASD) is a pervasive developmental condition that affects multiple domains of child development, including social, cognitive, linguistic, emotional, and sensory functioning. Children with autism often experience difficulties in verbal and non-verbal communication, social interaction, and adaptive behavior, which in turn influence their educational performance (Al-Zuraiqat, 2010; Abdel Rahman, 2001). The severity of autism varies from mild to severe, with children at moderate levels often exhibiting negative behaviors such as self-injury, repetitive movements (e.g., hand-flapping), and atypical sensory responses (Al-Jalabi, 2005; Al-Mughlouth, 2006). Despite these challenges, children with mild autism may demonstrate improved concentration and the potential for exceptional abilities when provided with appropriate interventions (Treffert, 2006).

One promising intervention approach is the use of visual arts as an educational and therapeutic medium. Visual arts function as a form of non-verbal communication, enabling children with autism to express emotions and ideas that may be difficult to convey through language (Al-Sayyid, 2004). Activities such as drawing, sculpting, and guided imagery can also support the development of social and cognitive skills while reducing maladaptive behaviors. Previous studies have highlighted the benefits of art-based interventions in enhancing emotional regulation and engagement (Dina, 2015); however, their role in systematically reducing negative behaviors and fostering specific developmental skills remains underexplored, particularly within Arabic research contexts and local educational environments.

Children with autism commonly exhibit deficits in core developmental areas, including joint attention, eye contact, imitation, listening comprehension, and the use of gestures. They may also struggle to interpret facial expressions and vocal tones, which further limits their social integration (Al-Sayyid & Badr, 2001). These difficulties often lead to socially inappropriate behaviors, such as repetitive stereotypical actions and reduced attention span. While visual arts have shown potential in addressing some of these challenges, there is a lack of structured, evidence-based programs that evaluate their measurable impact on both behavioral and skill development outcomes (Sayed Jarahi, 2004).

Accordingly, this study aims to examine the effectiveness of a visual arts-based training program in reducing negative behaviors and enhancing selected social and cognitive skills among children with autism. Specifically, the study seeks to determine whether the program leads to statistically significant differences between pre- and post-intervention measures, and whether it contributes to uncovering latent abilities, including aspects associated with Savant Syndrome (Treffert, 2006).

The significance of this study lies in its contribution to the limited body of Arabic literature on art-based interventions for children with autism, as well as its potential to provide a practical framework for educators and psychologists. By integrating visual arts into intervention programs, this study highlights an innovative strategy to support behavioral modification, encourage creative expression, and ultimately improve the quality of life for children with autism and their families.

2. Method

This study employed an experimental approach using a one-group pretest-posttest design to evaluate the effectiveness of a visual arts-based training program in reducing negative behaviors and improving selected social and cognitive skills among children with Autism Spectrum Disorder (ASD). The use of experimental designs in autism intervention research is widely supported in the literature as an effective approach to measure behavioral and developmental change (Sayed Jarahi, 2004; Bayoumi, 2008). The participants consisted of 20 children diagnosed with ASD, divided into two groups based on severity level: 10 children with moderate autism with a mean age of 10 years, and 10 children with mild autism with a mean age of 6.5 years. All participants were selected from Al-Awj Center for Special Education and Autism in Irbid Governorate, Jordan, where the intervention was conducted over a six-week period from March 19 to April 28, 2019.

The intervention consisted of a structured visual arts-based training program designed to achieve specific behavioral and developmental outcomes. It included activities such as drawing, coloring, decorating, and sculpting using dough and clay. The use of structured educational activities for children with special needs has been emphasized as an effective approach to enhance engagement and skill acquisition (Al-Sayyid, 2004). The procedures were implemented in three stages: pre-assessment to establish baseline measures, program implementation using structured sessions, and post-assessment to evaluate changes after the intervention.

To enhance the effectiveness of the program, several behavioral techniques were employed, including immediate reinforcement (material and social), prompting (verbal and physical guidance), modeling and imitation, and repetition with shaping to support gradual skill acquisition. Reinforcement strategies have been widely recognized as essential in modifying the behavior of children with autism and promoting adaptive skills (Sayed Jarahi, 2004; Gamze & Coukaytar, 2007). A variety of materials were used, including A4 paper, pencils, colored pencils,

dough, pottery clay, oil paints, canvas, paintbrushes, and turpentine, providing a multi-sensory learning environment that supports perceptual and motor development (Al-Sayyid & Badr, 2001).

To ensure methodological rigor, multiple measurement instruments were used to assess the study variables. Negative behaviors were measured using a structured behavioral observation checklist developed by the researcher, which included items related to self-injury, stereotypical movements, tantrums, and attention deficits. The measurement of such behaviors is consistent with established approaches to assessing maladaptive behaviors in children with autism (Abdel Rahman & Abdel Rahim, 1999). Responses were rated on a Likert-type scale (e.g., 1 = never to 5 = always) based on frequency and intensity of behaviors observed during sessions. Social and cognitive skills were assessed using a skills assessment scale adapted for children with ASD, covering domains such as eye contact, joint attention, imitation, response to instructions, and task engagement, which are considered core developmental areas affected in autism (Al-Zuraiqat, 2010).

In addition, observational recording forms were used during each session to document behavioral changes and participation levels, allowing for continuous monitoring of progress throughout the intervention. To ensure validity, the instruments were reviewed by a panel of experts in special education and psychology, and content validity was established based on their feedback. Reliability was assessed using internal consistency (Cronbach's alpha) and test-retest procedures, yielding acceptable reliability coefficients. These procedures are consistent with methodological standards in educational and psychological research (Bayoumi, 2008).

Operationally, the training program is defined as a structured set of artistic activities aimed at reducing negative behaviors and enhancing specific developmental skills. ASD is defined as a developmental disorder characterized by deficits in communication and social interaction along with repetitive behaviors (Al-Jalabi, 2005; Al-Mughlouth, 2006). Negative behaviors refer to maladaptive, repetitive, and socially inappropriate actions, while Savant Syndrome refers to exceptional abilities in specific domains despite developmental challenges, as discussed in the literature on autism (Treffert, 2006). The study was limited to a specific sample, setting, and time frame.

Table 1. Summary of Research Methodology

Component	Description
Research Design	Experimental, one-group pretest-posttest design
Participants	20 children with ASD (10 mild, 10 moderate)
Age	Mild: 6.5 years; Moderate: 10 years
Setting	Al-Awj Center for Special Education and Autism, Irbid, Jordan
Duration	March 19 - April 28, 2019 (6 weeks)
Intervention	Visual arts-based training program
Activities	Drawing, coloring, decorating, sculpting
Procedures	Pre-test → Intervention → Post-test
Techniques Used	Reinforcement, prompting, modeling, imitation, repetition, shaping
Materials	Paper, pencils, clay, oil paints, brushes, canvas
Instruments	Behavior checklist, skills assessment scale, observation forms
Measurement Scale	Likert scale (1-5)
Validity	Expert review (content validity)
Reliability	Cronbach's alpha, test-retest
Key Variables	Negative behaviors, social skills, cognitive skills
Study Boundaries	Human, spatial, temporal

3. Findings and Discussion

The findings of this study demonstrate that the visual arts-based training program produced a substantial and systematic impact on reducing negative behaviors while enhancing cognitive, social, and motor skills among children with Autism Spectrum Disorder (ASD). At the baseline (pre-intervention stage), clear developmental and behavioral differences were observed between children with moderate and mild autism. Children with moderate autism exhibited pronounced maladaptive behaviors, including self-injury, repetitive motor actions (e.g., clapping), and emotional dysregulation. In contrast, children with mild autism primarily demonstrated deficits in sustained attention, limited variability in task engagement, and a tendency toward repetitive and restricted interests. These observations are consistent with existing literature describing autism as a disorder characterized by impairments in communication, behavior, and social interaction (Al-Zuraiqat, 2010; Abdel Rahman, 2001).



Figure 1. Early-stage drawing activity using geometric shapes and coloring to improve attention and engagement in a child with autism.



Figure 2. Drawing and coloring activity involving geometric shapes to enhance attention and task engagement in children with autism.

Following the implementation of the structured intervention, improvements were not immediate but occurred progressively across sessions, indicating a cumulative learning effect. In the initial stage of the program, children engaged in structured drawing activities involving simple geometric shapes (see Figure 1), followed by coloring tasks within defined boundaries (see Figure 2). These early activities played a critical role in establishing behavioral stability and task engagement. The structured and predictable nature of the tasks provided a secure learning environment, which is particularly important for children with autism who often rely on routine and visual organization (Al-Jalabi, 2005). As a result, noticeable improvements were observed in attention span, task compliance, and responsiveness to instructions. This suggests that visual structuring can function as an effective regulatory mechanism for attention and behavior.



Figure 3. Clay modeling activity used to develop sensory-motor skills and reduce negative behaviors in children with autism.

As the intervention progressed, clay modeling activities were introduced to stimulate sensory and motor engagement (see Figure 3). These activities allowed children to explore different textures and manipulate materials, thereby promoting sensory integration and fine motor development. At the beginning of this stage, some maladaptive behaviors were still present, including attempts to bite the clay or engage in inappropriate sensory exploration. However, through consistent prompting, reinforcement, and guided interaction, these behaviors

gradually decreased. At the same time, stereotypical behaviors such as repetitive clapping showed a noticeable decline. This finding supports the theoretical perspective that structured sensory experiences can redirect maladaptive behaviors into purposeful and functional activities (Al-Sayyid & Badr, 2001).



Figure 4. Advanced-stage activities involving color organization, line connection, and geometric assembly to improve concentration and reduce negative behaviors in children with autism.

A significant turning point in the intervention occurred during the advanced activity stage, where children were exposed to more cognitively demanding tasks such as color discrimination, categorization, and organization (see Figure 4). During this phase, one child initially exhibited a strong negative emotional response to the color red, including agitation and refusal to continue the activity. However, through gradual exposure, reinforcement, and task structuring, the child was eventually able to engage with the same color without any negative reaction. This behavioral shift reflects the effectiveness of systematic desensitization and controlled exposure within a supportive learning environment, aligning with established principles of behavior modification (Sayed Jarahi, 2004). Moreover, the ability to organize colored elements into meaningful patterns (e.g., forming a flower) indicates emerging cognitive processing skills such as categorization and visual organization.



Figure 5. Oil painting on canvas demonstrating improved concentration, positive interaction, and absence of negative behaviors in children with autism.

Further developmental progress was observed during the transition to oil painting on canvas, which represented a more advanced and expressive stage of the program (see Figure 5). At this stage, children demonstrated high levels of concentration, independence, and emotional stability. Notably, stimuli that previously triggered negative responses, such as certain colors, no longer elicited maladaptive behaviors. Instead, children engaged in creative expression with confidence and autonomy. The absence of behaviors such as aggression, clapping, and self-injury suggests that these behaviors had been effectively replaced by constructive and meaningful activities. In addition to behavioral improvements, changes in social interaction were also observed, as children displayed signs of enjoyment, initiated communication, and expressed interest in their environment. These outcomes reinforce the role of visual arts as a powerful non-verbal communication tool that supports emotional expression and social engagement (Dina, 2015).



Figure 6. Use of red color demonstrating enhanced self-control, sustained attention, and absence of negative behaviors in a child with autism.

In the subsequent phase, children demonstrated a high level of self-regulation and sustained attention when re-exposed to previously challenging stimuli (see Figure 6). The continued absence of negative behaviors indicates that the behavioral changes achieved were not temporary but had become internalized. This suggests that the intervention contributed to the development of self-control mechanisms and adaptive behavioral patterns, which are essential for long-term functioning.



Figure 7. Drawing activities in children with mild autism showing improved attention, task variation, and emerging symbolic representation skills.

For children with mild autism, the pattern of development followed a different trajectory, focusing more on cognitive and creative expansion rather than behavioral reduction. Initially, these children exhibited restricted interests and limited variability in their artistic expressions. However, during thematic drawing activities, they began to expand their representations and incorporate multiple elements into their drawings (see Figure 7). This progression reflects improvements in symbolic thinking, cognitive flexibility, and visual-motor integration. The ability to move from simple, repetitive drawings to more complex and meaningful representations indicates enhanced cognitive processing and learning adaptability.



Figure 8. Dough modeling activity demonstrating improved fine motor skills, imitation, and concentration in children with mild autism.



Figure 9. Thematic drawing of the Jordanian flag showing improved concentration and organized task engagement in children with mild autism

In later sessions, clay and dough modeling activities further contributed to the development of fine motor skills and creativity (see Figures 8 and 9). Children were able to replicate given shapes and gradually produce more complex and imaginative forms. Continued progression in modeling tasks is illustrated in Figures 10 and 11, where children demonstrated increased independence, precision, and sustained engagement. These findings suggest that hands-on

artistic activities provide an effective medium for integrating motor, cognitive, and creative processes simultaneously.



Figure 10. Clay shaping activity demonstrating development of fine motor skills and structured task performance.



Figure 11. Clay and pottery modeling activity demonstrating improved fine motor skills, creativity, and sustained concentration in children with mild autism.



Figure 12. Thematic drawing and art-based cognitive task demonstrating high concentration, accurate representation, and emerging exceptional (savant-like) abilities in a child with autism.

One of the most remarkable findings of this study emerged during the cognitive-art integration stage, where a child demonstrated exceptional abilities in combining artistic expression with abstract cognitive concepts (see Figure 12). The child successfully represented complex ideas such as environmental pollution and mathematical operations through visual and verbal means, despite not having received formal instruction in these areas. This performance provides strong evidence of Savant Syndrome, characterized by the presence of extraordinary abilities in specific domains despite overall developmental challenges (Treffert, 2006). The accuracy, speed, and originality of the child's work highlight the potential of visual arts as a diagnostic and developmental tool for uncovering latent talents in children with autism.

Overall, the findings of this study extend existing research by demonstrating that the integration of structured visual arts activities with behavioral intervention techniques results in more comprehensive and sustained developmental outcomes. While previous studies have emphasized the role of reinforcement in behavior modification (Gamze & Coukaytar, 2007), the present study highlights the added value of incorporating creative, sensory, and cognitive elements into intervention programs. The complete reduction of negative behaviors among children with moderate autism, combined with the emergence of advanced cognitive abilities

among children with mild autism, underscores the transformative potential of visual arts as both a therapeutic and educational approach.

These results emphasize the importance of adopting holistic and individualized intervention strategies that address multiple developmental domains simultaneously. Visual arts should therefore be systematically integrated into special education programs for children with ASD, as they offer a multidimensional framework for enhancing behavior, cognition, and emotional expression while also providing opportunities to identify and nurture individual strengths.

Table 2. Integrated Summary of Findings

Activity Stage	Sessions	Activity Type	Behavioral Outcomes	Skill Outcomes
Initial Stage	3, 11, 12	Drawing and Coloring	Reduced distractibility and increased task compliance	Improved attention and basic visual-motor coordination
Sensory Stage	6–10	Clay Modeling	Decreased stereotypical and sensory-seeking behaviors	Enhanced fine motor skills and sensory integration
Advanced Stage	13–15	Color Organization	Reduced emotional reactivity and improved self-regulation	Improved cognitive processing and visual organization
Expressive Stage	19–20	Oil Painting	Elimination of maladaptive behaviors	Enhanced emotional expression and autonomous engagement
Cognitive Stage	16–22	Art-Cognition Integration	Sustained behavioral stability	Emergence of higher-order cognitive skills and savant-like abilities

3.1. Limitations of the Study

This study has several limitations that should be considered when interpreting the findings. The sample size was relatively small ($n = 20$) and drawn from a single specialized center, which may limit the generalizability of the results to broader populations of children with Autism Spectrum Disorder (ASD). The focus on children with mild and moderate autism, without including severe cases, also narrows the scope of the findings across the full autism spectrum.

The research design relied on a one-group pretest–posttest approach without a control group. While this design made it possible to observe changes following the intervention, it does not allow for a full separation of the program’s effects from other potential influences.

The intervention was conducted over a relatively short period of six weeks. Although noticeable improvements were observed during this time, it remains uncertain whether these changes would be sustained over a longer duration, as no follow-up data were collected.

In addition, part of the data was based on observational measures and researcher-developed instruments. Despite efforts to ensure their validity, this may introduce some degree of subjectivity in the assessment process. Individual differences among the children—such as prior experiences, levels of support, and sensory sensitivities—were also not systematically controlled and may have influenced their responses to the program.

3.2. Implications

The findings of this study suggest that visual arts can play a more central role in intervention programs for children with Autism Spectrum Disorder (ASD) than is often

assumed. Rather than functioning merely as a complementary activity, structured artistic engagement appears to contribute directly to behavioral regulation, attention development, and emotional expression. This supports the view that combining behavioral strategies with creative and sensory-based approaches can produce more comprehensive developmental outcomes.

The results also indicate that visual arts activities can be effectively integrated into everyday educational and therapeutic practices. Simple, structured tasks such as drawing, coloring, and clay modeling were shown to support attention, reduce maladaptive behaviors, and encourage participation. At the same time, the progression of activities and the use of reinforcement highlight the importance of guided and individualized instruction when working with children with ASD.

An additional insight from this study is the potential of visual arts to reveal abilities that may not be evident through conventional assessment methods. The emergence of skills associated with Savant Syndrome suggests that creative activities can provide alternative pathways for understanding children's strengths, not only their difficulties. This perspective aligns with the work of Darold A. Treffert, who emphasizes the coexistence of challenges and exceptional abilities in autism.

Overall, these findings point to the value of incorporating more flexible and creative approaches within structured intervention programs. Expanding the use of visual arts in educational and rehabilitation settings may help create more engaging learning environments while supporting both behavioral and developmental progress.

4. Conclusion

This study demonstrated that a visual arts-based training program can play a significant role in reducing negative behaviors and enhancing cognitive, social, and motor skills among children with Autism Spectrum Disorder (ASD). The results showed progressive and sustained improvements across intervention stages, culminating in the complete elimination of several maladaptive behaviors, particularly among children with moderate autism.

In addition, the study revealed the potential of visual arts to uncover latent talents, including abilities consistent with Savant Syndrome, highlighting the importance of adopting strength-based approaches alongside behavioral interventions.

Overall, the findings confirm that visual arts represent an effective, holistic, and evidence-based strategy for supporting the development of children with ASD. By combining behavioral techniques with creative expression, the program addressed multiple developmental domains simultaneously, making it a valuable model for both educational and therapeutic applications.

Future research is recommended to expand the sample size, include diverse autism severity levels, and employ more rigorous experimental designs to further validate and generalize these findings.

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Appendix A. Intervention Session Summary

This appendix presents a structured summary of selected intervention sessions conducted during the implementation of the visual arts–based training program. The data are organized by participant group and highlight key activities, behavioral responses, and developmental outcomes observed throughout the intervention period.

A1. Moderate Autism Group (n = 10)

Session	Activity Type	Description of Task	Observed Response	Behavioral Outcome
3	Drawing (Colored pencils)	Abstract drawing to express emotions	Moderate engagement	Reduced tension and initial focus
10	Clay modeling	Reintroduction to clay activity	Weak response	Limited behavioral change
11	Drawing (Line connection)	Connecting geometric shapes	Positive response	Improved attention and task compliance
12	Drawing (Shape completion)	Completing and coloring circular shapes	Good engagement	Increased concentration
13	Drawing (Color exposure)	Use of multiple colors including red	Negative reaction	Emotional agitation
14	Color organization	Arranging colored balls into patterns	Active participation	Reduced emotional instability
15	Color organization	Reintroduction of red within structured task	Gradual acceptance	Improved emotional regulation
19	Oil painting (Canvas)	Painting within structured frame	High engagement	Absence of negative behaviors
20	Oil painting (Free expression)	Use of red and green colors on canvas	Excellent response	Full behavioral regulation

A2. Mild Autism Group (n = 10)

Session	Activity Type	Description of Task	Observed Response	Skill Development Outcome
1	Drawing (Fruits)	Drawing and coloring fruits; writing names	Positive engagement	Improved attention and labeling
2	Dough modeling	Creating facial shapes using dough	Independent exploration	Sensory and motor development
4	Thematic drawing	Drawing a mosque and writing name	Good concentration	Symbolic representation skills
5	Thematic drawing	Drawing the Jordanian flag based on visual input	Organized response	Visual-motor coordination
6	Clay modeling	Creating a basket shape	Independent execution	Fine motor skill development
7	Clay modeling	Forming a flower shape	Positive engagement	Creative skill enhancement
8	Clay modeling	Shaping a jar structure	Enjoyment observed	Motor coordination
9	Creative modeling	Constructing a cake based on imagination	High engagement	Creative thinking
16	Cognitive drawing	Drawing environmental pollution concept	High concentration	Cognitive awareness
17	Coloring task	Coloring previously drawn image	Sustained attention	Task persistence
21	Art-math integration	Visual representation of mathematical concepts	Exceptional performance	Advanced cognitive ability
22	Art-math integration	Use of numbers and symbols in visual composition	Highly focused	Evidence of advanced/savant skills

Appendix Notes

- 1) Sessions were conducted over a six-week intervention period.
- 2) Observations were recorded using structured behavioral and skill assessment forms.
- 3) Session selection reflects key developmental transitions and representative responses.
- 4) Detailed raw observational logs are available upon request for replication purposes.