

# MANDALA COLORING FOR CHILDREN WITH SYMPTOMS OF ATTENTION DEFICIT HYPERACTIVITY DISORDER- A CASE SERIES

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## Abstract

Attention Deficit Hyperactivity condition (ADHD) is the most common neuropsychiatric condition of childhood. Inattention, Hyperactivity, and impulsivity are the 3 major signs of ADHD. Various therapies and techniques are well-established for children with ADHD disorder. However, there is a sizable subset of some signs of ADHD in children that do not fulfill the diagnostic standards. To adjacent this gap, psychologists have adopted various forms of art therapy to attain good results. Mandala coloring is a relatively new art-based intervention that can be used on children at risk of ADHD. However, literature is lacking on the usefulness of mandala coloring intervention on such at-risk children. Here we present a series of three children with ADHD symptoms in whom mandala coloring intervention was used. There were significant improvements in executive functioning after 30 sessions, indicating enhanced cognitive skills. There was also a moderate improvement in emotional and motivational self-regulation. At follow-up, parents reported improvement in academic performance and were able to concentrate on one activity for a longer duration.

**Keywords:** Art Therapy, Mandala Coloring, ADHD Symptoms, Executive Functioning, Attention Span.

## INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most frequent behavioral disorders with an estimated global incidence of 3-5%, in children and adolescents. Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [1] defines ADHD in children younger than age 17 years as the presence of six or more symptoms in either the inattentive or hyperactive and impulsive domains, or both. The major symptoms of ADHD According to the ICD-10 [2] Classification are as follows

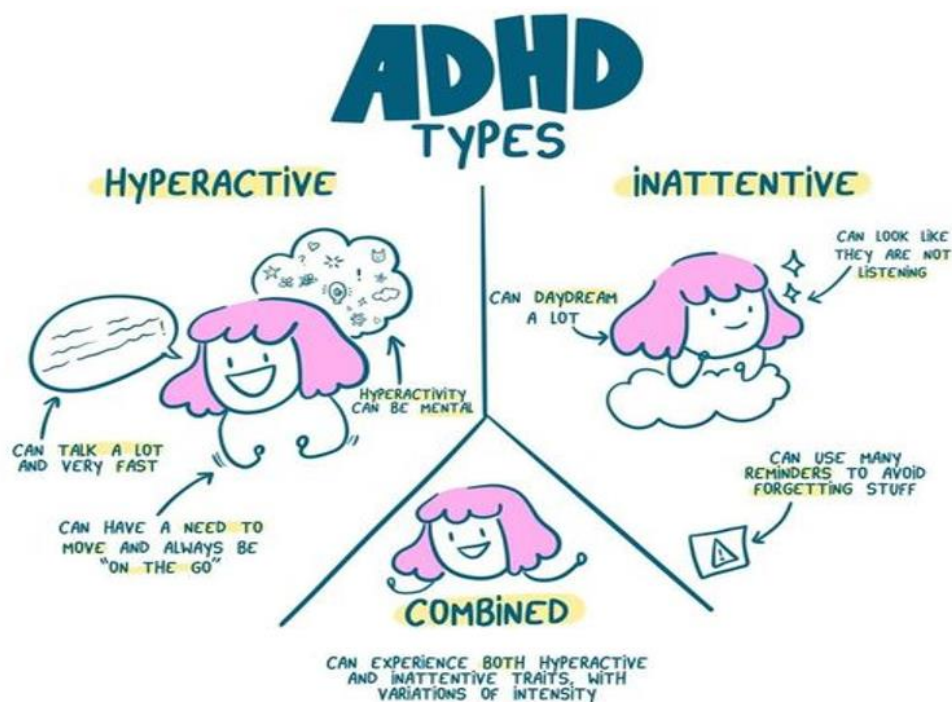
### Symptoms of ADHD

- Inattention
- Difficulty in perceiving
- Hyperactivity
- Constant fidgeting
- Excessive physical exertion
- Action without thinking
- Unable to sit quiet in calm surroundings
- Unable to concentrate on tasks
- No sense of danger
- Excess talking

- Anxiety, Carelessness, Restlessness
- Forgetfulness
- Inability to deal with stress
- Impatience
- Less Organizational Skills
- Inability to focus

These manifestations of ADHD symptoms lead to profound effects in adulthood like academic underachievement, anti-social behaviors, substance abuse, borderline personality disorder and addiction [3, 4]. Some existing strategies for supporting children with symptoms of inattention and impulsivity/hyperactivity and preventing the progress to ADHD are art therapy, cognitive restructuring, behavior modification, social skills training, self-control training, and parent training. Art therapy is one of the methods that has been used to channelize aggressive and impulsive behaviors related to hyperactivity into socially constructive forms of self-regulation [5].

## TYPES OF ADHD



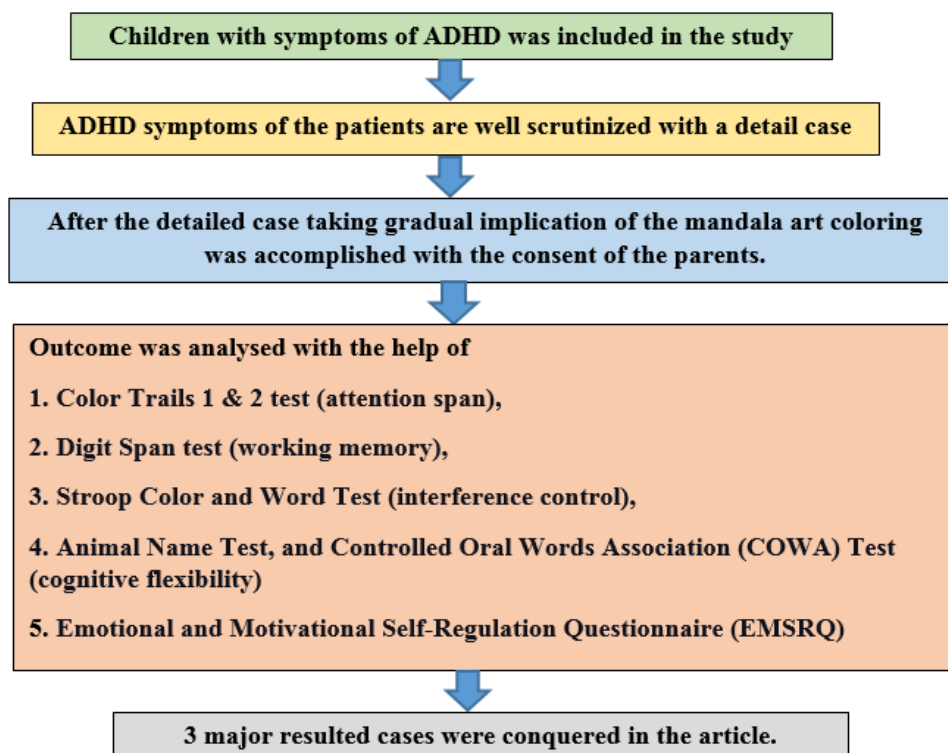
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**1. In attentive type:** It refers to the challenges with tasks, focus and organization. <sup>6</sup>

- A) Does not pay attention to tasks
- B) Inefficient in focusing on tasks
- C) Does not listen while speaking
- D) Does not follow the instructions given by the adults
- E) Inefficient in organizing tasks and work

- F) Dislikes tasks that requires sustained mental efforts
  - G) Easily distracted
  - H) Forgets daily tasks
2. **Hyperactive / Impulsive type:** It refers to the excessive movements such as excessive energy, fidgeting and actions taken without thinking<sup>6</sup>.
- A) Fidgets with hands and feet
  - B) Does not stay seated
  - C) Does not play quietly
  - D) Talkative and blurts the answers before the question
  - E) Intrudes others conversations
3. **Combined type:** It is the combination of inattentive and hyper active types under the umbrella term of art therapy, one of the upcoming approaches is mandala coloring. Mandala coloring has been used in patients with schizophrenia, bipolar affective disorder and major depressive disorder with good outcomes<sup>8</sup>. With the growing chorus on the efficacy of mandala coloring in various behavioral disorders, we explored its use in the management of children with inattention and hyperactivity. Drawing, Painting and Sculpting are the various techniques used in this art therapy. It employs to deal the interpersonal abilities, behaviour, stress, self-awareness, emotional issues etc.

## METHODOLOGY



## CASE PRESENTATION

### Case-1

Ms A is a 9-year-old girl in fifth grade. Her parents brought her to the clinic to evaluate her inattention and lack of focus at school. She has struggled with academic tasks in school since the beginning. She has been disorganized, with inattention, easy distraction, and mood swings. Ms A feels anxious when she arrives at school due to homework and classroom activities. Further questioning reveals that she dislikes going to school because “she can never focus,”. She is unable to interact well with individuals who do not share her interests, and she often becomes frightened when asked to speak in public or spend time with people she does not know.

Her parents are both university graduates. Her father is a businessman, while her mother is a teacher. She is the first child of a non-consanguineous marriage and has no other congenital or developmental issues. She has met all of her developmental and social milestones at the right age.

### Case-2

Mr B is a 10-year-old child who was brought to the clinic by his parents with concerns about his disobedient and violent attitude toward siblings and school teachers. He was not paying attention at home and spoke loudly and excessively. He got less interested in academic activities after starting school. He typically avoids activities that require greater mental work.

He began to avoid schoolwork and became disobedient to classmates and teachers. As a result, his academic performance was deteriorating daily. He had a strained relationship with his teachers and performed mediocly in class. He believes he has been rejected by teachers and parents as a result of his poor academic performance. He began to dislike school even more after being chastised by teachers and parents for his bad performance and disrespectful behavior. All of his developmental and social milestones were on time. The family history suggested his father had symptoms of inattention and during pregnancy mother was diagnosed with hypertension.

### Case-3

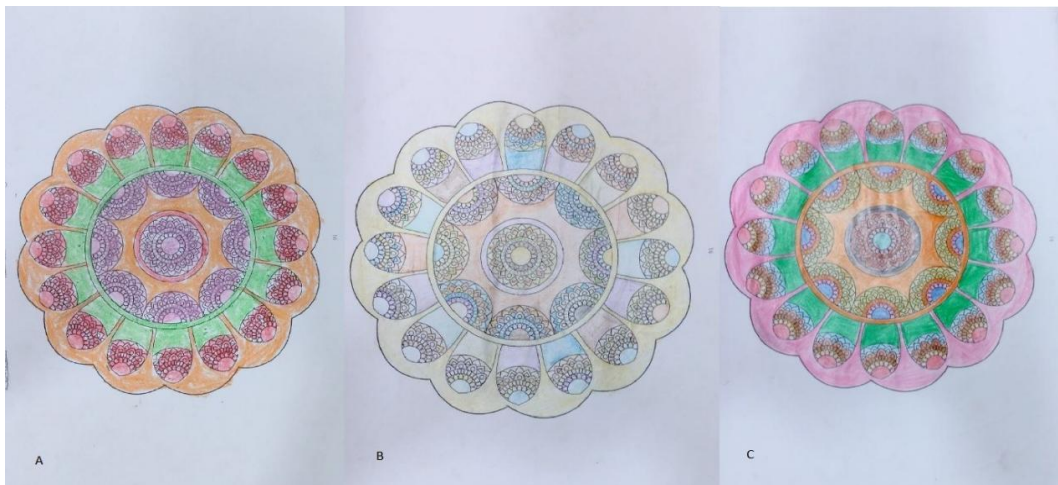
Ms C, a 9-year-old boy, was brought to the clinic with concerns of inattention for the past 1.5 years. He is the youngest child in his family and has one older sister. He does not have any other congenital or developmental disorders. He achieved all physical, mental, and social milestones at the appropriate age.

During clinical observation, it was noted that he had difficulty remaining seated in class and struggled to maintain focus on tasks or play activities. He frequently interrupted other students and engaged in continuous conversation with them. His speech was sometimes challenging to comprehend due to word omissions and rapid speech rate. In group activities he displayed impatience, often demanding immediate attention and failing to return items to their proper places after the activities. Despite these challenges, his fine motor skills were developmentally appropriate for his age.

Ravens Color Progressive Matrices and ADHD-SRS were used for screening of disability and ADHD symptoms. Color Trails 1 & 2 test (attention span), Digit Span test (working memory), Stroop Color and Word Test (interference control), Animal Name Test, Controlled Oral Words Association (COWA) Test (cognitive flexibility) and, Emotion and Motivation Self-Regulation Questionnaire (EMSRQ) were used in the

study. Clinical history and screening tests for all three children showed that they had symptoms of ADHD and had an average level of intelligence. Based on these findings, the case was considered (diagnosed) to be of ADHD symptoms and was planned for mandala coloring intervention.

A mandala coloring workbook consisting of 30 designs of increasing complexity was used for the intervention. The designs were created by the authors and validated by experts from the field of psychology with more than eight years of expertise. The child was instructed to use only 11 universal basic colors - red, pink, orange, brown, white, gray, black, yellow, blue, green, and purple. Each day participants were asked to color one design in the given sequence (Figure 1). A total of thirty sessions were completed within five weeks. Pre and post-intervention data were recorded using a battery of above mentioned six tests. After the sessions, a debriefing was done in the presence of their parents, along with conclusive remarks and suggestions for follow-up sessions.



**Figure 1: (A) Mandala Coloring done by Ms A; (B) Mandala Coloring done by Mst B; (C) Mandala Coloring done by Mst C**

All three children showed significant improvement subjectively as well as objectively. Ms A & Mst B reported improvement in five parameters meanwhile Mst C shows improvement in executive functioning. We found maximum improvement in Color trial Test-2 which represents that there is an improvement in the attention span of the children. It was observed that compared to other sub-tests, the improvement in the Animal Name Test was less. The difference between the pre-test and post-test data shows that there is an improvement in executive functioning after the mandala coloring intervention.

## DISCUSSION

ADHD is the most prominent mental level disorder affecting children. Children with the symptoms of ADHD have difficulty controlling activity, attention, focus organization, still sitting, concentration, mood management, etc. [7]. Mandala coloring is being utilized more commonly for behavioral and emotional issues as it is becoming more widely recognized as a quick and efficient therapy choice. When made by an individual, it promotes psychological recovery through the serenity brought on by a serene state of mind [9]. Mandala is useful in reducing impulsive behavior, improving



the ability to accomplish tasks, allowing for improved decision-making, allowing for an interest in personal aesthetics, and enhancing attention abilities [10-13].

We may conclude that mandala coloring is successful in enhancing attention span because the results of color trial tests 1 and 2 demonstrate that attention is raised in all three children at the end of therapy. Both the forward and backward sub-scales of the digit span test also showed significant improvements in working memory in Ms A and Mst C. However, Mst B's scores showed no improvement, indicating that his working memory has not improved, which may be due to anxiousness or aberrant cognitive processes. We can assume that mandala coloring might be a useful technique for immediate remembering since this is a test of immediate auditory-verbal memory.

After the intervention, parents reported that their children's ability to adjust behavior and thinking has improved as compared to before, which represents an improvement in verbal fluency, as evidenced by higher ANT and COWA test scores. In the STROOP test, all three of the children demonstrated an improvement in their capacity to manage interruptions and conflicting information efficiently, which represents an improvement in interference control. A study produced remarkably comparable findings. A drawback of this strategy is that of the three children, EMSRQ showed the least improvement.

An advantage of this intervention was that the children were comfortable during the process as it was administered in their homes under parental supervision. After the whole intervention child was more focused on studies and other day-to-day activities, level of hyperactivity also decreased. The child started taking an interest in academics.

## CONCLUSION

Based on observation of the three cases, we found mandala coloring is an effective therapy for children with ADHD symptoms and may also have a role in other childhood behavioral disorders. However, further studies with longer follow-ups and larger sample sizes will be needed to evaluate the same.

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