

# Evaluating the Effect of Therapeutic Art Therapy Methods on Hyper Arousal, Mindfulness and Anxiety in a Child with Fragile-X- A Case Study Report

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**Abstract**—Introduction—Art therapy is an integrative mental health profession that engages the mind, body, and spirit through kinesthetic, sensory, perceptual, and symbolic opportunities. The aim of art therapy is to facilitate positive change through engagement with the therapist and the art materials in a safe environment. The method of art therapy is used to help children with emotional, developmental and behavioural problems. It will show how change occurs during the process of physical involvement with the materials; through the making of a significant art object; through sublimation of feelings into the images; and through communication with the therapist via the art object.

**Objective**—The emphasis of this study is to use art forms in order to regularize and diminish the deficits in domains of socialization skills and sensory stimulus processing in a child aged 9 years with fragile X syndrome.

*Research Design and Level of evidence: Descriptive Case Study, Level VI.*

## **Procedure and Intervention-**

The child was pre and post assessed on Sensory Processing Checklist, and Social communication Questionnaire. During course of intervention of 12 weeks, various strategies and creative techniques of art intermingled with elements of play were executed by the art therapist. These were mainly targeted to strengthen the mindfulness, the processing speed, socialization and enhance the oral and verbal expressions with counteracting anxiety and hyper-arousal difficulties for this subject. As anxiety alters the functional level of a child with FX, thus PARS was used to evaluate the severity of anxiety both at baseline and post- art therapy interventions.

**Result and Discussion:** The way that Fragile X syndrome affects people will vary. Girls and women are usually less affected than boys and men. A person may be fully affected by Fragile X but not show all of the signs. Behavioral, Social and Emotional are the main features that can be challenged with art. In this case study, during and post 12 weeks the child became calmer and could develop some control over anxiety. The vocabulary improved. Along with this the sensory processing difficulties became easier to cope with post art therapy sessions. The child became more playful, cheerful and

social with peers as well as adults in the community environment. The child could better adapt a transition with minimal use of visual schedules.

**Conclusion:** Expressive Arts is about being mindful, entering a state of relaxation and bringing balance. Thus clinically, art therapy methods with components of play when applied intensively for child of 9 years can help to cope with socialization and higher mental concerns of anxiety in Fragile X. This particular mode makes therapy enjoyable for special need children

**Keywords:** Arts, Arts Education, Art Therapy, Education, Special Education.

## **1. INTRODUCTION**

### **1.1 Art Therapy and its historical background**

Art therapy predates psychiatry and psychology. In the late 1800s and early 1900s, Art therapy and Art Education became more present due to the desire to increase quality of life. Reil and Esquiro were two psychologists believed in the “healing power of beauty together with the reconstructive power of creativity” Key Figures Hermann Simon- In the 1920s, he introduced the practice of art therapy into facilities that needed a positive change. The goal was to bring patients into renewed contact with the world. Among these activities were work, sports, music, dance and art therapy. John Levy- 1943 was one of the first to use art in child psychotherapy. Madeline Rambert- 1949 French psychiatrist, pioneered the use of puppet in therapy Adrian Hill- Created the term ‘art therapy’ as a description for his work with tuberculosis patients in the sanitarium.<sup>[1]</sup>

### **1.2 Art therapy and its significance**

Art therapy (AT) can be described as the therapeutic use of art making within a professional relationship by people who experience illness, trauma or challenges in living, or by people

who seek personal development. The purpose of AT is to improve or maintain mental health and emotional well-being. Art therapy utilises drawing, painting, sculpture, photography and other forms of visual art expression.

Art and creativity has been found to be an important outlet for children. Findings from the Art Therapy Arena indicate that art can help young people reconcile emotional conflicts (Kramer & Gerity, 2000). In addition, creative arts therapies have been shown to improve children's verbal and creative thinking, reading comprehension, and in particular, their self-perceptions of mastery and intrinsic motivation when classroom interventions focus students on their creativity and expressiveness (Harvey, 1989).<sup>[2,3]</sup>

### 1.3 Fragile-X and Clinical manifestations

Fragile X syndrome is a genetic condition that causes a range of developmental problems including learning disabilities and cognitive impairment. Usually, males are more severely affected by this disorder than females.

The clusters of difficulties that this population exhibits are the epitome of most types of sensory processing problems, including pervasive sensory defensiveness, poor self-regulation and attention, disorganized or diminished processing of sensory input, poor postural development, difficulties with praxis, and poor visual-perception, visual-motor, and fine-motor skills.

Children with fragile X syndrome may also have anxiety and hyperactive behavior such as fidgeting or impulsive actions. They may have attention deficit disorder (ADD), which includes an impaired ability to maintain attention and difficulty focusing on specific tasks. About one-third of individuals with fragile X syndrome have features of autism spectrum disorder that affect communication and social interaction.

#### 1.4 Social Anxiety In FX

Anxiety especially social anxiety – fear or discomfort when interacting in social setting- is prevalent in males with Fragile-X syndrome (FXS) with approximately 86% meeting the diagnostic criteria for an anxiety disorder.

In the population with fragile X syndrome, self-regulation problems run the full gamut, including disordered sleep cycles, attention deficits, difficulty maintaining appropriate levels of alertness and arousal, and difficulties modulating emotional intent and effect.<sup>[8]</sup>

#### 1.4 Hyperarousal

Arousal refers to a general state of nervous system activation that is reflected in behavior, physiological activity and emotional experience. There is an optimum level of arousal that is necessary for controlled behavior, and this level is usually maintained by internal homeostatic mechanisms. One

of the characteristics of fragile X syndrome (FXS) is an impairment of this homeostatic control of arousal. Another is a heightened sensitivity to environmental and social stimulation. Together, these factors combine to cause boys and girls with FXS to become aroused more easily, and to a greater extent, than others, and to remain in such a “hyperaroused” state for prolonged periods of time. While hyperaroused, such individuals are less able to control their behavior. They may act impulsively, have difficulty focusing and sustaining attention to tasks, exhibit speech and language impairments, and emit other “problem” behaviors. A study was done by D Hessel and colleagues to determine if children with fragile X syndrome, who typically demonstrate a neurobehavioral phenotype that includes social anxiety, withdrawal, and hyperarousal, have increased levels of cortisol, a hormone associated with stress. The relevance of adrenocortical activity to the fragile X phenotype also was examined. Results showed that children with fragile X, especially males, had higher levels of salivary cortisol on typical days and during the evaluation. Highly significant family effects on salivary cortisol were detected, consistent with previous work documenting genetic and environmental influences on adrenocortical activity. Increased cortisol was significantly associated with behavior problems in boys and girls with fragile X but not in their unaffected siblings. These results provide evidence that the function of the hypothalamic-pituitary-adrenal axis may have an independent association with behavioral problems in children with fragile X syndrome.<sup>[8]</sup>

### 2. Case History

A girl child aged 9 years diagnosed with Fx at the age of 3.5 years by genetic testing at Ganga Ram Hospital. Post the confirmation of the diagnosis, the child underwent occupational therapy and psychological assessment in order to decipher her developmental milestones. She showed tactile defensiveness, low problem solving, motor planning and working memory abilities. She could not take the transitions from one task to other without visual cueing and scheduling. Along with this, the language was poorly developed, more of physical gestures assisted in declaring the basic needs, likes and dislikes. Social skills and reciprocation also showed delay and not age appropriate.

The child got easily anxious and also hyper aroused leading to excessive salivation and sweating, jumping, head shaking and hand flapping.

Once the concerns were clearly identified, the child went for intensive occupational therapy and language and communication one on one session in Mumbai at the fragile – x center. The subject also received floor time interventions from United States to achieve self regulation and to improve language skill.

When the child grew to the age of 6.5 years, the concerns of hyperarousal, anxiety still dominated. Also attention and mindfulness interfered with the academic tasks and performance. The fine motor and sensory problems still persisted. The child continued with special education and occupational therapy sessions but little improvement was reported. At the age of 9 years, considering the age and the temperament of the child, the therapist of the child advised to go for the combination of gross motor play and art therapy session to address the chief concerns of attention, working memory, hyperarousal, anxiety and tactile defensiveness.<sup>[4,5]</sup>

**3. Methodology, Outcome Measures and Intervention Protocol**

**i) Method**

1. Subject: A nine year old Girl with confirmed diagnosis of Fragile -X

Criteria – Fragile -x child with I.Q =

3. Research Design : Descriptive Case Study

4. Level of Evidence : Level VI

**ii) Outcome Measures :**

i) Sensory Processing Disorder Checklist

ii) Social communication Questionnaire.

iii) Pediatric Anxiety Rating Scale PARS

The subject was pre and post assessed on three outcome measures mentioned above respectively to know the prognosis of Art Therapy intervention.

Post the 12 weeks of therapeutic art regime, there was a better and somewhat unexpected positive change in the negative developmental outcomes from baseline period. There was gradual improvement in developmental profile of the subject.

**iii) Intervention Protocol**

1. The art therapy was given to the subject for 12 weeks time.
2. The child was made to sit comfortably on her favorite chair, mat or bean bag to grab interest to the task in hand.
3. Every week, 2 sessions were given for 45 minutes each.
4. The following activities were given. These were progressed from easy to difficult along the span of three months.

These include: i) mandala coloring, ii) vision board, iii) happiness jar, iv)courage jar, v)mask painting, vi)superhero making, vii)scrap book making, viii)story comic strip, ix) pinnata making, x) color wheels, xi) coin shading, xii ) paper stamping, xiii) ice painting, xiv) vegetable painting, xv) self care box, xvi) panic book.

5. Before starting the session, every time a verbal mood check in was done on white board.

6. The 45 minutes art therapy session was interspersed with breathing and some bilateral coordination poses from brain gym and yoga.
7. Some of the days the session was carried out with slow soothing nature sounds and musical tracks.
8. At end of session reflection was done of the steps performed to complete the art work.

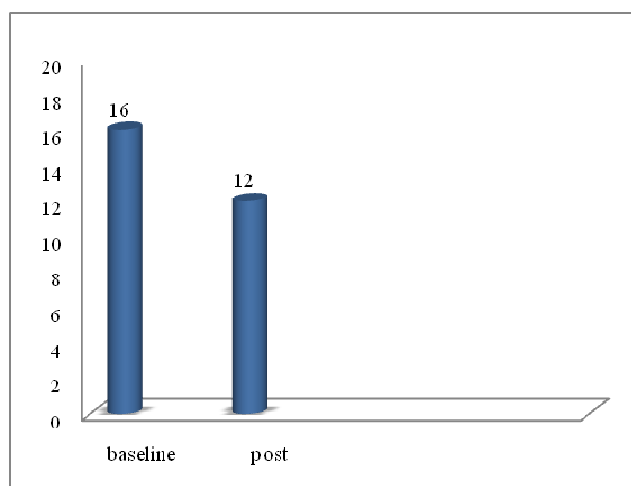
The intervention commenced from May 2018 to July 2018.

**4. Results**

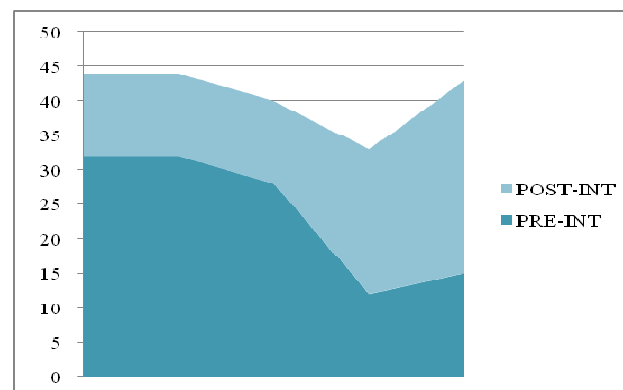
Post the 12 weeks of art therapy regime, there was a better and somewhat unexpected positive change in the developmental outcomes from baseline period. There was gradual improvement in all the three outcome measure scales.

**Table 1: Baseline and Post – Intervention readings of Sensory Processing Checklist**

SPC	BASELINE	POST
Score	63	42



**Figure 1: Bar diagram depicting baseline and post –intervention readings of Social Communication Questionnaire**



**Figure 2: Line Diagram depicting baseline readings of Pediatric Anxiety Rating Scale (PARS)**

## 5. Discussion and Implications from the study

Broadly speaking, art therapy promotes mental and emotional growth through art making. Unlike art instruction, art therapy is conducted with the aim of building life skills, addressing deficits and problem behaviors, and promoting healthy self-expression. Clients are encouraged to explore and express themselves using art materials; crafting attractive artwork is not the goal, though it may be a happy by-product. Art therapy is a natural fit for Fragile-x for several reasons. Verbal self-expression and language is often especially difficult.<sup>[2]</sup> People with Fragile-X are often highly visual thinkers, and many report that they “think in pictures”. Expressing feelings and ideas through images is very natural for such people and can be a welcome relief from the struggle to use words effectively.<sup>[6]</sup> In this particular case, the language and communication was average, post art therapy sessions, the child had become more lively and crafty in language. The use of descriptive words increased. People with Fragile -X also tend to struggle with social issues, such as interpreting tone of voice and facial expression, and may feel uncomfortable relating to others. One-on-one interactions, such as conversations, are often extremely intimidating and stressful. For such people, working alongside a therapist can be much more comfortable. As the two share focus on the client’s art-making, a powerful bond can be forged without the initial need for direct, face-to-face interaction. Cooperation, turn-taking, respecting differences and other social skills can all be practiced in an enjoyable, natural setting. They may also struggle to comprehend other people’s perspectives. The art work offers a concrete way to “see” another person’s point of view. The social communication questionnaire and the other outcome “ Pediatric Anxiety Rating Scale” have shown positive changes proving that art has been a boon to counteract the challenges of social skills and hyper anxiety in Fragile-X.

Art therapy is ideally suited for addressing sensory processing disorder (SPD), a pervasive problem in FX which contributes to a great deal of difficult emotions and behaviors, yet is too often overlooked. One of the most common goals in art therapy is to increase tolerance for unpleasant stimuli, while channeling self-stimulating behavior into more creative activity. Sensory fixations are another common feature of FX. Repetitively engaging in such self-stimulating behaviors (or “stimming”) can make people with FX stand out, prevent them from interacting with others, and can distract them from other activities, such as school work or play.<sup>[4]</sup> In art therapy, the goal is to channel non-functional or inappropriate stimming into socially acceptable, creative outlets. In addition to its efficacy in improving sensory, social and emotional functioning, art therapy is an excellent treatment for because it is inherently reinforcing. Kids get enjoyment, stress relief and a boost to their self confidence from tackling art projects or

simply exploring art materials. That they are practicing life skills while doing so may not enter their minds.<sup>[4]</sup> In agreement to the above literature from previous studies, there is decrease in tactile defensiveness. Now the wet textures can be easily coped up by the subject. Also stimming by head shaking and flicking fingers reduced. The agitation and impulsivity in temperament also showed a decrease. There is drop in various sensory seeking behaviors and patterns. The child’s level of hyper arousal also showed lesser occurrences progressively in 12 weeks span of time. The scientific method is one way we can demonstrate that art and art therapy modify the brain’s physiology and structure and lead to a more flexible, adaptable individual. Moreover, if we want to validate non-standard approaches, such as art therapy, we need more studies to assess their effects on brain function. Owing to changes in the temperament and emotional ordinance in a child with Fragile- X, art therapy can be practiced and provided to a bigger sample in a study. It can also be applied to subjects of FX with extreme anxiety concerns and of different adolescent age groups to prove art therapy a good mode of treatment rather than just a form of relaxation technique for kids with special needs. Future studies can focus to compare effects of art therapy in fragile- x vs down syndrome children. Research can also emphasize to compare art therapy with music therapy or pediatrics yoga on calmness and anxiety in special need children to chart out the feasibility and sustainability of art as therapy over the other and help children with concerns in verbal expressive language, behaviors, social skills and problem solving and working memory.<sup>[7]</sup>

## 6. Conclusion

The overall ethos of this research study for healthcare practitioners is that art therapy is not just a mode to calm and control emotional disturbances. It can also help to improve language, working memory and regulate sensory processing ability in children with Fragile- X syndrome. And since the, development and delays get altered positively, it indirectly effects the anxiety and arousal levels of children with social skill deficits .

## 7. Acknowledgement

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