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Research Article

**A CASE CONTROL STUDY COMPARING CHILDREN'S  
CREATIVITY WITH AND WITHOUT ATTENTION DEFICIT  
HYPERACTIVITY DISORDER****Dr. Hafiz Osama Mehboob<sup>1</sup>, Dr. Fareeha Kanwal<sup>2</sup>, Dr. Sanaulhaq<sup>3</sup>**<sup>1</sup>Holy Family Hospital, Rawalpindi, <sup>2</sup>Basic Health Unit Hattar, Haripur, <sup>3</sup>Mohtarama Benazir Bhutto Shaheed Medical College, Mirpur AJK.**Article Received:** November 2020 **Accepted:** December 2020 **Published:** January 2021**Aim:**

*The aim of the study was to compare creativity in children with attention deficit hyperactivity disorder and without.*

**Place and Duration:** Study was conducted in the Psychiatry department of Holy Family Hospital, Rawalpindi for one-year duration from 1<sup>st</sup> May 2019 to 30<sup>th</sup> April 2020.

**Method:** It was an analytical and descriptive study. The participants were 33 children aged 7-12, selected from the psychiatric department for children and adolescents in who were diagnosed with ADHD by psychiatrist. They met the DSM-IV ADHD diagnostic criteria and showed no comorbidities according to K-SADS (Kiddi-Scadule for Affective disorder and Schizophrenia). They were asked not to take any medications. After using the drugs, they passed the Figural TTCT (Torrance Test of Creativity Thinking) and the Raven Intelligence test. Thirty-three children matched for age and sex, selected from regional schools, were selected for the control group. According to K-SADS, they had no mental health problems. Figural TTCT and Raven Intelligence tests were also performed for controls.

**Results:** There was no statistically significant difference in the intelligence scale and the mean  $\pm$  SD of the total creativity score between children with ADHD ( $125.2 \pm 42.6$ ) and the control group ( $130.6 \pm 47.5$ ) ( $p$ -value = 0.49). Children with ADHD had poorer functioning in positions of fluency and flexibility and did not differ in originality and design.

**Conclusion:** The creativity of ADHD children does not differ from the creativity of the control group.

**Keywords:** attention deficit hyperactivity disorder (adhd), children, creativity.

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**INTRODUCTION:**

Attention Deficit Hyperactivity Disorder is one of the most common childhood psychiatric disorders, and its diagnosis is increasing among children and adolescents [1]. Although ADHD can negatively affect academic performance, work performance, and social relationships, there are children with ADHD who are very creative and successful in adulthood. Gifts and ADHD can overlap [2-3]. Some authors believe that research in children with ADHD often focuses on problems, diagnosis, and treatment; but he rarely treats the symptoms as being creative-like. There are some similarities between creative people and those with ADHD: the distraction and inattention that is associated with creativity; Hypersensitivity; anxiety and hyperactivity; inability to manage time; dangerous activities; impulsiveness and impatience, especially in everyday activities; uncontrolled behavior and influence on emotions; daydreaming; mixed laterality and anomalies in cerebral dominance; more spontaneous imaginations; higher level of thrill-seeking behavior [4]. There are reports of the superiority of children with ADHD in certain areas of creativity. For example, they were able to solve problems better and were more creative with extraordinary ideas in response to stimulating video games. In cooperative tasks, the group with children with ADHD was more successful in solving problems. In one study, a group of 34 children with ADHD were tested for creativity using the figural form of Torrance's Creative Thinking Tests and found that although the group achieved roughly the mean on the TTCT, 32% of the children scored above the 90th percentile and half above the 70th percentile [5-6]. However, a significant limitation of this study was the author's lack of control over whether or not children with ADHD were receiving drugs during the study. Because there is a possibility of an inverse relationship between creativity and concentration, some believe that when people use stimulants to improve cognitive ability, their creative abilities may decline [7]. One study looked at this topic and had no effect, while other researchers reported improved creativity, and another study found a reduction in thinking divergence. Researchers noted the importance of approaching education from the perspective of strengths rather than focusing on removing weaknesses. It is helpful to consider the capabilities of these children and to promote their achievement by improving the organization through treatment and making better use of these strengths. A creative child who can learn to organize his activities, carry out his projects and pay attention to detail is more likely to be perfect. Given the methodological problems of previous studies, such as highly intelligent trial,

uncontrolled medications, and the unconfirmed diagnosis of ADHD, the higher creative ability of children with ADHD remains a question [8-10]. In this study, we tried to compare creativity in children with and without ADHD, taking into account the limitations of previous studies.

**MATERIALS AND METHOD:**

This study was held in the Psychiatry department of Holy Family Hospital, Rawalpindi for one-year duration from 1<sup>st</sup> May 2019 to 30<sup>th</sup> April 2020. Thirty-three children aged 7-12, diagnosed with ADHD by a child and adolescent psychiatrist, were selected from a psychiatric department for children and adolescents. They also met the DSM-IV TR ADHD diagnostic criteria and showed no comorbidities according to KSADS (Kiddi-Scadule for Affective disorder and Schizophrenia). Thirty-three children matched for age and sex from regional schools were selected for the control group. According to K-SADS, the controls did not have any mental disorders. Figural TTCT (Torrance Test of Creativity Thinking) and Raven Intelligence test, the reliability of which was confirmed and carried out for both groups. TTCT is the most widely used test of its kind because it only requires the test taker to reflect on their own life experiences. Creative thinking with pictures is appropriate at all levels, from preschool to adulthood. The test-retest method showed a reliability coefficient of 0.8. The test lasts 30 minutes and includes three tasks to draw unusual and creative pictures. In the first activity, the child should use a yellow bean-shaped paper to demonstrate the idea of the story in his mind and choose a title for it. The second task contains 10 incomplete pictures from which the child should take the most unusual photo. In the third task, which involves several circles, the child should make as many pictures as possible. Creativity is assessed by four components including: fluidity, flexibility, originality and refinement. Task 1 is rated for originality, which means how rare and creative the idea is, and for development which shows how the test taker could explain the idea in detail. Tasks 2 and 3 are rated for fluency, which is the number of meaningful ideas for each task, and flexibility, which shows how different the topics of the ideas are. Children with ADHD performed TTCT without taking stimulants but received it prior to the IQ test. Children with an IQ less than 90 were excluded from the study. Written consent was obtained from each participant. To compare the IQ of both groups, a t-test was used and the creativity positions between the two groups were compared with the Mann-Whitney test with a significance level of 0.05 using the SPSS 19.

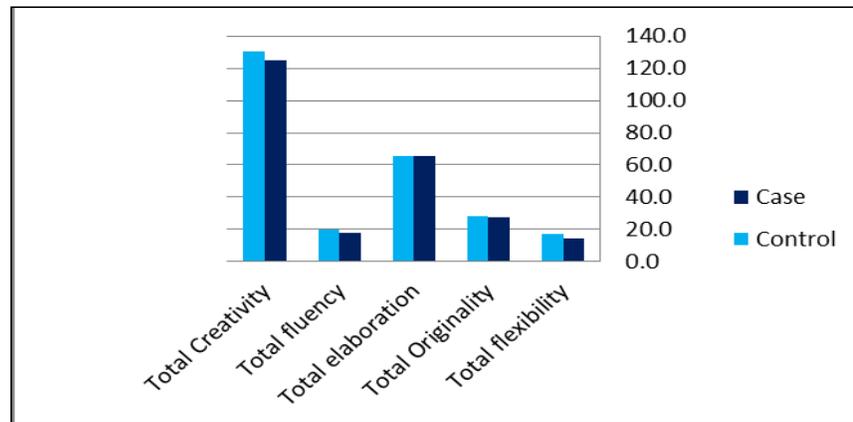
**RESULTS:**

The mean age of the children in both groups was  $9 \pm 2$  years, and there were 9 girls and 24 boys in each group. The results are presented in Table 1.

**Table1. Comparison of IQ and Creativity Items between Children with and without ADHD**

	Control Group (Mean±SD)	Children with ADHD (Mean±SD)	P-value
Intelligence quotient	110±10	106±11	0.205
Fluency	20.1±5.9	18.1±9	0.021
Flexibility	16.9±4.9	14.3±3.2	0.019
Originality	28.1±13.9	27.5±14.3	0.955
Elaboration	65.5±28.8	65.2±28.4	0.955
Total creativity	130.6±47.5	125.2±42.6	0.49

Based on the results of the Student's t-test, no statistically significant difference was found in the IQ of both groups. Creativity was assessed in four items: originality, fluidity, flexibility and refinement using the Mann-Whitney test. The difference in the total creativity scores of children with and without ADHD was not statistically significant. The results of the fluidity and elasticity elements were significantly better in the group without ADHD (Fig. 1).

**Figure1. Creativity results in children with and without ADHD**

Moreover, no statistically significant difference was found between the two groups in terms of the elaboration and originality of the items.

**DISCUSSION:**

In this study, the total creativity score did not differ between the two groups, but the children with ADHD had poorer performance in terms of fluidity and flexibility. The same results have been seen in another studies [10-11]. In some studies, the creativity of children with ADHD was found to be lower during free play and performing non-verbal, figural creative tasks (10, 20), and in others they did not differ either in the use of objects (ideational fluency), verbal and design fluency (5-point). Many studies have found no difference in creativity in children with and without

ADHD. For example, creativity and language, general science, and math were compared between ADHD and the control group and found no difference. However, a major methodological limitation of this study was that the diagnosis of ADHD was made solely on the basis of the hyperactivity teacher ratings on the DSM-IV assessment form [12-13]. Given the lower function of children with ADHD in other cognitive tasks, such as naming speed, information processing speed, and reaction time, a lower function in creative tasks could also be predicted. On the other hand, if they were more creative than the normal population, this skill should have a positive effect on their lives, but usually people with ADHD have a lot of problems with study and work. In fact, adults with ADHD are less likely to reach the educational (and vocational) level that is

predicted based on their IQ. For example, while statistically expected 84% of adults diagnosed with ADHD were college graduates, only 50% achieved this level of education. In a study of 32 children with ADHD, they showed better analysis for problem solving and more creative and unusual ideas, but the diagnosis of ADHD was only based on the teacher's report, and the symptom continuum in other situations was not assessed. Another limitation was that the overall sample IQ was above 115, so they were not representative of the social sample of children with ADHD. The same result was found in thirty-seven students aged 10-17. The ADHD group with equal IQ had better creative tasks but worse working memory. However, the sample was selected from a camp for gifted students and was not representative of ordinary ADHD students, and the diagnosis of ADHD was made on a self-report basis and was not professionally confirmed<sup>14</sup>. In our study, the IQ of children with ADHD did not differ statistically from the control group and this result was similar to the results of other studies. Some studies have examined the relationship between IQ and creativity, but the results have been contradictory and inconclusive. Some have suggested that creativity and IQ are correlated up to an IQ of 120. Furthermore, it has been found in the literature that creativity does not require a high IQ, and high intelligence does not provide creativity. In our study, IQ was assessed using the Raven test and was only used for screening, not for testing the relationship between IQ and creativity. This study was conducted on the normal IQ range to imply a result in the normal ADHD child population, while higher creativity in other studies may have been due to high intelligence, not ADHD symptoms. The similarities between ADHD and creative people must not be a reason to expect creativity in people with ADHD<sup>15</sup>. In fact, in some cases, ADHD and creativity can overlap, which requires caution against misdiagnosis. In some studies, the diagnosis of ADHD was not accurate and was based on reports from teachers or students; However, in our study, the diagnosis was made by a psychiatrist and was confirmed by the KSADs.

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