



## Screening of attention deficit activity disorder using two way analysis

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### ABSTRACT

Attention Deficit Disorder (ADD) is a behavioural and developmental disorder. ADD is one of the most common childhood neurological disorders and can continue through adolescence and adulthood. Symptoms include difficulty staying focused and paying attention. It is a chronic condition that affects millions of children and often persists into adulthood. Children with ADD also may struggle with low self-esteem, troubled relationships and poor performance in school. ADD can cause significant emotional, social and educational problems. However, when ADD causes are known early and properly, the condition can be managed effectively, so children can grow up to have productive, successful and fulfilling lives. The main purpose of this two way statistical analysis is to assess the variations in ADD subjects under different environment. The data has been taken from three moderate ADD students (mean age 20) under stressed and relaxed condition. Three moderate subjects of p value 0.1966, 0.3351 and 0.5204 with six short screening questions and the two sets of data for each case has considered for the analysis. Complete analysis is carried out to find out the variations of scores in each question and the variability between the subjects under different environment.

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### KEYWORDS

ADD;  
ANOVA;  
Childhood neurological disorder;  
Minimal brain damage.

### INTRODUCTION

ADD/ADHD always begins in childhood. For some people, though, ADD is not diagnosed until adulthood<sup>[8]</sup>. That means adults who are newly diagnosed have actually had ADD for years, and have had to endure symptoms as they've matured. Long-term studies have shown that 40% to 60% of children who have ADD/ADHD still have symptoms into adulthood<sup>[3]</sup>. Untreated adults have an increased incidence of aggressive behaviour, anti-social personality disorder, conduct dis-

order, depression, divorce, school drop-out and alcohol and drug abuse<sup>[2]</sup>. The exact causes of ADD are not known with certainty<sup>[1]</sup>. There are, however, a number of factors that may contribute to, or exacerbate ADD. They include genetics, diet and the social and physical environments<sup>[6]</sup>. Scientists are not sure what causes ADD, although many studies suggest that genes play a large role<sup>[3]</sup>. In addition to genetics, researchers are looking at possible environmental factors, and are studying how brain injuries, nutrition, and the social environment might contribute to ADD<sup>[7]</sup>. Like many other

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illnesses, ADD probably results from a combination of factors. The main purpose of this paper is to provide variations in neurological behaviour during the medication procedure<sup>[4]</sup>. There is no single test to diagnose ADD/ADHD. For a child, a paediatrician may make the diagnosis, or may make a referral to a specialist. For adults, a mental health professional generally does the evaluation<sup>[2,3]</sup>. Hence this paper presents the statistical analysis, which may be useful for professionals to carry out further assessment.

### CAUSE OF ADD

The specific causes of ADD are not known. There are, however, a number of factors that may contribute to, or exacerbate ADD. Scientists agree that ADD/ADHD is a medical disorder affecting the several areas of the brain with the frontal area likely having the greatest involvement<sup>[7]</sup>. Heredity is the most common cause of ADD/ADHD and twin studies also given valuable results. Molecular genetics research has focused on the specific genes that may be responsible for characteristics of ADD/ADHD. Other risk factors for ADD/ADHD have to do with factors that can influence brain development and functioning such as exposure to toxic substances in the developing fetus and acquired brain injury due to trauma or disease<sup>[5]</sup>. Factors such as diet, vestibular dysfunction, television viewing and parenting have not been proven to be causes of ADHD.

### ANALYSIS OF ADD

Three subjects with six questions set by the medical expert suitable for our demographic area are used for extracting the information. Each question is graded by giving the scores from zero to five. Two way ANOVA procedure has been carried out for calculating the variations in the score of all six questions to three different subjects in two different condition. This test decides whether the variation arises within or among different population groups. Samples are described in terms of variation around group means and variation of group means around an overall mean. Figure 1 shows the plot of three ADD subjects for six different circumstances. Figure 2 shows the boxplot of same data with mean, maximum score, minimum score and the

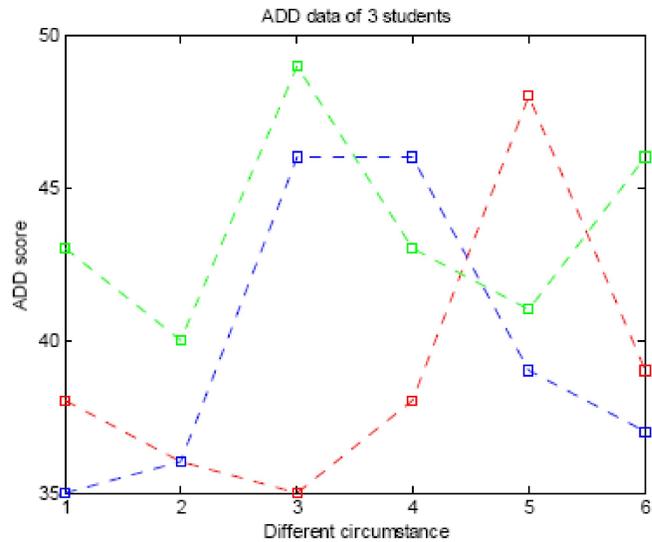


Figure 1 : ADD score of 3 students

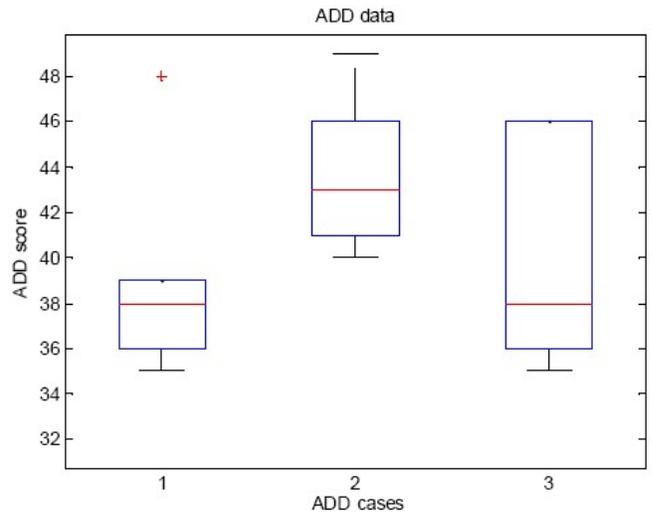


Figure 2 : Box plot of ADD score

other information in detail.

The ANOVA-2 table consists of six columns. The first shows the source of the variability. The second shows the Sum of Squares (SS) due to each source. The third shows the degrees of freedom (df) associated with each source. The fourth shows the Mean Squares (MS), which is the ratio SS/df. The fifth shows the *F* statistics, which is the ratio of the mean squares and the last one shows the probability *p*.

TABLE 1

'Source'	'SS'	'df'	'MS'	'F'	'Prob>F'
'Columns'	[74.3333]	[2]	[37.1667]	[1.8687]	[0.1966]
'Rows'	[20.0556]	[1]	[20.0556]	[1.0084]	[0.3351]
'Interaction'	[27.4444]	[2]	[13.7222]	[0.6899]	[0.5204]
'Error'	[238.6667]	[12]	[19.8889]	[]	[]
'Total'	[360.5000]	[17]	[]	[]	[]

**SUMMARY**

Two way statistical analyses of three ADD subjects under two different conditions with six short screening questions are presented in this paper. This statistical analysis is useful for tracking the variations in the amount of attention under different environments. We hope that the analysis is useful for researchers and clinicians for the precise assessment of attention deficit. By considering more number of subjects / by increasing the number of questionnaires, by comparing with severe ADD and non-ADD subjects, the analysis can be performed more effectively.

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