

## Behavioral and Psychological Profile of Indian Children with Attention Deficit Hyperactivity Disorder

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### **Abstract:**

*Attention Deficit Hyperactivity Disorder, first described by Dr. Heinrich Hoffman in 1845, is not a recent discovery. According to the DSM-IV TR, Attention Deficit Hyperactivity Disorder is a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequent and severe than is typically observed in individuals at a comparable level of development. Malhi and Singhi (2000) report that in India, the prevalence of Attention Deficit Hyperactivity Disorder is estimated at 10% to 20% in school age children. The current study focusses on exploring the behavioral and psychological profile of children in India who have been diagnosed with Attention Deficit Hyperactivity Disorder. Data collected from nearly 200 children from a tertiary care hospital was analyzed. Detailed psychological assessment was also carried out. Results indicate significant differences in the behavioral and psychological profile of children based on the type of Attention Deficit Hyperactivity Disorder, various social aspects and symptom intensity. Exploring similarities with world-wide findings has also been carried out and interesting observations were made. Data was analyzed using t test, F test and ANOVA. These results will positively impact the understanding of children with Attention Deficit Hyperactivity Disorder and contribute to the delivery of effective management programs.*

**Key words:** ADHD, Psychological profile, Behavior profile

### I. INTRODUCTION

Attention Deficit Hyperactivity Disorder is a common problem among school-age children wherein a student exhibits significant difficulties with attention span, impulse control and activity level (Du Paul, 1991) [1]. Malhi and Singhi (2000) [2] report that in India, the prevalence of Attention Deficit Hyperactivity Disorder is estimated at 10% to 20% in school age children. In recent years, an increasing number of children appear to be manifesting the core symptoms of Attention Deficit Hyperactivity Disorder. The essential feature of Attention Deficit Hyperactivity Disorder is a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequent and severe than is typically observed in individuals at a comparable level of development. According to the DSM-IV [3], For diagnosis, some hyperactive-impulsive or inattentive symptoms that cause impairment must be present before seven years of age. Some impairment from the symptoms must be present in at least two settings (e.g., home and at school). There will be interference with developmentally appropriate social, academic or occupational functioning. This disorder may be classified into 1. Attention Deficit Hyperactivity Disorder, combined type 2. Attention Deficit Hyperactivity Disorder, predominantly inattentive type 3. Attention Deficit Hyperactivity Disorder, predominantly hyperactive-impulsive type.

Children with this disorder will commonly fail to give close attention to details and make careless mistakes, will have difficulty sustaining attention in tasks or play activities, will not follow through on instructions and fail to finish schoolwork or chores, will lose things necessary for tasks or activities, will often fidget with hands or feet and squirm in seat, will often run about excessively in situations in which it

is inappropriate, are talkative and are often 'on the go' and act as if 'driven by a motor'.

The awareness of Attention Deficit Hyperactivity Disorder has been gaining momentum in the Indian setting over the past decade. Pediatricians, paramedics, parents and teachers alike have begun to realize that the 'naught, uncontrollable, truant' child may actually have a developmental difficulty. The results of the current study highlight the behavioral and psychological profile of the Indian child with Attention Deficit Hyperactivity Disorder to enhance the understanding and management of children diagnosed with this developmental disorder.

### II. METHODOLOGY

The design of this study was predisposed to be causal comparative and is descriptive in nature. Detailed psychological assessment, including measurement of Intelligence Quotient, Memory, Attention Span, Visuo-motor functions and in-depth interviews with caregivers were the primary modes of data collection.

The sample selected for the present study included children with Attention Deficit Hyperactivity Disorder residing in TamilNadu (India), using purposive sampling technique. Diagnosis of children was carried out by a professional team of a clinical neuropsychologist, pediatrician and psychiatrist. This involved a detailed case history and observation of the child. Details regarding the birth history, developmental history, educational history, family history and clinical history were obtained. Parents and caregivers were the informants. All consecutive cases diagnosed with ADHD were included in the sample. The DSM-IV criteria were used

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for diagnosis. The following psychological assessment tests were then administered: Binet Kamat Intelligence Scale, Seguin Form Board test, Bender Gestalt test and the maladaptive checklist of the Vineland Adaptive Behavior Scale. Screening for Specific Learning Difficulty was also carried out.

### III. RESULTS AND DISCUSSION

Results are based on two hundred and two (202) children included in this study. 76.2% of children were diagnosed as having the combined type of Attention Deficit Hyperactivity Disorder, 14.4% belonged to the Hyperactive type and 9.4% belonged to the inattentive type. It was interesting to note that the maximum number of children studied were diagnosed with Attention Deficit Hyperactivity Disorder combined type. This is in contrast to the study on the prevalence of Attention Deficit Hyperactivity Disorder in a pediatric setting by Singhi et al (1998) [4] which estimated that Attention Deficit Hyperactivity Disorder hyperactive type was most prevalent (50%) in the Indian setting.

It was also seen that out of the children with Attention Deficit Hyperactivity Disorder studied, 75.7% were males and 24.3% were females. This finding correlates with the study by Graetz in 2005 [5], which reports that Attention Deficit Hyperactivity Disorder was 2.3 times more common in boys than girls. Graetz also noted that gender does not interact with the overall correlates of Attention Deficit Hyperactivity Disorder, but plays a major role in the sub-types. It was seen in this study that girls more frequently exhibited symptoms of inattention. Boys showed features of both hyperactivity-impulsivity and inattention.

The average age of children in this study was 6.67 years, indicating that the diagnosis of Attention Deficit Hyperactivity Disorder around this age is most frequent. This may be attributed to the fact that in the Indian setting, a child would have been exposed to the formal education system and at this stage may develop difficulty coping with regime. This may contribute to higher number of referrals as well.

Ornoy et al (1993) [6] reported that Attention Deficit Hyperactivity Disorder is associated with speech delay and suggested that speech delay may be an early sign of Attention Deficit Hyperactivity Disorder as seen in 80% of their sample. In the current study around 55% of children experiences speech delay and this may be attributed to the risk of developing Attention Deficit Hyperactivity Disorder. Thus, speech delay is a precursor for the development of Attention Deficit Hyperactivity Disorder.

Rodriguez et al (2008) [7] suggested that mixed handedness is related to and common in Attention Deficit Hyperactivity Disorder. It is noted in this study that a history of forced change in handedness (forcing a child to adapt to right handedness, when he is a natural left-hander) is reported in more than half (51%) of children with Attention Deficit Hyperactivity Disorder. This observation may be attributed to a cultural expectation, wherein, in the Indian setting use of the left hand is considered inauspicious in activities of daily living. This factor contributes to the difficulties children with Attention Deficit Hyperactivity Disorder face in relation to academic situations.

It was observed in this study that around 63.9% of children with Attention Deficit Hyperactivity Disorder had difficulty with academics as reported by Matte and Bolaski (1998) [8], where students with Attention Deficit Hyperactivity Disorder were observed to have more difficulty with multiple academic tasks.

Biderman, Newcorn and Sprich (1991) [9] reported that comorbidity in Attention Deficit Hyperactivity Disorder is high. They observed that 50% of children with Attention Deficit Hyperactivity Disorder have learning problems and 2% have autistic features. Similarly, it is noted in this study, that 53% of children with Attention Deficit Hyperactivity Disorder have Specific Learning Difficulty and 10.4% have autistic features. It should be mentioned that the diagnosis of autistic features is higher in the Indian setting, perhaps indicating greater rates of prevalence.

**Table No. 1:** IQ and PIQ based of the types of Attention Deficit Hyperactivity Disorder

	Type					
	Hyperactive		Inattentive		Combined	
	Mean	SD	Mean	SD	Mean	SD
<b>IQ</b>	97	24	85	19	92	21
<b>PIQ</b>	105	20	96	19	102	20

**Table No. 2:** Comparison of IQ and PIQ based on the types of Attention Deficit Hyperactivity Disorder

Oneway - ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
<b>IQ</b>	Between Groups	1547.838	2	773.919	1.779	.171
	Within Groups	86570.756	199	435.029		
	Total	88118.594	201			
<b>PIQ</b>	Between Groups	943.169	2	471.585	1.207	.301
	Within Groups	77755.212	199	390.730		
	Total	78698.381	201			

The mean IQ of children in this study was 92, being in the average low range. Tables 1 and 2 indicate that with regard to the types of Attention Deficit Hyperactivity Disorder, it is seen that the group of children with Attention Deficit Hyperactivity Disorder- Hyperactive type had the highest mean IQ (97), while the group of children with Attention Deficit Hyperactivity Disorder-Inattentive type had the lowest mean IQ (85). There was no significant difference between groups with regard to IQ. The mean PIQ of children with Attention Deficit Hyperactivity Disorder in this study was 101, being in the average high range. With regard to the types of Attention Deficit Hyperactivity Disorder, it is seen that children with hyperactive and combined types had PIQ in the average high range (105 and 102 respectively) while children of the inattentive type had PIQ in the average low range (96). There was no significant difference between groups with regard to PIQ. Barkley (2005) [10] reported that studies of Attention Deficit Hyperactivity Disorder in children often find their IQ to be significantly below those of

the control groups, the difference averages about 7 to 10 points. He also indicates that when efforts are not made to control for IQ, samples of children with Attention Deficit Hyperactivity Disorder differ significantly from controls, particularly demonstrating lower verbal intelligence as consistent with a theoretical model of Attention Deficit Hyperactivity Disorder. Barkley (2005) [10] also suggests that no differences are observed with regard to the relationship between IQ and the types of Attention Deficit Hyperactivity Disorder. This is consistent with the results of this study, where there is no significant difference between groups (Attention Deficit Hyperactivity Disorder: Combined type, Inattentive type and Hyperactive type) in relation to IQ.

Attention and Concentration in children with Attention Deficit Hyperactivity Disorder was studied using digits forward and backward. With regard to the types of Attention Deficit Hyperactivity Disorder, children with the combined type had an average of 5 digits forward and 3 digits backward, children with the hyperactive type had an average of 4 digits forward and 3 digits backward and children with inattentive type had an average of 5 digits forward and 3 digits backward. No significant differences were observed. Brown (2000) [11] suggested that there are a number of children with Attention Deficit Hyperactivity Disorder who do not show the deficit in Digit Span. These individuals are able to muster attention for the brief period required for the task, but are unable to hold this level of alertness for longer memory demands. This observation is similar to this study, where no significant differences in observations were seen in the performance of digits span in children with Attention Deficit Hyperactivity Disorder.

Children with Attention Deficit Hyperactivity Disorder in this study had mild to moderate disturbance in the visuomotor gestalt function. This is consistent with the findings of Resta and Eliot (1994) [12], who found significantly more errors for Attention Deficit Hyperactivity Disorder children on the Bender Gestalt Test.

Biederman et al (1990) [13], report that nearly 50% of children had maladaptive behaviours relating to conduct disorder, Oppositional Defiant Disorder, anxiety and mood disorders. Features of the above disorders, especially, bed wetting, nail biting, avoiding school work, temper tantrums, defying authority figures were reported in children with Attention Deficit Hyperactivity Disorder in this study. It was also noted that the intensity of maladaptive behaviours was greater in children with Attention Deficit Hyperactivity Disorder-Combined type than the other two groups. The above observations suggest that children with Attention Deficit Hyperactivity Disorder-Combined type have more difficulty coping with their disorder and effectively manage activities of daily living.

**Table No. 3:** Relationship among IQ, symptom intensity and maladaptive behaviours in children based on the type of ADHD

Correlations				
Type		IQ	DSM-Symptom Checklist Scores	Maladaptive Behaviour Checklist - Score
IQ	Pearson Correlation	1	.131	-.365(**)
	Sig. (2-tailed)	.	.106	.000
	N	154	154	153
Combined	Pearson Correlation	.131	1	-.369(**)
	Sig. (2-tailed)	.106	.	.000
	N	154	154	153
Maladaptive Behaviour Checklist - Score	Pearson Correlation	-.365(**)	-.369(**)	1
	Sig. (2-tailed)	.000	.000	.
	N	153	153	153
IQ	Pearson Correlation	1	-.235	-.722(**)
	Sig. (2-tailed)	.	.221	.000
	N	29	29	28
Hyperactive	Pearson Correlation	-.235	1	.297
	Sig. (2-tailed)	.221	.	.125
	N	29	29	28
Maladaptive Behaviour Checklist - Score	Pearson Correlation	-.722(**)	.297	1
	Sig. (2-tailed)	.000	.125	.
	N	28	28	28
IQ	Pearson Correlation	1	-.810(**)	-.538(*)
	Sig. (2-tailed)	.	.000	.017
	N	19	19	19
Inattentive	Pearson Correlation	-.810(**)	1	.420
	Sig. (2-tailed)	.000	.	.073
	N	19	19	19
Maladaptive Behaviour Checklist - Score	Pearson Correlation	-.538(*)	.420	1
	Sig. (2-tailed)	.017	.073	.
	N	19	19	19

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).



Results from Table 3 show that findings in this study are consistent with those observations of Goldstein (2000) [14], where he reported that rates of hyperactive-impulsive behaviour and measures of intelligence have a negative association. It is noted in this study, that a negative correlation is seen between IQ and maladaptive behaviours (-0.305, significant at 0.01 level) and symptom intensity and maladaptive behaviours (-0.369, significant at 0.01 level). This is for Attention Deficit Hyperactivity Disorder-Combined type. In children with Attention Deficit Hyperactivity Disorder- Hyperactive type a correlation is seen between IQ and maladaptive behaviour (-0.722, significant at 0.01 level). In children with Attention Deficit Hyperactivity Disorder- Inattentive type, an association is seen between IQ, symptom intensity (-0.810, significant at 0.01 level) and maladaptive behaviour (-0.538, significant at 0.05 level).

In this study, 45 children (out of 202) were part of a management program for Attention Deficit Hyperactivity Disorder. In the Indian setting a multi- modal approach is used in the rehabilitation of Attention Deficit Hyperactivity Disorder. 77.6% of children were on medication, 29.3% attended speech therapy, 81% attended occupational therapy, 56.9% remedial coaching for Specific Learning Difficulties and 34.5% special schooling, indicating that medication and occupational therapy were commonly used in the management of Attention Deficit Hyperactivity Disorder.

#### IV. CONCLUSIONS

Thus, most observations in this study are consistent with international reports. A few highlights include that Attention Deficit Hyperactivity Disorder Combined type is more prevalent among children in India. Though in the normal range, a significant difference was noted between verbal and performance IQ of children with Attention Deficit Hyperactivity Disorder. Mild to moderate visuo-motor disturbance was also observed in the children studied. It was also interesting to note that the intensity of symptoms negatively correlates with cognitive functioning. Children with Attention Deficit Hyperactivity Disorder combined type therefore face more a challenging coping process. This profile of children with ADHD curbs uncertainty and provides insight with regard to the psychological and behavioral profile of children with Attention Deficit Hyperactivity Disorder in the Indian setting.

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