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Comparison Between Attention Deficit Hyperactivity Disorder and Best Children on Intelligence

Poornima

Department of Human Development, College of Rural Home Science, University of Agricultural Sciences,
Dharwad – 5, Email- poornima.kalsanki@gmail.com

Abstract

The purpose of the study was to compare the attention deficit hyperactivity disorder (ADHD) and the best children on intelligence. The sample consists 52 children among them 26 ADHD and the 26 best children; age ranged from 10 to 12 years, purposively drawn from randomly selected 8 Government primary Kannada medium schools in Dharwad city of Karnataka state. DSM-IV criteria were used to identify ADHD and WISC-III was used to measure intelligence among the ADHD and best children. The results of distribution of the children on verbal IQ characterized that majority (89%) and few (11%) of the ADHD children were defective and borderlines, respectively in their verbal IQ, whereas in the cases of the Best children, majority of (92%) of them were low average and above, few (8%) were defective and border line in their verbal IQ. The status of distribution of the children on performance IQ alluded that majority (81%) and some (19%) of the ADHD children were defective, borderline and low average, respectively in their performance IQ. On the other hand, in case of the best children, all most all children were at borderline and above, in their performance IQ. The status of distribution of the children on intelligence typified that majority (92%) and some (8%) of the ADHD children were defective and borderline, respectively, but in case of the Best children majority (96%) of them were borderline and above in their intelligence. The results also revealed that the boys and the girls were similar on verbal IQ, performance IQ and on intelligence in their own group of ADHD and the best children.

Key word: ADHD, WISC-III, IQ, DSM-IV.

Introduction

Attention deficit hyperactivity disorder (ADHD) is generally considered to be developmental disorder, largely neurological in nature affecting 3 to 5 per cent of the population. The disorder typically found during childhood and is characterized by a persistent pattern of inattention and hyperactivity/impulsivity. Attention deficit hyperactivity disorder is one of the most commonly diagnosed behavior disorders of childhood. In recent year, increasing number of preschoolers appears to be manifesting the core symptoms of ADHD. Diagnosis of ADHD in very young children is difficult as high activity level, impulsivity and short attention span are to some extent age appropriate characteristic of normal pre

school children. In earlier attempts at conceptualizing the underlying mechanisms of this disorder focused on excessive motor activity, there is less attempt on brain damages/dysfunction and functions. Although the growing evidence prove that ADHD children perform poorly on various cognitive tasks and leads to functional problems such as school difficulties, academic under achievement, troublesome interpersonal relationships with family member and peers.

ADHD is a disorder with symptoms of inattention or hyperactivity and impulsivity that can affect both daily life and school performance in school aged children. It is likely that ADHD has a uni-directional effect on intelligence in a number of ways. The impact of limited self-control and

impaired sustained attention may well, diminish the acquisition of intellectual skills. However, to a large degree ADHD is likely to interfere with the application of skills and the efficient test taking strategies necessary to perform well on intelligence tests. It was found that distribution of estimated IQ for ADHD and normal groups of children did not differ significantly from a normal distribution¹. It was concluded that children with ADHD have an average IQ than normal children. Wechsler scales are the most commonly used measure of intellect within children ADHD problem². The result showed that there is significant difference between ADHD children and normative sample with the former scoring higher on the picture completion, block design and mazes subtests but significantly lower on the information, coding, picture arrangement, arithmetic, symbol search and digit span subtests. The research studies show that the symptoms of ADHD and lower intelligence quotient co-vary in children. Similarly the co-occurrence of ADHD and lower IQ was also accounted for genetic influence³. Wechsler intelligence score for children profiles were compared for children with ADHD and normal intelligence and confirmed that the children with normal intelligence perform better on Wechsler intelligence scale than children with ADHD⁴. In India, very few studies on aspects of ADHD and intelligence are undertaken. Therefore, there is need to study the relationship between ADHD and intelligence. So this study is an attempt to assess the intelligence of ADHD children with the objectives: To study the level of intelligence among ADHD and the best children, and To compare between the ADHD and the best children on intelligence

Experimental

Sample

The sample considered of 52 children among them 26(20 boys and 6 girls) ADHD and 26 (20 boys and 6 girls) the best children, aged between 10 and 12 years from randomly selected 8 Government primary Kannada medium schools in Dharwad city of Karnataka state.

Tools

Diagnostic and statistical manual IV⁵ was used to assess ADHD children. It consists of two subscales, such as inattention and hyperactivity / impulsivity, having 13 and 15 items respectively. Wechsler intelligence scale for children⁶ was used

to measure intelligence among ADHD and the best children. It consisted of 13 subtests, each measures a different facet of intelligence.

Procedure

Eight government primary Kannada medium schools were randomly selected from 114 Government primary Kannada medium schools situated in Dharwad city of Karnataka state. To assess the ADHD among children, respective V class teacher was considered as respondent from each school. Later the teacher assessed each student by giving the response to ADHD scale, 8 teachers of Vth standard from 8 schools identified and assessed as having ADHD. After collection of the data from each teacher, assessment of a girl/ boy was compared with the norms of DSM-IV. Correspondingly, to compare the intelligence of ADHD children with the Best children, the same number of boys and girls were selected from same schools and classes to which ADHD girls and boys belonged. The Best student was one who was not expressing inattention, impulsive and hyperactivity behavior and also rank holder in the class. By following the above procedures a total of 20 boys and 6 girls of V standards from 8 primary schools were selected as sample of study. After selection of ADHD and the best children the researcher administered WISC-III scale on selected children individually. The scoring and classification were carried out according to the recommended procedure in the manual of WISC-III. All the 13 subscales of WISC-III were administered on one student on a specific day by giving intervals between the administration of subscale to avoid fatigue and to create interest in the child.

Results and Discussion

Status of Verbal IQ

Verbal IQ represents the development of knowledge about common events, objects, places, people, concepts, words, numbers calculations and applying knowledge in solving everyday problem and understanding the prevailing situation and social context. The results of Table-1 indicated that verbal IQ of ADHD boys ranged from 54 to 79 with 62.20 mean, whereas in case of ADHD girls it ranged between 54 and 69 with 63.50 mean. The overall total indicated that out of 26 ADHD children, 23 (88.50%) children verbal IQ was between 54 and 69, 3 (11.50%) children verbal IQ was between 70 and 79. Correspondingly in the case of the Best boys verbal IQ was between 63 and 129

Table1 . Distribution of the ADHD and Best Children on Verbal IQ

Category	Verbal IQ	ADHD children			Best children		
		Boys	Girls	Total	Boys	Girls	Total
Intellectually deficient	54-69	17 (85.00)	6 (100.00)	23 (88.50)	1 (5.00)	-	1 (3.85)
Borderline	70-79	3 (15.00)	-	3 (11.50)	1 (5.00)	-	1 (3.85)
Low average	80-89	-	-	-	8 (40.00)	3 (50.00)	11 (42.35)
Average	90-109	-	-	-	7 (35.00)	-	7 (26.90)
High average	110-119	-	-	-	3 (15.00)	2 (33.33)	5 (19.20)
Superior	120-129	-	-	-	-	1 (16.67)	1 (3.85)
Mean		62.20 (6.37)+	63.50 (3.27)+	62.50 (5.77)+	92.20 (13.09)+	98.00 (18.02)+	93.54 (14.30)+

Boys= 20; Girls = 6; Total = 26 for both ADHD and Best children

Values in parenthesis show percentage

+ sign shows standard deviation value

with 92.20 mean and in case of the Best girls the verbal IQ was between 80 and 129 with 98.00 mean. The overall total indicated that out of 26 Best children, 1 (3.85%) child verbal IQ was between 63 and 79, 11 (42.35%) children verbal IQ was between 80 and 89, 7 (26.90%) children verbal IQ was between 90 and 109, 5 (19.25%) was between 110 and 119 and 1 (3.85%) child verbal IQ was 124.

The results of ANOVA (Table-2) indicated that the 'F' value of gender was 0.978, which was not significant even at 0.05 levels. 'F' value of the ADHD and the Best children was 80.700, which was significant at 0.01 levels. The results indicated that there was no significant difference between the boys and the girls on verbal IQ, but there was significant difference between the ADHD and the Best children on verbal IQ.

Table2. Comparison of the ADHD and the Best children on Verbal IQ

Sources	F value	SE	CD
Group (A)	80.70**	2.538	6.964
Group (B)	0.978	2.436	-
A X B	0.393	3.446	-

**significant at 0.01 levels

SE = Standard Error; CD = Critical Difference

The observation of distribution of the children on verbal IQ characterized that majority (89%) and few (11%) of the ADHD children were defective and borderlines, respectively in their verbal IQ, whereas in the cases of the Best children,

majority of (92%) of them were low average and above, few (8%) were defective and border line in their verbal IQ. These results supported that the boys and the girls were similar on verbal IQ within their own group, but the ADHD and the Best children significantly differed in their verbal IQ.

Status of performance IQ

Performance IQ measures the ability of apprehension, identification, logical comprehension, spatial relation, objective configuration and perceptual analysis. This component of intelligence is assessed by picture completion, coding, picture arrangement, block design and object assembly. The results of Table-3 indicated that the performance IQ of ADHD boys ranged between 54 and 89 with 66.00 mean, where as in case of ADHD girls it was ranged between 54 and 69 with 61.83 mean. The overall results of total demonstrated that out of 26 ADHD children, 21 (80.85%) children's performance IQ ranged from 54 to 69 and 4 (15.30%) children's performance IQ was between 70 and 79, one child's performance IQ was 80. Correspondingly, in the case of the Best boys and girls performance IQ was between 70 and 109 with 85.70 mean in case of the boys and 84.67 in case of the girls. The overall total declared that out of 26 Best children 7 (26.90%) children's performance IQ was between 70 and 79, 12 (46.10%) children's performance IQ was between 80 and 89, 7 (26.90%) children's performance IQ was between 90 and 109.

The results of ANOVA (Table-4) explicated that the 'F' value of gender was 1.301, which was

Table3. Distribution of the ADHD and Best children on Performance IQ

Category	Performance IQ	ADHD children			Best children		
		Boys	Girls	Total	Boys	Girls	Total
Intellectually deficient	54-69	15 (75.00)	6 (100.00)	21 (80.85)	-	-	-
Borderline	70-79	4 (20.00)	-	4 (15.30)	6 (30.00)	1 (16.70)	7 (26.95)
Low average	80-89	1 (5.00)	-	1 (3.85)	8 (40.00)	4 (66.66)	12 (46.10)
Average	90-109	-	-	-	6 (30.00)	1 (16.70)	7 (26.95)
Mean		66.00 (7.03)+	61.83 (6.65)+	65.04 (6.59)+	85.70 (7.59)+	84.67 (6.310)+	85.46 (7.21)+

Boys= 20; Girls = 6; Total = 26 for both ADHD and Best children

Values in parenthesis show percentage

+ sign shows standard deviation value

not significant even at 0.05 levels. 'F' value of ADHD and the Best children was 87.037, which was significant at 0.01 levels. The results indicated that there was no significant difference between the boys and the girls on performance IQ but there was significant difference between the ADHD and the Best children on performance IQ.

Table 4. Comparison of the ADHD and the Best Children on Performance IQ

Sources	F value	SE	CD
Group (A)	87.037**	1.616	4.434
Group (B)	1.301	1.547	-
A X B	0.476	1.140	-

**significant at 0.01 levels

SE = Standard Error; CD = Critical Difference

The status of distribution of the children on performance IQ alluded that majority (81%) and some (19%) of the ADHD children were defective borderline and low average respectively in their performance IQ. Whereas, in case of the Best children, all most all children were at borderline and above in their performance IQ.

These results featured that the boys and the girls were similar in their own group on performance IQ whereas the ADHD and the Best children were significantly differed on performance IQ.

Status of Full Scale IQ

Intelligence can manifest itself in many forms, it is for this reason that Wechsler conceived of intelligence not as a particular ability but an aggregate, "capacity of the individual to act

purposefully, to think rationally, to deal effectively with his or her environment"⁷⁷.

The results of Table-5 implied that full scale IQ of the ADHD boys ranged between 53 and 79 with 60.80 mean, whereas in case of ADHD girls it was between 53 and 69 with 59.33 mean. The overall total results indicated that out of 26 ADHD children, 24 (92.30%) children's full scale IQ was between 53 and 69 and 2 (7.70%) children's full scale IQ was between 70 and 79. Correspondingly, in case of the Best boys full scale IQ was between 53 and 109 with 88.15 mean, but in case of Best girls it ranged between 70 and 119 with 91.00 mean values. The overall results of total indicated that out of 26 Best children 1 (3.85%) child's full scale IQ was 68, 4 (15.40%) children's full scale IQ was between 70 and 79, 8 (30.70%) children's IQ was between 80 and 89, 12 (46.20%) children's IQ was between 90 and 109, 1 (3.85%) child's full scale IQ was 112.

The results of ANOVA (Table-6) indicated that the 'F' value of gender was 0.055, which was not significant even at 0.05 levels. 'F' value of the ADHD and the Best children was 100.129, which was significant at 0.01 levels. The results indicated that there was no significant difference between the boys and the girls on full scale IQ, but there was significant difference between the ADHD and the Best children on full scale IQ. The status of distribution of the children on intelligence typified that majority (92%) and some (8%) of the ADHD children were defective and borderline, respectively, but in case of the Best children majority (96%) of them were borderline and above in their intelligence. These results confirmed that the boys and girls were similar within their group in their intelligence, but the ADHD children were

Table 5. Distribution of the ADHD and Best Children on Full Scale IQ

Category	Full scale IQ	ADHD children			Best children		
		Boys	Girls	Total	Boys	Girls	Total
Intellectually deficient	53-69	18 (90.00)	6 (100.00)	24 (92.30)	1 (5.00)	-	1 (3.85)
Borderline	70-79	2 (10.00)	-	2 (7.70)	3 (15.00)	1 (16.70)	4 (15.40)
Low average	80-89	-	-	-	6 (30.00)	2 (33.30)	8 (30.70)
Average	90-109	-	-	-	10 (50.00)	2 (33.30)	12 (46.20)
High average	110-119	-	-	-	-	1 (16.70)	1 (3.85)
Mean		60.80 (6.71)+	59.33 (3.01)+	60.46 (6.09)+	88.15 (10.44)+	91.00 (13.13)+	88.81 (10.90)+

Boys= 20; Girls = 6; Total = 26 for both ADHD and Best children

Values in parenthesis show percentage

+ sign shows standard deviation value

Table 6. Comparison of the ADHD and the Best Children on Full Scale IQ

Sources	F value	SE	CD
Group (A)	100.129**	2.085	5.721
Group (B)	0.055	2.001	-
A X B	0.536	2.830	-

**significant at 0.01 levels

SE = Standard Error; CD = Critical Difference

lower, but the Best children were differentially higher in their intelligence.

Conclusion

The boys and girls of ADHD and the best children were similar in their IQ in their own group. But the best children significantly superior in their verbal, performance and full scale IQ compared to children of ADHD.

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