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Research Paper

Academic, Cognitive and Social Correlates of ADHD

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ABSTRACT

The present study examined academic, cognitive and social correlates of ADHD. Most of the researches were focused on academic or social problems associated with ADHD. Hence the present study focused not only about academic and social relationships but the cognitive relationships with ADHD. The participants for the present investigation were selected from referred population and consisted of 105 ADHD children whose age ranges from 7-12. The data were collected from 212 ADHD children and 105 children were selected for the final analysis randomly based on randomization without replacement in a sense that each of the sub groups consisted of 35 number of ADHD children. Different study materials like Academic performance rating scale, Social skill rating system, WISC, SPM, CPM, Maze test and VSMS were involved for the data collection procedures. The results showed differences in the age, gender and financial background of ADHD children towards academic, cognitive and social aspects. Different relationship between academic, cognitive and social aspects also noted. Differences in the ADHD groups, namely inattention, hyperactivity/impulsivity and combined on academic, cognitive and social aspects were also examined and reached to certain conclusions.

Keywords: *ADHD, Cognition, Social, Academics*

Attention deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental condition marked by developmentally inappropriate levels of inattention, and/ or impulsivity and hyperactivity that often significantly impair functioning across multiple domains and place children at elevated risk for a variety of adverse outcomes. For children and adolescents, those difficulties typically interfere with academic performance and functioning (Pennington, 2009). It is important for clinician's who work with youth to possess a basic understanding of ADHD as it is one of the most frequently misunderstood even by mental health professionals. This is due in part to the confusing array of labels by which it is known, misinformation disseminated through the popular press, social media, and on the web, and to the complex, heterogenous and highly variable nature of the disorder itself.

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METHOD

The participants consist of a total of 105 ADHD children, at the age range of 7-12. They were selected for the present investigation after proper screening and diagnostics procedure. The participants included 60 male children and 45 female children. Different academic variables examined in the present study were academic success, academic productivity, impulse control and overall academic performance. Cognitive variables under the study were working memory, processing speed, verbal comprehension, fluid intelligence and planning. The social variables under the study were social intelligence, cooperation, assertion, self-control and overall social skills. For data collection and screening; Academic Performance Rating Scale (APRS), The Social Skills Rating System (Teacher Rating), Wechsler Intelligence Scale for Children-IV- India, The Vanderbilt ADHD Diagnostic Parent Rating Scale, Raven's Progressive Matrices, Maze Test, Vineland Social Maturity Scale and Personal Data Sheet were used. Different Statistical techniques used for analysing the data are *t*-test, one way ANOVA, Duncan's multiple range test, Pearson product moment coefficient of correlation and factor analysis.

RESULTS

The mean scores of academic successes between two age groups differed significantly. The *t*- value obtained was 2.357 and significant at 0.05 levels. All the other three academic variables not showed any significant differences in the mean scores. The mean scores of verbal comprehensions are significantly different between two age groups. The *t*-value obtained was 2.061, which significant at 0.05 level. The mean scores of other cognitive variables were not significantly different. Academic success was higher for female ADHD children than Male ADHD children.

ADHD children from higher economy class scored higher on academic success, academic productivity, overall academic performance, working memory, processing speed, verbal comprehension, fluid intelligence, planning and social intelligence than lower economic class Academic success, academic productivity and overall academic performance were positively correlated with working memory, processing speed, verbal comprehension, fluid intelligence, planning, social intelligence, cooperation, assertion, self-control and overall academic performance.

Working memory is positively correlated with social intelligence, assertion, self-control, overall social skills, processing speed, verbal comprehension, fluid intelligence and planning. Processing speed is positively correlated with verbal comprehension, fluid intelligence and planning. Verbal comprehension is positively correlated with cooperation, self-control, fluid intelligence and planning. Fluid intelligence is positively correlated with planning, social intelligence, self-control, cooperation, assertion and overall social skills. Planning is positively correlated with social intelligence

Also, almost all the variables showed significant relationships between each other. Also, using 0.07as the cut-off point, the variables were gathered to its corresponding factors. This ensures that the factor extracts sufficient variance from that variable. Owing to this criterion, variables have been grouped in each of the three factors, namely, social competence, cognitive proficiency and academic excellence. ADHD children with combined presentation had lower overall academic performance in comparison with other two groups. It was observed that ADHD children with hyperactivity/impulsivity scored higher than the other two groups on working memory, processing speed, fluid intelligence and planning. Also,

ADHD children with inattention showed more cooperation, assertion, self-control and overall social skills than the other two types of ADHD.

DISCUSSION

It was observed that the mean score of the first group (7-9) was higher than the second age group (10-12) for the variable academic success. As academic success is a measure of a student's academic and intellectual development, it is clear that as age increases the difficulty level also increases for the ADHD children to make things over for his/her academic success. It may be due to the complexity of the demands of higher classes or the inability of the child's adaptation to the novel and complex situations. Notable gender differences were observed on the variable academic success. The scores for female ADHD children were higher than the male ADHD children The trend in results obtained showed significant academic improvement or achievement for the high-income group in comparison with the lower income group Academic success was positively correlated with all the cognitive variables under the present study, i.e. when academic success increases, the cognitive variables also increases, vice versa. All the variables which were related with social skills were in positive relationship with all the academic variables under the study. All the academic variables were possessed inter- correlations among them. Academic success showed high positive correlation with academic productivity and overall academic performance and negligible positive correlation with impulse control. Academic productivity also showed same pattern similar as academic success. Impulse control had negligible positive correlation with overall academic performance. The factor analysis provided three factors. Factor 1 contains variables that make the person more competent in the society and therefore the name of the first factor has been chosen as "social competence". Factor 2 contains variables whose common element is the proficiency with which one processes certain types of cognitive information and therefore the name chosen for the second factor is "cognitive proficiency". Factor 3 contains variables related to certain abilities to perform, achieve and/or excel in scholastic activities and therefore the name chosen for the third factor is "academic excellence".

CONCLUSION

The present study was conducted when there continues to be major challenges to the assessment and treatment of children with ADHD even though it was the single most frequently diagnosed and most thoroughly researched psychiatric illness of childhood. The changing diagnostic criteria overtime, different diagnostics schemes used worldwide, and the complex task of integrating diagnostic information from multiple sources complicate studies of ADHD. The present investigation surely eases certain complications regarding the co-existence of certain academic, cognitive and social aspects upon ADHD children. The results showed differences in the age, gender and financial background of ADHD children towards academic, cognitive and social aspects. Different relationship between academic, cognitive and social aspects also noted. Differences in the ADHD groups, namely inattention, hyperactivity/impulsivity and combined on academic, cognitive and social aspects were also examined and reached to certain conclusions.

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Conflict of Interest

The author(s) declared no conflict of interest.

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TABLES

Table 1: Mean, standard deviation, t-value and significance among two age groups on academic variables

Variable	Age	N	Mean	SD	*t* -value	Sig
Academic success	7-9	57	21.4211	6.31027	2.357	.020
	10-12	48	18.5625	6.04559		
Academic productivity	7-9	57	33.3333	8.75731	.671	.504
	10-12	48	32.1875	8.67291		
Impulse control	7-9	57	4.5965	2.14526	-.824	.412
	10-12	48	4.9167	1.77252		
Overall academic performance	7-9	57	58.8246	13.85528	1.187	.238

Table 2: Mean, standard deviation, t-value and significance among two age groups on cognitive variables.

Variable	Age	N	Mean	SD	*t* -value	Sig
Working memory	7-9	57	78.4561	14.40495	.710	.479
	10-12	48	76.3125	16.54029		
Processing speed	7-9	57	80.8421	14.77545	-.239	.812
	10-12	48	81.5625	16.09401		
Verbal comprehension	7-9	57	76.3509	15.27661	2.061	.042
	10-12	48	70.1875	15.25898		
Fluid intelligence	7-9	57	72.1228	14.51117	.940	.349
	10-12	48	69.5208	13.65687		
Planning	7-9	57	95.3158	14.32301	1.318	.190
	10-12	48	91.5000	15.30123		

Table 3: Correlation between the different variables under study

Sl no	variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Academic success	1													
2	Academic productivity	.709**	1												
3	Impulse control	.028*	-.091*	1											
4	Overall academic performance	.876**	.922**	.103*	1										
5	Working memory	.499**	.537**	-.113*	.558**	1									
6	Processing speed	.386**	.361**	-.111*	.408**	.768**	1								
7	Verbal comprehension	.471**	.491**	-.031*	.536**	.751**	.600**	1							
8	Fluid intelligence	.634**	.574**	-.102*	.623**	.673**	.554**	.587**	1						
9	Planning	.575**	.621**	-.200*	.632**	.730**	.552**	.633**	.722**	1					
10	Social intelligence	.486**	.641**	-.088*	.618**	.630**	.481**	.111*	.592**	.719**	1				
11	Cooperation	.221*	.301**	.364**	.345**	-.022*	-.075*	.525**	.056*	.044*	.025*	1			
12	Assertion	.171*	.270**	.325**	.286**	.028*	-.058*	.120*	.094*	.113*	.061*	.797**	1		
13	Self control	.224*	.332**	.437**	.368**	.132*	-.023*	.219*	.209*	.164*	.152*	.737**	.670**	1	
14	Overall social skills	.227*	.332**	.414**	.368**	.050*	-.057*	.165*	.132*	.118*	.087*	.933**	.903**	.886**	1

** p< 0.01 * p< 0.05

Table 4: Rotated factor solutions for the data on different study variables (Varimax rotation)

			Factor 1	**Factor 2**	**Factor 3**
		Eigen values	3.732	3.621	3.424
		% Var. Exp	26.659	25.863	24.456
		Cum Var. Exp.	26.659	52.522	76.978
	1	Academic success	.102	.284	.822
	2	Academic productivity	.173	.285	.871
	3	Impulse control	.589	-.024	-.196
	4	Overall academic performance	.241	.329	.870
	5	Working memory	-.018	.884	.302
	6	Processing speed	-.096	.856	.117
variables	7	Verbal comprehension	.124	.807	.254
	8	Fluid intelligence	.022	.636	.531
	9	Planning	-.014	.669	.551
	10	Social intelligence	-.026	.560	.560
	11	Cooperation	.898	-.075	.197
	12	Assertion	.870	-.006	.146
	13	Self-control	.870	.107	.166
	14	Overall social skills	.970	.009	.188

Table 5: F ratio and significance value of the three groups on overall academic performance.

Variable	**Source**	**Sum of squares**	**Df**	**Mean square**	**F**	**Sig.**
Overall academic performance	Between group	1323.333	2	661.667	3.465	.035
	Within group	19477.657	102	190.957		
	Total	20800.990	104			