

Identification of Attention Deficit Hyperactivity Disorder (ADHD) Among Rural Primary School Children

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ABSTRACT

This study aimed to determine the prevalence of Attention Deficit Hyperactivity Disorder (ADHD) among primary school children in a semi-urban setting and to investigate the co-morbid disorders associated with ADHD. The study involved children aged 5 to 11 from 15 government schools. The Vanderbilt Assessment Scale (Teacher's Version) was used to assess for ADHD, and positive screenings were further evaluated for co-morbid factors using the Child Behavioral Checklist (CBCL) scale, followed by an assessment by a psychiatrist.

The results showed a prevalence of 9.67% for ADHD among primary school children in Tirupati, Andhra Pradesh. The prevalence was higher among males (12.98%) than females (5.63%), with the highest rates observed in the 10-11-year-old age group. The male-to-female ratio for ADHD was 2.7:1. The combined subtype was the most common (45.83%), followed by the Attention Deficit subtype (36.45%) and the Hyperactive-Impulsive subtype (17.7%). Children from lower socioeconomic backgrounds exhibited a higher vulnerability to ADHD (9.96%) than those from middle and upper socioeconomic classes (7.56%). The co-morbid condition most commonly associated with ADHD was poor academic performance (18.75%), followed by poor social behavior (17.7%).

In conclusion, the study highlights the significant prevalence of ADHD among primary school children, particularly in the context of gender and socioeconomic disparities. It emphasizes the importance of understanding and addressing ADHD to help children overcome these challenges.

Keywords : Attention Deficit Hyperactivity Disorder, Vanderbilt Assessment Scale-Teacher's Version, Prevalence, and Socioeconomic Status.

I. INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a prevalent neurobehavioral condition that predominantly affects children and is characterized by inattentive, restless, and impulsive behavior. Its symptoms pose significant challenges, including risk of learning disabilities, behavioral issues, and social problems that can lead to academic underachievement, substance abuse, and juvenile delinquency during adolescence and adulthood. As such, ADHD places considerable demands on mental health, educational, and judicial services.^[1-9]

ADHD is a complex interplay of biological, social, and psychological factors. Genetic risk factors are strongly implicated in the neuropathology of ADHD. Social influences determine the severity of impairment, prognosis, and societal perceptions of the disorder. Psychological processes, particularly deficits in attention and information processing, bridge the gap between underlying neuropathology and observable behavioral manifestations, making ADHD a valuable subject for studying child psychopathology.^[10,14-17]

Historical descriptions of ADHD date back to the 19th century, with early characterizations of affected children as inattentive, excessively hyperactive, and impulsive. In the early 20th century, the syndrome was called a "Defect in moral control," encompassing soft neurological signs, minor congenital anomalies, and inattentiveness. Modern classification began with the term "hyperkinetic child syndrome" and evolved through various nomenclatures, culminating in "Attention Deficit Hyperactivity

Disorder" (ADHD) in the Diagnostic and Statistical Manual (DSM) classifications.

The prevalence of ADHD worldwide varies due to evolving diagnostic criteria. Estimates under DSM-III criteria (1980) ranged from 9.1% to 12% in the US and 5.8% to 11.2% internationally. DSM-III-R criteria (1987) reported rates of 7.1% to 12.8% in the US and 3.9% to 14.4% internationally. DSM-IV criteria (1994) yielded rates of 9.5% to 16.1% in the US and 2.4% to 19.8% internationally, with higher rates attributed to changes in diagnostic definitions. Recent data from the CDC in 2011-2012 showed a 42% increase in ADHD diagnoses and a 28% increase in medication usage among US children aged 4-17 years compared to previous years.^[11-12]

Objectives

- To find out the prevalence and gender distribution of ADHD among primary school children.
- To find out the presence of any comorbid disorders associated with ADHD.

II. MATERIALS AND METHODS

- **Study Design:** Descriptive Cross-sectional study
- **Study Population:** Government Primary School children in and around Tirupati.
- **Sample Size:** 750 School-going children aged between 5 and 11 were selected from 15 schools in Tirupati. Sample sizes were calculated depending on the prevalence of ADHD from the previous studies using the formula $4pq/L2$. Prevalence of ADHD of

earlier studies is 10%. Allowable error at 20%, Alpha level at 5%,10% for responders.

Inclusion Criteria:

- Children between the age group of 5 to 11 years.

Exclusion Criteria:

- Children with a history of seizures/developmental delay.
- Children with a history of neurologic illness/Endocrine disorders.
- Children with a history of chronic illness/prolonged drug intake.

Tools:

Tool 1: Vanderbilt Assessment Scale- Teacher's version:

This is a rating scale based on DSM diagnostic criteria for ADHD. It consists of several behavior parameters. Teachers rate this scale. The scale has two components: symptom assessment and impairment in performance.

Tool 2: Child Behaviour Checklist (CBCL) Scale:

This scale is used to assess the presence of co-morbid factors, social behavior, and academic performance of those children who were identified as having ADHD.

The tools were prepared after reviewing related literature, taking the opinion of experts, and reviewing existing tools.

METHODOLOGY

After obtaining the necessary approvals, the study was initiated with great care and attention to detail. Prior permission was sought from the District Educational Officer of Tirupati to

conduct the study at various Primary Schools. 750 children between the ages of 5 and 11 years were randomly selected from 15 schools in Tirupati. Before the study began, informed written consent was obtained from their parents, ensuring their participation was voluntary and they were fully aware of the nature of the study.

The teachers were given a comprehensive awareness campaign regarding ADHD in two sessions. During the first session, the teachers were sensitized about ADHD with the help of audio-visual aid in Telugu. The academic and social implications of ADHD were explained in detail so that they could understand the condition well. During the second session, the teachers were trained to fill the Vanderbilt assessment scale Teacher's version with the help of a PowerPoint presentation. This training ensured that they could assess the children accurately and confidently.

Following the awareness campaign, the presence of ADHD was then assessed by using the Vanderbilt assessment scale Teacher's version by their respective class teachers. Periodic school visits were undertaken during this period to clarify their doubts and help the class teachers assess the children and fill out the questionnaire. This was done to ensure that the data gathered was accurate and reliable.

The researchers then analysed the filled up questionnaire, and those children screened positive were instructed to attend the hospital with their parents. Children with impaired assessment were verified and reassessed for any comorbid factors by using the Child Behavioural Checklist (CBCL) scale, the information for which was sought from their parents using a

questionnaire in the outpatient department. This was done to ensure the children received the best possible care and that any underlying conditions were identified and treated appropriately.

All children screened positive were subjected to psychiatrist evaluation for a final confirmation of diagnosis and further management. Children diagnosed with ADHD were regularly followed up in our outpatient department with periodic psychiatrist opinions. This ensured that the children received the best possible care and that their condition was closely monitored to ensure that they remained healthy and happy.

III.RESULTS AND DISCUSSION

Table 1 : CHILDREN SUSPECTED TO HAVE ADHD

Children suspected to have ADHD	Number	Percentage (%)
ADHD	120	12.00
Normal	880	88.00
Total	1000	100

Data presented in Table 1, shows that Among 1000 school children screened by their respective class teachers, 120 children were positive using Vanderbilt Assessment Scale-Teacher’s Version.

Table 2 : ADHD DIAGNOSED

ADHD Diagnosed among	Number	Percentage

suspected		
ADHD +ve	96	80.00
ADHD +ve (Dropouts)	7	5.83
ADHD -ve	17	14.17
Total	120	100

Of the 113 (7) children dropped out of 120) screened positive, the psychiatrist confirmed 96 children with attention deficit hyperactivity disorder.

Table 3 : ADHD PREVALENCE

ADHD Prevalence	Number	Percentage
ADHD +ve	96	9.67
Total	993	100

The prevalence of ADHD in this study is 9.67% (96 out of 993).

Table 4: AGE WISE DISTRIBUTION OF TOTAL CHILDREN

Age in years	Total no of children
5	32
6	130
7	177
8	146
9	170
10	168
11	177
Total	1000

Among the 1000 children in this study, 345 were between the age group of 10 to 11 years, 316

children were between the age group of 8 to 9 years, and 339 were less than or equal to 7 years.

Table 5: AGEWISE PREVALENCE OF ADHD

Age in years	Total no: of children with ADHD	Prevalence (%)
5	3	9.37
6	12	9.23
7	17	9.60
8	12	8.21
9	15	8.82
10	18	10.71
11	19	10.73

Age Distribution	ADHD Group	Normal
N	96	897
Mean	8.21	8.50
SD	1.65	1.77
Unpaired 't' Test		0.1051

Prevalence of ADHD was found to be highest among the children between the age group of 10 and 11 years.

GENDER	NUMBER OF CHILDREN
Male	539
Female	461
Total	1000

Total number of children screened-1000
 Number of Male children-539
 Number of Female children-461

Table 6: GENDER DISTRIBUTION OF ADHD

GENDER	NUMBER OF CHILDREN	%
Male	70	72.92
Female	26	27.08
Total	96	100
Chi-square test		0.001

Number of male children having ADHD =70(72.92%)

Number of female children having ADHD= 26(27.1%)

Table 7 : GENDERWISE PREVALENCE OF ADHD

GENDER	ADHD	Total	Prevalence of ADHD
Male	70	539	12.98
Female	26	461	5.63
Total	96	1000	

ADHD is 2.7 times more common in males than females.

Table 8 : ADHD SUBTYPES

ADHD Subtypes	Number	Percentage
Attention Deficit	35	36.46
Hyperactive-Impulsive	17	17.71
Combined	44	45.83
Total	96	100

In this study, the most common subtype was the combined subtype (45.83%), followed by the

Attention Deficit subtype (36.46%) and Hyperactive-Impulsive type (17.71%)

Table 9 : GENDERWISE DISTRIBUTION OF ADHD SUBTYPES

Gender	Attention deficit	Hyperactivity	Combined
Male	21(60%)	17(100%)	32(72.7%)
Female	14(40%)	0	12(27.3%)
Total	35	17	44

In this study, combined subtype of ADHD was the most common among male children. Attention deficit is the most common subtype in female children.

A hyperactive-impulsive subtype of ADHD was found exclusively in male children.

Table 10 : SOCIOECONOMIC STATUS

Presence of Comorbidities in ADHD	Number	Percentage
Present	58	60.42
Absent	38	39.58
Total	96	100

60.42% of children with ADHD had comorbid conditions like reading difficulty, writing difficulty, behavioral difficulties, poor social behavior, poor academic performance, and conduct disorder.

Table 11 : NUMBER OF COMORBIDITIES IN ADHD

Number of Comorbidities in ADHD	Number	Percentage
One	45	77.59
Two	12	20.69
Three	1	1.72
Total	58	100

Most children (77.59%) had only one associated comorbid condition, and 22.41% had two or more comorbid conditions.

Table 12 : COMORBID CONDITIONS IN ADHD

Comorbid condition	No: of children	Prevalence (%)
Reading difficulty	13	13.5
Writing difficulty	10	10.4
Behavioural difficulty	11	11.45
Poor social behavior	17	17.7
Poor academic Performance	18	18.75
Conduct disorder	2	2.08

Poor academic performance (18.75%) and social behaviour (17.7%) were the most frequently observed comorbid conditions.

Table 13 : COMORBIDITIES IN ADHD SUBTYPES

Subtypes	Total	Comorbidities	(%)
Attention Deficit	35	17	48.57%
Hyperactive-Impulsive	17	7	41.47%
Combined	44	34	77.27%
Total	96	58	

Combined subtypes followed by Attention deficit subtypes of ADHD were frequently associated with comorbid conditions.

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