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Research Article

A Descriptive Study to assess the Prevalence of ADHD and its' Co-morbidity among School Children

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ABSTRACT

ADHD, or attention deficit hyperactivity disorder, is a common neuro-developmental disease that begins in childhood. It is a clinically heterogeneous illness with co-morbidity, making diagnosis and management of these children and adolescents difficult. The present study was conducted to assess the prevalence of ADHD and its co-morbidity among children in selected schools in Tamilnadu, India. Initially, 500 children aged 6-12 years, who fulfilled the inclusion criteria were selected from 4 schools of Chennai, Tamilnadu through non – probability convenient sampling technique. The parents were interviewed, for any symptoms of ADHD by ADHD Rating Scale. Vanderbilt Assessment scale is a validated, parent-completed questionnaire that obtains information needed for diagnosis from a parent about core symptoms of ADHD and areas of functional impairment, which was used to assess the prevalence and co-morbidities of ADHD. The overall prevalence of ADHD was 7.8% with male children had slightly more (5.4%) compared to females (2.4%). There were no co-morbidities found in the ADHD children and no significant association between the prevalence and demographic characteristics of the children. This study concludes that it is essential to facilitate measures for early identification and management of ADHD among children to prevent the consequences of ADHD in their adulthood.

Keywords: Prevalence, Attention Deficit Hyperactivity Disorder (ADHD), Co-Morbidity, children, ADHD Rating Scale, Vanderbilt Assessment Scale

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INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a neurobehavioral condition marked by inattentiveness, hyperactivity, and impulsivity as key symptoms. ADHD can cause above normal levels of hyperactive and impulsive behaviours, people with ADHD may also trouble focusing their attention on a single task or sitting still for long periods of time. The Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-IV) identifies three subtypes of ADHD based on major symptoms: primarily inattentive, mostly hyperactive-impulsive, and combination subtype[1].

ADHD is one of the most frequent mental diseases in children aged 5 to 15 years old, affecting around 8%–12% of all children globally[2]. It has a massive financial cost, causes stress in families, interferes with academic and vocational pursuits, and has severe impacts on self-esteem[3]. Worldwide, ADHD is the third-most-common mental health disorder, after depression and anxiety, affecting an estimated 3.4% of children and youth [4].

In children, ADHD is generally associated with problems at school. Boys are more than twice as likely as girls to receive an ADHD diagnosis. The reduction of dopamine is a factor in ADHD. Dopamine is a chemical in the brain that helps move signals from one nerve to another. It plays a role in triggering emotional responses and movements. The ADHD children also additionally have lifelong effects. The ADHD children more likely have depression, anxiety, learning disability, conduct disorders and language disabilities. ADHD leads to low self esteem, poor academic function, family & peer relationships problem, and disruptive behaviours in children. Children with diagnosis of ADHD, experience impaired well-being or quality of life compared to healthy children[5].

Traditional schools expect student to be patient, listen attentively, complete assignments, cooperate with peers, and pay close attention to the task at hand. These activities are difficult for children who have ADHD because they cannot control their behaviours. Behaviours that often accompany ADHD include the inability to "think before you act," take turns, wait in line, and excessive fidgetiness and restlessness. School children who have ADHD may have a hard time remembering to do tasks, constantly run late, and turn in homework that is unfinished or past its' due date. Students with ADHD may appear to be emotionally immature, quick-tempered, and easily frustrated[6]. All of the above characteristics may make it difficult for children to function successfully in school setting both academically and socially.

Half of two thirds of school children identified with ADHD also have concurrent psychiatric & developmental disorders, including oppositional & aggressive behaviours, anxiety, low self esteem, learning and language disabilities. Global impairment in children with ADHD increases with increasing numbers of concurrent disorders. The concurrent conditions also increase the likelihood of additional difficulties developing as children become adolescents and young adults. Whenever possible the potential for cognitive, language and developmental problems requires evaluation so that appropriate academic interventions can be implemented[7].

According to current estimates, 50% of children with ADHD continue to have ADHD symptoms in adolescence and adulthood. Inattention/ hyperactivity combined, higher symptom severity, co-morbid major depressive or other mood disorders, significant co-morbidity (>3 additional DSM illnesses), parental anxiety, and paternal antisocial personality disorder are all predictors of persistence[8].Because of the severity of the disease, a precise estimation of ADHD prevalence is critical. The present study was conducted to assess the prevalence of ADHD and its co-morbidity among children in selected schools in Chennai, Tamilnadu, India.

METHODOLOGY

Research Approach: The research approach used for the study is quantitative approach with a Non – experimental descriptive design.

Sample: The population consists of children between the ages of 6 - 12 years in selected schools, Chennai. Initially, 500 children aged 6- 12 years and who fulfilled the inclusion criteria were selected from 4 schools through non – probability convenient sampling technique.

Tool:
Part A: Demographic characteristics of the sample such as gender, age, birth order, family size, care giver, co-morbidity, religion, socio economic status, maternal health status during pregnancy, family history of mental illness, duration of pregnancy, mother's educational level, mother's occupation were collected. Part B: The parents were interviewed initially for any symptoms of ADHD by ADHD Rating Scale. Part C: The instrument used for the study was Vanderbilt Assessment scale[9] and it is a standardised scale. This tool is a validated, parent-completed questionnaire that obtains information needed for diagnosis from a parent about core symptoms of ADHD and areas of functional impairment. It includes a screen for co-morbidities including

externalizing disorders (oppositional-defiant and conduct) and internalizing disorders (depressive and anxiety). It consists of 55 questions regarding the symptoms, performance of prevalence of ADHD and Co-morbidity.

Scoring and interpretation:
Inattentive type: Must score a 2 or 3 out of 9 items on questions 1- 9 and score a 4 or 5 on any of the performance questions 48- 55.
Hyperactive type: Must score a 2 or 3 on out of 9 items on questions 10-18 as well as score a 4 or 5 on any of the performance questions 48- 55.
Combined type: Requires the above criteria on both inattention and hyperactivity.
Oppositional deficit disorder: Must score a 2 or 3 on 4 out of 8 behaviours on questions 19-26 and score a 4 or 5 on any of the performance questions 48- 55.
Conduct Disorder: Must score a 2or 3 on 3 out of 14 behaviours on questions 27-40 and score a 4 or 5 on any of the performance questions 48- 55.
Anxiety and Depressive disorder: Must score a 2or 3 on 3 out of 7 behaviours on questions 41-47 and score a 4 or 5 on any of the performance questions 48- 55.
Ethical consideration: Official Permission from the principals of the schools was obtained to get the permission to collect the list of students aged 6 -12 years and to collect data from the parents. Ethical permission was obtained from the Institutional ethical committee. A written consent from the parents were collected before the study by explaining the purpose of the study, the role of the parents, confidentiality of the information and their right to withdraw from the study at any point of time of the study.

Data Collection: The data collection period was two weeks. Initially, 500 children aged 6- 12 years where selected from 4 schools, Chennai, Tamilnadu. Through convenient sampling technique, the children who were willing to participate were selected. The parents were interviewed initially for any symptoms of ADHD by ADHD Rating Scale. If the score is above 18 out of 54, it is considered as positive and they were screened further to assess the stages. There were 38 children were diagnosed as have ADHD by our investigators trained in Clinical Psychology by Vanderbilt Assessment scale. The Interview technique was adopted and the parents were asked about their children's condition as per Vanderbilt Assessment scale.

Statistical Analysis: Descriptive statistical method such as frequency, percentage, mean and standard deviation was used to assess the prevalence of ADHD and its co-morbidity among children and to describe the selected demographical variables. Inferential statistics such as chi square was used to find out the association between the prevalence of ADHD and its co-morbidity among children.

RESULTS AND DISCUSSION

The table 1 shows the distribution of demographic data of the ADHD Children. Among the 500 children screened 39 children had ADHD according to the screening tool used for this study. Among the ADHD children, 27(69.2%) were boys and 12 (30.8%) were girls, 53.8% were aged between 6 – 8 years and 15.4 % were 10 to 12 year-old. Sixty one percent of the children were first child in the family and 56.4% were living in joint family. Most of them were (69.2%) belonged to upper lower class, 3% of the children's mothers were sick while they were pregnant. Among the ADHD children, 5.1% had the family history of mental illness, 76.9% were full term babies, 25.6 % mothers did not have any formal education and 33.3% of the mothers were home makers.

Table 1: Distribution of Demographic Data of the ADHD Children

Demographic Characteristics of Children	**No.**	**%**
GENDER		
(a) Male	27	69.2
(b) Female	12	30.8
AGE		
(a) 6-8 years	21	53.8
(b) 8-10 years	12	30.8
(c) 10-12 years	6	15.4
BIRTH ORDER		
(a) I child	24	61.5
(b) II child	11	28.2
(c) III child	4	10.3
FAMILY SIZE		
(a) Nuclear	17	43.6
(b) Joint family	22	56.4
SOCIO ECONOMIC STATUS		
(a) Upper class		
(b) Upper middle class	1	2.6
(c) Lower middle class	4	10.3
(d) Upper lower class	27	69.2
(e) Lower class	7	17.9
MATERNAL STATUS DURING PREGNANCY		
(a) Sick	3	7.7
(b) Healthy	36	92.3
FAMILY HISTORY OF MENTAL ILLNESS		
(a) Yes	2	5.1
(b) No	37	94.9

DURATION OF PREGNANCY		
(a) Preterm	7	17.9
(b) Full term	30	76.9
(c) Post term	2	5.2
MOTHER'S EDUCATIONAL STATUS		
(a) Primary level	4	10.3
(b) Secondary level	12	30.8
(c) Graduate	6	15.4
(d) Post graduate	7	17.9
(e) No Formal Education	10	25.6
MOTHER'S OCCUPATION		
(a) Self employee	7	17.9
(b) Home maker	13	33.3
(c) Private employee	11	28.2
(d) Government employee	8	20.6

Table 2: Prevalence of ADHD subtypes by gender among screened children (n=500)

Subtype	No. of children	Estimated Prevalence (%)
All	39	7.8
Inattentive	21	4.2
Hyperactive	3	0.6
Combined	15	4.7
Male	27	5.4
Inattentive	11	2.2
Hyperactive	7	1.4
Combined	9	1.8
Female	12	2.4
Inattentive	4	0.8
Hyperactive	2	0.4
Combined	5	1

The table 2 shows the prevalence of ADHD subtypes by gender among 500 screened children. Among the 500 screened children, 39 were identified having ADHD. It shows that among 39 children, 21 had inattentive ADHD, three were hyperactive and 15 children had combined ADHD. The male children (5.4 %) had higher prevalence as compared to female children (2.4%). Among 27 male children, 11 had inattentive ADHD, seven were hyperactive and 9 children had combined ADHD. Among 12 female children, four had inattentive ADHD, two were hyperactive and five children had combined ADHD.

The findings are supported by a study conducted by Golden Catherine et al (2014)[11], conducted a study to determine a prevalence of ADHD among 8 -11 year old school children, from six selected schools, Kanchipuram district, Tamilnadu. The prevalence of ADHD was assessed using Corner's Teacher Parent Scale. The result revealed the overall prevalence of ADHD was 8.8. ADHD is diagnosed approximately 3 times more often in boys than in girls. ADHD was found to be prevalent in 11.7 percent of boys and 5.2 percent of girls, for an overall prevalence of 8.5 percent. At 4.7 percent of the population, the combined form of inattentive and hyperactive was the most common.

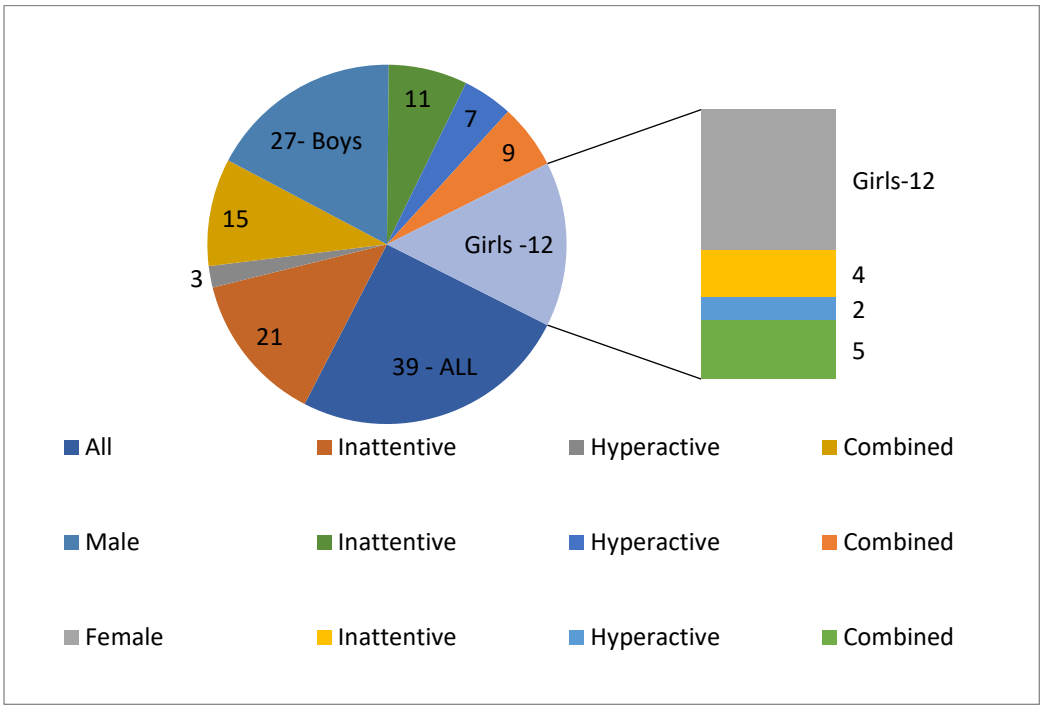

Fig. 1: Distribution of ADHD Prevalence among children

In the present study, regarding the association of the prevalence of ADHD with the selected demographic characteristics of the children, none of the variables had significant association. But in contract, in a study done in Korea[12], there was a significantly higher prevalence of ADHD was found among children whose parents were separated or divorced and/or less educated. There were also no co-morbid conditions associated with ADHD in the present study population such anxiety disorder. To elicit such variables and its variance, larger population may be studied.

Conclusion

This study finding was similar with an estimated worldwide-pooled prevalence of ADHD. Hence, the children with ADHD may have consequences in the adulthood, it is essential to identify them early and treatment and rehabilitative measures to be given. The teachers and parents to be educated about the signs and symptoms of ADHD and the referral system for the children if there are identified with ADHD.

Declaration of Conflicting Interests

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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