Prevalence of ADHD in Children and Knowledge and Attitude of Parents about ADHD in a Tertiary Hospital in Mumbai, Maharashtra, India

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Background: Attention deficit hyperactivity disorder (ADHD), is a neurodevelopmental disorder, commonly diagnosed in children. The brain of children and adults with ADHD develops differently than a neuro-typical brain, altering their attention, ability to sit still, and self-control. The misconceptions of ADHD related behaviors seen in children project as poor parental discipline, lack of motivation to succeed, or lack of respect for authority. These misconceptions come from the lack of knowledge about this disorder, and how to nurture a child with these symptoms. The parent child relationship is affected in major ways due to this lack of knowledge on ADHD, significantly so out-side of the "mental health awareness" wave in the United States. In a country such as India, many parents are not educated on the presentation of ADHD and behaviors of children diagnosed. This can lead to blaming the child for being rude, fidgety, irresponsible, not wanting to pay attention or focus, or not care about consequences, etc. These misconceptions of their child's behavior can negatively impact the relationship between the parent and child creating an extremely difficult environment for the child to flourish in, diminishing their developmental potential. With proper parental education and understanding of this disorder, the relationship between the parents and child will be able to flourish, increasing the child's quality of life. According to the CDC in the United States the average 9.4% of children from the age of 2-17 are diagnosed with ADHD (2). Yet, a population survey conducted in the United States and European countries suggests that ADHD has a 5% prevalence across the world in children (5). And a study from Asia, Europe, the Americas and the Middle East showed that the worldwide prevalence of ADHD that has been calculated in children and adolescents at 2.2% (1). With no consistent data on prevalence in the United States, where Mental Health is gaining awareness, understandably so there are very few statistics on the prevalence of ADHD in India, however one estimated prevalence of ADHD in India ranges from 2% to 17% (4). Research done in Tehran, Iran identified the effect of cultural stigma on ADHD and the prevalence of ADHD, the comorbidity of ADHD and Bipolar Disorder was comparatively lower than most western studies. (3). The most common source of the caregiver's knowledge on ADHD came from media sources, and the correlation between the parent's level of formal education and knowledge of ADHD strongly correlated (p=0.01) (3). Cultural stigma towards ADHD can be seen in India based on research done finding only 73 studies on e-publication sources using a specific search containing "ADHD", "Attention Deficit and Hyperactivity Disorder", "Hyperactivity", "Child psychiatry", "Hyperkinetic disorder", "Attention Deficit Disorder", and "India" (6). The lack of studies on ADHD in India shows a gap in statistical data on this disorder and science based noninvasive interventions on human health.

Purpose: The main purpose of the study is to identify the prevalence of ADHD in children aged 6-15 years in a Tertiary Hospital setting, in addition to understanding the knowledge and attitudes of caregivers of children with ADHD, about ADHD in India.

Design: **Target Population:** Children between the age of 6-14 years who come to the Children Psychiatry Out-Patient Department (OPD) of a Tertiary General Hospital in Mumbai Maharashtra India, with one or both their parents / primary caregivers. **IRB:** Approval was obtained from the Institutional Ethics Committee of the Tertiary Municipal Medical College and General Hospital Institutional Ethics; Committee & Human Research to gather data. **Procedure:** The provider will initially undertake an introduction and opinion survey. Then caregiver of a new patient in the COPD, who is diagnosed by the provider with ADHD, will be instructed on the study and offered to be enrolled with verbal consent in Hindi, a common language in the locality. Each caregiver will be verbally given a demographic survey and an Attitude and Knowledge Questionnaire, taking an approximate time of 10 minutes per caregiver. Once the survey has been completed an educational brochure will be offered in both English and Hindi, in the presence of a provider. If any questions or concerns arise from the caregiver the provider will speak on them. To gather ADHD prevalence data, the analog records of the COPD dating back to early 2017 will be digitized. Once data has been gathered the correlation between the demographic and the knowledge questioners will be calculated. Through graphical analysis and calculations of the period prevalence, gender ratio, and diagnosis spectrum will be analyzed.

Results:

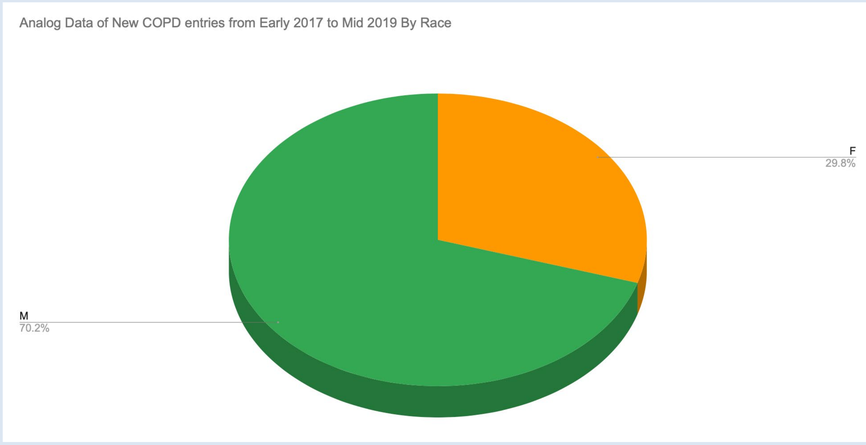

Figure 1: The pie chart above distributes the gender of the 1789 patients from analog data in the Children's Out Patient Department of the Tertiary Hospital, dating from early 2017 to mid 2019. The data presented a 70.2 % male prevalence vs a 29.8 female prevalence of all patients in the COPD.

Supplemental interviews from the providers shared that males often present with disruptive and over active symptoms where as females are often noted as distracted. Most patients are brought in on the requirement of schools for learning disability accommodations and psych evaluations for program placement

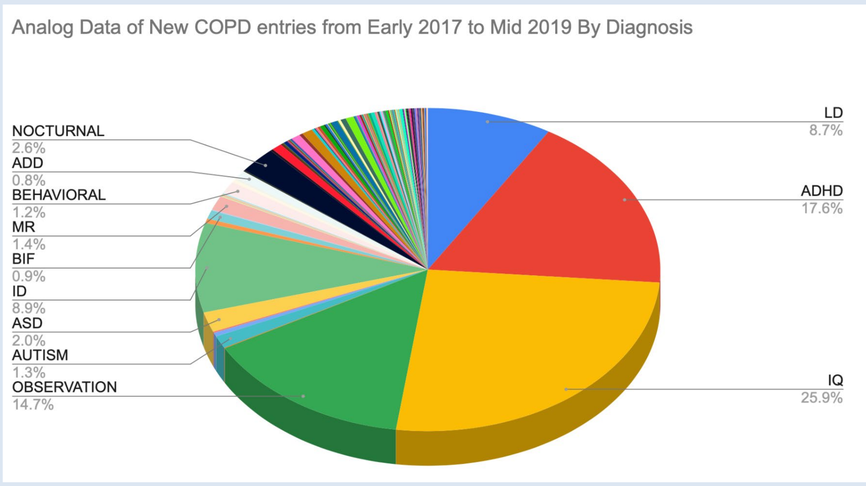

Figure 2: The pie chart above distributes the diagnosis of the 1789 patients from analog data in the Children's Out Patient Department of the Tertiary Hospital dating from early 2017 to mid 2019, a total of 97 diagnosis. The data presented a prevalence of 25.0% Low Intelligence Quotient, 17.6% for ADHD , 14.7% Under Observation, Intellectual Disabilities at 8.9% and Learning Disabilities at 8.7%

Abbreviations:
Nocturnal – Nocturnal Enuresis (bed wetting)
ADD - Attention Deficit Disorder
Behavioral – Behavioral Disorder
MR – Mental Retardation
BIF - Borderline Intellectual Functioning
ID – intellectual Disorder
ASD – Autism Spectrum Disorder
Observation – Unver Observation (no definite diagnosis)
LD – Learning Disability
ADHD - Attention deficit hyperactivity disorder
IQ- Low Intelligence Quotient, or IQ testing

Results:

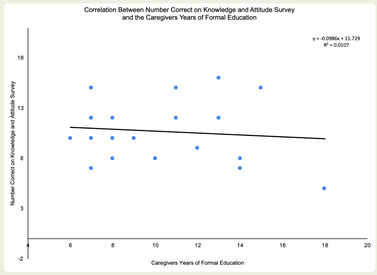

Figure 4: The graph above represents the correlation between the number of correct knowledge and attitude survey questions and the caregivers years of formal school education. The R^2 value presented at 0.0107.

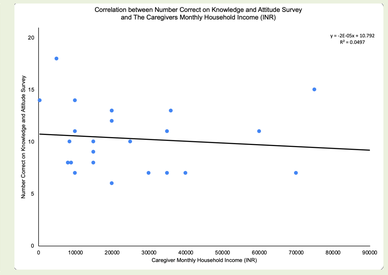

Figure 3: The graph above represents the correlation between the number of correct knowledge and attitude survey questions and the monthly household income of the caregiver in Indian Rupees . The R^2 value presented at 0.0479.

Results: The COPD analog data dated back to early 2017 and recorded 1789 patients (70.2% male) categorized under 97 diagnosis, with an ADHD prevalence of 17.6% (314 out of 1789). During this survey a total of 25 caregivers (64% mothers) had been questioned, resulting in a mean age of 38.5 years, 10.4 years of education, and a monthly household income of 31,676 INR (~ 436.58 UDS). There was no significant correlation found between the demographic questions and the number of knowledge questions correctly answered. Of the eight providers questioned, five wrote that there are caregiver misconceptions about ADHD and mental diagnosis due to lack of mental health education.

Conclusion: This is one of the first pilot studies looking at the prevalence and knowledge and attitude of parents in a COPD in India. The prevalence of ADHD in the COPD of the Tertiary Hospital for children ages 6-15 years, from 2017 to mid 2019 was 17.6%. Unexpectedly, there was no statistical significance correlating the knowledge and attitude of caregivers of children with ADHD and their demographics. Based on provider interviews females are brought in to the COPD less than males due to the difference of symptoms. Most children are brought in for behavioral problems, learning disabilities, or IQ testing. Noting here that providers not only treat psychiatric patients, but also feel like the "one stop shop" for children's behavioral and intellectual burdens. The main barrier in this study was low literacy and the language barrier, however, information delivered was positively accepted.

Next Steps: Moving further more caregiver knowledge data needs to be gathered over a longer period of time in order to gather statistically significant data. It's projected by the providers and previous research literature that the more provider and caregiver interaction occurs, the more knowledgeable caregivers will be about mental health disparities, slowly reducing the stigma around mental illnesses in India, therefore more resources should be presented to the caregiver at diagnosis.

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