ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, SCHOOL OF MEDICINE, DEPARTMENT OF PEDIATRICS AND CHILD HEALTH.

Comorbidity of Attention-Deficit/Hyperactivity Disorder in Children with epilepsy in TASH,2024

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Acronyms and abbreviations:

CWE: Children with Epilepsy

ADHD: Attention/Deficit Hyperactivity Disorder

DSM TR: Diagnostic and Statistical Manual Text Revision

CBCL: Child Behavior Checklist

ASM: Anti-seizure medication

DBD: Disruptive Behaviors Disorders rating scale

Abstract

Background: Children with epilepsy frequently have comorbidities; about half of kids have at least one condition. The psychiatric condition known as attention deficit hyperactivity disorder (ADHD) is typified by hyperactivity and inattention that are out of proportion to the child's developmental stage. ADHD has a significant impact on the clinical results, psychosocial characteristics, and quality of life of children with epilepsy. In clinical practice, comorbid ADHD is still not well acknowledged. Comorbid ADHD must be identified and treated early in order to improve prognosis and lower the chance of negative long-term neurodevelopmental effects

Objectives: To investigate the comorbidity of ADHD among children diagnosed with epilepsy in TASH.

Methods: This is a prospective cross-sectional study which Is carried out in TASH, pediatric neurology clinic on children fulfilling the inclusion criteria between October 2024 and January 2025.Children with epilepsy 3 to 18 years of age with duration of epilepsy more than 6 months duration were included in the study. Patients were selected by convenient sampling method. The trained data collectors filled the pre structured questionnaire and Diagnostic and Statistics Manual of mental disorders V text revision is used to diagnose ADHD.

Results: 205 children were enrolled in the study. From these 121 patients (59%) has ADHD. Among the subtypes 49.8% had inattentive type while 40.1 % has hyperactive/impulsive type. In this study age of the children, presence of seizure in the last 6months and ASM were an association with ADHD by bivariate logistic regression. The multivariate logistic regression found that the odds of children age 1-5 years and 6-10 years had 3.4 and 2.5 times increase the risk of ADHD compared to age >=10 years respectively (AOR=3.4, 95%CI=1.34, 8.68 & AOR=2.5, 95%CI=1.17, 5.19). The odds of children having seizure in the last 6months had 4.2 times increase risk ADHD compared to those of its opposite compartment (AOR=4.2, 95%CI=2.14, 8.41) and study participants who use polytherapy were 2.4 times increase its risk of ADHD compared to monotherapy (AOR=2.4, 95%CI=1.21, 4.82).

Conclusion: There is high prevalence of ADHD 59% among children with epilepsy in TASH pediatric neurology clinic. Yet, those who are having follow up at psychiatric clinic are 36 (29%). This shows under diagnosis of ADHD in children with epilepsy.

Introduction

1.1 Background

A common comorbidity among children with epilepsy, ADHD is linked to issues with learning, social functioning, academic achievement, and quality of life. Underlying brain pathology, long-term effects of seizures, epileptiform brain activity as detected by EEG, and the effects of antiepileptic medications are some of the factors that may contribute to this comorbidity. Additionally, this comorbidity makes it difficult for clinicians to decide on a treatment plan and medication schedule. ADHD is typified by impulsivity, hyperactivity, and persistent inattention, whereas epilepsy is characterized by recurrent seizures brought on by aberrant brain activity. The percentage of children with epilepsy in high-income countries who have ADHD varies from 23% to 70%, depending on the sample and diagnosis criteria.

There is one study done in Ethiopia (Gondar) which showed a prevalence of 44.2 % of ADHD in children with epilepsy.

Understanding the comorbidity between ADHD and epilepsy is crucial for developing comprehensive management strategies and improving outcomes for affected children.

1.2 Statement of the problem

The typical age of seizure start is between five and six years of age, and children are most at risk for seizures during their first year of life. Compared to healthy subjects, children with chronic diseases were more than 2 times more likely to develop psychopathology. Children with long-term abnormalities of the central nervous system were at a higher risk because of underlying brain dysfunction. Mental health issues were present in 16 percent to 77% of children and adolescents with epilepsy. Although a wide range of psychopathologies can affect children and adolescents with epilepsy, attention deficit hyperactivity disorders may be more unique to the condition.

1.3 Significance of the study

The study holds importance in advancing the understanding of comorbidity of ADHD among children with epilepsy. It can lead to improved diagnostic accuracy, early identification, and appropriate management strategies for affected children.

understanding the interplay between these two conditions provides healthcare providers with insights into potential interactions, side effects of medications and treatment approaches.

Although ADHD is commonly encountered in children with epilepsy, there is a paucity of research specific to the comorbidity of ADHD among children with epilepsy in our setting. This study aims to fill this research gap, providing valuable insights into the prevalence and characteristics of this comorbidity, thus enriching the scientific literature and informing future research endeavors.

1. LITERATURE REVIEW

Childhood - onset epilepsy:

The neurological disorder which is epilepsy is one of the most common chronic neurological disorders is characterized by recurrent seizures caused by abnormal electrical discharge in the brain.[36]

Classification of seizure

There are two broad classes of epilepsy: focal onset and generalized (bilateral). Both hemispheres are involved in generalized seizures, which can be absent, myoclonic, clonic, tonic, or tonic-clonic. Secondary generalization may or may not follow focal seizures, which start in a focal region in one hemisphere of the brain. 2. Childhood-onset epilepsy is characterized by a variety of seizure forms, some of which may change during the course of the illness. 3.

Epilepsy syndrome

Epilepsy syndromes refer to groups of epileptic disorders that share common clinical features, electroencephalogram characteristics, and etiology.[36]

Idiopathic epilepsy

Idiopathic epilepsy refers to seizures that have no identifiable cause. They occur spontaneously without any known underlying medical condition or brain abnormality. (36)

Symptomatic and cryptogenic epilepsies

Cryptogenic seizures are seizures that have an unknown cause, but there is suspicion or evidence of an underlying brain abnormality or condition. Symptomatic seizures are associated with a specific cause or underlying condition, such as brain injury, infection, or a structural abnormality.[36]

Psychopathology in children with epilepsy

As opposed to well children, children with chronic diseases were more than 2 times more likely to develop behavioral problems(.5). Children with long-term abnormalities of the central nervous system were at a higher risk because of underlying brain dysfunction.6, 7

Population based study on psychopathology in childhood

According to Rutter et al. (1970), the prevalence of behavioral and emotional problems was 6.6% in the general childhood population, 11.6% in children with physical deformities that did not involve the central nervous system, 28.6% in children with simple seizures, 37.5% in children with damage to the central nervous system, and 58.3% in children with both seizures and damage to the central nervous system. (8)

Prevalence of psychopathology in children with epilepsy

The prevalence of mental health issues in children with epilepsy (CWE) varied from 16% to 77%(.9–14) Compared to population-based studies; cross-sectional studies conducted in hospitals revealed a significant prevalence

Behavior problems in new onset epilepsy

The CBCL internalizing, thinking, and somatic problem scores of children with new onset epilepsy were greater than those of their siblings, but the biggest disparities were found in the overall behavioral and attention problem scores, according to Austin et al. (2001).15. Even after controlling for child, demographic, and seizure factors, this study found a strong correlation between seizure recurrence and behavioral and attention issues in CWE. This discovery raises the possibility that behavioral issues and seizures are caused by the same brain malfunction.

Meta-analysis of psychopathology in children with epilepsy

Rodenburg et al. (2005) conducted a meta-analysis titled "Psychopathology in Children with Epilepsy," which corroborated similar findings. 2,434 children with epilepsy (CWE) were included in 46 research conducted between 1970 and 2003 that were reviewed by the authors. Siblings, children with chronic illnesses (such as asthma, diabetes, heart disease, and migraine), healthy study controls, and normative controls were compared to children with epilepsy.16.

Comparison with normative controls

For the whole spectrum of psychopathology, the effect size for the difference between children with epilepsy and normative controls was consistently large. Large effect sizes were found in meta-analyses of total behavior problems for both teacher and parent reports: $d = 0.75$ ($p < 0.001$) and $d = 1.39$ ($p < 0.001$). Comparing children with epilepsy to normative controls revealed greater effect sizes for internalizing issues as opposed to externalizing issues. For parent reports, the effect sizes for internalizing issues were $d = 1.27$ ($p < .001$). For the parent report, the effect sizes for externalizing difficulties were $d = 0.81$ ($p < .001$). Parents rated attention issues and somatic complaints the highest, with $d = 2.49$ ($p < .001$) and $d = 2.38$ ($p < 0.001$), according to meta-analyses of the narrowband measures.

Comparison with healthy controls

Medium effect sizes were found for both parent and teacher reports in meta-analyses of all behavior issues. For internalizing problems, the effect sizes (parent report alone) were minor ($d = 0.23$; $p < .01$), and for externalizing problems, they were medium ($d = 0.45$; $p < .001$). Attention issues had the biggest effect size, with a $d = 0.72$ ($p < .001$) meta-analysis of the narrowband scales (parent report alone). This was approximately 0.30 times bigger than the narrowband scales' mean effect size ($d = 0.43$).

Comparison with a chronic illness

For contrast with normative controls, the effect sizes were large; for contrast with healthy study subjects, they were small to medium; and for comparisons with children with a chronic illness, they were small to medium. The effect sizes were larger for attention problems ($d = 0.46$, $p < .001$), thought problems ($d = 0.37$, $p < .001$), and social problems ($d = 0.40$, $p < .001$) than for withdrawal ($d = 0.14$, ns), somatic complaints ($d = 0.19$, ns), depression ($d = 0.19$, $p < .01$), delinquency ($d = 0.11$, ns), as well as for aggression ($d = 0.20$, $p < .01$).

Comparison with siblings

. A small number of syndromes showed small to medium and significant effect sizes: somatic complaints ($d = 0.46$, $p < .001$), attention problems ($d = 0.49$, $p < .001$), thought problems ($d = 0.38$, $p < .001$), and social problems ($d = 0.34$, $p < .01$). The authors came to the conclusion that children with epilepsy were more likely to experience a variety of emotional and behavioral issues than both healthy controls and children with non-neurological chronic illnesses.

Risk factors

According to theoretical models, psychopathology is caused by intricate interactions between a number of etiological factors. (17)

Epilepsy-related risk factors

The potential impact of epilepsy-related factors in the psychopathology of developmentally normal children with epilepsy remains controversial, despite the fact that cognitive and family factors are reliable risk factors for mental health issues in children with idiopathic epilepsy. Some studies have found no correlation between psychopathology in CWE and age at seizure onset, seizure frequency, seizure type, and lateralization of seizure focus. 18,19

In their study, Caplan et al. (18) investigated the role of cognitive, linguistic, seizure-related, and demographic factors in the psychopathology of children with complex partial seizure disorder (CPS) of average intelligence. Using CBCL, 111 CPS patients and 102 normal children, ages 5.1 to 16.9 years, were evaluated. Among the patients, verbal IQ predicted the presence of a psychiatric diagnosis and CBCL scores in the borderline/clinical range.

However, other studies demonstrated the role of epilepsy related variables in the psychopathology of cognitively unimpaired children. 20, 21, 22, 23 Seizures (e.g., prolonged seizures/febrile convulsions; seizure frequency/number of antiepileptic drugs) and demographics (e.g., minority status) predicted the cognitive and linguistic deficits of the CPS group.

Symptomatic epilepsy and psychopathology

Children under the age of three who had remote symptomatic epilepsy at the time of their initial diagnosis showed delays in adaptive functioning (communication, sociability, motor, and daily living) in a population-based longitudinal study conducted by Berg et al.24. Furthermore, these children delayed adaptive functioning deteriorated with time, which resulted in eventual loss or failure to acquire new skills.

According to the Child Behavior Checklist's overall score, 22.2% of the 108 epileptic children in a cross-sectional study by Friellinger et al. 21 who were between the ages of 5 and 18 had moderate to severe behavioral or emotional issues. Higher ratings on the Child Behavior Checklist were linked to particular medical epilepsy-related characteristics such polypharmacy, age of onset, and etiology. An earlier age at onset and symptomatic epileptic syndromes were linked to higher social issue scale scores. Polytherapy with antiepileptic drugs was linked to higher scores on the social issues, attention problems, and aggressive behavior scales.

At the time of evaluation, there were no statistically significant correlations between the Child Behavior Checklist ratings and the frequency and symptoms of seizures or the EEG. Higher scores on the CBCL social difficulties measure were found to be statistically associated with symptomatic epileptic syndromes.

Seizure frequency and psychopathology

Research conducted on animals has shown that frequent seizures harm growing brain neurons and decrease cognitive performance in these creatures.25, 26. Higher seizure frequency was found to be strongly associated with poorer language, attention, and IQ scores in clinical investigations.27, 28 When other risk factors, such IQ, were taken into account in children with average intelligence, seizure frequency did not stand alone as a risk factor for psychopathology in children with complex partial seizures.18

Likewise, a number of researchers came to the conclusion that seizure frequency had a different impact on psychopathology in cognitively normal children as opposed to children with epilepsy syndromes, epileptic encephalopathies, and intellectual disabilities.21, 25 A 7-year follow-up study conducted by Sbarra et al., 2002, showed no difference in the behavioral and emotional adjustment issues between teenagers with ongoing seizures and those in full remission.(29)

Antiseizure medications and psychopathology

Research on the relationships between antiepileptic medications and behavioral or cognitive issues has so far produced mixed findings; polypharmacy was linked to behavioral issues in a few studies (12,14), but it was not a significant factor in the Austin et al. report (19).

In their study, Mandelbaum D E et al. examined the cognitive and behavioral profiles of forty-three children aged four to sixteen who had recently developed idiopathic seizures. They also examined the impact of antiepileptic drugs on psychologic functioning over a 12-month period. Thirty subjects were only included in the study if their seizures were adequately controlled on monotherapy, and they found no discernible change in psychologic functioning that could be linked to the medication treatment.

In their study of adult patients, Schmitz B et al. found that behavioral issues were the most frequent psychiatric side effects of antiepileptic medications, with depressive disorders coming in second.31.1 The researcher discovered that high dosages of medications, polytherapy, rapid titration, and the severity of epilepsy were likely to increase the risk of psychiatric symptoms.

Antiepileptic medications are frequently held responsible for behavioral or cognitive issues in

children receiving treatment for epilepsy, but it can be challenging to determine how much of a role they actually play in a given child's issues. As a result, the information currently available about the precise causal effects of ASMs on the behavioral and cognitive issues in intellectually normal CWE is either insufficient or unclear.

ADHD and Epilepsy

ADHD is the most common psychopathology detected in CWE.[36]

According to a meta-analysis of 49 studies involving above 172,000 people on the comorbidity of ADHD and epilepsy, the prevalence of ADHD was 22.3% (95% CI 20.3–24.4). The prevalence of the ADHD inattentive subtype was 12.7% (95% CI 9.1%–17.1%). 37

The prevalence of ADHD is much greater in CWE than in the general population. According to several population studies, the prevalence rate of ADHD in patients

Compared to 3–5% of the general population, the prevalence of ADHD in CWE was reported to be as highas77%.[33] In Africa, according to Egyptian study the prevalence rate of 31.3 % is reported. [34] In Ethiopia, a prevalence rate of 44.2% is reported. [35]

There is lack of data on ADHD in epileptic children and adolescents in our country. Only one study has been published.[35] The study published didn't use DSM (Diagnostic and Statistical Manual of Mental Disorders).

The highly prevalent subtype of ADHD encountered in CWE is inattentive type.[35,36]

Keeping this in mind, this study has planned to estimate prevalence of ADHD and association of epilepsy related risk factors with ADHD in children and adolescents with epilepsy.

TABLE1: STUDIES REPORTING THE MAGNITUDE OF ADHD IN CHILDREN WITH EPILEPSY

FIRST AUTHOR	COUNTR	SAMPL	SAMPLE	MEAN	DIAGNOSTI	PREVALENC	

	Y	E SIZE	SPECIFICATIO N	AGE(SD)	C TOOL	E %	
ABI ODUN/2005	NIGERIA	166	HOSPITAL BASED	14.8/1.9 6	DSM-IV	9	
HAREGEWOIN / 2016	ETHIOPI A	260	HOSPITAL BASED	-	DBD	44.2	
QING/2014	CHINA	161	HOSPITAL BASED	10.6/2.9	DSM-IV	59	
KIM/2014	KOREA	74	HOSPITAL BASED	10.9/2.1	DSM-IV	64.9	
REILLY/2016	UK	125	HOSPITAL BASED	18.3/2.9	DSM-IV	15.2	
TANER/2007	TURKEY	95	HOSPITAL BASED	NR	DSM-IV	48.4	
KASSELMAYER / 2019	USA	53	HOSPITAL BASED	12/3.2	DSM-IV	26.4	

Research Question: What is the magnitude of ADHD in children with epilepsy age 4 to 18 years as assessed by DSM V TR criteria in TASH pediatric neurology department?

Objective of the study

3.1 General objective

To investigate the comorbidity of ADHD among children diagnosed with epilepsy in TASH Pediatrics Neurology clinic.

3.2 Specific objectives

1. To assess the magnitude of comorbid ADHD among children with epilepsy.
2. To assess the clinical profile of children with comorbid ADHD and epilepsy.
3. To Identify risk factors associated with the development of comorbid ADHD in children with epilepsy.
4. To evaluate the management of comorbid ADHD and epilepsy in Tikur Anbessa Specialized Hospital and identify areas of improvement.

2. Methods

4.1 Study area and period: Study was conducted in TASH, Addis Ababa Ethiopia. Addis Ababa is the capital city of Ethiopia. According to the 2007 census, its population is 3,384,569. TASH is the largest specialty and subspecialty hospital in the country. It has many departments one of which is department of pediatrics and child health**.** It offers comprehensive health care service for around half a million patients per year through specialty clinics and inpatient service departments. The Pediatric neurology clinic is one of the many subspecialty clinics in the hospital. It has 2 consultants and one fellow. And about 5 residents will be assigned each month. And there are 4 to 5 nurses and one nurse will be available each day. It provides service 5 days per week. The study was conducted from November 2024 to January 2025**.**

4.2 Source population: The source population includes all children coming to the Pediatric neurology clinic during the study period.

4.3 Study population: All children with epilepsy attending the clinic during the study period diagnosed clinically and using EEG.

4.4 Sample size determination: The single population proportion formula with an assumption of 95 % confidence interval level, a 5 % margin of error, prevalence of 44% and 5 % of non-response rate was taken to calculate the sample size. So, the Z value will be 1.96. The expected proportion(p) : the prevalence of ADHD among children with epilepsy in Gondar was 44%. So, p of 0.44 will be used to calculate the sample size. Precision(d): 5 % will be taken which means d= 0.05.

- **Sample size: n = z^2p(1-p)/d^2**

  = 1.96^2×0.44 × (1-0.44)/0.05^2

  =378

- **Since source population is < 10,000, I use correction formula**
- **I.e., corrected sample size is 205. (n= n_0/ (1+$n_{0/N}$).**

  With 5% non-response rate sample size would be 215.

4.5 Study design: A prospective cross- sectional study is used to study the comorbidity of Attention/Deficit hyperactivity Disorder in children with epilepsy in Tikur Anbessa Specialized Hospital.

4.6 Sampling method: simple random sampling method was used for all CWE visiting the neurology clinic were included until the final calculated size is reached.

4.7 Inclusion and exclusion criteria:

4.7.1 Inclusion criteria: Children 4 to 18 years of age with epilepsy and duration of epilepsy greater than or equal to 6 months were included in the study.

4.7.2 Exclusion criteria: Those with intellectual disability or comorbid systemic disease like cardiac patients, hematology and DM patients were excluded from the study.

4.8study variables:

4.8.1 Dependent variable: Magnitude of ADHD.

4.8.2 Independent variable: etiology (idiopathic vs symptomatic), seizure type (focal vs generalized), age of onset, number of seizures (no seizure, 1- 10 seizures, > 10 seizures in the past 6 months), duration of epilepsy, number of antiepileptic drugs (monotherapy, polytherapy), EEG finding (normal, epileptiform).

4.9Data collection tool: DSM 5 TR checklist for ADHD was used for diagnosing ADHD and identifying the predominant types of ADHD in children with epilepsy. DSM 5 TR criteria are published by American Psychiatric Association. They are the most commonly used criteria for the diagnosis of mental disorders. The alpha Cronbach value for DSM V ADHD diagnostic criteria is 0.88 so it is valid. For present study we include the ADHD. It has 18 criteria. Scores are presented for the three subtypes of ADHD; predominantly inattentive subtype: if they have 6 or more “often” or “very often” on items 1 to 9, predominantly hyperactive/impulsive subtype: if they have 6 or more “often” or “very often” on items 10 to 18, or combined subtype: if they meet for both. A structured questionnaire is developed to identify factors associated with ADHD, and patient records from EMR were revised to get seizure related factors. A detailed history was taken from parent/primary

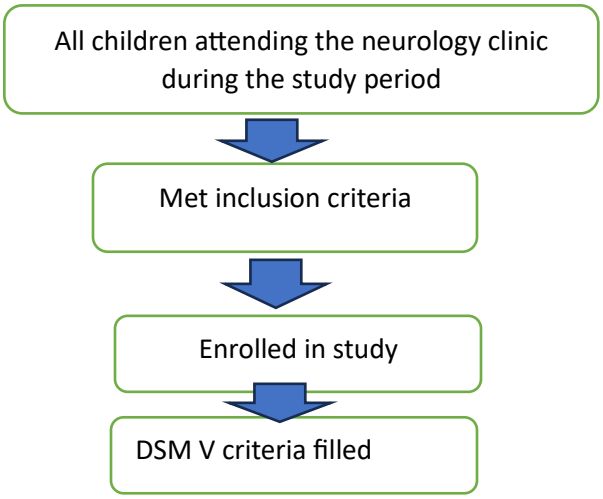
care giver and the patient on a preset questionnaire. This includes demographic profile, age at first seizure, seizure type, seizure frequency, duration of epilepsy, anti-epileptic drugs taken during past six months. Epilepsy is classified as per ILAE (International League against Epilepsy) 2017 classification. Family history regarding any family members having epilepsy, psychiatric illness is noted. Patients' academic performance including whether attends school or not, if not reason for not attending and any school failure is noted.

4.10 Data collection method: A pre – test was performed on 5 patients and no difficulties detected in data collection. Data were collected by a trained data collector. They are given incentives per each patient they fill. The principal investigator has monitored the data collection process. A structured questionnaire is developed to identify factors associated with ADHD, and patient records from EMR were revised to get seizure related factors. A detailed history has been taken from parent/primary care giver and the patient on a preset questionnaire. The data were collected consecutively until the calculated sample size is reached.

4.11 Data analysis: Data entry, cleansing and analysis was done using SPSS version 25. Frequencies and percentages were calculated for the different variables. Prevalence rates of comorbid ADHD among children with epilepsy were calculated. Bivariable analysis was used to detect the difference between patients with and without ADHD. Variables which show significant variation in the bivariable analysis were used for multivariable analysis using logistic regression. With ADHD as dependent variable odds ratio for epilepsy related factors were calculated.

4.12 Ethical clearance: Ethical approval was obtained from Research and Ethics Committee (REC) of the Department of Pediatrics and Child Health. Informed consent was obtained from parents/care givers, ensuring confidentiality and voluntary participation. Patient identifiers like name, phone number and address have been omitted.

Figure: plan of the study


All children attending the neurology clinic during the study period
Met inclusion criteria
Enrolled in study
DSM V criteria filled

5. Result

5.1 Sociodemographic characteristics of the study participants

Majority of the children were in the age group of 6-10 years and 64.4% were males. Forty-seven percent of the mothers had a primary education level and 41.5% of the fathers had a primary education level. Fifty-eight percent of the mothers were house wife and 91.7% of the parents were from urban area.

Variable	Frequency	Percent
Age (in years)		
1-5	42	20.5
6-10	95	46.3
≥10	68	33.2
Sex		
Female	73	35.6
Male	132	64.4
Maternal education		
Illiterate	22	10.7
Primary	97	47.3
Secondary	50	24.4
College and above	36	17.6
Paternal education		
Illiterate	12	5.9
Primary	85	41.5
Secondary	53	25.9
College and above	55	26.8
Maternal occupation		
Daily laborer	26	12.7
Government employee	35	17.1
House wife	120	58.5
Self employed	16	7.8
Unemployed	8	3.9
Paternal occupation		
Daily laborer	35	17.1
Government employee	60	29.3
Merchant	25	12.2
Private employee	50	24.4

Self employed	23	11.2
Unemployed	12	5.9
Residency		
Urban	188	91.7
Rural	17	8.3

Table 1. Sociodemographic characteristics of the study participants having epilepsy among children on follow up at Pediatric Neurology clinic, TASH, 2024.

5.2 Seizure related characters of the study participants

Majority (56.6%) of the study participants developed seizure at the age of 1-5 years and 41% of them had cryptogenic ethology. Sixty-three percent of them had generalized tonic-colonic type of seizure and 61.5% of them had seizure in the last 6 months. Forty-eight percent of the children had epilepsy for 2 to 5 years. Fifty-four percent of the children on monotherapy (one antiseizure medication).

Table 2. Seizure related characters of the study participants having epilepsy in follow up at TASH pediatric neurology clinic.

Variable.	Frequency	Percent
Age at onset of seizure (in years)		
<1	44	21.5
1-5	116	56.6
6-10	41	20
>10	4	2
Etiology		
Symptomatic	43	21.0
Cryptogenic	84	41.0
Idiopathic	78	38.0
Types of seizure		
Focal aware	9	4.4
Focal Impaired awareness	13	6.3
Focal to bilateral tonic-clonic	18	8.8
Generalized tonic-clonic	129	62.9
Absence	7	3.4
Generalized other	29	14.1
Presence of seizure in the last 6 months		
Yes	126	61.5
No	79	38.5
Duration of epileptics (in years)		
<2	19	9.3
2-5	99	48.3
5-10	60	29.3

>10	27	13.2
Anti-Seizure Medication		
Monotherapy	110	53.7
Polytherapy	95	46.3

5.3 Seizure risk related associated risk characteristics of the study participants

Twenty-three percent of the study participants had neurological deficit and 6.3% of them had 1st degree family history of epilepsy. Two-third of the children were attending schools and 37.6% of them had school failure.

Table 3. Seizure related associated characteristics of the study participants of children with epilepsy on follow up at TASH pediatric neurology clinic.

Variable	Frequency	Percent
Neurological associated deficit		
Yes	47	22.9
No	158	77.1
Family history of epilepsy in first degree relative		
Yes	13	6.3
No	192	93.7
Family history of psychiatric illness in first degree relative		
Yes	1	.5
No	204	99.5
Attends school		
Yes	141	68.8
No	64	31.2
School failure		
Yes	53	37.6
No	88	62.4
Have EEG finding		
Yes	168	82
No	37	18
Have CT/ MRI findings		
Yes	104	50.7
No	101	49.3
Known ADHD patients		
Yes	36	17.6
No	169	82.4

5.4 ADHD related characteristics of the study participants

This study found that the magnitude of ADHD was 59% as shown in the figure1 below

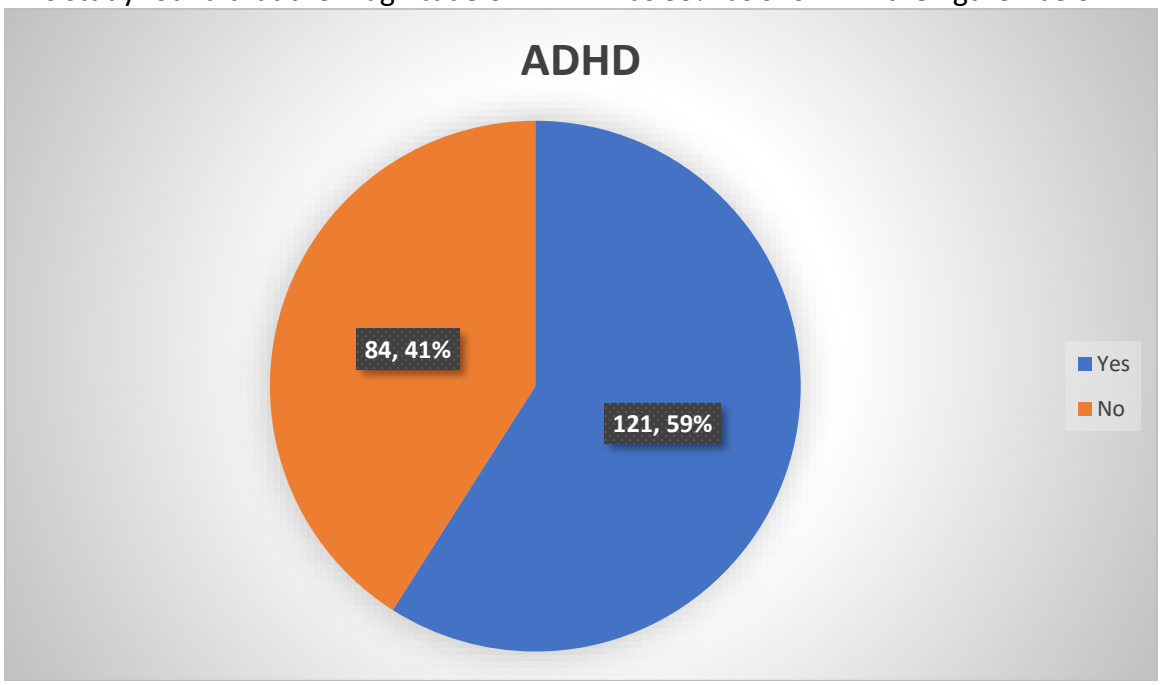


Figure 1. Prevalence of ADHD among children with epilepsy having follow up at Pediatric Neurology clinic, TASH, 2024.

Among the subtypes of ADHD, 49.8% of the children had inattentive type and 40.1% of them had hyperactive type. On the other hand, 30.7% had both inattentive and hyperactive disorder.

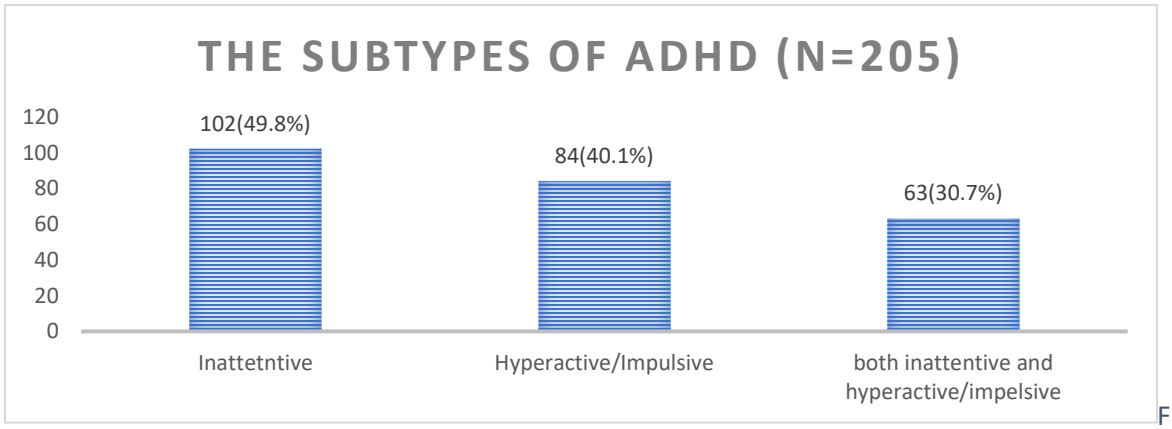


Figure 2. The subtypes of ADHD among children with epilepsy having follow up at Pediatric Neurology clinic, TASH, 2024.

Concerning to the specific measurement of ADHD, twenty-nine percent of the children often have difficulty of sustaining attention to tasks or play activities and 39% of the children often do not seem to listen when spoken to directly. Nineteen percent of the children often talk excessively and 14.1% of them had very often difficulty waiting his or her turn.

5.5 The associated risk factors of attention deficit/hyperactive disorder

In this study age of the child, presence of seizure in the last 6 months and ASM were found to have an association with ADHD by bivariable logistic regression. The multivariable logistic regression found that the ages of children aged 1-5 years and 6-10 years had 3.4 and 2.5 times increase the risk of ADHD compared to age >=10 years respectively (AOR=3.4, 95%CI=1.34, 8.68 & AOR=2.5, 95%CI=1.17, 5.19). children of those mothers whose occupation was self-employed and unemployed were 84% and 86% showing less likely risk of ADHD compared to daily laborer respectively. Children having seizure in the last 6 months had 4.2 times increased risk of ADHD compared to those children who do not have seizure in the last 6 months (AOR=4.2, 95%CI=2.14, 8.41) and study participants who use polytherapy were 2.4 times at increased risk of ADHD compared to monotherapy (AOR=2.4, 95%CI=1.21, 4.82).

Table 4.The bivariable and multivariable logistic regression of association between independent variables and outcome (ADHD) variable among children with epilepsy having follow up at Pediatric Neurology clinic, TASH, 2024.

Variables	**ADHD**		**P-value**	**COR with 95%CI**	**P-value**	**AOR with 95%CI**
	Yes	No				
Age (in years)						
1-5	29	13	0.037	2.4(1.05, 5.31)	0.010	**3.4(1.34, 8.68)**
6-10	59	36	0.086	1.7(0.93, 3.27)	0.018	**2.5(1.17, 5.19)**
≥10	33	35	1		1	
Mothers' occupation						
Daily laborer	16	10	1		1	
Government Employee	28	7	0.117	2.5(0.79, 7.85)	0.320	1.9(053, 6.93)
House wife	68	52	0.649	0.82(0.34, 1.95)	0.240	0.55(0.20, 1.49)
Self - Employed	6	10	0.134	0.38(0.10, 1.34)	0.018	**0.16(0.04, 0.73)**
Unemployed	3	5	0.240	0.38(0.07, 1.92)	0.042	**0.14(0.02, 0.93)**

Presence of seizure in last 6 months						
Yes	91	35	0.000	4.2(2.33, 7.73)	0.000	**4.2(2.14, 8.41)**
No	30	49	1		1	
Anti-Seizure Medication						
Monotherapy	53	57	1		1	
Polytherapy	68	27	0.001	2.7(1.51, 4.85)	0.012	**2.4(1.21, 4.82)**
Neurological deficit						
Yes	30	17	0.145	1.3(0.66, 2.55)	0.274	1.5(0.71, 3.35)
No	91	67	1		1	
First degree relative history of epilepsy						
Yes	10	3	0.187	1.41(0.11, 1.54)	0.118	0.16(.04, 1.73
No	111	81	1		1	

6. Discussion

The finding of this study revealed that, 59% of epileptic children developed ADHD. The finding of the study was in line with the study done in China [38]. This finding was higher than the study of the meta-analysis (22.3%) [(37)] and in various population studies. Africa (31.3%%) [(34)] and in Ethiopia (44.2%) [(35).] This comorbidity may be due to ADHD and epilepsy often affect areas of the brain involved in attention, impulse control, and executive functions, particularly in the frontal lobe. Children with epilepsy may have disruptions in these brain circuits, which can increase the risk of developing ADHD. On the other hand, some anti-epileptic drugs used to control seizures have side effects that can mimic or exacerbate ADHD symptoms, such as impulsivity, hyperactivity, or inattention. For example, medications like phenytoin and valproate can have cognitive side effects, and prolonged use may affect executive functioning, leading to symptoms similar to those of ADHD.

Children aged 1-5 years and 6-10 years had 3.4- and 2.5-times increased risk of ADHD compared to age >=10 years respectively (AOR=3.4, 95%CI=1.34, 8.68 & AOR=2.5, 95%CI=1.17, 5.19). This may be due to adolescents being more likely to hide or mask their symptoms, especially in environments where attention and academic performance are more heavily scrutinized. As a result, the diagnosis might not be as readily made in older children or teens. Uncontrolled seizure and use polytherapy were identified risk factors for ADHD among children with epilepsy in current study and in the study done in India/2018. [36]

Children having seizure in the last 6 months had 4.2 times increased risk of ADHD compared to those of without seizure in the last 6 months (AOR=4.2, 95%CI=2.14, 8.41). This may be due to children often experience a postictal state, which is a period of confusion, drowsiness, and cognitive sluggishness. This recovery period may cause attention problems, irritability, and other behavior changes that may mimic ADHD symptoms.

Study participants who use polytherapy had a 2.4 times increased risk of ADHD compared to monotherapy (AOR=2.4, 95%CI=1.21, 4.82). This was may be due to children who are on polytherapy may also experience higher levels of fatigue due to the combined sedative effects of the drugs. This can affect their ability to focus, learn, and engage socially, which can

contribute to behaviors commonly associated with ADHD. Given the cognitive side effects of polytherapy, it's possible that ADHD symptoms could be over diagnosed or mistakenly attributed to ADHD when they are actually the result of medication side effects or seizure-related cognitive deficits. Children on polytherapy may appear more hyperactive, impulsive, or distracted, which may be misinterpreted as ADHD, even though the symptoms are drug-induced.

7. Conclusion

In this study a significantly high burden of ADHD and inattentive types of ADHD were slightly higher than hyperactive type. The determinant factor affecting ADHD were children age 1-5 years and 6-10 years having 3.4 and 2.5 increased risk compared to age >=10 years respectively (AOR=3.4, 95%CI=1.34, 8.68 & AOR=2.5, 95%CI=1.17, 5.19), The risk of children having seizure in last 6 months compared to those of who have no seizure in the last 6 months (AOR=4.2, 95%CI=2.14, 8.41) and use of polytherapy compared to monotherapy (AOR=2.4, 95%CI=1.21, 4.82).

8. Recommendation

To reduce ADHD-like symptoms among epileptic children requires a comprehensive approach that takes into account various factors:

- ✓ Seizure control is a primary concern in children with epilepsy. Frequent or uncontrolled seizures can exacerbate ADHD-like symptoms, such as inattention, impulsivity, and hyperactivity.
- ✓ Consider medications with fewer cognitive side effects.
- ✓ Early intervention with specialized education is important to address both seizure-related cognitive deficits and ADHD symptoms.
- ✓ Consistency in daily routines is important for both children with epilepsy and those with ADHD symptoms. Children with seizures may benefit from regular sleeping, eating, and activity schedules that help them feel stable and secure.

9. Limitations of the study:

- ✓ The data collection was from direct interview of the parents which may be prone to recall bias.
- ✓ The cross- sectional design of the study cannot allow to make causal relationship.

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Annex 1: DSM 5 ADHD symptom checklist

Age _____ Sex_____ Date_____
Completed by: _____
_____

For each item below, circle the answer that best describes this child. 0=Not at all; 1=Just a Little; 2=Often; 3= Very Often

Inattention Symptoms

1. Fails to give attention to details or makes careless mistakes in schoolwork, work, or during other activities (e.g., overlooks or misses details, work is inaccurate).

0 1 2 3

2. Has difficulty sustaining attention to tasks or play activities (e.g., has difficulty remaining focused during lectures; conversations; or lengthy reading). 0 1 2 3

3. Does not seem to listen when spoken to directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction). 0 1 2 3

4. Does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked. 0 1 2 3

5. Has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized with work; has poor time management; fails to meet deadlines).0 1 2 3

6. Avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers).0 1 2 3

7. Loses things necessary for tasks or activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones). 0 1 2 3

8. Is easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts). 0 1 2 3

9. Is forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments).

0 1 2 3

Hyperactive Symptoms

10. Fidgets with or taps hands or feet or squirms in seat 0 1 2 3

11. Leaves seat in situations in which it is inappropriate (NOTE: in adolescents or

adults may be limited to feelings of restlessness). 0 1 2 3
12. Unable to play or engage in leisure activities quietly 0 1 2 3
13. Has difficulty playing or engaging in leisure activities quietly 0 1 2 3
14.Is “on the go” or acts as if “driven by a motor” (e.g., is unable to be or uncomfortable being still for extended time in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with) 0 1 2 3
15. Talks excessively 0 1 2 3
Impulsive Symptoms
16. Blurts out an answer before question has been completed (e.g., completes people’s sentences; cannot wait for turn in conversation). 0 1 2 3
17. Has difficulty waiting his or her turn (e.g., while waiting in line). 0 1 2 3
18. Interrupts or intrudes on others (e.g. butts into conversations, games, or activities; may start using other people’s things without asking or receiving permission; for adolescents and adults may intrude into or take over what others are doing) 0 1 2 3

Approximately when did you first notice the behaviors that occur often or very often?
Do these symptoms impair the person’s functioning in two or more settings? Yes No
Where is there impairment? (circle all that apply) Home School Socially
Scoring Instructions
To meet DSM-V criteria for ADHD in childhood, a child must have at least 6 responses of "Often" or "Very Often" (scored 2 or 3) to either the 9 inattentive items (1-9) or the 9 hyperactive-impulsive items (10-18), or both. For older adolescents and adults (age 17 and older), at least five symptoms are required. The clinician may consider ADHD as a possible diagnosis if 5 or more symptoms are scored 2 or 3 in either one or both domains. In addition, symptoms must have occurred by age 12, they must impair the individual's functioning in two or more settings, and they must not be primarily due to any other factors or conditions. Depending on the domains affected, ADHD, predominantly inattentive type; ADHD, predominantly hyperactive-impulsive type; or ADHD, combined type may be considered

ANNEX 2: QUESTIONNAIRE

Identification:

Patient's code: _____

Age: _____ Sex: _____

Occupation: Father _____ Mother_____

Adress: A. Urban B. Rural

Region: A. AA B. Oromia C. Other (specify)

Father's education: _____

Mother's education: _____

Epilepsy related factors:

1. Age at onset of seizure: _____
2. Etiology: A. idiopathic B. cryptogenic C. symptomatic
3. Type of seizure:
   A. Focal aware
   B. Focal impaired awareness
   C. Focal to bilateral tonic – clonic
   D. Generalized tonic-clonic
   E. Unknown onset
   E. Generalized other
   F. Absence
4. Seizure frequency in the past 6 months: _____
5. Duration of epilepsy: _____
6. ASM: A. Monotherapy B. Polytherapy
7. ASM name and dosage: _____
8. Any associated neurological deficit: A. yes B. No
   Describe: _____
9. Family history of epilepsy (first degree relative): A. Yes B. No
10. Family history of psychiatric illness (first degree relative): A. Yes B. No
    Specify: _____
11. Attends school: A. Yes B. No

12. Reason for not attending school: A. Epilepsy B. ADHD C. other
13. School failure: A. Yes B. No
14. Do they have EEG finding: A. Yes B. No.
15. If yes Describe A. normal B. epileptiform discharges C. other specify
16. Do they have CT/MRI: A. Yes. B. No
17. If yes, A. Normal B. Abnormal (specify)
18. Known ADHD A Yes B. No

ANNEX 3: PARENT INFORMATION SHEET

Epilepsy is a common neurological disorder in children. Children with epilepsy may have various kinds of behavior problems. These problems may lead to poor quality of life.

Aim of study

We invite your child to participate in this study that looks for the prevalence of ADHD in epileptic children and also looks for associated risk factors.

Study procedure

213 children will be included in the study. Pediatric residents in the neurology department will fill the ADHD DSM 5 checklist while in neurology department. This is a questionnaire, which assesses behavior problem during past 6 months.

Expected duration of the subject participation

After enrollment in study, it will require 10-15 minute.

Risk from study

No risk is anticipated from therapy

Benefit from the study

If the participant is found to be suffering from behavior problem, he will be treated appropriately. Treatment is not a part of study.

Complication

No complications are anticipated. However, complication may occasionally arise due to primary disease in patient. Treatment of such complication will be carried out as required. No financial compensation will be provided for such complication.

Confidentiality

All information collected in this study will be kept strictly confidential, except as may be required by law. Your child or family will be not be identified by name if the results of study are published.

Rights of the participants

Participation in the study is voluntary. Refusal to participate will not influence care of your child in this hospital in any way. Though we would like all study participants to complete the study, you are free to withdraw from study at any time during the course of study. If at any time during the course of study, you have any questions or concern related to the study you may contact the following doctor.

Dr. Firezer Milashu

Tel: 0966358095.

Email; firezeraau@gmail.com

ANNEXURE 4: CONSENT FORM

I have had the study explained to me and have read the contents of this form (parent information sheet)/had the content of this form read to me. I have been given the opportunity to ask questions and have them answered to my satisfaction. I am willing for my child to be enrolled in the study.

Name of subject:

Signature of parent/guardian:

Name:

Relationship to subject:

Date:

ANNEX 5: Amharic version of ADHD DSM 5

ከዚህ በታች ለተዘረዘሩት ለእያንዳንዱ ነገር የዚህን ልጅ ከሁሉ በተሻለ መንገድ ለመግለጽ የሚያስችል መልስ ክበብ ። 0=በፍፅም አይደለም፤ 1=ትንሽ ብቻ፤ 2=ብዙ ጊዜ፤ 3= በጣም ብዙ ጊዜ

በትኩረት አለመከታተል ምልክቶች

1. . ለዝርዝሮች ትኩረት አለመስጠት ወይም በትምህርት ቤት ሥራ፣ በሥራ ወይም በሌላ ጊዜ ግድየለሽ ስህተቶችን ያደርጋል (ለምሳሌ ዝርዝር ጉዳዮችን ችላ ብሎ ይመለከታል ወይም ይሳሳታል, ስራ ትክክል አይደለም). 0, 1, 2, 3
2. .ለስራዎች ወይም ለጨዋታ እንቅስቃሴዎች ትኩረት መስጠት ይቸግረዋል (ለምሳሌ፣ ትኩረት ሰጥቶ ለመቀጠል ተቸግሯል በንግግሮች ወቅት፤ ውይይት፤ ወይም ረዘም ያለ ንባብ) 0,1,2,3
3. በቀጥታ ሲነገር የሚሰማ አይመስልም (ለምሳሌ ግልጽ የሆነ ትኩረትን የሚከፋፍል ባይኖርም አእምሮ ሌላ ቦታ ይመስላል) ።) 0,1,2,3
4. የተሰጠውን መመሪያ አይከተልም፤ እንዲሁም የትምህርት ቤት ሥራዎችን፣ የቤት ውስጥ ሥራዎችን ወይም ሥራዎችን ሳይጨርስ ይቀራል (ለምሳሌ፣ ሥራዎችን ቢጀምርም ቶሎ ትኩረት ያጣና በቀላሉ ትኩረት ሊያሳጣው ይችላል።) 0,1,2,3
5. ስራዎችን እና እንቅስቃሴዎችን ለማደራጀት ይቸገራል (ለምሳሌ፣ ተከታታይ ስራዎችን ማስተዳደር፣ ቁሳቁሶችንና ንብረቶችን በቅደም ተከተል ማስያዝ መቸገር፤ በስራ ያልተደራጁ፤ የጊዜ አጠቃቀም ደካማ፤ የጊዜ ገደብ ሳያሟሉ መቅረት) 0, 1, 2,3
6. ዘላቂ የሆነ የአእምሮ ጥረት የሚጠይቁ ሥራዎችን ከመሥራት መጥላት ወይም ከመሥራት መቆጠብ (ለምሳሌ፣ የትምህርት ቤት ስራ ወይም የቤት ስራ፤ በዕድሜ ለገፉ ወጣቶችና ለአዋቂዎች, ሪፖርቶችን ማዘጋጀት, ቅጾችን ማጠናቀቅ, ረጅም ወረቀቶችን መከለስ.) 0,1,2,3
7. ለስራዎች ወይም እንቅስቃሴዎች አስፈላጊ የሆኑ ነገሮችን መጣል (ለምሳሌ, የትምህርት ቤት ቁሳቁሶች, እርሳሶች, መፅሐፍት, መሳሪያዎች, የኪስ ቦርሳዎች, ቁልፎች, የወረቀት ስራዎች, መነጽር, የተንቀሳቃሽ ስልክ). 0,1,2,3
8. በውጫዊ ማነቃቂያዎች በቀላሉ ትኩረት ይከፋፈላል። (በጉርምስና ዕድሜ ላይ ለሚገኙ ወጣቶችና ለአካለ መጠን የደረሱ ሰዎች ያልተዘመዱ ሀሳቦችን ሊያካትት ይችላል) ።) 0,1,2,3

9. በዕለት ተዕለት እንቅስቃሴዎች መዘንጋት (ለምሳሌ የቤት ውስጥ ሥራዎችን መሥራት፣ ሥራ መሥራት፤ በዕድሜ ለገፉ ወጣቶችና ለአዋቂዎች፣ ስልክ በመመለስ፣ ወጪ በመክፈል፣ ቀጠሮ በመያዝ) 0,1,2,3

ከፍተኛ እንቅስቃሴ የሚያደርጉ ምልክቶች

10. ወንበር ላይ ተቀምጦ ያሽከረከራል። በወንበር ላይ እጆችን ወይም እግሮችን ያርገበግበዋል። 0,1,2,3
11. ተገቢ ባልሆኑ ሁኔታዎች ውስጥ መቀመጫውን ይተዋል. (መቀመጫውን ትቶ ይወጣል።) (በጉርምስና ዕድሜ ላይ የሚገኙ ወይም አዋቂ የሆኑ ሰዎች በመረበሽ ስሜት ብቻ የተወሰነ ሊሆን ይችላል) ። 0,1,2,3
12. በጸጥታ መጫወትም ሆነ በመዝናኛ እንቅስቃሴዎች መካፈል አለመቻል) ። 0,1,2,3
13. በጸጥታ መጫወት ወይም በመዝናኛ እንቅስቃሴዎች መካፈል ይቸግረዋል ። 0, 1, 2, 3
14. "በሞተር የሚነዳ" ነው። (ለምሳሌ በምግብ ቤቶች፣ በስብሰባዎች ላይ አሁንም ረዘም ያለ ጊዜ ማሳለፍ አይችልም፤ ሌሎች እንደ መረበሽ ወይም ለመራመድ አስቸጋሪ እንደሆኑ ሊያጋጥማቸው ይችላል) ። 0,1,2,3
15. ከመጠን በላይ መናገር።0,1, 2, 3

የችኩልነት ስሜት

16. ጥያቄው ከመጠናቀቁ በፊት ቶሎ መልስ መስጠት ። (ለምሳሌ የሰዎችን ዓረፍተ ነገር ያጠናቅቃል፤ ጭውውት እስኪመጣ መጠበቅ አይቻልም።)
17. ተራውን መጠበቅ ይቸግራል ። (ለምሳሌ በመስመር እየተጠባበቅን) ። 0,1,2,3
18. ሌሎችን ያቋርጣል ወይም ጣልቃ መግባት ። (ለምሳሌ ያህል፣ በጭውውት፣ በጨዋታ ወይም በድርጊት ውስጥ መግባት፤ ፈቃድ ሳይጠይቁ ወይም ሳይቀበሉ የሌሎችን ነገሮች መጠቀም ሊጀምሩ ይችላሉ፤ በጉርምስና ዕድሜ ላይ የሚገኙ ወጣቶችም ሆኑ አዋቂዎች ሌሎች የሚያደርጉትን ነገር ሊገቡ ወይም ሊቆጣጠሩት ይችላሉ) ። 0,1,2,3

የወላጅ መረጃ ወረቀት

የሚጥል በሽታ በልጆች ላይ የሚከሰት የተለመደ የነርቭ ችግር ነው። የሚጥል በሽታ ያለባቸው ልጆች የተለያዩ የባሕርይ ችግሮች ሊያጋጥሟቸው ይችላሉ። እነዚህ ችግሮች የኑሮ ችግር ሊያስከትሉ ይችላሉ ።

የጥናት ዓላማ

ልጃችሁ የሚጥል በሽታ በለባቸው ሕፃናት ላይ የ ADHD ስርጭት መኖሩን ለማወቅና ከዚህ ጋር ተያይዘው የሚመጡ አደገኛ ሁኔታዎችን ለማወቅ በሚደረገው በዚህ ጥናት እንዲካፈል እንጋብዛለን።

የጥናት ሂደት

በጥናቱ ውስጥ 213 ልጆች ይካተታሉ። በ ኒውሮሎጂ ክሊኒክ ውስጥ የሚገኙ ሐኪሞች በነርቭ ክፍል ውስጥ እያሉ ADHD DSM 5 የምርመራ ዝርዝር ይሞላሉ። ይህ ባለፉት 6 ወራት ውስጥ የባህርይ ችግርን የሚገመግም ጥያቄ ነው ።

የተሳትፎ የሚጠበቅበት ጊዜ

በጥናት ከተመዘገቡ በኋላ 10-15 ደቂቃ ያስፈልጋል።

የጥናቱ ጥቅም

ተሳታፊው በባህርይ ችግር እየተሰቃየ መሆኑ ከተገኘ ተገቢውን ህክምና ያገኛል። ሕክምና የጥናት ክፍል አይደለም ።

የጥናቱ አደጋ

ከጥናቱ ምንም አይነት አደጋ አይጠበቅም ።

ምሥጢራዊነት

በዚህ ጥናት ውስጥ የሚሰበሰቡት መረጃዎች በሙሉ በጥብቅ ምስጢራዊ ሆነው ይቆያሉ። የጥናቱ ውጤት ከወጣ ልጃችሁ ወይም ቤተሰባችሁ በስም አይታወቁም።

የተሳታፊዎቹ መብት

በጥናቱ መሳተፍ በፈቃደኝነት የሚደረግ ነው ። ለመሳተፍ ፈቃደኛ አለመሆን በዚህ ሆስፒታል ውስጥ ልጃችሁን በመንከባከብ ላይ ምንም ዓይነት ተጽዕኖ አያሳድርም። ሁሉም የጥናት ተሳታፊዎች ጥናቱን እንዲያጠናቅቁ ብንፈልግም በጥናታችሁ ወቅት በማንኛውም ጊዜ ከጥናት

ለመውጣት ነፃ ናችሁ። በጥናት ወቅት በማንኛውም ጊዜ ከጥናቱ ጋር የተያያዙ ጥያቄዎች ወይም አሳሳቢ ጉዳዮች ካሉህ የሚከተለውን ሐኪም ልታነጋግረው ትችላለህ ።

Dr. Firezer Milashu

Tel: 0966358095.

የስምምነት ፎርም

ጥናቱን አስረድቶኝ የዚህን ቅጽ ይዘት (የወላጅ መረጃ ወረቀት)/ አንብቤአለሁ/የዚህ ቅጽ ይዘት እንዲነበብልኝ አድርጌያለሁ። ጥያቄዎችን የመጠየቅና ለእርካታዬ መልስ የመስጠት አጋጣሚ ተሰጥቶኛል ። ልጄ በጥናቱ እንዲመዘገብ ፈቃደኛ ነኝ ።

የተሳታፊ code; _____

የ ወላጅ/የተንከባካቢ ፊርማ _____

ስም፡- _____

ተሳታፊ ጋር ግንኙነት_____

ቀን፡-_____