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Assessment of school performance among children with Epilepsy Khartoum, Sudan 2022: Thesis submitted for partial fulfilment of MBBS

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MBBS Research Project titled Assessment of school performance among children with epilepsy Khartoum sudan 2022, Ahfad University for women, Omdurman, Sudan

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Abstract

Background: Epilepsy is a common disease among children and its impact on school and social life have ever been underestimated and stigmatized.

Objectives: The aim of this study is to assess the school performance among children with epilepsy and to measure the association between school performance and some children characteristics (age, gender, type and severity of epilepsy).

Patients and Methods: This study was a cross-sectional hospital-based, it was conducted at Fath Al Rhman outpatient referral clinic, pediatrics' neurology unit involving 97 children aged between (6-18) diagnosed with primary epilepsy.

Results: Our results showed that the majority were less than 15 years with slight male predominance at 55%, the majority had generalized epilepsy and mostly was well controlled. furthermore, we found that epilepsy significantly impacted patients in their school performance where around third of our participant (30.9%) have poor grades and (32%) have average grades. We found that there is a high-rate of school absenteeism with only (21%) attending regularly. Regarding cognitive function the majority of our participant (69%) recorded attention problems and (63%) having writing problems, where (62%) have memory problems and only (39%) have language problems. Concerning the social life, the majority (61%) showed good participation in school activities and sports and major part of the participants (70%) play outside freely and (87%) are able to form friendship normally. The result revealed the impact of epilepsy in mood and behavior is significant with (51%) recorded aggressive behavior.

Conclusions: we concluded that the impact of epilepsy on the school and social life of affected children is quite significant.

Keywords: Epilepsy in Children; Pediatric Neurology; Aggressive Behavior in Children; Cognitive Function; Attention Problems in Children

Introduction

Background:

Epilepsy is a common long-term brain condition. It causes seizures, which are bursts of electricity in the brain. There are four main types of epilepsy: focal, generalized, combination focal and generalized, and unknown. A person's seizure type determines what kind of epilepsy they have. Different types of seizures affect the brain in different ways. For example, focal seizures affect only one part of the brain, whereas generalized seizures affect the entire brain. To be categorized as having epilepsy, a person must experience two or more unprovoked seizures. Some people can receive an epilepsy diagnosis if they have had one seizure and a doctor thinks they have a high likelihood of having another [1]. Epilepsy represents a significant cause of morbidity as it is considered to be the most common cause of referral to outpatient pediatric neurology clinics [2] it is a progressive and complex

disease with an unpredictable and debilitating nature Coupled with the social stigma surrounding it and the economic burden associated with it, its effects extend not only to the individual suffering from it, but also to the family unit as a whole [3,4].

This is often characterized by stigmatization, dependence, low self-esteem, depression and emotional instability alongside social, occupational and financial restrictions Families of children with epilepsy are more likely than families of healthy children to experience social and marital issues, impaired parent-child relationships, and higher levels of stress, depression and anxiety [5,6]. In addition, disease burden may worsen associated depression [7,8], Mothers in particular often assume the role of primary caregivers to their children [9] and are therefore at a higher risk of developing psychological issues, e.g., depression [10,11]. It is therefore important not only to consider the effect that pediatric epilepsy has on the child, but also on other family members including caregivers and siblings. School-related difficulties, as evidenced by receipt of special educational services, are common in children with epilepsy [3,4]. It is likely that many of the difficulties that are experienced by children with epilepsy at school arise because of the association with global cognitive impairment. However, it is also possible that school-based difficulties experienced by children with epilepsy are due to difficulties in academic achievement independent of global cognitive impairment. Children with epilepsy are at risk of academic underachievement which can lead to poor social outcomes and contribute to underemployment or unemployment in adulthood.

Problem Statement

Epilepsy is a chronic disorder that significantly affects learning and behavior. the rapid increase in epilepsy is a worrisome problem, school-age children with chronic illnesses are known to have academic problems but children with epilepsy are more vulnerable to educational problems than any other chronic illness.

Justification

The aspect of life quality and educational achievement among epilepsy patients is important yet it's ignored problem and thus putting a light on a such problem will be of great importance. According to our best knowledge no recent research has been done in Sudan thus this research will be of great importance and will trigger future work.

Objectives

General

To assess the school performance among children with Epilepsy.

Specific

1. To assess the academic achievement in term of student's grades.
2. To Measure the rate of absenteeism among school age children with Epilepsy.
3. To measure the association between school performance and some children characteristics (age, gender, type and severity of epilepsy, social stigma).

Literature Review

Literature review

Epilepsy is affecting approximately 46 million people globally and therefore is one of the most common neurological disorders worldwide [12]. Epilepsy is a chronic disease of the CNS that affects individuals of all ages and has a worldwide distribution [13].The cardinal manifestations of epilepsy are epileptic seizures: that is, recurrent paroxysmal events characterized by stereotyped behavioral alterations reflecting the neural mechanisms involved in the epileptic process [14].The diagnosis of epileptic seizures and epilepsy and ascertainment of the cause are difficult tasks, especially in low-income countries where socioeconomic and cultural constraints are obstacles to the recognition and acceptance of the disease [15]. The recurrence of seizures and their physical and psychological consequences make epilepsy a burdensome neurological disorder. However, medical treatment of epilepsy with first-line antiepileptic drugs can render up to 70% of patient's seizure free when adequately treated [16].

Definition

The reference definition for epilepsy was based on the International League Against Epilepsy (ILAE) Guidelines for Epidemiologic Studies on Epilepsy,which defined an epilepsy case as someone with an active, recurrent condition of epileptic seizures (two or more) unprovoked by an immediate cause and who has had at least one epileptic seizure in the past 5 years regardless of antiepileptic drug treatment [17].

Symptoms

Because epilepsy is caused by abnormal activity in the brain, seizures can affect any process your brain coordinates. Seizure signs and symptoms may include:

1. Temporary confusion.
2. A staring spell.
3. Stiff muscles.
4. Uncontrollable jerking movements of the arms and legs.
5. Loss of consciousness or awareness.
6. Psychological symptoms such as fear, anxiety or Deja vu [18].
7. seizure is the clinical manifestation of epilepsy. This occurs basically due to excessive firing of the neurons and fast spread of these impulses over the brain. Thus, there are two phenomena in the pathophysiology of a seizure:

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- hyper-excitability of a neuron
- hyper synchronization

Hyper synchronization means that a hyper-excitable neuron leads to excessive excitability of a large group of surrounding neurons. This means that when a large electrical impulse is generated in one part of the brain from a focus of tissues millions of neurons in the brain fire excessively in addition bringing on a seizure. Seizure is defined as an "involuntary alteration of behavior with or without loss of consciousness accompanied by an abnormal electrical discharge in the brain. Seizures may be due to a reason or reactive seizures or may be without cause (idiopathic). Reactive seizures occur in normal nonepileptic tissue. This may be seen in cases like those with hypoglycemia who develop seizures due to excessive low blood sugar. Seizures may also occur in patients with encephalitis or meningitis due to inflammation of the brain tissues. Other causes include low blood sodium (hyponatremia), severe dehydration, low blood oxygen (hypoxia) etc. Idiopathic epileptic seizures occur in chronically epileptic tissue. The steps by which a normal brain tissue become epileptic is called palatogenesis. The normal neuronal networks become hyper-excitable networks. There are various factors which may lead to epileptogenic. This includes genetic predisposition, infections or induced by medications.

Types of seizures

There are two types of seizures - partial and generalized. The difference between the two is loss of consciousness. In partial cases a focal point of the brain is affected. In generalized seizures the impulses come out from both sides of the brain at the same time. Partial seizures may generalize; start from one site in the brain and spread to involve the whole brain. This is called secondary generalization.

Neuronal Excitability

Neuronal messages are transmitted by electrical impulses called the Action Potential. This is actually a net positive inward ion flux that leads to depolarization or voltage change in the neuronal membrane. The ions involved include sodium, potassium, calcium and chloride. Normally brain tissues prevent hyper excitability by several inhibitory mechanisms involving negative ions like chloride ions. Disturbance in this normal excitability leads to hyper-excitability. In this state there is increases excitatory transmission of impulses and decreases inhibitory transmission. In addition, there is alteration in the voltage gated ionic channels. These ion channels normally open when the voltage difference across the neuronal membrane is changed favorably. Once activated the impulses flow via the neuronal circuits along the axons of the nerves. An action potential travels down the axon to the terminal buttons and then releases neurotransmitters in the synaptic cleft. This carries the action potential from one nerve to another.

Transmission

There are two types of transmission of impulses - excitatory and inhibitory. Excitatory transmission involves Glutamate that is the principal excitatory neurotransmitter in the brain. GABA or Gamma amino butyric acid is the principal inhibitory neurotransmitter in the brain. There are two groups of glutamate receptors - Ionotropic (NMDA receptors) that modulate calcium and sodium channels and are responsible for fast synaptic transmission and Metabotropic (non-NMDA receptors) that are for slow synaptic transmission. GABA is mediated via Chloride and Potassium channels.

Mechanism of seizure formation

Excitation of a group of nerves. This is caused by inward currents of Na, Ca and involvement of excitatory neurotransmitters like Glutamate and Aspartate. Too little inhibition. Epileptogenic and hyperexcitability and hyper synchronization of neurons that facilitates spread. There has to be abnormal synchronization - a property of a population of neurons to discharge together independently. Alone, a hyperexcitable neuron cannot generate a seizure [19].

Treatment

Treatments include:

1. Medicines called anti-epileptic drugs (AEDs)

2. Surgery to remove a small part of the brain that's causing the seizures

3. A procedure to put a small electrical device inside the body that can help control seizures

4. A special diet (ketogenic diet) that can help control seizures

Types of AEDs:

There are many AEDs., Common types include:

- sodium valproate
- carbamazepine
- lamotrigine
- levetiracetam
- topiramate

AEDs are available in a number of different forms, including tablets, capsules, liquids and syrups.

Common side effects of AEDs include:

- drowsiness
- a lack of energy
- agitation

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- headaches
- uncontrollable shaking (tremor)
- hair loss or unwanted hair growth
- swollen gums
- rashes

Ketogenic diet

A ketogenic diet is a diet high in fats, and low in carbohydrates and protein. In children, the diet is thought to make seizures less likely by changing the levels of chemicals in the brain. The ketogenic diet was one of the main treatments for epilepsy before AEDs were available. But it's now not widely used in adults because a high-fat diet is linked to serious health conditions, such as diabetes and cardiovascular disease.

Previous Studies

Robert Vinicius Aguiar, Kouhiro Danielle McBrian and Marilisa M. Guerreiro Elizabeth Montenegro [20] conducted a study about Seizure impact on the school attendance in children with epilepsy in 2007 in Brazil. The juvenile epilepsy clinic at the University of Campinas conducted this prospective study. They signed up 50 children who had been diagnosed with epilepsy in a row. One of the authors conducted semi-structured interviews with parents while utilizing a questionnaire that particularly asked about how epilepsy affected the child's academic life. Ages of the 50 patients tested ranged from 6 to 18 years old (mean = 11), with 34 boys and 16 girls. Eighty-eight percent of the study's participants missed at least one day of school as a result of seizures. Parents cited seizures (75%), medical appointments (79.5%), epilepsy-related testing (EEG, MRI, etc.), 68.2%, and other (0.03%) as the reasons their children missed school. Nearly half of the parents (46%) said the child should leave school right away if they experienced a seizure while they were there. Even if the child was healthy and had no seizures that day, 60% of families allowed the child to miss a day of school. 12.5% of the patients who had siblings had a brother or sister who missed at least one day of school because of the epilepsy.

On August 9, 2014, Desta B. Ali, Durodami R. Lisk, and Michael Tomek [21] conduct research on the effects of epilepsy on child education in Sierra Leone. The data for this study were gathered at different epilepsy clinics and schools in Freetown, Sierra Leone. A total of 150 children were surveyed, including 50 patients who were interviewed and their teachers and carers. 51 percent of the kids missed more than five days of school each month. Ninety percent abstained from activities and sports, with the most frequent excuse being a fear of epileptic convulsions. 36 percent of respondents claimed to have encountered rude behaviors from their classmates. In terms of the carers, 48% thought epilepsy was a medical condition, while 34% thought it was a manifestation of the devil. Forty-eight% of these parents were worried about bringing their kids to school, with 83% of them citing concerns about seizures and possible injury. Only 8% of parents allowed their kids to participate in any physical activity at school. 10% of teachers thought epilepsy was contagious, and 16% thought it was a manifestation of the devil. Children with epilepsy should attend school, according to 14% of respondents, but 80% would forbid them from participating in sports and games. 48% of people would restrain a kid suffering a seizure, 12% would put something hard in the kid's mouth, and 12% would stay away from any physical contact. 20% of all the kids quit going to school permanently; Positivity among classmates (p 0.001), having an uneducated caregiver (p 0.02), and experiencing daily seizures all indicated a significant connection with permanent termination of schooling. The study shows that epilepsy has a serious negative impact on children's schooling. Notably, the causes of a student's lifelong expulsion from school seem to have more to do with attitudes than with the actual medical characteristics of the illness. Thus, the statistics emphasize the need for educational initiatives to address the widespread false beliefs that both teachers and caregivers hold.

In another similar study done by Abiodun O. Adewuya, Saheed B. A. Oseni, and John A. O. Okeniyi [22-24] about School Performance of Nigerian Adolescents with Epilepsy The study assessed the school performance of Nigerian adolescents with epilepsy compared with healthy controls and examined the variables correlating with their academic difficulties. The school grades of 73 adolescents with epilepsy aged 12 to 18 years over the past academic year were com-pared with the grades of their classmates of the same age and gen-der. Risk factors possibly associated with school performance, such as adolescent variables (age, gender, perceived stigma, attitude toward epilepsy, and psychopathology), seizure variables (age at onset of illness, years of illness, types of seizures, and frequency of seizures per month), drug variables [types of antiepileptic drugs (AEDs), number of AEDs and side effects of AEDs], and family variables (family's socioeconomic status, family functioning, caretakers' psychopathology, and caretakers' perceived stigma) were assessed. They found that the mean school grades of adolescents with epilepsy are significantly lower than are those of their healthy controls in all subjects. The variables that significantly predict poor school performance in adolescents with epilepsy in-clued psychopathology in the caretaker, adolescents 'perceived poor family functioning, adolescents' attitude toward the illness, adolescents' felt stigma, externalizing symptoms in the adolescents, and duration of illness. The mean scores in the English language, mathematics, and mean overall total scores of the adolescents with epilepsy over the past three terms (1 academic year) were compared with those of their healthy classmates of the same age and sex. The healthy controls were found to have performed significantly better than the epilepsy groups in all the subject areas.

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In regional area Whitney Fitts, Nana Tassiou Rahamatou, Cisse Fode Abass, André C. Vogel, Atakla Hugues Ghislain, Foksouna Sakadi, Qiu Hongxiang, Mohamed Lamine Conde, and Amadou Talibé Baldéb Abdoul Bachir (24). Conducted a Research on Children with epilepsy in the Republic of Guinea and their school status At the Ignace Deen Hospital in Conakry, children with epilepsy of school age were enlisted through press releases and a clinical record of epilepsy patients in 2018. Each CWE and parent underwent an interview with a group of Guinean and American neurologists and neurologists-in-training regarding their history of epilepsy, household finances, level of education, and perceptions of stigma using the Stigma Scale of Epilepsy (SSE). Additionally, the Wechsler Nonverbal Scale of Ability was administered to each kid (WNV). Low academic performance was characterized as either being absent from school or having at least one grade level held back. They examined possible determinants of poor academic achievement. 64.8% (n = 83) of 128 CWE (mean age: 11.6 years, 48.4% female), 11.7% (n = 15), never attended school, 23.3% (n = 30), and dropped out. 46.9% (n = 39) of CWE who were enrolled in school were held back a grade. 54 kids (42% of the total) were classified as low achievers (LPs). ; When potential confounders were taken into account, both having more than 100 lifetime seizures (odds ratio (OR) = 8.81; 95% confidence interval (CI) = 2.51, 37.4; and p = 0.001) and having a lower total WNV score (OR = 0.954; 95% CI = 0.926, 0.977; and p 0.001) were significantly associated with poor academic performance. Given the clear association between seizure freedom and academic performance Achieving the lifetime seizure category of 10 seizures and being cognitively intact once more, we calculated that 38 extra CWE (or 33.6% of all CWE) may become high performers (HPs). SSE and household wealth quintile were not significantly correlated with academic achievement in the models that were run.

Hala Osman conducted a study in Sudan in 2018 about School enrollment and school performance of epileptic children in Fath AL Rahman complex of clinics at Khartoum locality. An analytic cross-sectional study design was used , structured questionnaire was used to interview parents of 85 epileptic children aged 6 - 18 , it was a total coverage including all who came in the period from 17th of December 2017 to the 17th of January 2018 recruiting them while they were in the waiting room, data were presented as number and percentage and different charts and tables were used the 85 epileptic children were 51(60%) males and 34 females (40%), there are 28 children who were not attending the school, 10 children have never been enrolled in school mainly due to parental anxiety mainly. Two children were enrolled in schools for special needs. 26 children had repeated an academic year before mostly due to their disease symptoms and this tend to occur in younger children. All children were absent from school for at least one day in each month constantly due to medical follow up. One third of children who attended ordinary school had good as their grade for the previous year.

Material and Method

Study design

This is a cross-sectional hospital-based study.

Study area

Fath Al Rhman outpatient referral clinic at Khartoum locality, Sudan. The neurology clinic is one of the 2 major pediatrics neurology units in the country, the referred clinic functioning twice a week with a specialized day for epilepsy patients averaging at around 100 patients come to the clinic each month.

Study population

All school age children (6-18 years) who is diagnosed with epilepsy and they are students of primary or secondary schools.

Sample size

Sample size will be calculated using Solvin's formula:

$n = N/(1+Ne2)$

where:

- (n) is the sample size,
- (N) is the population size (was found to be equal to 136 children per-month in this study)
- (e) is the margin of error equal to 0.5.

therefore, by using the above equation the sample size (n) was found to be 97.

3.5 Sampling technique:

The sample was drawn using stratified random sampling.

Inclusion criteria

- Children age (6-18 years).
- Diagnosed with primary epilepsy.
- Students at primary or secondary schools.

Exclusion criteria

All children who don't fulfil inclusion criteria or refused to participate.

Data collection tools

Data was collected using structured administered questionnaire, the questionnaire was developed by the researchers and was tested by pilot study using 10% of the sample size. The questionnaire will be composed of 3 parts:

- Demographic and socioeconomic data.
- Medical data.
- Quality of life assessment data.

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- School performance data.
- Cognitive function and learning impairment.

Data analysis

Data was analyzed using SPSS version 26.

Ethical considerations

Ethical approval was released from state ministry of health, Ahfad university for women and verbal consent was taken from participants.

Results

In our study we managed to recruit 97 patients with epilepsy who attends mainstream school and match the inclusion criteria (Figure 1). In regard to age around 50.5% were between 6 and 10 years with a round 22.7% being 15 years or older and the rest 26.8% were between 11 and 14 years of age (Figure 2). In regard to gender, we have slight male predominance at 55% while 45 % were females (Figure 3). In regard to father education the majority of patient`s fathers in our sample had secondary school education at 50.5% with 24.7% had primary school education and about 7.2% being illiterate and 17.5 had university or higher grades (Figure 4). In regards to mother`s educational level we found that 38.1% report having primary school education and 28.9% had secondry school education along with 24.7% uneversity or above and 8.2% reported being illtrate (Figure 5). In viewing the father occupation among our sample, it is observed that around 34% were unskilled laborer and 34% were skilled laborer and 22% worked in Clark jobs and around 10% are currently unemployed (Figure 6). The vast majority of patient`s mothers 81% are housewives and 12% are unskilled laborer and 7% had private business (Table 1). The majority at 74.2% of our participants had an average monthly income of less than 100,000 SDG in their families and only 2.1% reported having a monthly income of greater than 300,000 SDG (Table 2). In regard to diagnosis time 48.5% were diagnosed between 1 to 4 years ago and 45.4% were diagnosed for more than 5 years and 6.2% had been diagnosed for less than 1 year (Table 3). In the aspect of epilepsy type we found 57.7% had generalized epilepsy type with 38.1% had Focal types and 4.1 had either complex or epilepsy syndromes (Table 4). 15.5% reported not having a clear trigger for seizures while stress was a trigger in 48.5% and loud voice in 14.4% and sleep deprivation and light were present in 13.4% and 8.2% respectively (Table 5).

Table 1: Average monthly income among patients' families (N=97).

Income Per Month	N	Percent
Less than 100000 SDG	72	74.2
100000 - 300000 SDG	23	23.7
More than 300000 SDG	2	2.1
Total	97	100

Table 2: Epilepsy diagnosis time among participants (N=97).

Diagnosis Time	N	Percent
Less than 1 year	6	6.2
1 to 4 years	47	48.5
More than 5 years	44	45.4
Total	97	100

Table 3: Epilepsy type among participants (N=97).

Epilepsy type	N	Percent
Focal	37	38.1
Generalized	56	57.7
Epilepsy Syndrome\ complex Epilepsy	4	4.1
Total	97	100

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Table 4: Seizure trigger among participants (N=97).

Seizure Trigger	N	Percent
No known trigger	15	15.5
Light	8	8.2
Stress	47	48.5
Loud voice	14	14.4
Sleep Deprivation	13	13.4
Total	97	100

Table 5: Seizure frequency among participants (N=97).

Seizure Frequency	N	Percent
Daily	19	19.6
Once Weekly	23	23.7
Once monthly or less	55	56.7
Total	97	100

Table 6: Adherence to medication and cause of non-compliant among participants (N=97).

Adherence to Medication	N	Percent
Compliant	88	90.7
Non-compliant due to Expensive medication	3	3.1
Non-compliant due to Side Effects	3	3.1
Non-compliant due to Unavailability of medication	3	3.1

Table 7: School attendance among participants (N=97).

School Attendance	N	Percent
Attending school normally	77	79.4
Not attending school because of Parental anxiety	4	4.1
Not attending school because of Economic reasons	2	2.1
Not attending school because of Frequency of seizure	10	10.3
Not attending school because of Fear of stigma	4	4.1
Total	97	100

Table 8: School Absence among participants (N=97).

School Absence	N	Percent
No absents	21	21.6
Absence due to Child Refusal of school	32	33
Absence due to Seizure occurring in the day before	34	35.1
Absence due to Parental anxiety of the occurrence of new seizure	10	10.3
Total	97	100

Table 9: Latest school grades among participants (N=97).

Grade	N	Percent
Excellent	10	10.3
Good	26	26.8
Average	31	32
Poor	30	30.9
Total	97	100

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Table 10: Association between age groups and academic grading among participants (P=0.023).

Age	Latest School Grades				Total
	Excellent	Very good	Acceptable	Poor	
6 to 10 Years	2	19	15	14	50
11 to 14 Years	0	5	9	10	24
15 Years or more	4	2	11	6	23
Total	6	26	35	30	97

Table 11: Association between gender and school grading among participant (P=0.63).

Gender	Latest School Grades				Total
	Excellent	Very good	Acceptable	Poor	
Male	2	16	18	16	52
Female	4	10	17	14	45
Total	6	26	35	30	97

Table 12: Association between frequent absence from school and age group of the patients (P=0.001).

Age	If Repeated Absenteeism Because				Total
	0	Child Refusal of School	Seizure Occurring in the Day Before	Parental Anxiety of the Occurrence of New Seizure	
6 to 10 Years	18	12	17	3	50
11 to 14 Years	2	6	9	7	24
15 Years or more	2	12	9	0	23

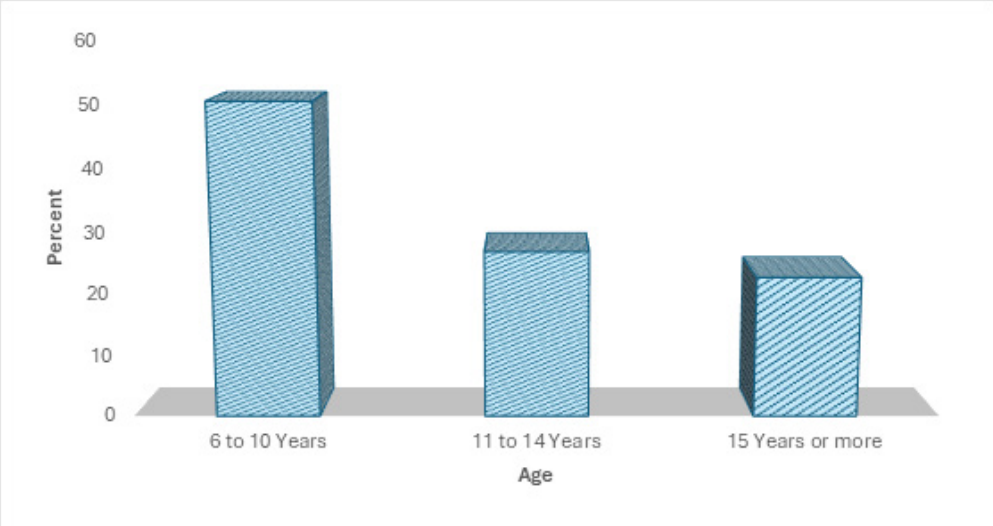

Figure 1: Age distribution among participants (N=97).

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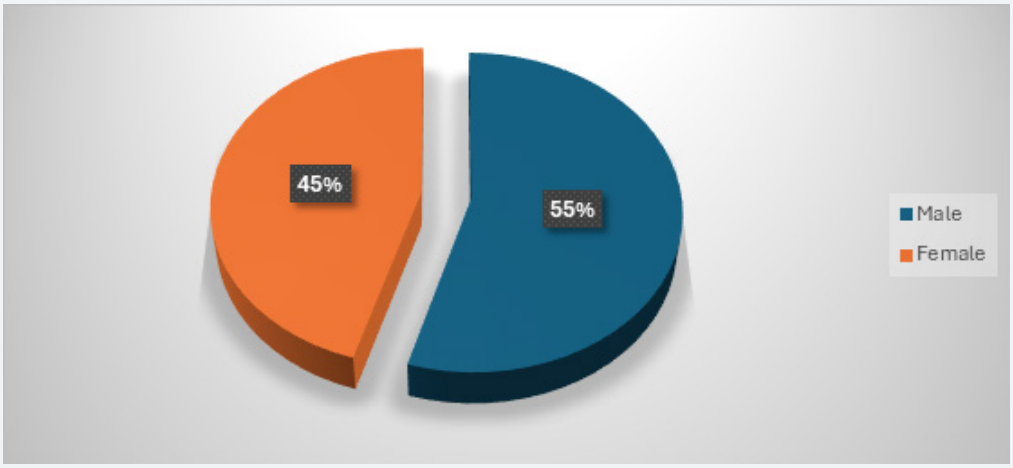

Figure 2: Gender distribution among participants (N=97).

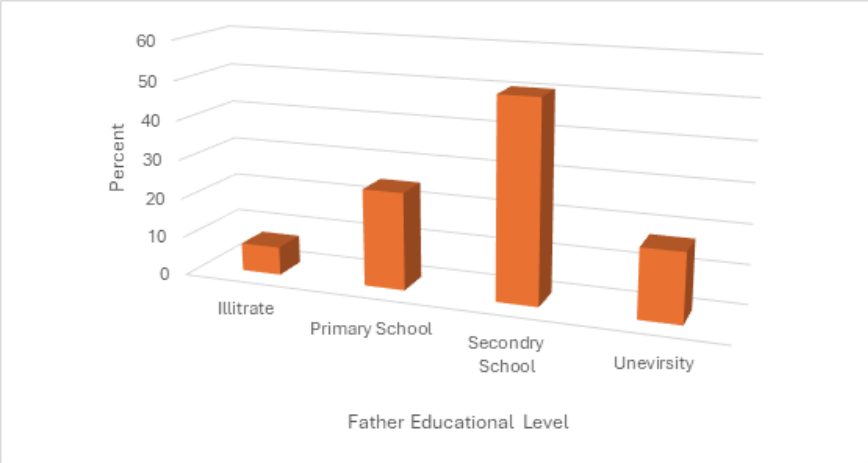

Figure 3: Father educational level among participants (N=97).

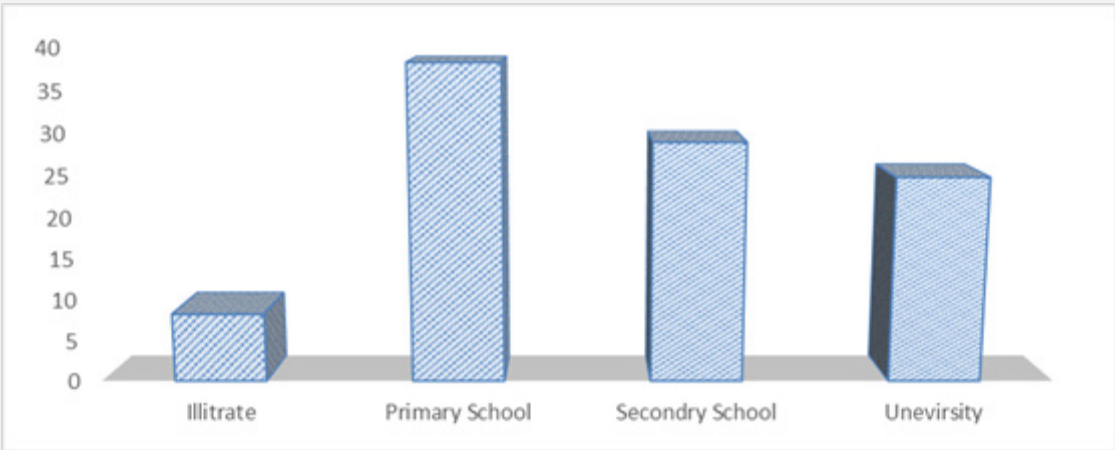

Figure 4: Mother education among participants (97%).

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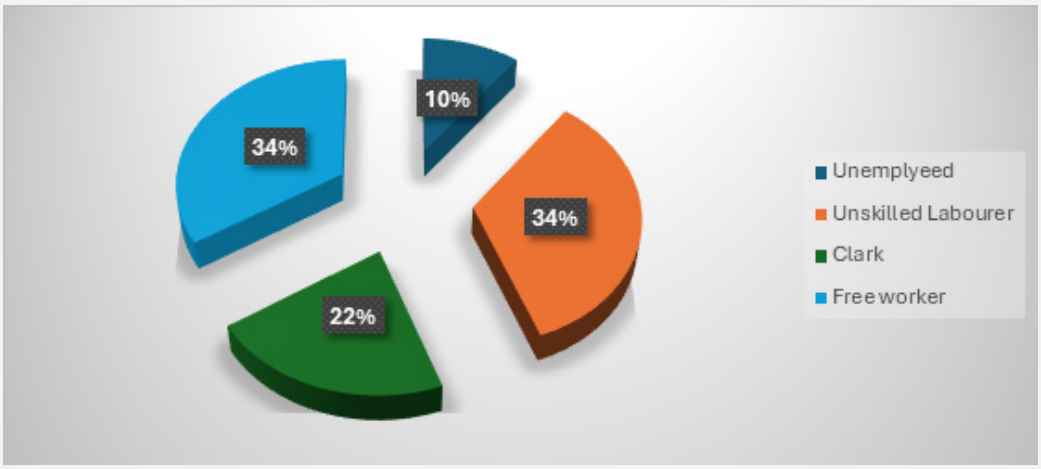

Figure 5: Mother education among participants (97%).

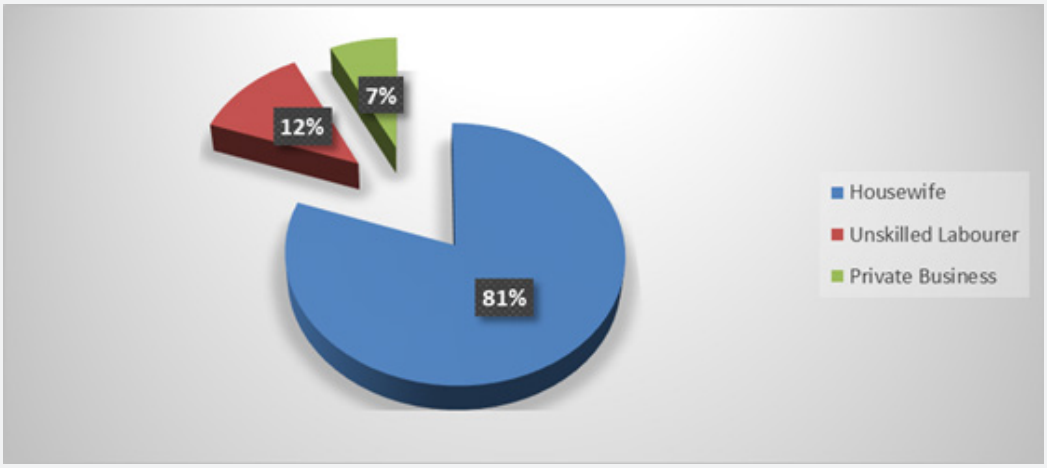

Figure 6: Mother`s occupation among participants (N=97).

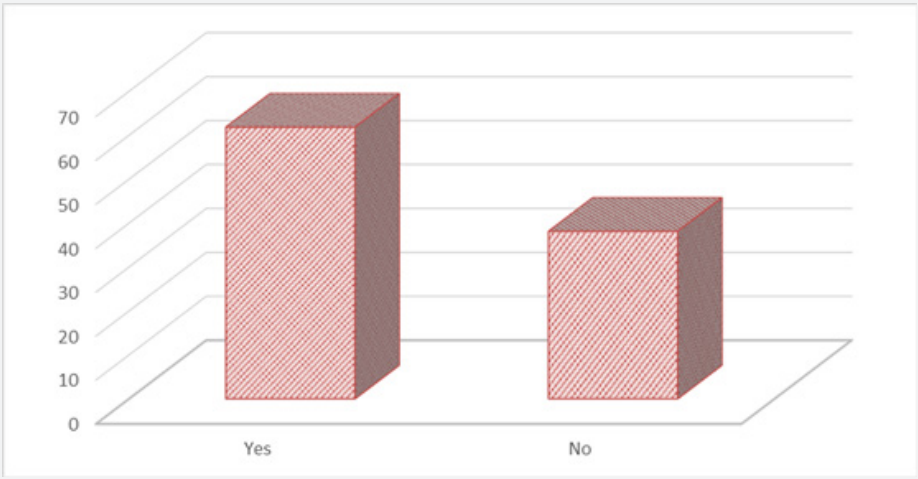

Figure 7: Child participation in school activities (N=97).

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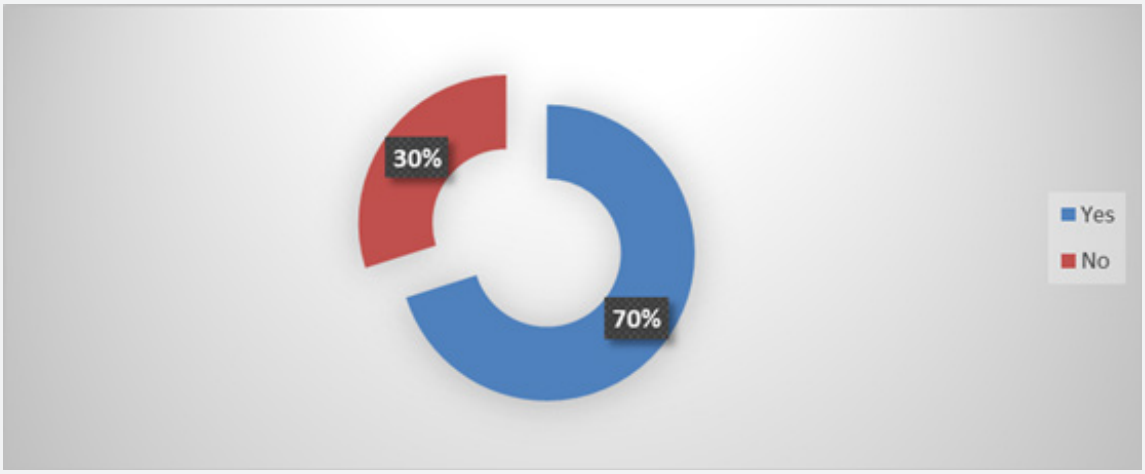

Figure 8: Playing freely outside among participants (N=97).

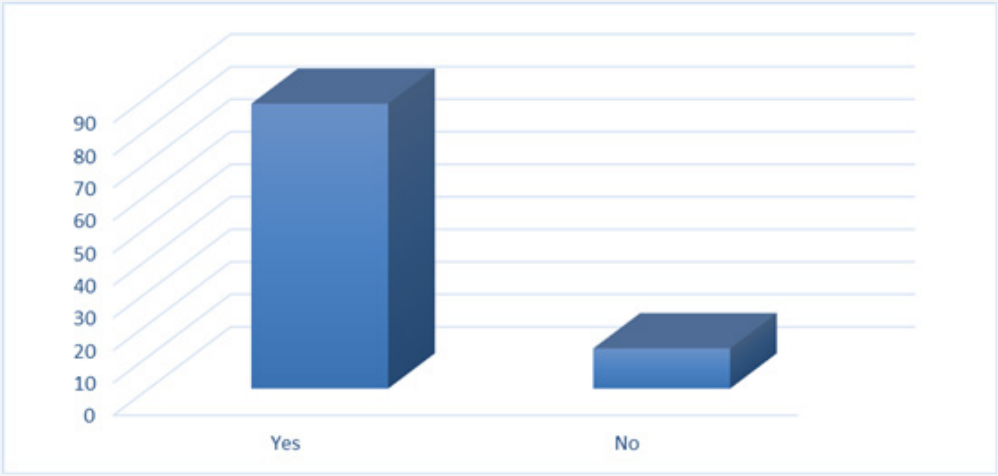

Figure 9: Having friends among participants (N=97).

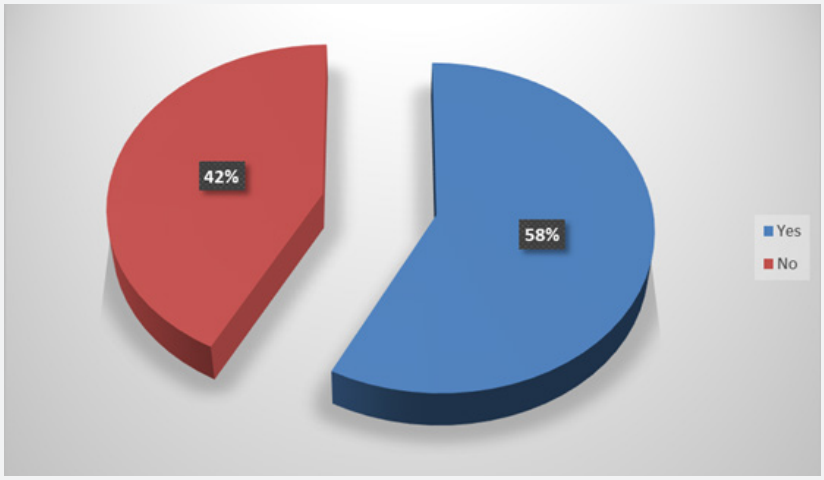

Figure 10: Low mood among participants (N=97).

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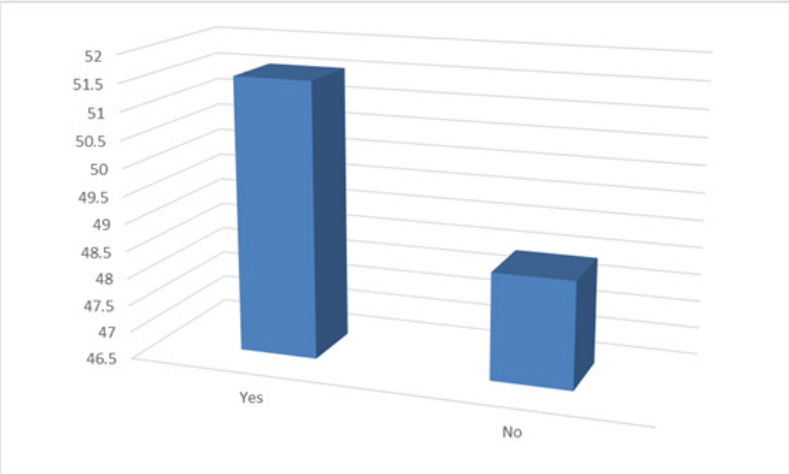

Figure 11: Aggressive behaviors among participants (N=97).

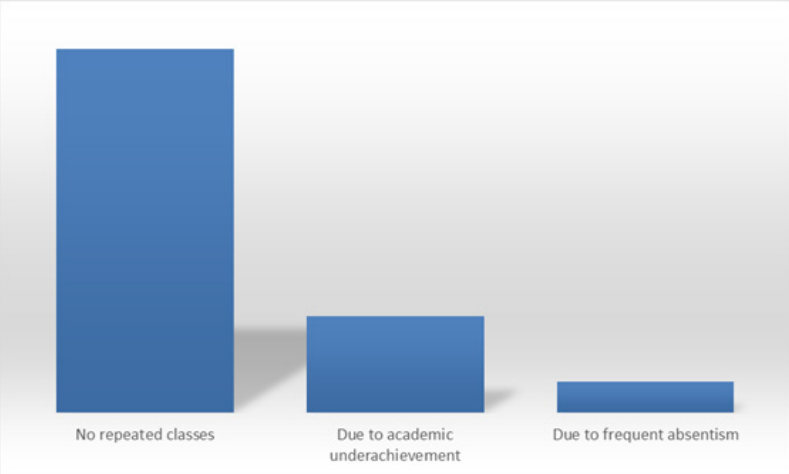

Figure 12: Class repetition among participants (N=97).

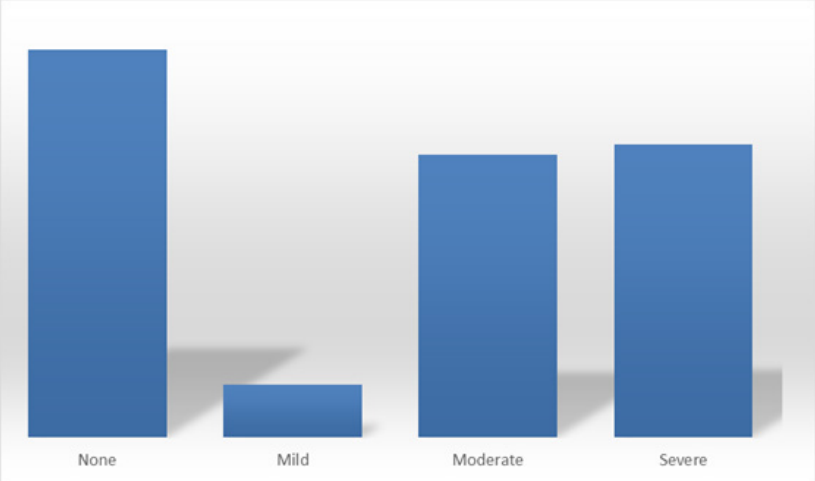

Figure 13: Writing problems among participants (N=97).

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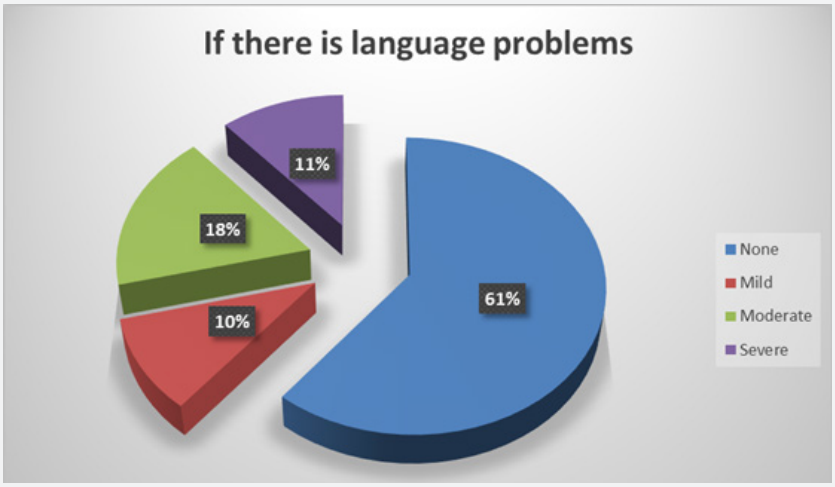

Figure 14: Language problems among participants (N=97).

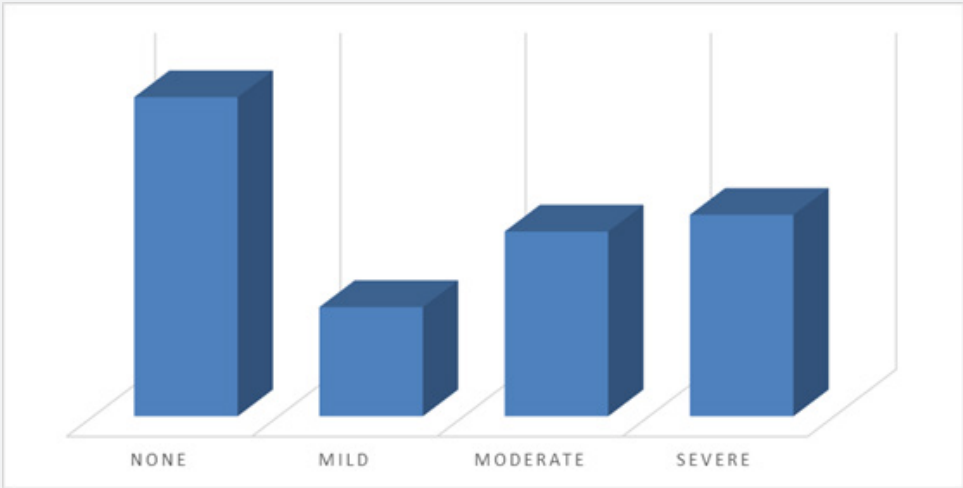

Figure 15: Memory problems among participants.

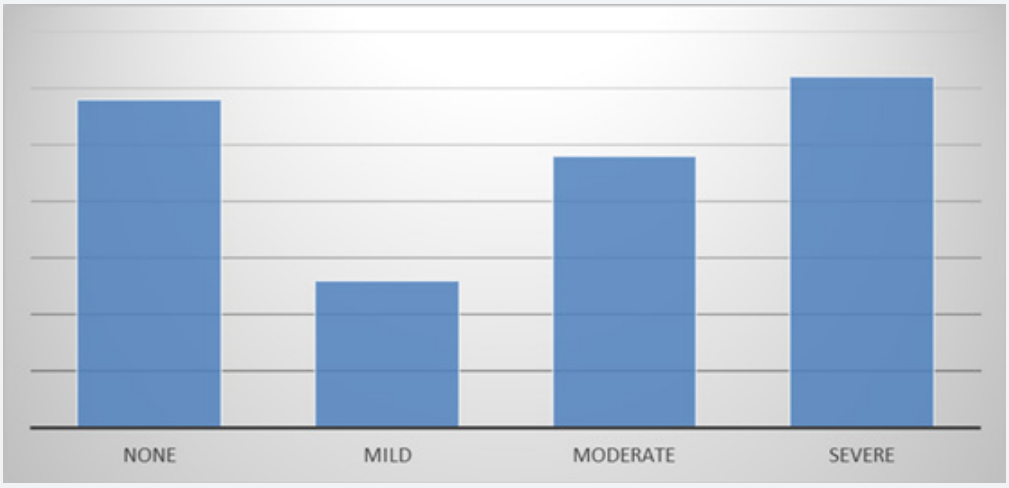

Figure 16: Attention problems among participants (N=97).

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Around 56.7% of our participant had low seizure frequency of once monthly or less and around 23.7% had seizure frequency of once a week and 19.6% had poor seizure control with daily seizures (Table 6). The majority of 90.7% were compliant to medication while 3.1 had poor adherence due to expanses of medication and similar number due to side (Table 7). The majority 79.4% attend school regularly while 10.3% are not attending school because of the frequency of the seizures and 4.1% had parental anxiety and excessive fear and a similar percentage not attending because of the fear of stigma and 2.1% are not attending for financial reasons (Table 8). Only 21.6% reported no frequent school absence with 35.1% of absence caused by seizures in the previous day and 33% due to child refusal and 10.3% due to parental fear of seizures (Table 9). Around 30.9% had poor school grades in compared to only 10.3% having high grades and 26.8% had good grades and 32% had average grade (Figure 7). 61.8% of our participants reported having good participation in school activities and sport (Figure 8). 70% of our participants reported playing freely outside while around 30% were prohibited from playing outside.

(Figure 9) The majority of 87.2% having normal friendship formation abilities. (Figure 10) Low mood is common in our participants with 58% reported having low mood. (Figure 11) 51.4% of our participants reported having aggressive behaviors. (Figure 12) Around 74.2% of our participants didn`t repeat any class while 19.5 have repeated for academic underachievement and 6.1 were due to absence. (Figure 13) 37% had no writing problems with 28% reported it being severe and 27% being moderate and 5 % had mild writing problems. (Figure 14) 61 % had no language problems and 10% had mild problems while 18% and 11% had moderate and severe language problems respectively. (Figure 15) 38% have no memory problems and 24% have severe memory problems and 22% have moderate memory problems and 13 % have mild memory problems. (Figure 16) Among participants we observe that the majority 31% have severe attention problems with 29% reported having no attention problems and 13% and 24% had mild and moderate problems. (Table 10) It is noted that the older age groups are much more likely to have worse grades than the younger age group with significant statistical relation. (Table 11) There was no significant difference between males and females in terms of school grading and the statistical relation is also not significant. (Table 12) There is apparent pattern showing that younger ages are much more likely to have frequent school absence due to all of its causes and the relation is statistically significant.

Discussion

This cross-sectional hospital-based study involving 97 children with primary epilepsy aging between (6-18) years found that the majority of our participants were less than 15 years with only around (26.8%) being more than 15 years old. Regarding gender distribution it was almost equal with male being slightly predominant at (55%) this finding was similar to most of the previous literature review where male percentage is higher than females, as a study done in Sudan by Hala Osman where (60%) were males, this indicates epilepsy is more common in males. In regard to parents education we can see no significant difference in the distribution of education of the fathers and the mothers in our samples around (7.2%) of Fathers in our study were illiterate and (82.5%) did not reach university level compared to around (8.2%) illiterate mothers and (75.3%) did not reach university level , while in regard to occupation most of the fathers have fixed occupation with around only (10%) being currently unemployed while the vast majority of (81%) of mothers were housewives, there is an association between the level of education of the caregivers and permeant termination of schooling because of lack knowledge as shown in study done by , Desta B. Ali, Durodami R. Lisk, and Michael Tomek in in Sierra Leone in this study illiterate parents drop their epileptic children from school this reflects that there is other factors such as parents knowledge and awareness that can affect schooling among children with epilepsy.Regarding the disease characteristics most of our participants are chronic patients with only (6.2%) being diagnosed for less than 1 year, and nearly half were diagnosed as generalized epilepsy (57.7%), stress was found to be the most common triggering factor ,and majority (56.7%) had good control with seizures occurring once monthly, many previous studies correlate this epilepsy and seizure variables with low academic performance as shown by a study done by Mohamed Lamine Conde, and Amadou Talibé Baldéb Abdoul Bachir in Republic of Guinea they found that having more than 100 lifetime seizures is significantly associated with low academic performance , another study done in Nigeria by O. Adewuya, Saheed suggest a poorer performance associated with long duration the disease .In our study of 97 epileptic children there were (79%) attending school normally and (10%) not attending because of seizure frequency this in contrast with study that was done in west African, it was apparent that the school dropping and unenrollment are much higher than those of ours study almost double our figures as we had only around (19%) compared to around (65%) in their data. this reflects the great difference in the local tradition and believes towards this highly stigmatized disease.

Regarding the school grades we found that the majority had poor or average grades (30.9%) and (32%) respectively this result is similar to the study done in Nigeria where they found that the mean school grades of adolescent with epilepsy are significantly lower than that of their healthy control, this finding is the main focus of our study and it is apparent that how the disease affect school life. significant proportion of our participants reported frequent absenteeism mostly due to seizure frequency (35%) and child refusal (33%) this result is in conform with the study done in Brazil by Robert Vinicius Aguiar where (88%) missed at least one day due to seizures this shows that this disease is affecting the

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school attendance and this can affect the academic performance as the child miss many classes. we found that aggressive behavior and low moods are quite common among participants with (51.4%)and (58%) respectively, participation in social activities seem to be not affected by the child condition where (70%) play freely outside and (61%)participate in school activities this is in contrast with a study done in Sierra Leon where (90%) don't attend activities or prohibited by their parents and teachers this reflects the different cultural perspectives of the disease or might be due to more strict parents and school regulations . also noted that concerning cognitive functions around two thirds of our participants have writing problems and around a third have language problems while the majority around (69%) have attention problems (62%) have memory problems these findings may reflect the cause behind the low grades and school performance.

Conclusion

- In our study the majority were younger than 15 years and we had a slight male predominance with generalized epilepsy being the most common variant and most of our patients have current well seizure control.
- In our study it was obvious that school absence is significant and have multiple causes with seizures frequency being the most common.
- In our study the overall school grading had tendency to low grades, and there was high rates of absenteeism and the major factor that was significantly associated is the age.
- most of our sample reported having good friendship formation ability and good participation in school activities.
- In our study there was significant prevalence of poor mood and aggression as well as language writing memory and attention problems with high severity in accordance to parents' reports.

Recommendation

- To raise the awareness and Knowledge of the families toward the disease and to break the social stigma as well controlled children can cope well with their educational process and social lives.
- To educate the families about the importance of good drug adherence and regular follow-up for better control.
- To empower the capacity building of healthcare system by developing national guidelines, training of health professionals and availability of antiepileptic drugs at all health care system levels.
- To implement health education programs for teachers to improve their knowledge and attitude toward children with epilepsy

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