

# A Observational Study to Measure Anti-Epileptic Drug Adherence

Shubham Babu Gupta<sup>1</sup>, Shahnaz Begum<sup>2</sup>, Shaik Saaduddin<sup>3</sup>

<sup>1</sup>Malla Reddy Institute of Pharmaceutical Sciences, Maisammaguda, Dhulapally, (Post Via Hakimpet), Secunderabad – 500014

<sup>2</sup>Bhaskar Pharmacy College, Bhaskar Nagar, Yenkapally Vil., Moinabad M.D Hyd-75

<sup>3</sup>Bhaskar Pharmacy College, Bhaskar Nagar, Yenkapally Vil., Moinabad M.D Hyd-75

**Abstract:** ***Objectives:** The objectives of the study were to measure Anti-Epileptic drug Adherence and also to identify factors affecting the drug adherence among people with epilepsy. **Methods:** A total number of 100 patients affected with epilepsy that fulfilled the inclusion criteria were recruited in the study. In this study purposive sampling technique was used. The total period of the study was from September 2016- April 2017. A validated self-prepared questionnaire was used to assess the drug adherence level among people with epilepsy. **Results:** Majority of then Patients used Valproic Acid (32%) drug for treatment 71% of prescription has Poly therapy for treating epilepsy sample are compliant to the medication. 73 (73%) patients never missed their dose and are compliant to the AEDs. 10 (35%) patients had uncategorized reasons for non-adherence . 44 (44%) patients experienced side effects, in that majority [41%] of sample experienced drowsiness. 27 (61%) patients are not affected by the side effects. The study shows a significant relationship between history of non-adherence and current status of non-adherence [P-value 7.879 > 0.05 level of confidence]. **Conclusion:** There was no significant relationship between drug non-adherence and age, education, residence, duration of illness, side effects, expenditure of medicine. There was a significant relationship between history of non-adherence and current status of non-adherence.*

**Keywords:** Epilepsy, Drug- Adherence, Non- adherence

## 1. Introduction

Epilepsy is a chronic disorder of the brain that affects people worldwide. It is characterized by recurrent seizures, which are brief episodes of involuntary movements that may involve a part of the body (partial) or the entire body (generalized), and is sometimes accompanied by loss of consciousness and control of bowel or bladder function.

One seizure does not signify epilepsy (up to 10% of people worldwide have one seizure during their lifetime). Epilepsy is defined as having 2 or more unprovoked seizures. Epilepsy is one of the world's oldest recognized conditions, with written records dating back to 4000 BC.

Epilepsy is the most common chronic brain disorder globally and affects people of all ages. More than 50 million people worldwide have epilepsy and 80% of them live in developing countries. With treatment, an estimated 70% of people with epilepsy can be seizure free, yet about three fourths of people in developing countries do not get the treatment they need. Furthermore, people with epilepsy and their families frequently suffer from stigma and discrimination.

**Drug Adherence:** Medication adherence is defined as the extent to which patients follow the instructions they are given for prescribed treatments and persistence as the duration of time from initiation to discontinuation of therapy. Medication non-adherence includes delaying prescription fills, failing to fill prescriptions, cutting dosages, and reducing the frequency of administration.

For individuals with epilepsy, adherence to medication is crucial in preventing or minimizing seizures and their cumulative impact on everyday life. Non-adherence to antiepileptic drugs (AEDs) can result in breakthrough seizures many months or years after a previous episode and can have serious repercussions on an individual's perceived quality of life.

Reasons for non-adherence are complex and multilayered. Patients can accidentally fail to adhere through forgetfulness, misunderstanding, or uncertainty about clinician's recommendations, or intentionally due to their own expectations of treatment, side-effects, and lifestyle choice. There are various strategies suggested for managing patient adherence but these are highly dependent on the reasons why a patient has not followed clinician advice initially.

## 2. Need & Significance of the Study

The magnitude of antiepileptic drug non-adherence is ranged from 26% in USA to 67% in Nigeria. As a study done in the North Carolina indicated, the prevalence of AEDs non-adherence was 39% and it was higher (43%) in elderly accompanied with increased likelihood hospitalization. A primary care based study in UK showed that the prevalence of antiepileptic drug non-adherence was 36.4% and those who were on multi drug treatment were tend to be noncompliant with their treatment. A study conducted in Finland indicated the prevalence of AEDs non-adherence as 34% and non-adherence was higher in individuals who smoke cigarette and drink alcohol. In sub-Saharan African countries, prevalence of antiepileptic drug non-adherence is significant which was about 67% in Nigeria, 54% in Kenya, and 37% in

Ethiopia and financial factors were the significant predictors of non-adherence.

The promotion of medication adherence or drug compliance is considered nowadays as an important component of pharmaceutical care practice. The consequence of AEDs non-adherence behavior has been associated with poor seizure control, increased morbidity and mortality along with increased time of hospitalization, worsened patient outcome, poor quality of life, and increased health care cost. AEDs non-adherence will also lead to increase burden of inpatient and emergency department services; moreover, it also affects the family members socially, economically, and psychologically.

For these reasons, we conducted the study to determine the adherence among people with epilepsy and identify different factors which could affect antiepileptic drug adherence, and to know how can we improve adherence among those patients for optimum therapy outcome and enhance their quality of life.

### 3. Literature Review

1) Zeber, Copeland and Pugh (2010) conducted a study to assess the variation in anti-epileptic drug adherence among older patient with new onset epilepsy. The objective of the study was to analyze adherence to nine different AEDs in a national clinical sample of elderly patients with new-onset epilepsy. Patients over age 66 were eligible if they met criteria for new-onset epilepsy with AED monotherapy of at least 3 months. The study population i.e sample (N = 6373) was primarily male (98%), white (79%), and exempt from medication copayments due to disability status; nearly 40% had a prior psychiatric or dementia diagnosis. Nearly half of the patients were poorly adherent, with rates ranging from 42% to 63% across AEDs. In multivariable models, patients on phenobarbital, valproate, and gabapentin were significantly less likely to be adherent on both outcomes, while lamotrigine and levetiracetam were positively associated with adherence per the MPR.

2) Waleed M Sweileh, Ihbeshah, Jarar ,Abutaha ,Sawallha, Zyoud, Jamous, Morisky (2011) conducted a study to assess self-reported medication adherence and treatment satisfaction in patients with epilepsy. The objective of the study was to assess medication adherence and its relationship with treatment satisfaction, number of AEDs taken, and epilepsy control in a sample of Palestinian patients. A sample of 75 patients was studied. On the basis of the Morisky Medication Adherence Scale MMAS, 11 patients (14.7%) had a low rate, 37 (49.3%) had a medium rate, and 27 (36%) had a high rate of adherence. Adherence was positively and significantly correlated with age ( $P=0.02$ ) and duration of illness ( $P=0.01$ ). No significant difference in adherence was found between patients with well-controlled and those with poorly controlled epilepsy. Similarly, there was no significant difference in adherence between patients on monotherapy and those on polytherapy. There were significant differences in mean values in the effectiveness ( $P<0.01$ ) and convenience ( $P<0.01$ ) domains, but not the side effect ( $P=0.1$ ) and global

satisfaction ( $P=0.08$ ) domains among patients with different levels of adherence. Patients on monotherapy had significantly higher satisfaction in the effectiveness domain ( $P=0.04$ ) than patients on polytherapy. Similarly, patients with well-controlled epilepsy scored significantly higher in the Effectiveness ( $P=0.01$ ) and Global Satisfaction ( $P=0.01$ ) domains than those with poorly controlled epilepsy.

3) Tang F, Zhu G, Jiao Z, Ma C, Wang B (2013) conducted a study on Self-reported adherence in patients with epilepsy who missed their medications and reasons for non-adherence in China. The objectives of this study were (1) to evaluate self-reported adherence in adult patients with epilepsy in China who had missed taking their antiepileptic drugs (AEDs) at least once and (2) to determine why patients were not adherent to their medication to employ interventions targeted at barriers to adherence. Of the 131 patients, 4.6%, 70.2%, and 25.2% showed high, medium, and low adherence, respectively. The reasons for non-adherence included forgetfulness (54.2%), being seizure-free for a period (48.9%), and fear of adverse drug effects (27.5%).

4) Angelia M pascha, Sara E Rush, Toni Sadler ( 2014) conducted a study to identify factors associated with medication adherence in patients with epilepsy and recommendations for improvement. The purpose of this study was to investigate factors associated with adherence and to provide recommendations for improvement. Among the sample of 180 patients, most had some education beyond high school, household incomes of varying amounts, and health insurance coverage. Most of the participants were unemployed. Clinical records showed that 46% had intractable seizures. About 66% missed taking their medication on a monthly basis, with "forgetfulness" being the primary reason. Adherence (seizure frequency) was associated with being employed ( $P = .028$ ). Adherence (complying with medication treatment plan) was also associated with "medication reminders" ( $P = .002$ ) and educational attainment ( $P = .008$ ).

5) Ranjana Gurumurthy, Kulkarni Chanda and GRK (2017) Sarma Conducted a study on An evaluation of factors affecting adherence to antiepileptic drugs in patients with epilepsy. This study aimed to evaluate the pattern and extent of AED adherence among PWE and to identify the factors that influence adherence. 451 PWE (mean age  $27.3 \pm 8.1$  years) were enrolled in the study; 251 (55.7%) were male and 198 (43.9%) were from the lower socioeconomic class. 326 (72.3%) patients had high adherence to AED therapy, while 125 (27.7%) had low adherence. AED adherence was significantly associated with socioeconomic status ( $p = 0.043$ ) and type of epilepsy ( $p = 0.033$ ). However, no significant difference was observed between adherence and age, gender, marital status, epilepsy duration, number and type of AEDs, and occurrence of adverse drug reactions. Patients with focal epilepsy and those from the middle/lower-middle socioeconomic classes were less likely to be nonadherent. The primary reason for nonadherence was forgetfulness. This study found that majorities of PWE have optimal rates of AED adherence and that forgetfulness is the primary reason for nonadherence among PWE.

#### 4. Methodology

A Prospective study was conducted in the **BHASKAR GENERAL HOSPITAL HYD, & MALLA REDDY NARAYANA HOSPITAL**. Purposive sampling technique was used. The sample consisted of people with epilepsy attending the tertiary hospital. The sample size was 100. The duration of study was from October 2016 to April 2017.

##### Inclusion criteria

- Patient who were willing to participate.
- Patients who have age above 12.
- Patients with other co-morbid diseases

##### Exclusion criteria

- Pediatric population,
- Patients not providing ICD.

#### 5. Development of the tool

An extensive study and review of literature helped in the preparation of the tool. A self-prepared questionnaire was used as the tool for this study. Patient's medical records also were reviewed to collect data.

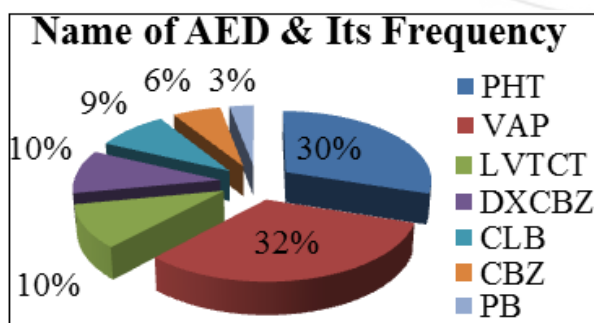
#### 6. Results

##### 6.1 Distribution of Sample According to Medication Data

###### 6.1.1 Distribution of sample according to usage of drugs

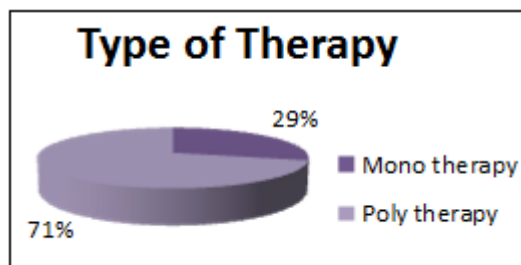
Different patients use different types of antiepileptic drugs as per the severity of seizures.

Name of AED	Frequency	Percentage
PHT	30	30%
VAP	32	32%
LVTCT	10	10%
OXCZ	10	10%
CLB	9	9%
CBZ	6	6%
PB	3	3%
Total	100	100%



**Table 6.1.1:** Distribution of sample according to type of therapy

Type of Therapy	Frequency	Percentage
<i>Monotherapy</i>	29	29%
<i>Polytherapy</i>	71	71%
<i>Total</i>	100	100 %

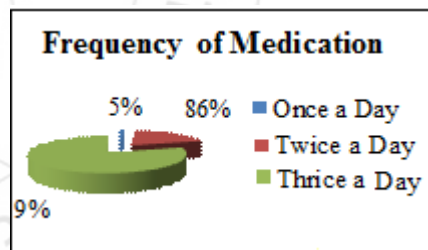


The above table shows that the majority of the sample follows polytherapy, which means they use more than one drug. Among 100 (100%) patients, 71 (71%) patients are following polytherapy and 29 (29%) patients are following monotherapy. The most commonly prescribed combination is Phenytoin and Valproic acid.

###### 6.1.2 Distribution of sample according to frequency of medication

Frequency of medication refers to the number of times a drug is administered in a day

Frequency of Medication	No. of Patients	Percentage
Once a day	5	5%
Twice a day	86	86%
Thrice a day	9	9%
Total	100	

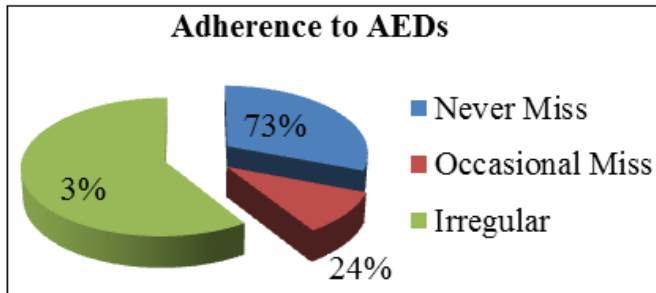


The above table shows that majority of the patients were administering AEDs two times a day. Among 100 (100%) patients, 86 (86%) patients were receiving AEDs twice a day, 9 (9%) patients were receiving AEDs thrice a day and only 5 (5%) patients were receiving AEDs once a day.

###### 6.1.2 Distribution of sample according to compliance to AEDs

Drug compliance is the reliability of the patient in using a prescribed medication exactly as ordered by the physician.

Adherence to AEDs	Frequency	Percentage
Never miss	73	73%
Occasionally miss	24	24%
Irregular	3	3%
Total	100	100

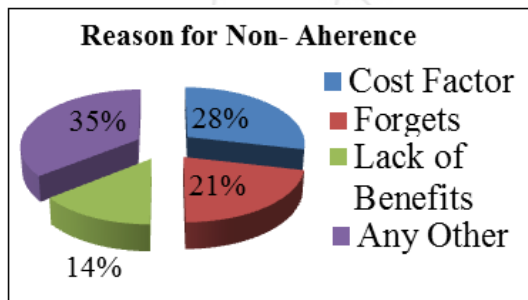


The above table shows that majority of the sample are compliant to the medication. Among 100 (100%) patients, 73 (73%) patients never missed their dose and are compliant to the AEDs, 24 (24 %) patients occasionally missed their dose and 3 Patients (3%) are irregular are non compliant to AEDs.

**6.1.3 Distribution of sample according to reason for drug non adherence**

Non adherence occurs when a patient forgets or neglects to take the prescribed dosages at the recommended times or decides to discontinue the drug without consulting the physician.

Reason for non adherence	Frequency	Percentage
Cost factor	8	28%
Forgets	6	21%
Lack of benefits	4	14%
Any other	10	35%
Total	28	

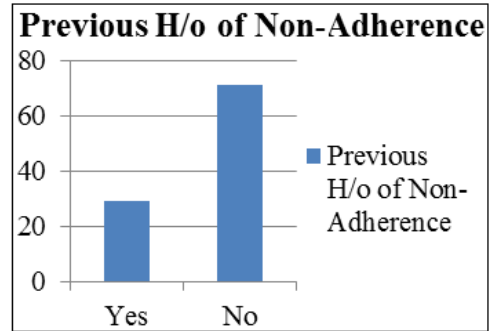


The above table shows that out of 28 (100%) patients who were non adherence, majority stated uncategorized reasons. 10 (35%) patients had uncategorized reasons, 8 (28%) patients stated cost factor as the reason for non-compliance, 6 (21%) patients often forget to take medication, 4 (14%) patients stated that they did not benefit.

**6.1.4 Distribution of sample according to previous history of Non – Adherence**

This section gives information whether the patient was compliant or non- adherence to the AEDs in previous history.

Previous H/o non- adherence	Frequency	Percentage
Yes	29	29%
No	71	71%
Grand Total	100	100

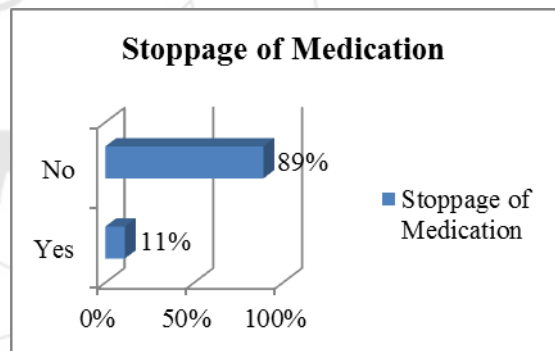


The above table shows that majority of the sample did not have previous history of non- adherence. Among 100 (100%) patients, 71 (71%) patients did not have any previous history of non -adherence, whereas 29 (29%) patients have previous history of non -adherence.

**6.1.5 Distribution of Sample According to Stoppage of Medication if No Seizure Episode**

It gives information whether the patients would stop taking medication if they do not experience seizure episode for about 2-3 months.

Stoppage of Medication	Frequency	Percentage
Yes	11	11%
No	89	89%
Total	100	



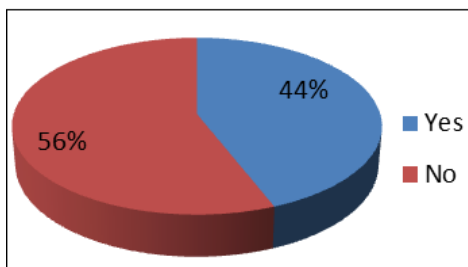
The above table shows that, majority of patients denied stopping medication in case of 2-3 months continuous absence of seizure episodes. 11 (11%) patients were willing to stop medication in case of 2-3 months continuous absence of seizure episodes.

**6.1.6 Distribution of sample according to development of side effects**

This section describes the number of patients who developed side effects due to AED therapy.

Development of Side Effects	Frequency	Percentage
Yes	44	44%
No	56	56%
Total	100	



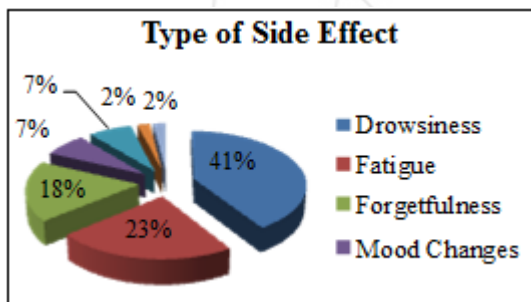


The above table shows that majority of the sample did not experience any side effects. Among 100 (100%) patients, 56 (56%) patients did not experience any side effects whereas, 44 (44%) patients experienced side effects due to AED therapy.

**6.1.7 Distribution of Sample According to Type of Side Effects**

This includes the different types of side effects experienced by the patients due to AED therapy.

Type of Side Effect	Frequency	Percentage
Drowsiness	18	41%
Fatigue	10	23%
Forgetfulness	8	18%
Mood changes	3	7%
Imbalance	3	7%
Cognitive deficit	1	2%
Any other	1	2%
Total	44	100

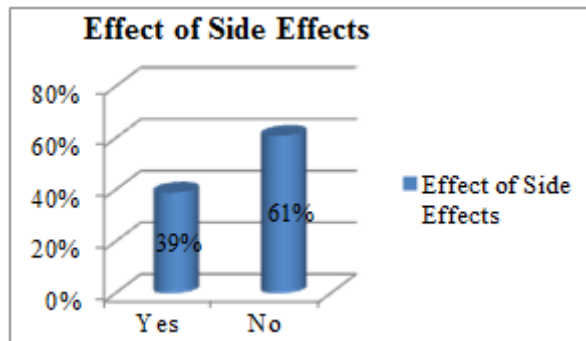


The above table shows the majority of sample experienced drowsiness [41%], and then followed by fatigue [23%], forgetfulness [18%], mood changes [7%], and imbalance [7%].

**6.1.8 Distribution of sample according to side effects effecting work**

This includes the patients who are affected by side effects developed due to AED therapy.

Side Effects Effecting Work	Frequency	Percentage
Yes	17	39%
No	27	61%
Total	44	100

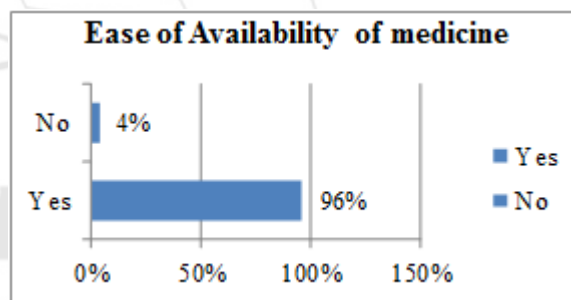


The above table shows the side effects were not problematic for majority of the patients. Among 44 (100%) patients, 27 (61%) patients are not affected by the side effects, whereas 17 (39%) patients were affected by the side effects that are developed due to AED therapy.

**6.1.9 Distribution of sample according to easy availability of medicine**

This informs whether the patients have easy availability of medicine in nearby pharmacies.

Easy availability of medicine	Frequency	Percentage
Yes	96	96%
No	4	4%
Grand Total	100	100

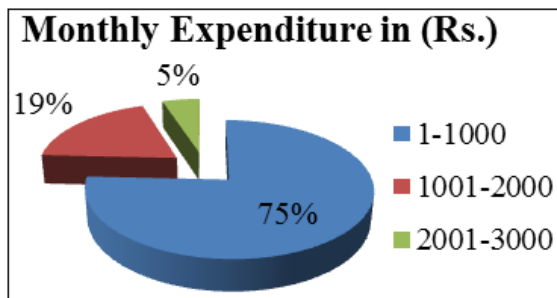


The above table shows, majority of patients had easy availability of medicines. Among 100 (100%) patients, 96 (96%) patients had easy availability of medicines and only 4 (4%) patients had problem with availability of medicines.

**6.1.10 Distribution of Sample According to Monthly Medicine Expenditures in Rupees**

It is the monthly expenditure of medicines by each patient.

Monthly Expenditure (Rs)	Frequency	Percentage
1-1000	75	75%
1001-2000	19	19%
2001-3000	5	5%
Total	100	100

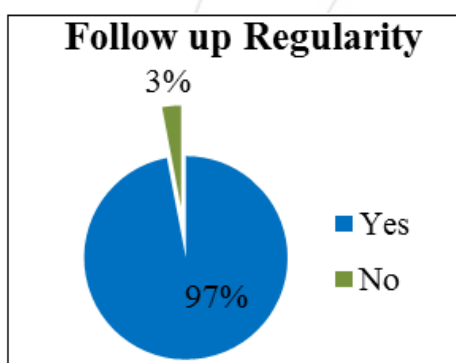


The above table shows the majority of the patients had monthly expenses up to Rs.1000/- Among 100 (100%) patients, 75 (75%) patients had monthly expenses of about Rs.1000/-, 19 (19%) patients had monthly expenses in between Rs.1001/- to Rs.2000/- and only 5 (5%) patients had monthly expenses more than Rs.2000/-.

#### 6.1.11 Distribution of sample according to follow up regularity

This distribution gives information regarding the patients who regularly visit the hospital for follow ups.

Follow up regularity	Frequency	Percentage
Regular	97	97%
Irregular	3	3%
Grand Total	100	100



The above table shows the majority of the patients who attended follow ups regularly. Among 100 (100%) patients, 97 (97%) patients attended regular follow ups and only 3 (3%) patient was irregular.

#### References

- [1] World Health Organization, Epilepsy, Media centre, Fact sheet 2017 available at [www.who.int/mediacentre/factsheets/fs999/en/](http://www.who.int/mediacentre/factsheets/fs999/en/)
- [2] Robert S Fisher, Revised definition- Epilepsy 2014
- [3] Robert S Fisher et.al, An operational clinical definition of epilepsy 2014 pages 1-3
- [4] Kartik Shah et.al, NHL Journal of Medical Science 2015 volume-4, issue-1, pages 75-82
- [5] Resource Central, Neurology Now 2008 volume-4, issue-6, page-36
- [6] Ali Akbar Asadi-Pooya, Seizure 2005 volume-14, issue-6, pages 393-395
- [7] Joanne Eatock, Gus A Baker, Neuropsychiatric disease and treatment 2007 volume-3, issue-1, pages 117-131

- [8] Wael M Gabr, Mohamed E E Shams, Saudi Pharmaceutical Journal 2015 volume-23, issue-1, pages 33-40
- [9] Robert S Fisher et.al, Operational classification of seizure types by ILAE 2016
- [10] K D Tripathi, Essentials of Medical Pharmacology , 7th Edition, Page-421
- [11] Josemir W Sander, Epilepsia 2004 volume-45, issue-6, pages 28-34
- [12] Kartik Shah et.al, NHL Journal of Medical Science 2015 volume-4, issue-1, pages 75-82
- [13] Epilepsy Foundation, Summary of anti-epileptic drugs 2014
- [14] K D Tripathi, Essentials of Medical Pharmacology , 7th Edition, Page-421
- [15] AsmamawGetnet et.al. Behavioral Neurology 2016 Article ID-3189108, pages 1-6
- [16] Wael M Gabr, Mohamed E E Shams, Saudi Pharmaceutical Journal 2015 volume-23, issue-1, pages 33-40
- [17] AsmamawGetnet et.al, Behavioral Neurology 2016 Article ID-3189108, pages 1-6
- [18] John E Zeber et.al. The Annals Of Pharmacology 2010 volume-44, pages 1896-1904
- [19] Waleed M Sewileh et.al, Epilepsy and Behavior 2011 volume-21, issue-3, pages 301-305,
- [20] E Faught et.al, Neurology 2008 volume 71, issue-20, pages 1572-1578
- [21] Ali Akbar Asadi-Pooya, Seizure 2005 volume-14, issue-6, pages 393-395
- [22] Helvikyngas, Seizure 2000 volume 9, pages 598-604
- [23] Wael M Gabr, Mohamed E E Shams, Saudi Pharmaceutical Journal 2015 volume-23, issue-1, pages 33-40

#### Author Profile



Pharm-D Intern. **Shubham Babu Gupta** from **Malla reddy college of phramaceutical Sciences** working as a **clinical Research Moniter** from Cliniserve India.



Pharm- D Intern. **Shahnaz Begum** from Bhaskar Pharmacy College interested in R& D.



Pharm- D 5th Year. **Shaik Saaduddin** from Bhaskar Pharmacy College.