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Medication Adherence in Patient Suffering from Epilepsy: A Descriptive Cross-sectional Study

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ABSTRACT

Introduction: Medication adherence is crucial in epilepsy management, as poor adherence increases seizure frequency and treatment failure. Identifying factors influencing adherence is essential for improving patient outcomes. This study aimed to evaluate the medication adherence in epilepsy patients at a tertiary care teaching hospital.

Methods: A descriptive cross-sectional study was conducted at tertiary care center from 23 July 2024 to 22 January 2025 after obtaining ethical approval from the Institutional Review Committee. Epileptic patients aged 21–70 years attending the outpatient Department of Medicine, without chronic comorbidities and taking antiepileptic drugs for at least 3 months and excluding those with absence seizures, vagus nerve stimulation treatment, cognitive impairments or mental health disorders, or pregnancy/lactation. Medication adherence was assessed using the Medication Adherence Report Scale-5. Convenience sampling method was used.

Results: Among 108 patients, high adherence was observed in 40 (37.1%) patients, moderate in 48 (44.4%) patients, and low in 20 (18.5%) patients. Adherence was highest in the 31–40 years age group, with 26 (86.67%) adhering, and lowest in the 61–70 years group, with 6 (66.77%) adhering. Patients on monotherapy 37 (92.5%) and those with education above Class 12, 22 (91.67) showed better adherence. Key barriers included forgetfulness 30 (27.8%), financial constraints 23 (21.3%), and side effects 17 (15.7%).

Conclusions: Younger age, higher education, and simpler treatment regimens have better adherence. Interventions such as education programs, cost-effective drug options, and reminder strategies (e.g., alarm clocks) can enhance adherence among epileptic patients.

Keywords: *anticonvulsant drug, barriers to adherence, education of patients, health services accessibility, seizure disorder.*

INTRODUCTION

An epilepsy is a neurological disorder causing recurrent seizures, affecting about 70 million people globally, making it the second most common neurological condition.[1] Despite advancements, antiepileptic drugs (AEDs) remain the primary treatment.[2] Common AEDs include carbamazepine, lamotrigine, levetiracetam for focal seizures; phenytoin, valproate, topiramate for generalized seizures; and ethosuximide, valproate, lamotrigine for absence seizures.[3]

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Poor medication adherence increases seizure frequency, medical costs, and the risk of accidental death.[4] Adherence refers to how well patients follow prescribed schedules.[1] WHO estimates nearly half of patients fail to take medications correctly.[5] Various methods assess adherence, including self-reporting, pill counting, and drug level monitoring.[6] Self-reports and interviews are the most commonly used due to their simplicity.[7]

This study aimed to evaluate the medication adherence in epilepsy patients at a tertiary care teaching hospital.

METHODS

A descriptive cross-sectional study was conducted from 23 July 2024 to 22 January 2025 at the Outpatient

Department of Medicine, Nepalgunj Medical College and Teaching Hospital (NMCTH), Nepalgunj, Banke, Nepal with ethical approval from the Institutional Review Committee (Reference number: 12/081/082). Patients with confirmed epilepsy diagnosis without chronic comorbidities, treated with at least one antiepileptic drug for a minimum of 3 months, and aged 21–70 years of both genders were included. Patients with clinical features of absence seizures, cognitive impairments, and mental health disorders as well as patients undergoing vagus nerve stimulation treatment and patients during their pregnancy/lactation period were excluded. Convenience sampling method was employed for data collection.

Sample size calculation:

$n = Z^2 \times p \times q/e^2$

$= 1.96^2 \times 0.5 \times 0.5/0.1^2$

$= 96.04 = 96$

where,

n = minimum required sample size

z = 1.96 at 95% of Confidence Interval (CI)

p = prevalence is taken as 50% for maximum sample size calculation

q = 1-p

d =margin of error, 10%

The calculated sample size was 96. However, a total sample of 108 was taken.

The patients participating in the study were explained the reason and nature of the study in the local language easily understood by them and their written consent was taken. Patients were interviewed to gather qualitative data on the patient's experiences, perceptions, barriers to medication adherence, Knowledge and understanding of epilepsy and its treatment. In addition, a structured questionnaire was utilized to collect demographic details (e.g., age, gender, educational level) and clinical history (types of seizures, current antiepileptic drugs). Medication Adherence Reporting Scale, Version 5 (MARS-5)[8] was used as the primary tool for assessing medication adherence in epilepsy patients. Interpretation of the MARS-5 scale is as follows:

a) 0-15: Poor adherence – The patient very often does not follow the prescribed medication regimen (non-adherent)

b) 16-20: Moderate adherence – The patient has some degree of adherence, but there is significant room for improvement (non-adherent)

c) 21-24: High adherence – The patient is following the prescribed medication regimen to a high degree but still requires improvement (non-adherent)

d) Score of 25:- Adherent

Data was entered into Microsoft Excel and statistically analyzed using IBM SPSS Statistics version 26.0.

RESULTS

Among 108 patients, it was found that 20 (18.5%) showed poor adherence, 48 (44.4%) showed moderate adherence and 40 (37.1%) showed high adherence (Figure 1).

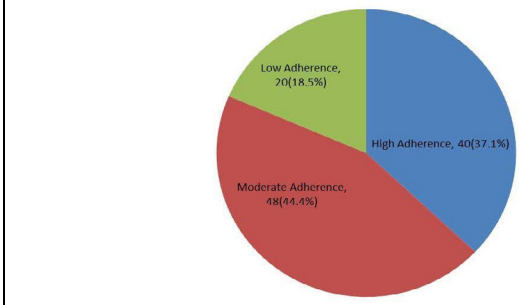

Figure 1. Distribution of patients as per the adherence on the basis of the MARS-5 adherence scale (n=108).

A total of 108 patients participated, among which male patients were a bit higher 62 (57.41%) and 46 (42.59%) females participated in the study. Patients between the age group 31-40 years showed the maximum 26 (86.67) adherence to antiepileptic drugs followed by the 21-30 age group 20 (83.3) whereas patients of the age group 61-70 years demonstrated the least adherence 6 (66.67) (Table 1).

Table 1. Distribution of patients showing adherence as per the age group (n=108).

Age group (years)	n (%)
21-30 (n=24)	20 (83.3)
31-40 (n=30)	26 (86.67)
41-50 (n=27)	22 (81.48)
51-60 (n=18)	14 (77.78)
61-70 (n=9)	6 (66.67)

Patients were divided as per the number of anti-epileptic drugs they were receiving and it was observed that as the number of drugs increases, adherence to drugs decreases (Table 2).

Table 2. Distribution of patients as per adherence to no of drugs used (n= 108).	
Type of therapy	**n (%)**
Monotherapy (40)	37 (92.5%)
Two drug therapy (57)	50 (87.72%)
Three drug therapy (11)	8 (72.27%)

Among 81 patients who were taking an anti-epileptic drug for tonic-clonic seizure, 76 (93.83%) patients took the drug exactly as directed while among 27 patients adherence was comparatively low 23 (81.48 %) in patients taking anti-epileptic drugs for complex partial seizure (Figure 2).

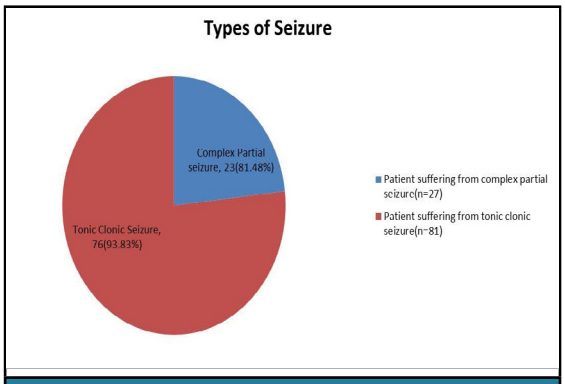

Figure 2. Adherence of patient as per the type of seizure (n=108).

Our study analyzed the study participants as per their formal/academic education status to understand the impact of education on adherence to anti-epileptic drugs. It was found that adherence to anti-epileptic drugs is directly proportional to education status (Table 3).

Table 3. Distribution of patients adhering to AED as per the education level (n=108).	
Education status	**n (%)**
No formal education (n=24)	17 (70.83)
Primary (n=26)	21 (80.77)
Secondary (n=34)	30 (88.24)
Above class 12 (n=24)	22 (91.67)

This study examined barriers like as forgetfulness 30 (27.8%), financial constraints 23 (21.3%), side effects 17 (15.7%), lack of education about epilepsy 14 (13%), social stigma associated with epilepsy 9 (8.3%), complex medication regimens 8 (7.4%), poor communication with healthcare providers 7 (6.5%), faced by the patients that prevent or decrease their adherence to anti-epileptic drugs (Figure 3).

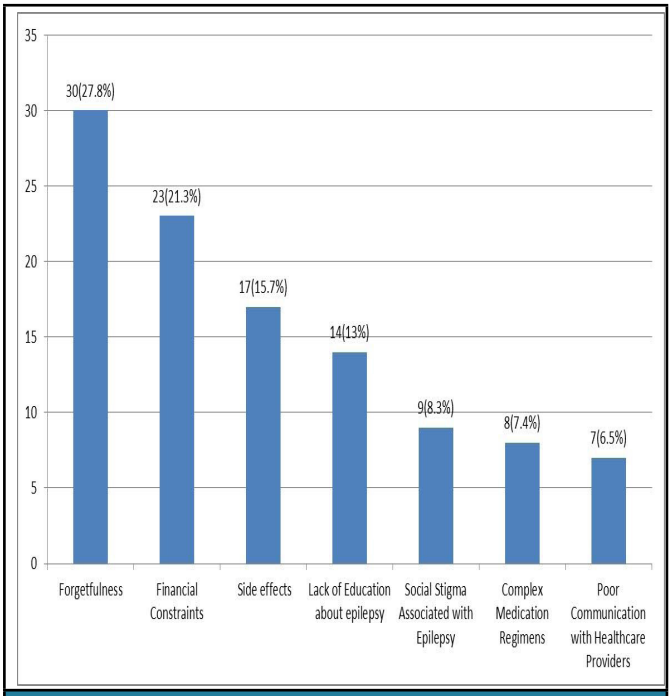

Figure 3. Barriers or challenges faced by the study participants for drug– adherence (n=108).

DISCUSSION

In this study, it was revealed that as per the MARS – 5 scale, 44.4% of patients demonstrated moderate adherence to AED therapy, while 37.1% exhibited high adherence and 18.5% showed low adherence. The 37.1% high adherence rate suggests that nearly one-third of patients are fully committed to their prescribed therapy, and taking their medications regularly, which is associated with better clinical outcomes such as seizure control and reduced hospitalizations, however, still a significant proportion of patients do not comply with the drug treatment. The findings of our study are strongly supported by Paschal A. et al. They found that 25.6% of patients had high adherence, 44.5% had moderate adherence, and 29.9% had low adherence.[9]

Medication adherence among epilepsy patients across five different age groups revealed the highest adherence with the 31-40 years group (86.67%), followed by the 21-30 age group (83.33%) and the 61-70 years group (66.67 %) the lowest. The highest adherence rate in the 31-40 years group can be attributed to factors such as stable health, established routines, and heightened responsibility for both personal and family well-being whereas the most likely explanation of the 21-30 years group showed better adherence due to strong health awareness, fewer chronic conditions. In contrast, elderly patients aged 61-70 showing the least adherence are most

largely due to age-related challenges such as cognitive decline, complex health conditions requiring multiple medications, and social isolation & lack of caregiver which can further hinder consistent medication use. The result of our study resonates with a study by Zeber J et al. in 2010 that analyzed adherence to 9 different AEDs in a national clinical sample of elderly patients with new-onset epilepsy. They found that nearly half of the older patients were non-adherent, with rates ranging from 42% to 63% across anti-epileptic drugs.[10]

Our study also observed medication adherence among epilepsy patients on monotherapy, dual therapy, and polytherapy. Our findings indicate that adherence rates decrease as the number of prescribed AED increases. Specifically, 91.30 % of monotherapy patients adhered to their medication regimen, compared to 86.49 % on dual therapy and 72 % on 3 drugs. The findings of our study are in agreement with those of a study carried out by Joshi et al.,which examined the impact of monotherapy and polytherapy on medication adherence among epilepsy patients where they found the same trend.[11] It is concluded that as the number of prescribed antiepileptic drugs increases, adherence rates tend to decrease. Both the studies highlighted that the physician should provide fewer drugs to increase patient adherence.

The present study identified several key barriers to medication adherence in patients with epilepsy, with forgetfulness (27.8%) being the most common. Forgetfulness is particularly critical in epilepsy due to the necessity of maintaining stable therapeutic drug levels to prevent seizure recurrence. This finding is consistent with a study by Faught et al. that also highlighted forgetfulness as a prominent factor contributing to non-adherence in adult epilepsy patients, accounting for nearly 25% of cases.[12] Financial constraints were the next most reported barriers to adherence by 21.3% of patients in this study, underscoring the economic burden of epilepsy treatment. Another study by Cutleret et al. also reported that patients with higher out-of-pocket costs for AEDs were less likely to remain adherent to their medication regimen. The nonadherence rate was approximately 25-30% higher among patients facing high costs.[13] Side effects were reported by 15.7% of patients in this study, reflecting concerns about medication safety and tolerability. A study by Schmidt D et al also reported in 2013 that 20% of epilepsy patients discontinued medications due to side effects.[14]

In this study, 13% of patients cited a lack of education about epilepsy as a barrier to adherence. This finding is supported by Munaf A et al. in which patients received 4 sessions of the structured educational program and found that the post-test Morisky Medication Adherence Scale reached 7.53 compared to a pretest score of 6.58 highlighting the need of health education to increase adherence.[15] Complex medication regimens were a barrier for 7.4% of participants in this study. A study by Sabaté et al. found that patients with complicated dosing schedules were significantly less likely to adhere to their treatment plans, with non-adherence rates reaching a maximum of 35%.[16]

Social stigma was also identified as a barrier of which 8.3% of participants reported that they didn't take their medication. A similar finding was reported by Zolnierek B et al., where 10% of patients avoided taking medications in public due to fear of discrimination or sigma.[17] Poor communication with healthcare providers accounted for 5.6% of barriers in the present study indicating the importance of healthy communication between a patient and physician. This aligns with findings by Jacoby A et al., where they advocated that there is a 19% higher risk of nonadherence among patients whose physician communicates poorly than among patients whose physician communicates well.[18]

The study is limited by its reliance on the reported data by the participants which can lead to recall bias, its single-center design that may not represent the wider population and its relatively small sample size.

CONCLUSIONS

The study revealed that adherence to antiepileptic drugs (AEDs) varied across different age groups, with patients between 21-40 years exhibiting the highest adherence. Patients on monotherapy demonstrated the best adherence rates, which kept on decreasing as no of drugs increased. The study also highlighted key barriers to medication adherence, with forgetfulness, financial constraints, and side effects being the most common reasons for non-adherence.

The study emphasizes the need for targeted interventions to improve medication adherence, such as simplifying treatment regimens, enhancing patient education, and addressing financial constraints thus ensuring cost minimization, fostering better communication by clinicians or reminders by family members or caregivers.

Conflict of Interest: None.

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