Article published online: 2024-10-07

Prescribing Pattern and Medication Adherence in Patients with Epilepsy in a Tertiary Neuro-Center, Kathmandu

Poonam Pant[1] Sarita Thapa[1] Shiba Bahadur Karkee[1] Sudip Pandey[2]

[1] Pharmacy Program, CiST College, New Baneshwor, Kathmandu, Nepal
[2] Madan Bhandari University of Science and Technology, Lalitpur, Nepal

Address for correspondence Poonam Pant, M. Pharm, Pharmacy Program, CiST College, New Baneshwor, Kathmandu, Nepal (e-mail: poonampant@cist.edu.np).

Int J Ep 2024;10:28–34.

Abstract

Background Epilepsy is a chronic condition characterized by unusual, frequent, excessive, and self-terminating neuronal firing. Adherence to medication is crucial to achieve the intended therapeutic outcome. However, not much research has been done on drug adherence in our context. Thus, the purpose of this study is to investigate the antiseizure medication prescribing pattern, medication adherence, and associated factors.

Materials and Methods A cross-sectional, analytical research was done on randomly selected epileptic patients through interview and documentary analysis using a semi-structured interview schedule and the eight-item Morisky Medication Adherence Scale (MMAS-8). The clinical and demographic characteristics were described using descriptive statistics (median, interquartile range [IQR], frequency, and percentage). The Shapiro–Wilk and chi-squared tests were used to examine the factors influencing medication adherence and the relationships between research variables. The analysis was performed using SPSS version 16.

Results From a total of 104 patients, 77.3% were males, the median age was 29 years (IQR: 16), the majority (42.3%) had higher secondary education, 15.4% had secondary education and 5.8% were illiterate, 25% were job holders, 26% were laborers, 41.3% were from province 3, and 16.3% were from province 4. Two-thirds (63.5%) of the patients were highly adherent to antiseizure medication and 54.8% were seizure free for more than 2 years.

The most common type of epilepsy diagnosed was generalized epilepsy (54.8%). Seizures were usually treated with monotherapy (65.4%), with sodium valproate being the most often used single antiseizure medicine (26.8%), followed by carbamazepine (16.3%) and levetiracetam (15.4%). Additionally, sodium valproate was the medication most frequently used in polytherapy for epilepsy. There was a strong association established between adherence and drug therapy type, age, adverse drug reaction, and

Keywords
- prescribing pattern
- medication adherence
- epilepsy
- antiseizure medication

article published online
October 6, 2024

DOI https://doi.org/10.1055/s-0044-1791263.
ISSN 2213-6320.

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

seizure control. The study revealed that adherence was not significantly associated with factors such as gender, occupation, regional distribution, or type of epilepsy.

Conclusion Low adherence was observed in 36.5% of patients. As a significant association was observed between medication adherence and seizure control, health care providers should focus on improving medication adherence. Evaluation of adherence needs to be a regular component of managing epilepsy. Further patients who do not stick to their drug regimens should receive more attention and assistance. It will support better therapy results.

Introduction

Recurrent episodic seizures, or at least two unprovoked (or reflex) seizures occurring more than 24 hours apart and affecting behavior, movement, sensations, or awareness, are the hallmarks of epilepsy, a neurological disorder.[1–3] Usually, excessive and hypersynchronized brain neuron discharges are the cause.[4] According to the International League Against Epilepsy (ILAE), epilepsies are classified into focal epilepsy, generalized epilepsy, and unknown epilepsy.[3,5] The World Health Organization (WHO) estimates that there are 50 million people with epilepsy worldwide, 80% of whom live in developing countries. In Nepal, a nation with a population of 27.5 million people, roughly 30,000 people have sought treatment for seizure disorders, yet many Nepalese with epilepsy remain undiagnosed and untreated.[6] The prevalence of epilepsy in Nepal is 7.3 per 1000 population.[7] Social stigma and misunderstandings about the condition, as well as pervasive poverty, illiteracy, ineffective and unequally distributed health care systems, make it difficult to diagnose epilepsy and offer appropriate, affordable treatment.[8] Medication adherence is essential for epileptics to avoid or minimize seizures and the overall impact they have on daily living.

In both developed and developing countries, nonadherence to medication remains a significant concern for health care providers as well as patients because of its adverse consequences on therapeutic outcomes. Unfortunately, data indicate that epilepsy patients' medication adherence is suboptimal.[9] Numerous studies have revealed that a significant number of epileptic patients in low-resource nations never receive proper care for their illness, and many who are diagnosed and started on medication quickly discontinue it.[10] According to a systematic review, the worldwide antiseizure medication (ASM) nonadherence rate among patients with epilepsy was between 25 and 66%.[11,12] Comparably, 34.1 to 65.4% of Ethiopians do not adhere to ASM.[13,14] Similarly, poor adherence to ASM was reported in 64.1% of Malaysian epileptic patients, a larger percentage than in Western populations.[15] The rate of medication adherence has been linked to several factors, such as age, gender, educational status, comorbidity, type of epilepsy, number of drugs, length of therapy, forgetfulness, and medication beliefs.[13,14,16–19]

In the recent years, polypharmacy has increased tremendously in chronic diseases like epilepsy, so a prescription pattern study will help identify the current practice of medications in epilepsy and its consequences.[20,21] Drug use studies are effective tools in evaluating drug prescribing trends, efficiency, and cost-effectiveness of hospital formularies. Thus, the current study was conducted to determine the drug adherence of patients with epilepsy and to assess patterns of ASM usage in a tertiary neuro-center in Kathmandu.

Materials and Methods

Study Setting and Population

A cross-sectional study was conducted from December 2019 to January 2020 in the outpatient department of Upendra Devkota Memorial National Institute of Neurological and Allied Sciences (UDM-NINAS), Kathmandu, Nepal. Patients at least 18 years old who had been prescribed ASM within the previous 6 months were included in the study, excluding patients with new cases of epilepsy, pregnant/lactating women, and those patients who were physically and mentally incapable of giving consent.

Sample Size

The sample size was calculated using the Cochran formula $n = Z^2pq/d^2$, where n = minimum sample size, Z = standard normal variate, p = estimated prevalence, $q = 1-p$, d = desired level of precision or margin of error, and confidence interval = 95%. Therefore, Z-score = 1.96 and the estimated prevalence $p = 7.3\%$.[7] Taking 95% confidence interval and 5% margin of error, the sample size was calculated as 104.

Data Collection and Variables

Data were collected by interviewing participants using a semi-structured questionnaire and the eight-item Morisky Medication Adherence Scale (MMAS-8), which was developed by Morisky et al.[22] The tool was translated into the Nepali language by the researchers and was back-translated into English by a translator. Pretesting was done to ensure the appropriateness, reliability, and clarity of the questionnaire in 10% of the sample size. The individuals who participated in pretesting were not included in the study.

Dependent Variable

ASM nonadherence was measured with the validated MMAS-8. MMAS-8 comprises a total of eight questions that must be answered with yes or no. The scoring procedure

is as follows: for questions 1 to 4 and 6 to 7, each "no" answer receives a score of "1" and each "yes" receives a score of "0." It is the opposite way around for question 5. On a 5-point Likert scale, the options for question 8 are the following: "never/rarely" (scored as 1), "once in a while" (scored as 0.75), "sometimes" (scored as 0.5), "usually" (scored as 0.25), and "all the time" (scored as 0). The total score of this questionnaire ranged from 8 to 0. Adherence to ASM was categorized into two categorical Likert scales: high adherence (6–8) and low adherence (<6). High and low adherence scores were calculated by using the mean adherence score.

Sociodemographic Variables

Sociodemographic variables included gender, age, education status, occupation, and state. Age was categorized into 18 to 25 years, 26 to 40 years, and above 40 years; education was categorized into illiterate, literate, secondary, higher secondary, and graduate; and occupation was categorized into farmer, service, business, teacher, laborer, students, unemployed, and others.

Statistical Analysis

Data were organized and stored in Microsoft Excel by using the validation command and analyzed in IBM SPSS version 16 software. Descriptive statistics (median, interquartile range, frequency, percentage) were used to describe the clinical and demographic variables. The determinants of medication adherence and the association between study variables were analyzed using a chi-squared test.

Results

Sociodemographic Characteristics

Out of 104 participants, the mean age of the participants was 31.9 ± 12.8 years (mean $\pm$ standard deviation [SD]), ranging from a minimum of 18 to a maximum of 73 years. Out of the total participants, 70 (67.3%) were males and 34 (32.7%) were females. The educational background of the study participants was primarily higher secondary (42.3%), followed by graduate (24%), while 12.5% of the participants were literate and 5.8% were illiterate. Approximately 26% of the participants were literate and 5.8% were illiterate. Approximately 26% of the participants were laborer followed by 23.1% service, 18.3% farmers, 11.5% unemployed, 8.7% student, and 9.6% involved in other occupation (►**Table 1**).

Table 1 Sociodemographic characteristics of epileptic patients ($n = 104$)

Variables		Frequency	Percentage
Gender	Male	70	67.3
	Female	34	32.7
Age group	18–25 y	39	37.5
	26–40 y	46	44.2
	Above 40 y	19	18.3
Educational status	Illiterate	6	5.8
	Literate	13	12.5
	Secondary	16	15.4
	Higher secondary	44	42.3
	Graduate	25	24.0
Occupation	Farmer	19	18.3
	Service	24	23.1
	Business	2	1.9
	Teacher	1	1.0
	Laborer	27	26.0
	Student	9	8.7
	Unemployed	12	11.5
	Others	10	9.6

Table 2 Distribution of patients with epilepsy by clinical related factors ($n = 104$)

Variables	Category	Frequency	Percentage (%)
Types of epilepsy	Focal epilepsy	34	32.7
	Generalized epilepsy	57	54.8
	Unknown epilepsy	13	12.5
Number of ASM prescribed	Monotherapy	68	65.4
	Polytherapy	36	34.6
Seizure-free period	Less than 2 y	47	45.2
	More than 2 y	57	54.8
Reported side effects	No	27	25.9
	Yes	77	74.1

Abbreviation: ASM, antiseizure medication.

Clinical and Treatment Related Factors

Generalized epilepsy (54.8%) was identified in the majority of participants, followed by focal epilepsy (32.7%) and unknown epilepsy (12.5%). In all, 54.8% reported having no seizures for more than 2 years, but 74.1% reported experiencing side effects. For the treatment of generalized epilepsy, sodium valproate (34%) was the most frequently prescribed ASM, followed by levetiracetam (11%) and carbamazepine (9%). Of the responders, 65.4% were on monotherapy (►**Tables 2** and **3**; ►**Fig. 1**).

Factors Associated with Medication Adherence

Compared with the 36.5% of patients who exhibited a low level of adherence, the MMAS-8 score showed that 63.5% of the patients demonstrated a high level of adherence. The Pearson chi-squared test was used to determine whether an association exists or not between the dependent and independent variables. The type of therapy, adverse drug reactions (ADRs), age group, and seizure-free years showed statistical significance with adherence; however, gender and epilepsy types did not show any significant association (►**Table 4**).

Table 3 Distribution of patients with epilepsy by types of therapy ($n = 104$)

Types of epilepsy	Types of therapy		Frequency
	Monotherapy	Polytherapy	
Focal epilepsy	24	10	34
Generalized epilepsy	39	18	57
Unknown epilepsy	5	8	13

Discussion

Types of Epilepsy and Prescribing Pattern of Antiseizure Medication

Generalized epilepsy accounted for the majority of the patients' encounters with epilepsy (54.8%), with focal and unknown epilepsy following closely after. The current result differs with research conducted at Jimma University, Ethiopia (80%),[23] Bangladesh (74%),[24] India (55.22%),[25] multiple teaching hospitals in Pakistan (47%),[26] and Saudi Arabia (65%).[27] This difference could be attributed to variations in the level of competence and the diagnostic instruments employed, which aid in the classification of seizure types. Lack of proper classification of seizure types affects the selection of drugs and treatment outcome.[28]

For managing generalized epilepsy, sodium valproate (34%) was the most commonly used single agent, followed by levetiracetam (11%) and carbamazepine (9%), while in treating symptomatic epilepsy, sodium valproate (32%) was the most commonly used single agent followed by carbamazepine (26%) and levetiracetam (21%). Findings from this study were consistent with those of other investigations, where phenytoin in India,[9] valproate in Pakistan[26] and Saudi Arabia,[27] and carbamazepine in the United Kingdom[29] and Bangladesh[24] were mostly prescribed. Similarly, 65.4% of patients received ASM as monotherapy. The finding is in line with the study done in Jimma, Ethiopia (54.5%),[23] United Kingdom (95.7%),[30] India (62.4%),[9] Cambodia (60%), Bangladesh (67%),[24] Pakistan (77.5%),[26] and Saudi Arabia (76.6%).[27] All these findings showed that treatment should be started with a single ASM (monotherapy) and the dose should be slowly built up until seizure control is achieved or side effects occur.

Similarly, in the present study, the most commonly prescribed ASM combinations were carbamazepine + clobazam (4.8%), levetiracetam + clobazam (3.8%), sodium valproate + phenytoin (2.9%), sodium valproate + clobazam (2.9%), sodium valproate + phenobarbital (1.9%), sodium valproate + lamotrigine + clobazam (3.8%), and carbamazepine + levetiracetam + clobazam (1.9%). This is in contrast to a study done by Tan et al in Singapore that observed sodium valproate + carbamazepine as the most common combination.[31]

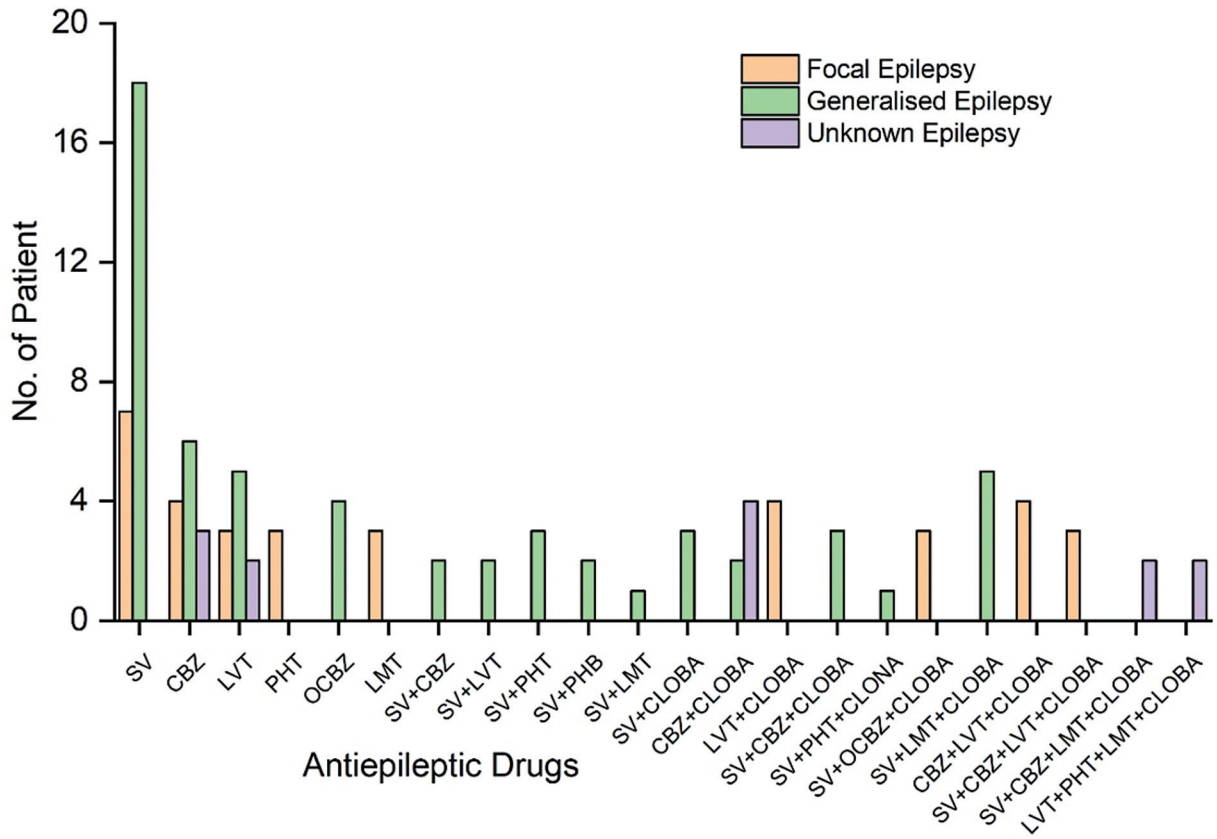

Fig. 1 Antiseizure medication utilization pattern among epileptic patients. Abbreviations: SV, Sodium valporate; CBZ, carbamazepine; LVT, levetiracetam; PHT, phenytoin; OCBZ, oxcarbazepine; LMT, lamotrigine; PHB, phenobarbital; CLOBA, clobazam; CLONA, clonazepam.

Table 4 Factors associated with medication adherence

Variables	Subcategory	Low adherence, *n* (%)	High adherence, *n* (%)	*p*-value
Gender	Male	25 (65.8)	45 (68.2)	0.802
	Female	13 (34.2)	21 (31.8)	
Types of therapy	Monotherapy	20 (52.6)	48 (72.8)	0.038
	Polytherapy	18 (47.4)	18 (27.2)	
ADRs	Yes	18 (47.4)	9 (13.6)	0.001
	No	20 (52.6)	57 (86.4)	
Age group	18–25 y	13 (34.2)	26 (39.4)	0.025
	26–40 y	13 (34.2)	33 (50)	
	>40 y	12 (31.6)	7 (10.6)	
Types of epilepsy	Focal epilepsy	11 (28.9)	23 (34.8)	0.340
	Generalized epilepsy	20 (52.6)	37 (56.1)	
	Unknown epilepsy	7 (18.4)	6 (9.1)	
Seizure-free years	<2	32 (84.2)	15 (22.7)	0.001
	>2	6 (15.8)	51 (77.3)	

Abbreviation: ADRs, adverse drug reactions.
Note: All *p*-values from a chi-squared test.

Factors Associated with Medication Adherence

One of the main problems with treating epilepsy is adherence to ASM. Poor adherence has received minimal attention in Nepal, despite being one of the primary reasons for nonresponsiveness to ASM therapy. Numerous methods can be used to assess adherence to ASM, such as self-reporting, pharmacy refill records, electronic monitoring, direct observation, and testing serum drug concentration.[32,33] MMAS-8 was used in the present study and it showed that the majority (63.5%) of the patients in our study adhered to the prescribed ASM. A study conducted in St John's Medical College and Hospital,[16] Neuro Spinal Hospital,[34] and France,[35] identified that 72.3, 70.8, and 79% of participants were adherent to the treatment. The high adherence in these studies might be because of the hospital-based participants who were more active, more health conscious, and hence were more motivated to adhere to their medication. However, the results were in contrast to another study that showed a low adherence.[36] The variations in the results could be attributed to the difference in data collection tools, the difference in sample size, or the true difference in different populations. Seizure-free year, age, and types of therapy and ADRs were observed to have significant associations with adherence. This finding is in line with the study that found a statistically significant association between the occurrence of ADRs and adherence. This could be because individuals who have negative side effects from their usual medications may decide not to take them regularly. However, a study done in the United Kingdom found that age does not affect the adherence of the patients.[37] This could be due to the difference in education level between the European community and the Nepalese community. In our study, we failed to find any significant association between gender and types of epilepsy with ASM adherence.

Conclusion

In conclusion, among ASMs, sodium valproate was utilized as a monotherapy and a polytherapy, while the majority of other ASMs were recommended as add-on therapies. In all, 63.5% of patients were found to be adherent and 36.5% of the patients had low adherence. Drug therapy (monotherapy and polytherapy), ADRs, age, and seizure control have a significant effect on adherence. The sole limitation of the current study is that it was performed in a tertiary hospital, which made extrapolating our findings to a broader population challenging. We suggest that more research be conducted utilizing several recognized techniques to assess adherence in a more diverse group to further address the issue of ASM adherence in epileptic patients.

Ethical Consideration

Prior to data collection, permission was obtained from UDM-NINAS and the Institutional Review Committee at the Central Institute of Science and Technology, affiliated to Pokhara University, Nepal approved the study (Ref no.: IRC-02–076/077). Participants received a written consent form outlining all the facts in both Nepali and English. For illiterate individuals, inform consent was obtained by thumbprint after verbally giving the content provided in the form. They were informed that participation would be voluntary, and sufficient time was given to read and understand it. Any types of economic and other benefits were not provided and any influence was not used to collect the data from the patients.

Ethical Approval and Consent to Participate

Research was performed in accordance with the Declaration of Helsinki and was approved by the ethics committee Institutional Review Committee at Central Institute of Science and Technology (IRC-CiST), affiliated to Pokhara University, Nepal (Ref: IRC-02–076/077). All the patients gave written consent to participate in the study.

Authors' Contributions

S.T., P.P., and S.B.K. developed the study concept; S.T., P.P., and S.P. conducted the data mining and analysis; and P.P. and S.P. wrote the manuscript, which was reviewed and edited by all the authors.

Availability of Data and Materials

The dataset analyzed during the current study are available from the corresponding author on request.

Funding

None.

Conflict of Interest

None declared.

Acknowledgments

The authors would like to express sincere acknowledgment to Central Institute of Science and Technology College and UDM-NINAS for giving permission to conduct this research. We are also grateful to all the patients who gave consent to participate in the study.

References

1 Falco-Walter JJ, Scheffer IE, Fisher RS. The new definition and classification of seizures and epilepsy. Epilepsy Res 2018;139:73–79
2 Janežič A, Locatelli I, Kos M. Criterion validity of 8-item Morisky Medication Adherence Scale in patients with asthma. PLoS One 2017;12(11):e0187835
3 International League Against Epilepsy (ILAE) 2017. Available at: https://www.ilae.org/guidelines/definition-and-classification/ilae-classification-of-the-epilepsies-2017
4 Baumann RJ, Ryan M, Yelowitz A. Physician preference for antiepileptic drug concentration testing. Pediatr Neurol 2004;30(01): 29–32
5 Martins HH, Alonso NB, Guilhoto LMFF, Guaranha MSB, Yacubian EMT. Adherence to treatment in patients with juvenile myoclonic epilepsy: correlation with quality of life and adverse effects of medication. J Epilepsy Clin Neurophysiol 2009;15:192–196
6 Ramsey RR, Zhang N, Modi AC. The stability and influence of barriers to medication adherence on seizure outcomes and adherence in children with epilepsy over 2 years. J Pediatr Psychol 2018;43(02):122–132
7 Trinka E, Kwan P, Lee B, Dash A. Epilepsy in Asia: disease burden, management barriers, and challenges. Epilepsia 2019;60 (Suppl 1):7–21
8 Ghimire P, Pant P, Khatiwada S, Ranjit S, Malla S, Pandey S. Self-medication practice in Kathmandu metropolitan city: a cross-sectional study. SAGE Open Med 2023;11:2050312123 1158966
9 Davis KL, Candrilli SD, Edin HM. Prevalence and cost of non-adherence with antiepileptic drugs in an adult managed care population. Epilepsia 2008;49(03):446–454
10 Buck D, Jacoby A, Baker GA, Chadwick DW. Factors influencing compliance with antiepileptic drug regimes. Seizure 1997;6(02): 87–93
11 Farrukh MJ, Makmor-Bakry M, Hatah E, Tan HJ. Use of complementary and alternative medicine and adherence to antiepileptic drug therapy among epilepsy patients: a systematic review. Patient Prefer Adherence 2018;12:2111–2121
12 Meyer A, Dua T, Ma J, Saxena S, Birbeck G. Global disparities in the epilepsy treatment gap: a systematic review. Bull World Health Organ 2010;88(04):260–266
13 Kassahun G, Moges G, Demessie Y. Assessment of patients' adherence to antiepileptic medications at Dessie Referral Hospital, chronic follow-up, South Wollo, Amhara region, north east Ethiopia. Neurol Res Int 2018;2018:1–6
14 Niriayo YL, Mamo A, Gidey K, Demoz GT. Medication belief and adherence among patients with epilepsy. Behav Neurol 2019; 2019:2806341
15 Tan X, Makmor-Bakry M, Lau CL, Tajarudin FW, Raymond AA. Factors affecting adherence to antiepileptic drugs therapy in Malaysia. Neurol Asia 2015;20:235–241
16 Gurumurthy R, Chanda K, Sarma G. An evaluation of factors affecting adherence to antiepileptic drugs in patients with epilepsy: a cross-sectional study. Singapore Med J 2017;58(02): 98–102
17 Elsayed MA, El-Sayed NM, Badi S, Ahmed MH. Factors affecting adherence to antiepileptic medications among Sudanese individuals with epilepsy: a cross-sectional survey. J Family Med Prim Care 2019;8(07):2312–2317
18 Hasiso TY, Desse TA. Adherence to treatment and factors affecting adherence of epileptic patients at Yirgalem General Hospital, Southern Ethiopia: a prospective cross-sectional study. PLoS One 2016;11(09):e0163040
19 Lamichhnae A, Pant P, Khadka S, Shrestha R, Pey S. Prevalence and associated risk factors of hypothyroidism in patients with diabetes mellitus. Diabetes Res 2024;1:1–11
20 Tefera G, Woldehaimanot T, Angamo M. Poor treatment outcomes and associated factors among epileptic patients at Ambo Hospital, Ethiopia. Gaziantep Med J. 2015;21:9
21 Kandel A, Pant P, Todi S, KC S, Pandey S. Effect of exercise and pharmacotherapy on non-alcoholic fatty liver disease. SAGE Open Med 2024;12:20503121241227090
22 Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. Med Care 1986;24(01):67–74
23 Gurshaw M, Agalu A, Chanie T. Anti-epileptic drug utilization and treatment outcome among epileptic patients on follow-up in a resource poor setting. J Young Pharm 2014;6:47–52
24 Habib M, Khan SU, Hoque A, et al. Antiepileptic drug utilization in Bangladesh: experience from Dhaka Medical College Hospital. BMC Res Notes 2013;6:473
25 Liu J, Xu R, Liu Z, You Y, Meng F. Factors influencing medication adherence after epilepsy surgery. Epileptic Disord 2015;17(01): 47–51, quiz 51
26 Mazhar F, Shamim S, Malhi SM. Drug utilization evaluation of antiepileptics in three selected multidisciplinary teaching hospitals of Pakistan. Int J Pharm Pharm Sci 2014;6:59–66
27 Gabr WM, Shams MEE. Adherence to medication among outpatient adolescents with epilepsy. Saudi Pharm J 2015;23(01): 33–40
28 Getnet A, Woldeyohannes SM, Bekana L, et al. Antiepileptic drug nonadherence and its predictors among people with epilepsy. Behav Neurol 2016;2016:3189108
29 Niriayo YL, Mamo A, Gidey K, Demoz GT. Medication belief and adherence among patients with epilepsy. Behav Neurol 2019; 2019:2806341
30 Conrad P. The meaning of medications: another look at compliance. Soc Sci Med 1985;20(01):29–37

31 Tan WW, Kong ST, Chan DWS, Ho PC. A retrospective study on the usage of antiepileptic drugs in Asian children from 2000 to 2009 in the largest pediatric hospital in Singapore. Pharmacoepidemiol Drug Saf 2012;21(10):1074–1080
32 Liu J, Liu Z, Ding H, Yang X. Adherence to treatment and influencing factors in a sample of Chinese epilepsy patients. Epileptic Disord 2013;15(03):289–294
33 Gollwitzer S, Kostev K, Hagge M, Lang J, Graf W, Hamer HM. Nonadherence to antiepileptic drugs in Germany: a retrospective, population-based study. Neurology 2016;87(05):466–472
34 Abd Wahab ES, Al Omar M, Altabakha MMAM. Adherence to antiepileptic drugs among patients attending the neuro spinal hospital in the United Arab Emirates. J Pharm Bioallied Sci 2020; 12(04):499–507
35 Laville F, Montana M, Roux N, Rathelot P, Giorgi R, Vanelle P. Factors limiting adherence to antiepileptic treatment: a French online patient survey. J Clin Pharm Ther 2018;43(01):73–79
36 Govil N, Chahal S, Gupta N, Kaloti AS, Nadda A, Singh P. Factors associated with poor antiepileptic drugs adherence in below poverty line persons with epilepsy: a cross-sectional study. J Neurosci Rural Pract 2021;12(01):95–101
37 Jones RM, Butler JA, Thomas VA, Peveler RC, Prevett M. Adherence to treatment in patients with epilepsy: associations with seizure control and illness beliefs. Seizure 2006;15(07):504–508

