



**Assessment of Psychoeducation on Patients' Adherence to Antiepileptic Drugs in Federal
Neuro Psychiatric Hospital, Maiduguri**
Psychoeducation and patients' adherence to antiepileptic drugs

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Abstract

Epilepsy is a disorder of the brain characterized by an enduring predisposition to generate epileptic seizures. Among patients on treatment with antiepileptic drugs, medication adherence remains a major challenge with consequences such as poor seizure control. This study examined the effect of psycho-educational intervention on patients' adherence to antiepileptic drugs. In this randomized controlled interventional study on a cohort of patients with epilepsy attending the outpatient clinic of the Federal Neuro Psychiatric Hospital, Maiduguri, one hundred and ninety (190) patients were randomized into control (n=95) and Intervention (n=95) groups. Patients in both groups received standard care as practiced in the hospital. In addition, the intervention group received three sessions of psycho-education on epilepsy focusing on basic knowledge regarding epilepsy, myths and truths about epilepsy, diagnosis, treatment with emphasis on drug adherence, living with epilepsy and coping strategies delivered at follow up visits for 3 months. Patients' drug adherence was measured using the eight-item Morisky Medication Adherence Scale (MMAS-8) for both groups while socio-demographic and clinical variables were collected using structured form at baseline. Medication adherence was measured in both groups post intervention. Data was analyzed using SPSS version 25 and expressed as frequency while paired sample t test was used to compare outcome in both groups. The majority of the participants in this study were male (57.1%), unemployed (32.1%), and 51.9% not married. The mean age of control and intervention groups are 25.55 ± 6.02 and 26.34 ± 6.18 respectively. Most of the patients have Focal type of epilepsy (61.5%). Majority of the patients are on monotherapy (67.3%) with carbamazepine as the most prescribed antiepileptic drugs. There was no significant difference ($p=0.286$) between the mean MMAS score before and after the intervention for the control group whereas the mean MMAS scores of the intervention group were 5.12 ± 0.64 and 6.99 ± 0.76 before and after psycho-education, respectively ($p=0.000$). The rate of medication adherence was observed to be low in this study. There was no association between medication adherence and patient-related variables. However, psycho-education was shown to improve medication adherence significantly.

Keywords: Adherence, Antiepileptic drugs, Assessment, Epilepsy, Psychoeducation.

Introduction

Epilepsy is a neurological disorder that is characterized by an enduring predisposition to generate epileptic seizures and the associated cognitive, psychological and social consequences (Fisher *et al.*, 2014). It is a common neurological disease affecting people of all age-groups, gender and geographic boundaries. This condition remits in some people following treatment while some others will have epilepsy throughout their lives (Stafstrom *et al.*, 2014). Epilepsy is associated with poor quality of life and psychological issues due to stigmatization by the community (Akinsulore and Adewuya, 2010; Fiest *et al.*, 2014). Among factors that have been identified to affect care for people with epilepsy are cultural beliefs, perception of the disease, poor access to treatment as well as epilepsy treatment gap (Shrivastava *et al.*, 2016).

Treatment with antiepileptic drugs (AEDs) is the mainstay in the management of patients with epilepsy and this is found to be effective in about 70–80% of patients (Sisodiya, 2007; Hussein *et al.*, 2010). The cornerstone of management of epilepsy in Nigeria is the use of antiepileptic drugs (Ezeala-Adikaibe *et al.*, 2010). However, medication adherence remains a major challenge among patients on treatment with antiepileptic drugs with consequences such as poor seizure control, increased hospitalizations and frequent visits to the emergency department (Faught *et al.*, 2009). No adherence has been associated with increased incidence of complications such as status epilepticus, increasing risk of mortality and healthcare costs among patients with epilepsy (Lie *et al.*, 2015). Factors that have been identified as

contributing to nonadherence among patients with epilepsy include forgetfulness, remission of symptoms, number of administered drugs, stigmatization and adverse effects of drugs (Gabr and Shams, 2015; Tang *et al.*, 2013).

Inadequate adherence to AED regimens is a global problem which may affect the management of epilepsy thereby placing a significant burden in terms of economic and clinical outcomes (Davis *et al.*, 2008). There is limited information available regarding medication adherence of epileptic patients to antiepileptic drugs in the Nigeria. In addition, studies have revealed that a significant number of parents had insufficient knowledge on the management of epilepsy thereby compromising adherence to treatment (Sweileh *et al.*, 2011). Psychoeducational interventions can help to improve adherence to antiepileptic drugs by providing knowledge about epilepsy, reducing misinformation and misconceptions about epilepsy, and teach people with the disorder and their families on better ways of coping with the illness (May and Pfafflin, 2005). Psychoeducational intervention is an important mental health intervention that improves patient care, and previous interventional studies in Nigeria and Uganda found that it improved patients' adherence to treatment (Prost *et al.*, 2013; Takai and Chikaodiri, 2015).

Most of the studies conducted in Nigeria have either determined the prevalence of non-adherence to antiepileptic medications or examined the effect of patients' perception of epilepsy or adverse effects of the drugs on adherence (Fadare *et al.*, 2018). This study was conducted to assess adherence to antiepileptic drugs and

investigate the effect of psychoeducation on patients' adherence to AEDs in Federal Neuro Psychiatric Hospital (FNPH), Maiduguri. The specific objectives of the study were to:

- determine patients' adherence to antiepileptic drugs among people with epilepsy attending the out-patient clinic of FNPH, Maiduguri,
- examine patient-related factors between adherent and non-adherent epileptic patients to identify factors that influence adherence,
- compare the effect of psychoeducation on patient's adherence to antiepileptic drugs and determine the effect of psychoeducational intervention on adherence.

Materials and methods

Study Design

The study was a case-control study on a cohort of patients living with epilepsy and was conducted at the out-patient clinic of the FNPH, Maiduguri. Patients with epilepsy who have been attending the medical out-patients' clinic of the hospital were prospectively recruited for this study. A total of one hundred and ninety (190) patients were randomized into control (n=95) and intervention (n=95) groups. Patients in both groups received standard care as practiced in the hospital and were sub-grouped base on their clinic appointment days for easy tracking. In addition, for patients in the intervention group, psychoeducation on epilepsy was administered in a structured format by an epilepsy nurse and a social worker.

Study Setting

The study was conducted at the Federal Neuro-Psychiatric Hospital (FNPH) Maiduguri, Borno State. Maiduguri is the capital and the largest city of Borno State in North-eastern Nigeria. It is located 11.85 latitude and 13.16 longitude and it is situated at elevation 325 meters above sea level. The Hospital is a regional Psychiatric referral Centre, as it serves the North-east region of Nigeria (Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe States) and also receives influx of patients from the neighbouring countries of Chad, Cameroun, and Niger Republic. The Hospital has two hundred (200)-bed capacity and receives walk-in patients as well as those on referral either as out-patients or in-patients/on admission. The general outpatient clinics run four (4) times a week between 8:00am and 3:00pm daily including Mondays, Tuesdays, Thursdays and Fridays excluding public holidays.

Study Population

The total population of patients accessing care at the FNPH, Maiduguri stands at 62,352 as of December, 2017. These include patients with both mental illnesses as well as neurodegenerative disorders. As of December, 2017 a total of 5321 patients comprising of 3,012 males and 2,309 females have been diagnosed with epilepsy. Patients with epilepsy that have been diagnosed using the International League Against Epilepsy (ILAE) criteria, supported with EEG and confirmed by a psychiatrist attending the out-patient clinic of FNPH, Maiduguri from 2013 (5-year period) to the onset of the study constituted the study population.

Sample Size Determination

The minimum sample size for the study was computed using the statistical formulae for

comparison of two proportions. The formula for sample size is given as:

Sample size=

$$\frac{\left(z_{\alpha}\sqrt{\left(1+\frac{1}{m}\right)p^*(1-p^*)+\frac{z_{\beta}\sqrt{p_1(1-p_1)}}{m+p_2(1-p_2)}}\right)^2}{(p_1-p_2)^2}$$

While p^* is given as;

$$p^* = \frac{p_2 + m p_1}{m + 1}$$

Where;

z_{α} = Standard normal variate for level of significance (at 5% type 1 error ($P<0.05$) it is 1.96)

m = number of control subject per experimental subject (1 for equal number of case and control)

Z_{β} = Standard normal variate for power (for 80% power it is 0.84)

p_1 = Probability of event in control group reported by Prost *et al.*, 2013 (80% = 0.80)

p_2 = probability of event in experimental group as reported by Prost *et al.*, 2013 (95% = 0.95)

Substituting in the formula above, when $P^*=0.88$

Sample size = 69.50 approximately 70.

To correct for attrition (drop-out) when the anticipated response rate is 80%, an adjustment was made to the calculated sample size, using the formula by Araoye, 2004.

$$\text{Sample size} = \frac{70}{0.8} = 87.5$$

This number was rounded up to 95 patients for each group (intervention and control groups) making a total of 190 patients recruited for this study.

Sample Selection

Inclusion criteria for patients

Patients included in the study were:

- Patients diagnosed with epilepsy using the ILAE criteria, supported by EEG, and receiving treatment with AEDs.
- Patient attending out-patient clinic within the last 5 years to the onset of the study.
- Patients aged 18 years and above.
- Patients who consented to participate in the study.

Exclusion criteria for patient

Patients were excluded from the study on the basis of:

- Presence of co-morbid mental disorder or cognitive impairment
- Presence of a rapidly progressing neurological or medical disorder
- History of significant substance abuse within the past year.

Sampling Technique

A systematic random sampling technique was used to select participants that were enrolled for this study. A total of 589 patients fulfilled the recruitment criteria for this study. For both control and intervention group ($n=95$ for each group), a total of 190 participants were required. The sampling ratio of 589/190 was used to achieve a sampling interval of 4. Using a random number sequence that was matched with the number on a computer-generated table of participants, 6 unique blocks were created using the labels A and B for the two groups. The Label "A" was allocated to the control group ($n=95$), while "B" ($n=95$) was allocated to the treatment group.

Development of Psychoeducation program

The psychoeducation program on epilepsy was developed in conjunction with a

psychiatrist, a clinical psychologist, epilepsy nurses and two social workers. The program was intended to target patients most of whom possess low educational background, so the learning tool was developed in the form of pamphlets with pictorial presentation covering different aspects of epilepsy. The domains covered by the psychoeducational program were basic knowledge regarding epilepsy, myths and truths about epilepsy, diagnosis, treatment modalities (with emphasis on adherence and side effects), living with epilepsy and coping strategies (*tab 1*).

Study Instruments used

Morisky Medication Adherence Scale

The primary outcome of drug adherence was measured using eight-item Morisky Medication Adherence Scale (MMAS-8) (Morisky *et al.*, 2008). The MMAS-8 have been used previously among Nigerian patients with epilepsy, hypertension, diabetes mellitus and psychiatric disorders (Fadare *et al.*, 2014). The instrument has also been shown to have good internal consistency and reliability when used in studies within the African continent and beyond (Okello *et al.*, 2016). There was an existing permission for usage of the tool in the hospital and it was consented for use in this study. This took an average of Fifteen (15) minutes to complete for each participant.

Patient socio-demographic and clinical data form

This was designed to obtain socio-demographic and clinical data of the participants. Information on patient's age, gender, education, employment status, marital status was collected. Clinical variables including patients' diagnosis,

current antiepileptic drugs, and seizure frequency were also recorded pro forma using the data form. This took an average of about ten (10) minutes to complete for each participant.

Ethical Consideration

Ethical clearance for the study was obtained from the Research and Ethics Committee (REC) of Federal Neuro psychiatric Hospital, Maiduguri. Patients were assured of confidentiality by concealing their identity, and that any information they provide will be used only for the purpose of this research. An informed consent was sought from patients after explaining the study aim, procedures, risk and benefits and that participation was voluntary (i.e., they can refuse in part or in whole, or withdraw at any time). Only those who consented were included in the study.

Study procedures

The study was conducted at the outpatient clinic of the FNPH, Maiduguri between 8th January and 22nd June, of 2018. All participants for the study in both groups received the standard care in which patients during clinic sessions receive a one-time session of brief advice on medication use regularly lasting just few minutes as delivered by the pharmacists, nurses, or physicians. Patients enrolled in the psychoeducational intervention group received the standard care and in addition, three (3) psychoeducational sessions. Patients for this study were recruited based on their clinic appointment days which was recorded against patient information following randomization into the respective groups. Other information such as phone numbers of patient or their relatives were also collected to enable patient tracking. For

the period of the study, all patients' folder for this study were kept at a separate location within the medical record department which also aided follow up. Patients' socio-demographic and clinical parameters were collected at the beginning of the study after which the patients were randomly allocated into intervention and control groups (control group receiving standard care and intervention group receiving psychoeducation in addition to the standard care). A baseline assessment (T_0) on day 1 was conducted to assess the medication adherence of the patients using MMAS for both groups. The psychoeducation program on epilepsy was conducted along with distribution of pamphlet (to the intervention group alone). At subsequent follow up visit for the different patients, the previous psycho-educational session was recapped before delivering the next session. All patients in the intervention group received three sessions each lasting between 30 minutes to 1 hour in a total of three follow up visits each of one month duration. After three months, a post intervention assessment (T_3) was conducted to assess adherence using MMAS and recorded for both groups as appropriate for all patients respectively.

Determination of effect of Intervention

Cohen's d is the appropriate effect size measure if two groups have similar standard deviations and are of similar size (Cohen, 1992). Cohen's d was used to calculate the effect size in this study.

Statistical Analysis

The International Business Machine (IBM) Statistical Package for Social Sciences (SPSS) version 25 was used for analyzing data obtained. Descriptive statistics was

used for patients' demographics, clinical variables, medication information, and adherence rates for antiepileptic medications. Data were expressed as frequency (percentage). The association between variables was calculated using Chi-square test. Paired sample t-test was used to compare adherence at the end of 3 months between both groups while an independent sample t-test was used to evaluate adherence within individual groups at baseline and the end of 3 months. A p -value < 0.05 was considered statistically significant.

Results

Participants Response Rate

After a follow-up of 3 months, 76 (80%) patients in the intervention group and 80 (84.2%) in the control group completed the study and were considered for analysis. From a total of 190 sample size, 156 participants completed the study giving a response rate of 82.1% (*fig 1*).

Patients Socio-demographic data

Baseline demographic data were comparable in both groups. *Table 1* shows the socio-demographic characteristics of the enrolled patients. The percentage of male patients in this study was 57.1% while female subjects represent 42.9% of the study participants. Marital status of the study participants revealed 51.9% are single with only 26.3% married. The percentage of participants that were divorced and widowed was 13.5% and 8.3% respectively. About 32.1% of the patients in this study were unemployed while 27.6% self-employed. The mean age of control and intervention groups are 25.55 ± 6.02 and 26.34 ± 6.18 respectively.

Patients clinical Variables

Table 2 shows the clinical variables and treatment related characteristics of all patients. Majority of the participants in this study were diagnosed with focal type of seizure (61.5%) with generalized type accounting for 38.5%. About 23.6% and 20.5% of the subjects had first- and second-degree relatives with epilepsy respectively whereas, most of the patients were not sure if there is a family history of epilepsy. Most of the respondents, 105 (67.3%), were on monotherapy and carbamazepine was the most commonly prescribed AED. Comorbid (medical) illness was reported by 25 (16.0%) participants and majority of the participants 87 (55.8%) were treated for epilepsy for at least 1 year.

Morisky Medication Adherence Scale (MMAS) Scores for Control and Intervention groups

The current study showed satisfactory Cronbach's alpha of 0.89. In the intervention group, the baseline mean MMAS score was 5.12 ± 0.64 while that of the control group was 5.29 ± 1.28 . However, the post intervention mean MMAS score was 6.99 ± 0.76 and 5.39 ± 1.05 for the intervention and the control group respectively.

Comparison of MMAS Score between Control and Intervention Groups

The mean MMAS score did not increase significantly ($p=0.328$) in the control group, while there was a highly significant difference ($p=0.000$) in the intervention group from the pre-test period to the post-test period.

Comparison of adherence level between control and intervention groups

Table 5 shows the distribution of patients based on adherence level. At baseline, 53.9% of patients in the intervention group had medium adherence scores (MMAS-8 score, 6–8), and only 13.2% were classified as having high adherence scores (MMAS-8 score, 8). 3 months after intervention, 59.2% of patients in the intervention group had medium adherence scores (MMAS-8 score, 6–8) and 25% had high adherence scores (MMAS-8, score 8).

Determination of Effect of psychoeducation on medication adherence

$$\text{Cohen's } d = \frac{(-1.86842 - 0.09375)}{0.861511} = 2.05995$$

Discussion

Evidences from literatures have shown that patients living with epilepsy require information regarding the different domains of epilepsy such as lifestyle management, employment, seizure types, medication, side effects from medication, treatment options, and seizure control (Rajpura and Sethi, 2004). At the end of our study, it was observed that the psychoeducation on epilepsy was effective in increasing MMAS scores. There was a significant difference between the control group and the intervention group following psychoeducational intervention after 3 months. In a randomized control trial on 738 patients of epilepsy by Ibinda and his colleagues, there was no significant difference in adherence to antiepileptic medication as well as seizure frequency after 1 year of an educational program (May and Pfäfflin 2002). This difference when compared with our study could be attributable to the relatively longer duration

of follow-up (1 year) in contrast to a short duration of follow-up (3 months) in the present study.

Several studies on this subject have demonstrated a positive impact of educational interventions on medication adherence in PWE. Dash *et al.* in a randomized control trial on PWE found a statistically significant increase in the self-reported antiepileptic drug adherence following a structured six-domain epilepsy educational program given over four sessions by a trained staff member (Dash *et al.*, 2015). This is in agreement with our study following Psychoeducational intervention administered in three sessions at follow up visits. Our intervention, while addressing basic knowledge regarding epilepsy, mainly instilled an understandable explanation of epilepsy as a disorder, myths and truths about epilepsy, its diagnosis, treatment modalities (with emphasis on adherence and side effects) thus attempting to demystify and possibly encourage the participants on living with epilepsy and coping strategies. These could be part of the reasons that ensured its positive impacts in our study.

The mean age of our patient cohort 25.95 ± 12.2 years compared to 34 ± 19.2 years reported in a study conducted at Ile-Ife, south-west Nigeria and Oman (Komolafe *et al.*, 2015; Al Za'abi *et al.*, 2013). Another study among adult Nigerians reported a mean age of 21 years with dominance of partial seizures (Ogunniyi *et al.*, 1998) which is similar to the findings of this study. This is probably due to the fact that the incidence of epilepsy is high in adolescence and the prevalence of psychiatric disorder is also higher than in childhood or adulthood.

Also, larger proportion of the patients in this study were of male gender (57.1%), this is in agreement with results of studies from Nigeria and Ethiopia with male preponderance (Sanya *et al.*, 2015; Hasiso and Desse, 2016). It is thought that, in most parts of Africa, males more readily visit the hospital for socioeconomic reasons and hence predominate in the hospital populations. The male sex preponderance may also be due to occupational and social exposure to epileptogenic insults such as cranial trauma, alcohol and substance use. Cultural barrier is another likely reason that may account for these differences and this is more so in the Northern part of Nigeria where this study is carried out.

In the present study, focal seizure (61.5%) was the major type of seizure which is close to 58% reported in a community survey in some African countries (Kariuki *et al.*, 2014). Most of the patients (55.8%) have a duration of illness of greater than 1 year. With regards to the number of prescribed AEDs, 67.3% of patients in this study are on monotherapy. This is in agreement with studies conducted in Colombia and Oman which reported 65.4% and 78% monotherapy use among PWE respectively (Machado-Alba *et al.*, 2016). The reason for this is probably because monotherapy is the gold standard in the treatment of epilepsy. This can also be attributed to the nature of the clinic from which the patients were recruited. Carbamazepine was the most prescribed AED in this study (63.5%), similar to results earlier reported in some studies in Nigeria (Ipingbemi, 2015; Fadare *et al.*, 2014). This can be attributed to the efficacy and safety profile of carbamazepine; it is well tolerated and is the most used agent in monotherapy (34.6%)

followed by sodium valproate (21.2%). New generation antiepileptic agents used by participants in this study are levetiracetam (8.3%) and lamotrigine (5.1%). This is lower than the number of older AEDs used by participants in this study and the reason for this could be the high cost of the newer agents or possibly their availability and affordability.

Compared with previous studies that used aMMAS-8 to measure medication adherence in patients with epilepsy (Sweileh *et al.*, 2011; Ferrari *et al.*, 2013 and Dash *et al.*, 2015) our participants had higher rates of high-to-moderate adherence. In the current study, only 14.1% among our study participants were classified as highly adherent. In comparison, reports from China and Palestine showed that 4.6% and 36% of patients were classified as highly adherent, respectively (Tang *et al.*, 2013; Sweileh *et al.*, 2011). Previously reported rates of adherence for antiepileptic medications ranged from 31.8 % to 70% (Abula and Worku, 2001). The inconsistency in the findings may be due to the difference in the data collection methods. There may be over or under reporting of certain variables due to patient personal variation in these settings. The method employed in measuring adherence could be another reason for these variations, while some studies used laboratory markers to calculate adherence rate others use odds ratio which are different from the method used to calculate adherence rate in this study. In this study, we used the MMAS-8 scores and only scores of 8 were considered as highly adherent.

There was no association between medication adherence, sex, marital status, and level of education, occupation, duration

of illness, seizure frequency and the presence or absence of comorbid illnesses in this study. In contrast, there were significant associations between seizure frequency and duration of illness and medication adherence in studies from the USA and China (Nakhutina *et al.*, 2011; Liu *et al.*, 2015). However, there was a significant association ($p= 0.03$) between family history and medication adherence in the control group which was different in the intervention group. Also, in the intervention group, a significant association was observed ($p= 0.01$) between medication adherence and number of AEDs. The inconsistency in the results might be due to the fact that most of the participants in the study were of low education background and may resort to alternative traditional practices at home other than proper medication follow up.

The effect of psychoeducation intervention in this study reveals that the intervention group (psychoeducation in addition to standard care) differs from the control group (standard care alone) by about 2 standard deviations. According to Cohens "rule of thumb" effect sizes greater than 1 can be referred to as "grossly perceptible and therefore large" (Cohen, 1992). Although there was no similar study that included the effect size determination, this result however, further corroborates the statistical significance ($p= 0.000$) that was observed between the control and intervention group in this present study.

The results of this study showed that medication adherence to AED was poor with no significant association between medication adherence and patient-related factors. This highlights the ubiquitous problematic degree of medication adherence

to antiepileptic drugs especially in developing countries. However, psychoeducation improves knowledge about epilepsy which in turn improves adherence to antiepileptic drugs. The low level of adherence observed in this study calls for further research and due consideration in planning appropriate strategies to improve the existing system employed in the management of people with epilepsy. Psychoeducation resulted in a significant improvement in medication adherence and therefore the intervention can be considered to be effective.

Declaration of interest

There is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

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Tables and Figures

Table 1: Socio-demographic characteristics of patients in the intervention and control group

Variables		Frequency (%)	
		Control group (n=80)	Intervention group (n=76)
Gender	Male	50 (62.5)	39 (51.3)
	Female	30 (37.5)	37 (48.7)
Marital status	Single	39 (48.8)	42 (55.3)
	Married	18 (22.5)	23 (30.3)
	Divorced	12 (15.0)	9 (11.8)
	Widowed	11 (13.8)	2 (2.6)
Education	No formal education	28 (35.0)	14 (18.4)
	Primary level	9 (11.3)	25 (32.9)
	Secondary level	31 (38.8)	25 (32.9)
	Tertiary level	12 (15.0)	12 (15.8)
Occupation	Unemployed	27 (33.8)	36 (47.4)
	Government employee	8 (10.0)	10 (13.2)
	Self employed	26 (32.5)	17 (22.4)
	Dependant	19 (23.8)	13 (17.1)

Table 2: Distribution of patients by clinical variables and treatment related factors

Variables	Category	Frequency (%)	
		Control group (n=80)	Intervention group (n=76)
Diagnosis	Focal	53 (66.3)	43 (56.6)
	Generalized	27 (33.8)	33 (43.4)
Family history	1 ⁰ relative(s)	22 (27.5)	19 (25.0)
	2 ⁰ relative(s)	11 (13.8)	21 (27.6)
	Unknown	47 (58.8)	36 (47.4)
Duration of illness	≥ 1yr	53 (66.3)	34 (44.7)
	< 1yr	27 (33.8)	42 (55.3)
Seizure frequency	1–3 per yr	18 (22.5)	26 (34.2)
	≥ 1 per month	15 (18.8)	9 (11.8)
	Seizure-free for > 2 yr	26 (32.5)	16 (21.1)
	Seizure-free for ≤ 2 yr	11 (13.8)	16 (21.1)
	Not applicable	10 (12.5)	9 (11.8)
Number of AED	Monotherapy	54 (67.5)	51 (57.1)
	Polytherapy	26 (32.5)	25 (32.9)
Co-morbid illness	Present	12 (15.0)	13 (17.1)
	Absent	68 (85.0)	63 (82.9)
Current AED(s)	Carbamazepine	30 (37.5)	24 (31.6)
	Sodium valproate	18 (22.5)	15 (19.7)
	Levetiracetam	1 (1.3)	8 (10.5)
	Lamotrigine	2 (2.5)	3 (3.9)
	Carbamazepine + Sodium valproate	6 (7.5)	3 (3.9)
	Carbamazepine + Phenobarbitone	13 (16.3)	13 (17.1)
	Carbamazepine + Phenytoin	1 (1.3)	2 (2.6)
	Carbamazepine + Levetiracetam	2 (2.5)	2 (2.6)
	Carbamazepine + Lamotrigine	2 (2.5)	1 (1.3)
	Sodium valproate + Phenobarbitone	3 (3.8)	3 (3.9)
	Sodium valproate + Phenytoin		2 (2.6)

Table 3: Mean and standard deviation of Morisky Medication Adherence Scale (MMAS) scores among subjects in control and intervention groups

MMAS	N	Group	Mean±SD	P value
Baseline	80	Control group	5.29±1.28	0.286
	76	Intervention group	5.12±0.64	
Post intervention	80	Control group	5.39±1.05	0.000
	76	Intervention group	6.99±0.76	

Table 4: Effect of psychoeducation on Morisky Medication Adherence Scale (MMAS) Scores in control and intervention groups (paired samples t-test)

Group	Paired differences			P value
	Mean	Std. deviation	Std. error of mean	
Control group(n=80)	-0.09375	0.85163	0.9522	0.328
Intervention group (n=76)	-1.86842	0.87128	0.9994	0.000

Table 5: Comparison of adherence level between control (n=80) and intervention (n=76) groups

Adherence level	Baseline, n (%)		3 months after Intervention, n (%)	
	Control	Intervention	Control	Intervention
High (8)	8 (10%)	10 (13.2%)	7 (8.7%)	19 (25%)
Moderate (6-8)	44 (55%)	41 (53.9%)	48 (60%)	45 (59.2%)
Low (<6)	28 (35%)	25 (32.9%)	25 (31.3%)	12 (15.8%)

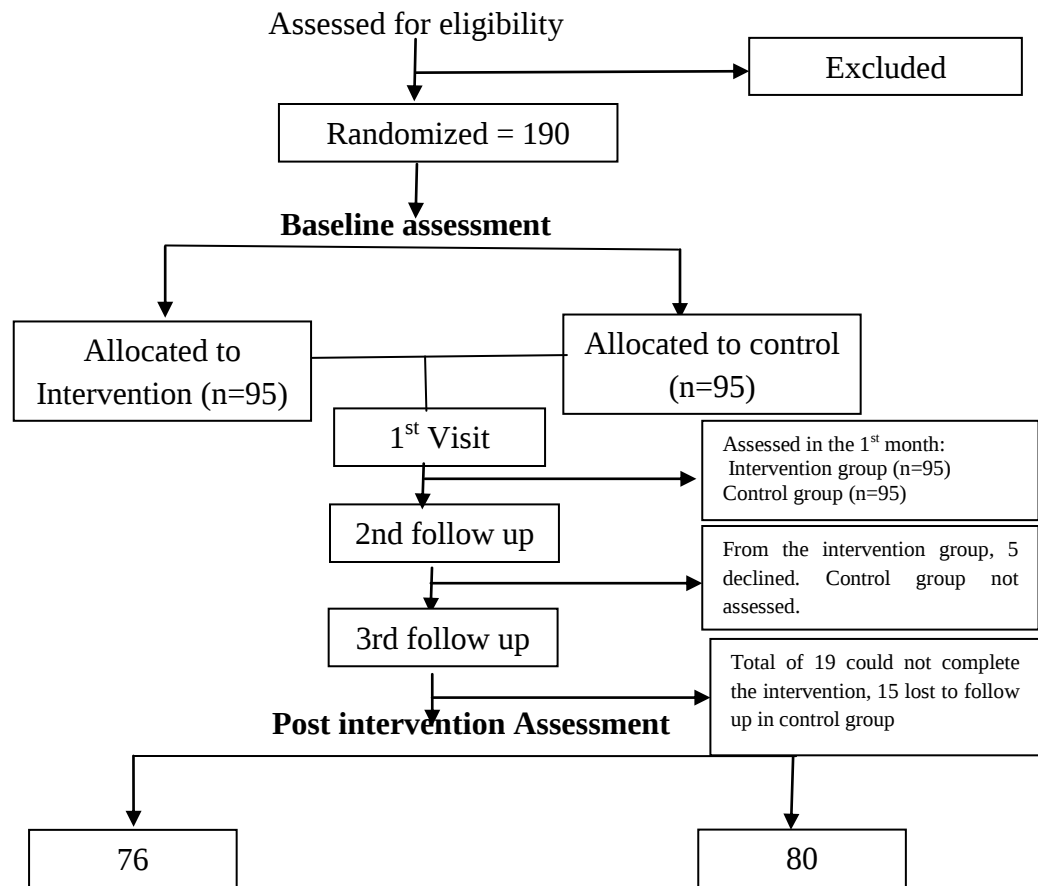


Figure 1: Flow chart of patient selection and randomization in control and intervention group

Appendix 1

Sessions	Epilepsy-Specific Management	Examples of Knowledge and Skills
Session one	General information on epilepsy	Knowledge: Specific seizure type, first aid response, recognition and treatment for seizure emergencies (seizure action plans) Skills: Recognizing, recording, and tracking episodic events; identifying seizure triggers; keeping a seizure diary
Session two	Medications and treatments: knowledge about antiepileptic drugs (AEDs), adherence to AEDs and measures to improve adherence	Knowledge: Medication name, dosage, possible medication interactions and side effects, consequences of missed or late doses, drug-alcohol interactions Skills: Tracking medication intake and matching intake with some aspects of daily living, tracking medication dose and changes, managing refills, responding to allergic reactions or adverse effects
Session three	Safety: seizure attack severity, dangers and impending signs of an attack and coping with epilepsy	Knowledge: Risks for injury related to seizures and treatment, strategies for reducing injury, risks for mortality, including sudden unexpected death in epilepsy. Skills: Assessing risks in environment, modifying, environment and lifestyle to reduce risks yet maintain quality of life, assessing the impact of seizures on daily life and making modifications

(physical activity, adequate sleep,
pleasurable activities, physical health,
emotional health)
