Seizure: European Journal of Epilepsy 69 (2019) 147–153

Contents lists available at ScienceDirect

Seizure: European Journal of Epilepsy

journal homepage: www.elsevier.com/locate/seizure

The efficacy of a pharmacist implemented educational treatment programme for people with epilepsy: A report of a randomised controlled trial

Unyime Eshiet[a], Jegbefume Okonta[b], Chinwe Ukwe[b]

[a] *Department of Clinical Pharmacy and Biopharmacy, University of Uyo, Nigeria*
[b] *Department of Clinical Pharmacy and Pharmacy Management, University of Nigeria, Nsukka, Nigeria*

ARTICLE INFO

Keywords:
Epilepsy
Knowledge
Perception
Pharmacist
Education

ABSTRACT

Purpose: To evaluate the efficacy of a pharmacist implemented educational treatment programme in improving knowledge and perception of epilepsy among people with the condition.

Method: A randomized controlled study was conducted on patients with epilepsy recruited from the medical and neurology out-patient clinics of two tertiary hospitals. Patients in the intervention group were offered an educational treatment programme implemented by a clinical pharmacist. The impact of the educational intervention was evaluated by using an epilepsy knowledge scale and the brief illness perception questionnaire.

Results: There was a statistical significant difference between the control and intervention group over time on the knowledge of epilepsy, as the knowledge of epilepsy among patients in the intervention group significantly increased; F (2154) = 150.15, p = 0.000, Partial $\eta^2 = 0.661$. Also, there was a statistical significant difference between the control and intervention group over time on the perception of epilepsy, as the perception of epilepsy among patients in the intervention group significantly improved; F (2, 154) = 12.386, p = 0.000, Partial $\eta^2 = 0.138$.

Conclusion: The Pharmacist implemented educational intervention improved patients' knowledge and perception of epilepsy. This finding has revealed the potential positive impact of pharmacists' involvement in the management of epilepsy.

1. Introduction

Sociocultural attitudes continue to have a negative impact on the management of epilepsy in many African countries, including Nigeria [1]. The disorder is negatively affected by superstition, discrimination and stigma [2]. Religion as well as socio-cultural beliefs influences the nature of treatment and care received by people with epilepsy. It is believed that epilepsy results from witchcraft or possession by evil spirits and therefore treatment should be through the use of herbs from traditional doctors, fetish priests and religious leaders. These beliefs contribute to the deterioration of the patients' condition and development of complications [3].

It has been noted that patients' knowledge and understanding of their condition has a significant role to play in providing good quality outcomes for the patient. A sufficiently informed patient with epilepsy will be more likely to provide relevant information to their healthcare provider to aid in diagnosis. Also, well informed patients will achieve better adherence to drug therapy, thereby leading to better seizure control.

A study c arried out by the Department of Neurology at St. James Hospital and the School of Medicine, Trinity College, concluded that many people with epilepsy are not properly informed about their disorder [4]. People with epilepsy often present with attitudes that are potential breeding ground for myths, stigma and exclusion [5,6]. Without adequate knowledge, people with epilepsy are likely to become the victims of other people's negative beliefs and misconceptions. Studies have revealed that people with epilepsy know only a little more, and in some cases may even know less, about their disorder than those without epilepsy [7,8]. Long et al in their study assessed the knowledge of people with epilepsy about their disorder as it regards safety, compliance and legal issues concerning driving and employment. This study revealed that, irrespective of demographic parameters such as age, education and duration of the illness, people with epilepsy tend to have limited knowledge about their condition [9]. As a result of this, people with epilepsy may be less likely to come to terms with their condition. Studies carried out in developing countries have examined cultural

---

E-mail address: unyimeeshiet@uniuyo.edu.ng (C. Ukwe).

https://doi.org/10.1016/j.seizure.2019.04.011
Received 21 February 2019; Received in revised form 15 March 2019; Accepted 13 April 2019

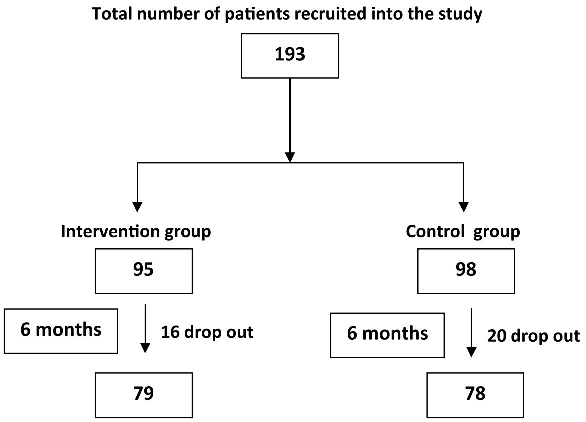

Fig. 1. Depiction of the study design with the number of patients randomized to each group and dropouts in each group.

attitudes and awareness of epilepsy [6,10]. However, there is still a need for more investigations to be conducted to evaluate the knowledge of people with epilepsy about their condition. In Nigeria, adequate information on the knowledge and attitude regarding epilepsy among epileptic patients is lacking. As the incidence and prevalence of epilepsy are thought to be several-fold higher in developing than in industrialized countries [11], there is clearly a pressing need to examine how much patients with epilepsy from developing countries understand about their disease. Hence, the specific objective of this study was to assess the knowledge and perception of patients with epilepsy regarding their condition and also to evaluate the efficacy of a pharmacist implemented educational treatment programme in improving patients' knowledge and perception of epilepsy.

2. Method

2.1. Study design

This study was an open, randomised, controlled, longitudinal and two-arm parallel prospective study with a 6-month patient follow up period.

2.2. Study setting

The study was conducted in Nigeria at the University of Uyo Teaching Hospital in Uyo-Akwa Ibom State and University of Calabar Teaching Hospital in Calabar-Cross River State. Patients were recruited from the Neurology and Medical out-patient clinics of the hospitals.

2.3. Study population/sample size

To ensure sufficient statistical power and to account for possible 'drop outs' during the study, all patients diagnosed with epilepsy and receiving treatment for epilepsy at the selected hospitals, who fulfilled the inclusion criteria were identified and recruited into the study.

The Inclusion criteria were patients diagnosed of epilepsy, patients receiving treatment for epilepsy in the study sites, patients who provided a written informed consent to participate in the study, and patients who expressed willingness to abide by the rules of the study.

The exclusion criteria were patients who were diagnosed of having non-epileptic seizures only, patients who were less than 16 years, patients who expressed willingness to withdraw from the study, patients with intellectual disabilities, and patients with acute psychiatric illness. Diagnosis of epilepsy was done by a neurologist after a detailed history, neurologic examination, and general physical examination. Laboratory evaluations served as adjunctive assays.

Table 1
Socio-Demographic Characteristics of Patients.

	Control		Intervention		Student t-test	
	Frequency	Proportion (%)	Frequency	Proportion (%)	T	P value
Age group						
16-24	19	24.40	27	34.20	1.115	0.267
25-34	23	29.50	21	26.60		
35-44	9	11.50	12	15.20		
> =45	27	34.60	19	24.10		
Sex						
Male	45	57.70	48	60.80	0.389	0.698
Female	33	42.30	31	39.20		
Educational Level						
Primary	6	7.69	4	5.06	-o.433	0.666
Secondary	27	34.62	21	26.58		
Tertiary	45	57.69	54	68.35		
Marital status						
single	46	59.00	46	58.20	−0.058	0.954
married	29	37.20	30	38.00		
widowed	3	3.80	3	3.80		
Religion						
Christianity	76	97.40	78	98.70	0.591	0.555
Islam	2	2.60	1	1.30		
Employment status						
employed	29	37.20	24	30.40	−0.370	0.712
unemployed	29	37.20	37	46.80		
self employed	16	20.50	13	16.50		
retired	4	5.10	5	6.30		
Monthly income (NGN)*						
no income	29	37.20	36	45.60	0.956	0.341
< 30,000	9	11.50	9	11.40		
30,000 - 50,000	9	11.50	5	6.30		
51,000 - 70,000	5	6.40	9	11.40		
71,000 - 100,000	16	20.50	11	13.90		
> 100,000	10	12.80	9	11.40		

*NGN = Nigerian Naira.

Table 2
Clinical Characteristics of Patients.

Characteristics	Control		Intervention		Student's t-test	
	Frequency	%	Frequency	%	t	P
Duration of Epilepsy						
≤2 years	20	25.6	22	27.8	−1.662	0.099
3-5 years	19	24.4	13	16.5		
≥6 years	39	50.0	44	55.7		
Presence of co-morbidity						
None	51	65.4	60	75.9	−1.606	0.110
Yes	27	34.6	19	24.1		
Type of co-morbidity*						
	Control		Intervention		Total	
Hypertension	16 (59.3%)		8 (42.1%)		24 (52.2%)	
HIV	1 (3.7%)		2 (10.5%)		3 (6.5%)	
Peptic ulcer disease	3 (11.1%)		0		3 (6.5%)	
Hypertension + Benign Prostatic hyperplasia	3 (11.1%)		4 (21.1%)		7 (15.2%)	
Tuberculosis	2 (7.4%)		0		2 (4.3%)	
Hypertension + diabetes mellitus	1 (3.7%)		1 (5.3%)		2 (4.3%)	
Hypertension + asthma	1 (3.7%)		1 (5.3%)		2 (4.3%)	
Leukaemia	0		1 (5.3%)		1 (2.2%)	
Hepatitis	0		2 (10.5%)		2 (4.3%)	

*Among Patients who Presented with Co-morbidity.
Patients' Knowledge of Epilepsy.
The impact of the intervention on the patients' knowledge of epilepsy is as shown in Tables 3 and 4.

Table 3
Mean Score of Patients' Knowledge of Epilepsy and Test of Difference Over-Time.

Time	Group	Mean score	Standard Deviation	Lower Bound	Upper Bound
Pre-intervention (Baseline)	Control	32.46	13.55	29.43	35.48
	Intervention	34.84	13.47	31.84	37.85
3months Post-intervention (Midline)	Control	37.58	14.16	34.83	40.34
	Intervention	74.08	10.18	71.35	76.82
6 Months Post-intervention (End-line)	Control	43.12	13.20	40.53	45.71
	Intervention	82.41	9.72	79.84	84.99
Test statistic	Pillai's Trace F= (2, 154) = 150.150 p = 0.000 Partial η2 = 0.661				

2.4. Randomization

The patients were randomly assigned to one of the two groups, Intervention or control group based on the number assigned to them using an online randomization software [http://www.randomization.com]. Patients in the intervention group were offered an educational treatment programme implemented by a clinical pharmacist. Patients in the control group did not participate in the educational treatment programme.

2.5. Educational treatment programme (intervention)

The intervention consisted of an educational treatment programme implemented by a clinical pharmacist.The focus of the educational programme was on improving patients' knowledge about epilepsy, its consequences, diagnostic and therapeutic procedures, as well as improving patients' understanding of the psychosocial and occupational problems associated with epilepsy. Patients were encouraged to cope actively with their disease, to live with as few limitations as possible, to participate in the treatment process, and to gain more self-esteem.

The educational programme was adapted from an educational programme developed for patients with epilepsy and their relatives (MOSES) [12].

The programme comprised of seven units covering the following topics:

i Basic Knowledge of Epilepsy
ii Diagnosis of epilepsy
iii Treatment of epilepsy
iv Living with epilepsy
v Self-control
vi Psychosocial aspects affecting outcomes
vii Care and support for people with epilepsy.

A pharmacist implemented educational treatment programme was provided to the patients on a one-on-one basis during their clinic appointments and reinforced on follow up meetings. During the period of the study (a duration of six months for each patient), the patients had their clinic appointments fortnightly. During each clinic visit, the patients met with the clinical pharmacist who provided teaching sessions in line with the content of the educational programme. At the first contact, each patient had a forty-five minute session with the research pharmacist. On subsequent clinic appointments, the session with the research pharmacist lasted for about twenty-five minutes. Furthermore, a document compiled by the clinical pharmacist, containing a summary of the various topics taught was given to the patients to take home to assist with the educational programme. Reminder text messages were sent to the patients before each clinic appointment to remind them of their appointments.

2.6. Evaluation of the impact of the intervention

The impact of the educational intervention implemented by the pharmacist was determined. Patients' knowledge of epilepsy and their perception towards the disorder were assessed.

The evaluation was done three times during the course of the study;

i At baseline (immediately before implementation of the educational intervention),
ii At midline (3months post- intervention).
iii At end-line (6months post-intervention).

Standardized instruments were used for the evaluation of the efficacy of the interventions. Instruments used in the evaluation were;

Table 4

Patients Performance on the Epilepsy Knowledge Scale and Test of Difference Over-Time.

Questions	Pre-intervention (Baseline)			3months Post-intervention (Midline)			6 Months Post-intervention (End-line)		
	Control	Intervention	χ^2	Control	Intervention	χ^2	Control	Intervention	χ^2
People with epilepsy should avoid strenuous work because this can provoke seizures	26.9%	20.3%	0.969	34.6%	92.4%	56.68***	55.1%	100%	45.62***
An EEG can always prove the diagnosis of epilepsy	23.1%	22.8%	2	43.6%	82.3	25.21***	50	96.2	42.76***
People with epilepsy are as capable as other people	19.2	34.2	4.47*	21.8	57	20.31***	26.9	73.4	33.94***
All people with seizures should avoid working with open machineries	34.6	31.6	0.15	39.7	67.1	11.79**	47.4	81	19.28***
Every seizure destroys a number of nerve cells in the brain	23.1	22.8	0.002	29.5	77.2	35.94***	41	87.3	36.69***
People with epilepsy should not swim without an accompanying person	67.9	58.2	1.59	67.9	70.9	0.16	66.7	81	4.19*
All people with epilepsy should avoid flashing or strobing lights	35.9	43	0.83	47.4	78.5	16.24***	51.3	86.1	22.13***
In most cases, doctors can control epileptic seizures with medication	41	45.6	0.33	37.2	65.8	12.89***	34.6	75.9	27.14***
If your seizures are controlled for some months, you can reduce the dose of your AEDs	24.4	27.8	0.25	28.2	73.4	32.10***	46.2	83.5	26.49
All people with epilepsy have similar symptoms	47.4	38	0.23	48.7	86.1	24.95***	52.6	88.6	24.62***
If a patient expects a seizure, he/she should take an additional dose of AED	24.4	35.4	2.29	33.3	84.8	43.07***	41	87.3	36.69
On job application, a patient should always disclose his/her epilepsy condition	34.6	44.3	1.54	38.5	81	29.58***	41	87.3	36.39***
People with epilepsy can take an active part in sports	28.2	34.2	0.65	30.8	70.9	25.29***	33.3	74.7	25.03***
An epileptic seizure always results in loss of consciousness	24.4	21.5	0.17	32.1	48.1	5.49	35.9	62	10.72
People whose seizures only happen during sleep may hold a driver's license	33.3	38	0.37	39.7	70.9	15.40***	42.3	72.2	14.29***
Everyone can have a seizure given the appropriate circumstances	41	45.6	0.33	48.7	79.7	16.47	52.6	81	14.34***
Blood samples can be used to measure concentrations of AED in the body	35.9	39.2	0.19	33.3	79.7	34.44***	34.6	84.8	41.16***
Epilepsy is a symptom of mental illness	19.2	27.8	1.61	29.5	81	42.17***	34.6	83.5	38.91***
If persons with epilepsy drive, they must inform the driving authorities about their condition.	32.1	31.6	0.003	29.5	60.8	17.15***	32.1	79.7	36.24***

{* = $p < 0.5$, ** = $p < 0.1$, *** = $p < 0.001$.

Patients' Perception of Epilepsy.

The impact of the intervention on the patients' perception of epilepsy is as shown in Table 5 and Table 6.

Table 5
Mean Scores of Patients' Illness Perception and Test of Difference Over-Time.

Time	Group	Mean	Standard Deviation	95% Confidence Interval	
				Lower Bound	Upper Bound
Pre-intervention	Control	55.06	8.91	52.96	56.16
	Intervention	55.59	10.06	36.0	71.0
3months Post-intervention	Control	56.51	8.97	33.0	73.0
	Intervention	38.83	10.01	27.0	63.0
6 Months Post-intervention	Control	54.47	7.35	33.0	70.0
	Intervention	31.25	8.51	27.0	68.0
Test statistic	Pillai's Trace F= (2, 154) = 12.386 p = 0.000 Partial η2 = 0.138				

i Epilepsy Knowledge Scale,
ii The Brief Illness Perception Questionnaire.

Study participants filled out the aforementioned questionnaires three times during the course of the study. The first time (T_1) was at baseline, and the second time (T_2) and the third time (T_3) were at midline and end-line respectively.

2.7. *Epilepsy knowledge scale*

This is a validated instrument adopted from a previous study in 22 epilepsy centres in Germany [12]. It is a short scale developed to assess epilepsy specific knowledge. It has 19-items with 3 answer categories ("True", "False", or "I do not know"). It was used to assess the patients' knowledge of epilepsy.

2.8. *The brief illness perception questionnaire*

The Brief illness perception questionnaire was used to assess the patients' perception of the condition. It has eight items plus one causal scale. All of the items except the causal question are rated using a 0-to-10 response scale. Five of the items assess cognitive illness representations: consequences (Item 1), timeline (Item 2), personal control (Item 3), treatment control (Item 4), and identity (Item 5). Two of the items assess emotional representations: concern (Item 6) and emotions (Item 8). One item assesses illness comprehensibility (Item 7). Assessment of the causal representation is by an open-ended response item which asks patients to list the three most important causal factors in their illness (Item 9) [13]. Systematic evaluation of the validity and reliability of the brief illness perception questionnaire has been conducted. The brief illness perception questionnaire scores correlates moderately with most of the measured health outcomes. Pearson's correlations for test-retest reliability were generally acceptable (range 0.5–0.7) [13,14].

2.9. *Data analysis*

Frequencies and means where used to present the data at the univariate level. The Student *t*-test was used to test the difference between socio-demographic characteristics of patients in the control and intervention groups. Chi-square was used to test the difference in proportions of outcome between the control and the intervention group at the different level of intervention. To evaluate the impact of the intervention the repeated measure ANOVA was used to test the difference of mean scores of the intervention and the control groups over the time of intervention. Repeated measure ANOVA was used for the analysis where the dependent outcome variable measure at different time interval were scale variable or variables that were computed into scale variables with the categorical intervention groups as the independent categorical variable. The Pillair's Trace F was the corrected statistic test of choice for the model estimate, while the estimated effect was assessed with Partial etha; the closer the value of Partial etha is to 1 the stronger the effect. ANOVA analysis was conducted after checking that all data met the criteria and assumptions for carrying out repeated ANOVA.

2.10. *Ethical approval*

The research protocol was approved by the Health Research Ethics Committees of the University of Uyo Teaching Hospital and University of Calabar Teaching Hospital (Reference numbers: UUTH/AD/S/96/VOL.XIV/571 & UCTH/HREC/33/454). In addition, an informed consent was obtained from the participants before recruitment into the study.

3. Results

One hundred and fifty seven patients completed the study (Fig. 1).

The socio-demographic profile and Clinical characteristics of the patients in the control and intervention groups is as presented in Tables 1 and 2 respectively below.

3.1. *Patients' knowledge of epilepsy*

The overall mean score for knowledge of epilepsy among patients in the control group was observed to have increased slightly from 32.46 (± 13.55) at baseline to 37.58 (± 14.16) and 43.12 (± 13.20) at 3 months and 6 months respectively. Meanwhile, there was a marked increase in the mean score for knowledge of epilepsy among patients in the intervention group at the end of intervention at 6 months as mean score increased from 34.84 (± 13.47) at pre-intervention to 74.08

Table 6
Mean Scores of Illness Perception Items and Test of Difference Between Groups Over-Time.

	Baseline		Midline		End-line		Test statistic	Estimated Effect
	Control	Intervention	Control	Intervention	Control	Intervention	Pillai's Trace F	Partial η^2
How much do you think your treatment can help your illness	7.37 (2.41)	7.57 (2.24)	7.50 (2.28)	5.49 (2.06)	6.55 (1.70)	4.35 (1.58)	32.300***	0.29
How much do you experience symptoms from your illness	3.28 (2.45)	3.08 (2.72)	4.22 (2.63)	2.68 (2.40)	5.06 (2.03)	2.87 (2.00)	16.087***	0.17
How concerned are you about your illness	7.88 (2.34)	8.16 (2.61)	7.37 (2.30)	5.46 (2.34)	6.54 (1.77)	4.10 (1.89)	22.002***	0.22
How well do you feel you understand your illness	4.77 (2.45)	4.96 (2.13)	5.15 (2.25)	4.09 (2.34)	5.96 (1.73)	3.65 (1.73)	18.105***	0.19
How much does your illness affect you emotionally	6.50 (2.07)	6.72 (2.20)	7.11 (2.06)	4.87 (2.28)	6.92 (1.58)	3.97 (1.83)	40.615***	0.34
How much does your illness affect your life	8.81 (1.80)	8.78 (2.09)	8.45 (1.90)	5.92 (2.26)	7.45 (2.04)	4.49 (1.81)	30.652***	0.28
How long do you think your illness will continue	8.03 (2.45)	8.28 (2.12)	7.96 (2.25)	4.29 (1.97)	7.15 (1.76)	2.91 (1.71)	82.332***	0.51
How much control do you feel you have over your illness	8.46 (2.06)	8.43 (1.92)	8.82 (2.00)	5.95 (2.52)	8.74 (1.73)	4.87 (2.21)	56.204***	0.42

{* = $p < 0.5$, ** = $p < 0.1$, *** = $p < 0.001$}.

(± 10.18) and 82.41 (± 9.72) at 3 months and 6 months post-intervention, respectively, indicating an improved knowledge of epilepsy among the intervention group compared with the control group. There was a statistical significant difference between the control and intervention group over time on the knowledge of epilepsy F (2, 154) = 150.150, p = 0.000, partial $\eta^2 = 0.661$ [See Tables 3 and 4 below].

3.2. Patients' perception of epilepsy

The overall mean score of illness perception among patients in the control group was 55.06 (± 8.91) at baseline; 56.51 (± 8.97) and 54.47 (± 7.35) at 3 months and 6 months respectively. Meanwhile, there was a marked reduction of mean score of illness perception among patients in the intervention group at the end of the intervention at 6 months as mean value decreased to 31.25 (± 8.51) from 55.59 (± 10.06) at pre-intervention, indicating a less threatening view of the condition among patients in the intervention group compared with the control group. There was a statistical significant difference in the mean illness perception score between the control and intervention groups over time F (2, 154) = 12.386, p = 0.000, partial $\eta^2 = 0.138$ [See Tables 5 and 6].

4. Discussion

Results obtained from this study suggest that the pharmacist's educational interventions significantly improved patients' knowledge of epilepsy as well as their perception of the condition.

The knowledge of people with epilepsy about the condition, its causes, diagnosis, treatment, prognosis and complications is often insufficient [15]. Irrespective of their age, level of education and duration of epilepsy, people with epilepsy appear to have a poor knowledge of the condition [9]. This study set out to examine the effect of a pharmacist implemented educational intervention on patients' knowledge of epilepsy.

The results not only showed significant differences between the pre- and post-intervention epilepsy knowledge scores among the patients in the intervention group but also showed significant differences between the epilepsy knowledge scores of patients in the control and intervention groups over time of the intervention, indicating that the patients significantly improved in their knowledge of epilepsy following the educational intervention.

Patient's knowledge and understanding of their condition is a major determinant of their ability to cope with the condition. Over the years, there has been increasing interest in implementing educational programmes for patients with epilepsy [15–17]. The significant improvement in the patients' knowledge as noted in this study is an indication of the efficacy of the educational treatment programme. This result clearly shows the potential impact of educational interventions for people with epilepsy irrespective of their age, educational status, or duration of epilepsy.

During the course of this study, it was observed that patients with epilepsy were managed in the hospitals without the implementation of an appropriate educational programme or intervention. This represents a treatment gap. Patient education is an important aspect of quality care for people with epilepsy. Results from a comparative assessment of the knowledge of epilepsy among people with the disorder and people without it showed that patients with epilepsy knew just a little more about their disorder than did those without the condition [7]. In contrast, a study in the United Kingdom indicated that patients without epilepsy had a better knowledge of the medical aspects of epilepsy than people living with epilepsy [18]. The observation of poor patient knowledge of their condition is not limited to persons with epilepsy alone as other studies have demonstrated a lack of knowledge among patients with other chronic diseases such as congestive heart failure, tuberculosis, arthritis, and gastro-esophageal reflux disease [19–22]. Many patients with epilepsy have reported not receiving sufficient information about their condition from healthcare providers [23]. Patients with epilepsy have diverse educational needs and should have unhindered access to educational services because patient education reduces the fear and stigmatization associated with seizures, and also improves self management practices [24]. A study on the preference of people with epilepsy concerning epilepsy education reported that the patients preferred to be educated by their physician [25]. However, pharmacists, within the context of pharmaceutical care, can provide patient education as a means of enhancing pharmacotherapeutic outcomes.

Patients' perception of their condition directly influences their coping behavior as well as their emotional response to the illness. Illness perception is also believed to affect treatment outcomes [26]. The assessment of the impact of a pharmacist implemented educational treatment programme on patients' perception of epilepsy also carried out in this study showed significant differences between the pre-and post-intervention illness perception scores among the patients in the intervention group as well as significant differences between the illness perception scores of patients in the control and intervention groups at the end of the intervention. The educational intervention had a positive impact on the patients' perception of epilepsy as the patients in the intervention group had a significant reduction in the mean illness perception score indicating that the patients in the intervention group had a less threatening view of their condition compared to those in the usual care group. This result is similar to the results from an intervention designed to change patients' poor perception of their illness, which was reported to have been effective in enhancing the rate of patient recovery by significantly altering patients' illness beliefs [26].

Patient's education is a key to the successful management of chronic medical conditions. The successful implementation of an educational intervention for patients with chronic conditions leads to more involvement of patients in their care, better self management and improved adherence to therapeutic recommendations [27]. Clinical pharmacists can play a pivotal role in providing health education to patients with epilepsy. As part of a multidisciplinary therapeutic team, clinical pharmacists have a crucial role in providing care and education for patients.

Our study suggests that educational intervention for patients with epilepsy is needed, and that such interventions should be a standard service in any specialized epilepsy care. To the best of our knowledge, this type of intervention for patients with epilepsy is the first of its kind to be reported in Nigeria and shows that pharmacists could contribute immensely to the successful management of epilepsy.

5. Conclusion

The Pharmacist led educational intervention improved patients' knowledge and perception of epilepsy. This finding has revealed the potential positive impact of pharmacists' involvement in the management of epilepsy.

Limitation of the study

Although the participants were randomized into groups, selection bias was a threat because participation in the study was voluntary. However, there was no statistically significant difference in the socio-demographic and clinical characteristics of patients in the two groups used in this study.

Conflict of interest

The authors hereby declare that there is no conflict of interest.

References

[1] Nbukpo P, Preux PM, Clement JP, Houinato D, Tuillas M, Aubreton C, et al. Comparison of sociocultural attitudes towards epilepsy in Limousin (France), in Togo and in Benin (Africa). Med Trop (Mars) 2003;63:143–50.

[2] Ndour D, Diop AG, Ndiaye M, Niang C, Sarr MM, Ndiaye IP. A survey of school teachers knowledge and behaviour about epilepsy in a developing country such as Senegal. Rev Neurol (Paris) 2004;160:338–41.

[3] Nwani PO, Asomugha LA, Arinze EO, Ewereji KO, Nwosu MC, Oguniyi A. Patterns of antiepileptic drugs use and seizure control among people with epilepsy in a surburban community in southeast Nigeria. Afr J Neurol 2012;31(2):36–42.

[4] National Epilepsy week special feature: understanding epilepsy. 2019. Assessed on December 09, 2015 at 1.00 GMT www.epilepsy.ie.

[5] Al-Adawi S, Al-Ismaily S, Martin R, Al-Naamani A, Al-Riyamy K, Al-Maskari M, et al. Psychosocial aspects of epilepsy in Oman: attitudes of health professionals. Epilepsia 2001;42:1476–81.

[6] Al-Dawi S, Al-Salmy H, Martin RG, Al-Naamani A, Prabhakar S, Deleu D, et al. Patient’s perspective on epilepsy: self-knowledge among Omanis. Seizure 2003;12:11–8.

[7] Dawkins JL, Crawford PM, Stammers TG. Epilepsy: a general practice study of knowledge and attitudes among sufferers and non-sufferers. Br J Gen Pract 1993;1993(43):453–7.

[8] Baker GA, Jacoby A, De Boer H, Doughty J, Myon E, Taieb C. Patients’ understanding of and adjustment to epilepsy: interim findings from a European survey. Epilepsia 1999;40:S26–9.

[9] Long L, Reeves AL, Moore JL, Roach J, Pickering CT. An assessment of epilepsy patients’ knowledge of their disorder. Epilepsia 2000;41:727–31.

[10] Klienman A, Wang WZ, Li SC, Cheng XM, Dai XY, Li KT, et al. The Social Course of Epilepsy: chronic illness as social experience in interior China. Soc Sci Med 1995;1995(40):1319–30.

[11] Theodore WH. Epilepsy in a wider world. Curr Opin Neurol 2000;13:155–6.

[12] Ried S, Specht U, Thorbecke R, Goecke K, Wohlfa R. MOSES: an educational program for patients with epilepsy and their relatives. Epilepsia 2001;42(Suppl. 3):76–80. 2001. Blackwell Science, Inc.

[13] Broadbent E, Wilkes C, Koschwanez H, Weinman J, Norton S, Petrie KJ. A systematic review and meta-analysis of the Brief Illness Perception Questionnaire. Psychol Health 2015;30:1361–85.

[14] Broadbent E, Petrie KJ, Main J, Weinman J. The brief illness perception questionnaire. J Psychosom Res 2006;60:631–7. 2006.

[15] May TW, Pfafflin M. The efficacy of an educational treatment program for patients with epilepsy (MOSES): results of a controlled, randomized study. Epilepsia 2002;43(5):539–49. Blackwell Publishing, Inc.

[16] Refstrup B, Tetzlaff E, Olesen P, et al. Evaluation of a 2-day programme for people with epilepsy and their partners. Epilepsia 2000;41(Suppl Florence 2000):167. 2000.

[17] Ogatta A, Amano K. A psychosocial approach to epileptic patients. Epilepsia 2000;41(Suppl 9):36–8. 2000.

[18] Tedman S, Thorton E, Baker G. Development of a scale to measure core beliefs and perceived self-efficacy in adults with epilepsy. Seizure 1995;1995:221–31.

[19] Lubrano E, Helliwell P, Parsons W, Emery P, Veale D. Patient education in psoriatic arthritis: a cross sectional study on knowledge by a validated self-administered questionnaire. J Rheumatol 1998;25:1560–5. 1998.

[20] Hanya N, Nauman D, Burgrss D, Wise K, Crispell K, Hershegerger RE. Factors influencing knowledge of and adherence to self-care among patients with heart failure. Arch Intern Med 1999;1999(159):1613–9.

[21] Jasani K, Piterman L, McCall L. Gastroesophageal reflux and quality of life; patients knowledge, attitudes and persceptions. Aust Fam Phys 1999;28(Suppl 1):S15–8. 1999.

[22] Liam CK, Lim KH, Wong CM, Tang BG. Attitudes and knowledge of newly diagnosed tuberculosis patients regarding the disease, and factors affecting treatment compliance. Int J Tuberc Lung Dis 1999;1999(3):300–9.

[23] Ridsdale L, Wojewodka G, Robinson E, Landau S, Noble A, Taylor S, et al. Characteristics associated with quality of life among people with drug-resistant epilepsy. J Neurol 2017;264:1174–84. 2017.

[24] Aliasgharpour M, Nayeri ND, Yadegary MA, Haghani H. Effects of an educational program on self-management in patients with epilepsy. Seeizure 2013;22(2013):48–52.

[25] DiIorio C, Manteuffel B. Preferences concerning epilepsy Education: opinions of nurses, physicians, and persons with epilepsy. J Neurosci Nurs 1995;27:29–34.

[26] Petrie KJ, Weinman J. Why illness perceptions matter. Clin Med 2006;2006(6):536–9.

[27] Farsaei S, Sabzghabaee AM, Zargarzadeh AH, Amini M. Effect of pharmacist-led patient education on glycemic control of type 2 diabetics: a randomized controlled trial. J Res Med Sci 2011;16(January (1)):43–9. 2011.