ผลลัพธ์ของการจัดการโรคลมชักโดยทีมสหสาขาวิชาชีพ ณ โรงพยาบาลเศรษฐาธิราช
Outcomes of a Multidisciplinary Team Care for Epilepsy Management at Setthathirat Hospital in LAO PDR

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บทคัดย่อ

วัตถุประสงค์: เพื่อประเมินผลลัพธ์ของทีมสหสาขาวิชาชีพในการจัดการโรคลมชักในประเทศลาว **วิธีการศึกษา:** ผู้ป่วยโรคลมชัก 68 ราย ได้รับการดูแลโดยทีมสหสาขาวิชาชีพนาน 6 เดือน ที่คลินิกผู้ป่วยนอกภาควิชาประสาทวิทยา ผู้ป่วยได้รับการประเมินความร่วมมือในการใช้ยาด้วยวิธีการนับเม็ดยา ประเมินความรู้ด้วยแบบสอบถาม และคำนวณความถี่ของการชักในช่วง 3 เดือน ปัญหาที่เกี่ยวข้องกับยาในด้านปฏิกิริยาระหว่างยา ผลข้างเคียงจากการใช้ยา และการใช้ยาเกินขนาด ประเมินคุณภาพชีวิตโดยใช้แบบสอบถาม QOLIE-10 **ผลการศึกษา:** ก่อนการดูแลของทีมสหสาขาวิชาชีพ ในนัดตรวจครั้งที่ 1 (เดือนที่ 0) ความร่วมมือในการใช้ยาเป็น 58.15 ± 27.3% แล้วเพิ่มเป็น 90.17 ± 4.5% ในการนัดตรวจครั้งที่ 2 (เดือนที่ 3) (P-value = 0.001) คะแนนเฉลี่ยความรู้ก่อนให้ความรู้เท่ากับ 29.72 ± 3.6 คะแนน เพิ่มเป็น 37.63 ± 1.1 ในการนัดตรวจครั้งที่ 1 (เดือนที่ 0) ความรู้เกี่ยวกับยากันชักเพิ่มขึ้นจาก 6.00 ± 0.45 คะแนนเป็น 9.58 ± 1.12 (P-value = 0.0001) ร้อยละผู้ป่วยที่มีอาการชักสามครั้งในสามเดือนลดลงจาก 29.4 เป็น 8.8% ในการนัดตรวจครั้งที่ 2 (เดือนที่ 3) จำนวนปัญหาที่เกี่ยวข้องกับยาลดลงจาก 24 เป็น 11 คะแนนคุณภาพชีวิตเพิ่มอย่างมีนัยสำคัญ (P-value < 0.001) ในด้านอารมณ์ ข้อจำกัดในการทำงาน ปัญหาด้านความจำ ผลการรักษาทางร่างกายและความรู้ความเข้าใจ และความวิตกกังวลในการชัก (P-value < 0.05) ยกเว้นการเคลื่อนไหว **สรุป:** การปฏิบัติงานเป็นทีมสหสาขาวิชาชีพเพิ่มความร่วมมือในการใช้ยา ความรู้ และคุณภาพชีวิต และลดความถี่ในการชักและปัญหาเกี่ยวกับยาในผู้ป่วยโรคลมชัก

คำสำคัญ: โรคลมชัก; ทีมสหสาขาวิชาชีพ; ความสม่ำเสมอ; ความรู้; ความถี่ในการชัก; ปัญหาเกี่ยวกับยาเสพติด; QOLIE-10; คุณภาพชีวิต

Abstract

Objective: To assess the outcomes of a multidisciplinary team (MDT) care for epilepsy management receiving usual care at the OPD clinic department of Setthathirat Hospital, Lao PDR. **Method:** Sixty-eight epilepsy patients receiving the 6-month MDT care. Medication adherence was evaluated using both pill counts. Patient knowledge was measured through a questionnaire, and seizure frequency was calculated every 3 months. We identified four main categories of DRPs including drug interactions, overdosage, failure to receive drugs, and adverse drug reactions. Quality of life was assessed using the QOLIE-10 questionnaire. **Result:** Prior to receiving MDT care at visit 1 (month 0), the patient's adherence was 58.15 ± 27.3% which increased to 95.24 ± 2.03% at visit 3 (month 6) (P-value = 0.001). Knowledge of epilepsy scores were 29.72 ± 3.6 points at pre-visit 1 (month 0) and increased to 37.63 ± 1.1 points at post-visit 1 (month 0). Knowledge about antiepileptic drugs increased from 6.00 ± 0.45 point at pre-visit 1 (month 0) to 9.58 ± 1.12 points at post-visit 1 (month 0). % patients experiencing seizures three times in three months decreased from 29.4% to 8.8% at visit 2 (month 3). DRPs decreased from 24 at pre-visit 1 (month 0) to 15 at visit 3 (month 6). Quality of life showed significant improvements (P-value < 0.05) in mood, work limitations, memory problems, physical and cognitive treatment effects, and seizure worries, except mobility. **Conclusion:** MDT practice enhanced adherence, knowledge, and quality of life, while decreasing seizure frequency and DRPs among epileptic patients.

Keywords: epilepsy; multidisciplinary team; adherence; knowledge; seizure frequency; drug-related problems; QOLIE-10; quality of life

Introduction

Epilepsy is a chronic brain disorder that affects about 70 million people worldwide.[1] Only 10 - 20% of all people with epilepsy receive suitable treatment. The treatment for epilepsy is complex.[2] Pharmacotherapy is the primary treatment approach for epileptic disorders, involving the use of antiepileptic drugs, either as monotherapy or in combination with other AEDs.[3] Pharmacists play a crucial role in counseling and monitoring patients with epilepsy due to their accessibility and expertise in pharmacotherapy, health education, and the management of chronic diseases.[4,5]

However, since patients often require long-term drug therapy, this can lead to various drug-related problems (DRPs).[6]

Numerous studies have indicated that patients achieve improved therapeutic outcomes when their antiepileptic drug therapy is managed by a pharmacist. These studies have consistently shown a statistically significant difference in medication adherence scores over time between control and intervention groups, with the mean medication adherence score in the intervention group increasing. This underscores the significant impact of pharmaceutical care services

provided by clinical pharmacists, which enhance patient knowledge, resolve drug-related problems, and lead to a reduction in drug-related problems in patients with epilepsy.

As one of the most accessible types of healthcare professionals, pharmacists have the opportunity to provide appropriate care to patients experiencing seizures, perform interventions, and provide education to their patients. There are many areas in which pharmacists can make a significant impact on the care of patients with epilepsy receiving antiepileptic drugs. This includes but not limited to drug interactions The importance of taking medication regularly, adverse reactions and evaluation of antiepileptic drugs suitability of medicine.[4,5,7-15]

In a recent review of methods aimed at enhancing medication adherence and quality of life for patients with epilepsy, the implementation of a multidisciplinary team approach yielded significant results. The program notably increased the proportion of patients with moderate-to-high adherence to antiepileptic drugs (P-value = 0.006) and raised the overall QOLIE score (P-value < 0.001) within the intervention group. Furthermore, both study groups exhibited a substantial increase in the number of patients experiencing a low seizure frequency (P-value < 0.001).[16] A systematic review, which examined five studies, also indicates that clinical services provided by pharmacists have a positive influence on the knowledge, medication adherence, and quality of life of patients with epilepsy.[17]

In the routine practice prior to multidisciplinary team (MDT) care management, patients would meet with a doctor to assess treatment outcomes, receive prescriptions for antiepileptic drugs, and adjust dosages as necessary. Subsequently, the pharmacist solely handled the prescription of antiepileptic drugs without providing counseling on epilepsy or the medications, and did not monitor or manage adverse events. Nurses were solely responsible for reminding patients about their scheduled visits. However, with the introduction of MDT care management, significant improvements in clinical outcomes for patients with epilepsy were observed, including enhanced medication adherence, knowledge, reduced seizure frequency, resolution of DRP consequences, and an overall improvement in the quality of life for patients with epilepsy.[8,16]

Lao PDR is a small, landlocked country sharing its borders with Vietnam, Cambodia, Thailand, China, and Myanmar. The overall prevalence of epilepsy in the country is 7.7 cases per thousand inhabitants.[18] Notably, there is a dearth of research

in the field concerning the role of pharmacist evaluation and the absence of an MDT for epilepsy management. These shortcomings are generally widespread in the management of chronic diseases presenting a major problem for medical practice. This study represented the first exploration of an MDT for epilepsy management in Lao PDR.

The study's primary objective was to assess medication adherence, while its secondary objectives included evaluating patient knowledge, seizure frequency, addressing the consequences of drug-related problems (DRPs), and examining the quality of life in epilepsy patients. A quasi-experimental study spanning six months was conducted among epilepsy patients at the outpatient clinic of the Department of Neurology at Setthathirath Hospital in Lao PDR.

Methods

A quasi-experimental one-group study was conducted to assess the effect of MDT care on medication adherence. This study spanned 10 months from November 2021 to August 2022. The study included patients aged 18 and older, who had been taking antiepileptic drugs for a minimum of one month and were expected to continue this treatment for at least six months. Additionally, eligible participants needed to have an epilepsy diagnosis, be capable of communicating in the Lao language, and provide voluntary written informed consent. Excluded from the study were patients with conditions such as cancer, psychiatric or neurological diseases, pregnancy, or mental retardation, preventing them from providing information.

The sample size for this study was estimated based on information provided by a doctor responsible for epilepsy treatment at Setthathirath Hospital (LAO), indicating an approximate medication adherence rate of 60%. Additionally, Singh et al. (2020) conducted a prospective observational study assessing compliance with AEDs, where a pill count value ranging from 0.85 to $\leq$ 1.15 was recorded as indicative of appropriate compliance. With a $Z_{\alpha/2}$ of 1.96, Z_{β} of 0.84, and a dropout rate of 20%, a total of 68 patients were needed. A total of 75 patients were screened and 68 patients were eligible for the study.

Within the 6-month multidisciplinary management, pill counts, knowledge, seizure frequency, and DRPs were

collected at baseline visit 1 (month 0), visit 2 (month 3), and visit 3 (month 6), and quality of life was assessed at baseline visit 1 (month 0), and at the last visit 3 (month 6). For follow-ups in between, patients were evaluated every 3 months. The patient data collection form (Lao language version) underwent validation by two researchers, yielding an Index of Item Objective Congruence score of 0.6 for all questions. The internal consistency reliability of the questionnaire was assessed in 20 patients at Mahosot Hospital using antiepileptic therapy. The questionnaire had a high internal consistency reliability with a Cronbach's alpha coefficient of 0.765.

In terms of the protection of study participants, the study protocol was approved by the National Ethics Committee for Health Research (NECHR) from Lao PDR (approval number: 021/NECHR) and Mahasarakham University Ethics Committee for Research in Human Subjects (Approval number: No 257-206/2021).

The intervention

The multidisciplinary management plan comprised several components. Upon their visit to the epilepsy clinic, patients would first consult with a doctor for assessment of treatment outcomes, prescription of antiepileptic medications, and adjustment of dosages as necessary. Subsequently, they would have a scheduled session with a pharmacist. During this session, the pharmacist would provide personalized counseling to patients, offering educational materials on various aspects such as proper usage of antiepileptic drugs, disease education, precautions, and guidance on monitoring and managing potential adverse effects. Any drug-related issues identified by the pharmacist would be promptly communicated to the physicians. Additionally, patients would receive guidance from a nurse on self-care practices and adherence to appointment schedules.

The standard practice involved the patient meeting with a doctor to assess treatment outcomes, issued prescriptions for antiepileptic drugs, and adjusted dosages as needed. Following this, the pharmacist solely handled the prescription of antiepileptic drugs, while a nurse was responsible for reminding patients about their scheduled visits. After patients received intervention led by the MDT, notable changes were implemented. The intervention involved one-on-one sessions with each patient meeting the MDT three times at months 0, 3, and 6, with each session lasting 20 to 30 minutes. During these sessions, patients were evaluated for adherence using pill counts, assessed for baseline knowledge of epilepsy through a pre-test, and monitored for any drug-related problems to prevent and resolve issues promptly. Seizure frequency was assessed every 3 months, and patients completed the Quality of Life in Epilepsy-10 (QOLIE-10) questionnaire. Throughout the visits, the MDT provided education on various medical aspects of epilepsy, including its definition, causes, and types, along with guidance on pharmacotherapy, medication usage, therapeutic drug monitoring, and adherence results.

The 6-month multidisciplinary management in an outpatient clinic with the cooperation team members included 2 doctors, 2 pharmacists, and 2 nurses. The outcomes measured included medication adherence, patient knowledge, seizure frequency, drug-related problems, and quality of life.

The multidisciplinary management included the following steps. When patients visited the epilepsy clinic, it would be arranged for them to meet with a doctor to evaluate treatment results, prescribe antiepileptic drugs, and adjust the dosage as appropriate, and after that there was an arranged meeting with a pharmacist who included the following agenda items. The pharmacist intervention included the 30-minute face-to-face structured interview on individual patient by the pharmacist researcher in the counseling room, obtaining medication history, reviewing current drug therapy for appropriateness, assessing the patient adherence, knowledge, DRPs, seizure frequency, and QOL, providing consultation to the patient and recommending relevant changes in drug therapy to physicians, providing patient education and consultation regarding the disease, its management, and drug therapy, and providing a self-report book and time and date of an appointment following each visit. This self-report book had a table for the patients to record the time that they took their antiepileptic drugs and the time that they had a seizure or experienced unusual symptoms. Finally, the patients were arranged to meet a nurse who provided advice to educate them on self-care and remind the patient about the visit time.

Outcome assessment

Primary outcome was the **percentage of medication adherence** among patients evaluated through a combination of pill counts. Patients taking 85% or higher of medication pills prescribed were considered to have good adherence.[15] The

adherence was assessed at visit 1 (month 0), visit 2 (month 3) and visit 3 (month6).

Secondary outcomes were as follows. The **knowledge** questionnaire consisted of 11 questions, with 6 items pertaining to epilepsy and 5 to antiepileptic drugs. These questions were translated from the English version authored by Siriporn Tiamkao in 2007[19] into Lao language by the researcher. The Lao knowledge questions were examined for content validity by three experts in pharmacy practice. It was found to have a borderline acceptable content validity with an Index of Item Objective Congruence score of 0.6 for all questions. Internal consistency reliability of the knowledge questionnaire was tested in 20 patients with characteristics comparable to the participants at Mahosot Hospital and found to have an acceptable one (Cronbach's alpha coefficient of 0.765). Patient knowledge was assessed at pre-visit 1 (month 0), post-visit 1 (month 0), visit 2 (month 3) and visit 3 (month 6).

Seizure frequency was determined by the mean number of seizures over a three-month period.[20] **Seizure frequency** was also defined as frequency of patients experiencing seizure. Seizure frequency was assessed every 3 months. Seizure frequency was categorized into four groups. First, in the seizure-free group, patients did not have a seizure. In the low-frequency group, there were 1 - 20 simple partial seizures or absence seizures, 1 - 4 complex partial seizures, or 1 general tonic-clonic seizure. In the moderate frequency group, there were 21 - 100 simple partial seizures or absence seizures, 5 - 12 complex partial seizures, or 2 - 4 general tonic-clonic seizures. In the high-frequency group, there were 101 - 200 simple partial seizures or absence seizures, 13 - 24 complex partial seizures, or 5 - 12 general tonic-clonic seizures. Seizure frequency was assessed at visit 1 (month 0), visit 2 (month 3) and visit 3 (month 6).

The assessment of **drug-related problems** (DRPs) was adapted from Hepler and Strand's criteria[22] with a focus on the resolution of DRP consequences. However, we identified three primary categories of DRPs, encompassing actual and potential issues related to drug interactions, over dosage, failure to receive drugs, and adverse drug reactions. We evaluated the physician's prescription for patients, as well as their consultations. To identify DRPs, we requested patients to provide information notes during each visit, as the hospital lacked a database specifically for DRPs related to patients with epilepsy. Percentage of patients experiencing DRPs were

presented and compared. DRP was assessed at visit 1 (month 0), visit 2 (month 3) and visit 3 (month 6).

The assessment of the patient's **quality of life** was conducted using a modified test that incorporated questions adapted from Joyce Cramer.[21] The self-administered 10-item questionnaire (QOLIE) addresses various epilepsy- and treatment-related concerns including energy levels, mood, mobility, work limitations, social limitations, memory issues, physical treatment effects, cognitive treatment effects, seizure-related worries, and general QOL. Higher QOLIE scores indicate lower quality of life. In this present study, the content validity was acceptable with an Index of Item Objective Congruence score of 0.7 for all questions. The questionnaire had a high internal consistency reliability with a Cronbach's alpha coefficient of 0.895. The QOLIE-10 total score, a minimum of 10 and a maximum of 51 points with higher scores indicating greater impairment. Quality of life was assessed at visit 1 (month 0) and visit 3 (month 6).

Statistical analysis

Descriptive statistics including with standard deviation and frequency with percentage were used to summarize demographic and clinical characteristics and study outcome variables. To compare changes of continuous variable before and after the intervention, paired t test or Wilcoxon signed rank test was used as appropriate. For categorical variables, McNemar's test was used to compare changes. Statistical significance was set at a type I error or 5%. All statistical analyses were done using the software program SPSS version 21.

Results

Of the total of 68 participants, about two-thirds were women (64.7%) and were in the age range of 18 - 39 years old (67.6%) (Table 1). The majority had no comorbidities (86.8%). The most used antiepileptic drug was phenobarbital (55.9%) followed by carbamazepine (17.6%), valproic acid (17.6%), and phenytoin (4.4%). Most participants had monotherapy for epilepsy treatment (95.5%).

Medication adherence

The majority of participants did not adhere to their AED regimens (98.5 %). At visit 1 (month 0 or before the intervention or) the mean percentage of pill count was 58.15

± 27.3%. The adherence increased to 90.17 ± 4.5% at visit 2 (or month 3) with significantly higher than that at visit 1 (P-value = 0.0001). At visit 3 (or month 6) the mean adherence of 95.24 ± 2.03% was statistically higher than that at significantly higher than that at visit 2 (P-value = 0.0001) (Wilcoxon signed rank test for all tests).

Table 1 Demographic and clinical characteristics of the participants (N = 68).

Characteristics	N	%
Gender		
Male	22	35.3
Female	24	64.7
Age (years)		
18 - 39	46	67.6
40 - 59	19	27.9
60 or older	3	4.4
Education		
Primary	7	10.3
Secondary	21	30.9
High school	20	29.4
University	20	29.4
Marital status		
Single	37	54.4
Married	29	42.6
Widow	2	2.9
Income (kip)		
No income	27	39.7
1,000,000 -2,000,000	30	44.1
2,000,000 - 5,000,000	9	13.2
> 5,000,000	2	2.9
Family history of epilepsy		
Positive family history	12	17.6
Negative family history	56	82.4
Comorbidities		
No comorbidity	59	86.8
Hypertension	5	7.4
Dyslipidemia	1	1.5
Diabetes mellitus	1	1.5
Depression	2	2.9
Type of AEDs		
Monotherapy	65	95.5
Phenobarbital	38	55.9
Carbamazepine	12	17.6
Valproic acid	12	17.6
Phenytoin	3	4.4
Polytherapy	3	4.5
Phenytoin + Valproic acid	1	1.5
Carbamazepine + Valproic acid	1	1.5
Phenobarbital + Carbamazepine	1	1.5
Type of epilepsy		
Generalized seizure	59	86.8
Temporal lobe seizure	2	2.9
Focal seizure	5	7.4
Myoclonic epilepsy	1	1.5
Atonic seizure	1	1.5

The patient's knowledge

Before the intervention (i.e., pre-test visit 1 or month 0) which was the drug use counseling, the mean baseline score for patient's knowledge of epilepsy was 29.72 ± 3.6 out of 39 points. Right after the counseling, the score increased to 37.63 ± 1.1 points with statistical significance (P-value = 0.0001). At visits 2 and 3, scores of knowledge were relatively similar to that right after the counseling. Similar changes were also

found with the knowledge about antiepileptic drugs where the score right after the counseling was significantly higher than that before the counseling (from 6.00 ± 0.45 to 9.58 ± 1.12 points, P-value = 0.0001) and remained high throughout the intervention period (Table 2).

Table 2 Changes in knowledge scores over time (N = 68).

Outcomes	Mean ± SD	P-value*
Knowledge about epilepsy (Total score =39 points)		
Pre-intervention: visit 1 (month 0)	29.72 ± 3.6	0.0001
Post-intervention: visit 1 (month 0)	37.63 ± 1.1	
Post-intervention: visit 2 (month 3)	37.57 ± 1.2	0.05
Post-intervention: visit 3 (month 6)	37.10 ± 1.6	
Knowledge about antiepileptic drugs (Total score = 23 points)		
Pre-intervention: visit 1 (month 0)	6.00 ± 0.45	0.0001
Post-intervention: visit 1 (month 0)	9.58 ± 1.12	
Post-intervention: visit 2 (month 3)	9.89 ± 1.46	0.002
Post-intervention: visit 3 (month 6)	9.45 ± 1.21	

* Wilcoxon signed rank test.

Drug-related problems

Prior to the implementation of MDT care, we identified a total of 24 DRPs, with the most prevalent issues being related to drug interactions (14.7%), overdosage (2.9%), side effects such as weight gain (5.9%), and failure to receive prescribed drugs (13.2%) (Table 3). These data represent the percentage of patients experiencing DRPs. Over the subsequent 6 months following the introduction of the MDT care, the number of DRPs decreased from 24 to 15 at visit 1 (month 0) and visit 3 (month 6), respectively with a statistical significance (P-value < 0.001) before and after the intervention. Notably, the percentage of patients experiencing more than one DRP decreased from 10.3% to 5.9% (Table 3).

Table 3 Number of drug-related problems (N = 68).

	N (%) by visit		
	Visit 1 (month 0)	**Visit 2** (month 3)	**Visit 3** (month 6)
Drug interaction	10 (14.7)	4 (5.9)	0
Over dosage	2 (2.9)	0	0
Failure to receive drugs	0	0	9 (13.2)
Adverse drug reactions			
Weight gain	4 (5.9)	4 (5.9)	4 (5.9)
Sedation	1 (1.5)	0	0
Behavior change	1 (1.5)	1 (1.5)	1 (1.5)
Alopecia	2 (2.9)	2 (2.9)	2 (2.9)
Dizziness	1 (1.5)	0	0
Headache	2 (2.9)	0	0
Allergy	1 (1.5)	0	0
The number of patients had >1 DRP	7 (10.3)	4 (5.9)	0
Total DRPs*	24	11	15

* P-value < 0.001 for the comparison of 24 and 15 DRPs at visit 1 (month 0) and visit 3 (month 6), respectively (Mcnemar test).

Seizure frequency

At visit 1 before the intervention (or month 0), the **mean frequency of epileptic episodes** was 2.85 ± 1.37 times. At visit 2 (or month 3), the mean decreased to 0.75 ± 1.38 times with statistical significance (P-value = 0.0001). The mean further decreased to 0.10 ± 0.30 times at visit 3 (or month 6) with statistical significance from that at visit 2 (P-value 0.0001) (Wilcoxon signed ranks test for both).

In terms of **frequency of patients experiencing seizure**, initially, there were 9 patients in the seizure-free group (13.2%) at visit 1 (month 0 or before the MDT care). Following the MDT care, in visit 2 (month 3) and visit 3 (month 6), the number of patients identified as seizure-free increased to 48 patients (70.6%) and 61 patients (89.7%), respectively. On the other hand, the number of patients experiencing seizure within three-month period at visit 1, visit 2 and visit 3 increased from 0 (0%), to 20 (29.4%), and 7 (10.3%), respectively. The differences in seizure frequency groups before and after the provision of the multidisciplinary team were statistically significant (P-value < 0.01) (McNemar test).

Quality of life

Scores of QOLIE-10 quality of life at visit 1 (month 0) and visit 3 (month 6) both total score and individual subscale scores were significantly different (P-value < 0.05 for all), except for mobility (P-value = 0.05) (Table 4).

Table 4 Scores of QOLIE-10 before and after the intervention (N = 68).

| QOLIE-10 | Scores (mean ± SD) by visits | | P-value* |
	Visit 1 (month 0)	Visit 3 (month 6)	
Total score	30.23 ± 4.4	24.48 ± 3.48	0.0001
Energy	1.78 ± 0.96	1.62 ± 0.69	0.048
Mood	3.04 ± 0.63	2.57 ± 0.65	0.0001
Mobility	1.91 ± 0.95	1.74 ± 0.90	0.050
Work limitations	3.32 ± 0.88	2.66 ± 0.53	0.0001
Social limitations	3.00 ± 0.57	2.74 ± 0.44	0.040
Memory problems	3.26 ± 0.63	2.82 ± 0.51	0.0001
Physical treatment effects	2.99 ± 0.53	2.62 ± 0.51	0.0001
Cognitive treatment effects	4.46 ± 0.85	2.93 ± 0.55	0.0001
Seizure worries	4.22 ± 1.07	2.91 ± 0.56	0.0001
General QOL	2.01 ± 0.90	1.72 ±0.64	0.019

* Wilcoxon signed ranks test.

Discussions and Conclusion

The research investigated the impact of MDT care on various aspects of patients with epilepsy including adherence, knowledge, seizure frequency, drug-related problems, and overall quality of life. The study involved 68 diagnosed cases of epilepsy patients, with 35.3% being male and 64.7% female. Predominantly, 95.6% of the patients were on AED monotherapy, while 4.4% were on AED polytherapy, aligning with findings in a study by Chandrasekhar et al (2019).[13] Our adherence assessment incorporated pill count and how to take medicine, with good adherence defined as ≥ 85%, consistent with Singh et al.[5] Zheng et al[16] (2019) conducted a study using the eight-item Morisky Medication Adherence Scale (MMAS-8) to assess medication adherence using methodology differing from our approach. However, their study found that intervention and follow-up by a professional team significantly improved medication adherence compared to the control group, supporting our results.[16] Various methods, such as pharmaceutical care managed by pharmacists, have been employed in evaluating medication adherence among epilepsy patients. Despite methodological differences, studies by Chandrasekhar et al using the Morisky Medication-Taking Adherence Scale (4-item) (MMAS-4)[13], Jaiklom et al[23] (employing interviews and self-administered forms), Fogg et al[14] using a Medication Adherence Rating Scale (MARS.), and AlAjmi et al[11] using Morisky Medication Adherence Scale (MMAS), the frequency of drugs or the number of drugs used per day greatly increased medication adherence because it made the patient not forget and be consistent in taking medicine, mirroring our findings.

Furthermore, this research represents the first study in Laos to evaluate medication adherence in epilepsy management through a multidisciplinary team. The consistent positive outcomes across different evaluation methods emphasize the effectiveness of collaborative healthcare approaches in improving patients' adherence to epilepsy medication in diverse settings.

Our research demonstrates that educational interventions administered by a multidisciplinary team a significant positive impact on epilepsy patients' knowledge regarding both the condition itself and antiepileptic drugs, as assessed through a questionnaire at each visit. The noteworthy improvement in patient knowledge can be attributable to the consistent provision of information by pharmacists during these visits. The active involvement of pharmacists in regular follow-ups contributed to a higher quality of patient medication behavior, leading to a notable decrease in seizure frequency and improved seizure control. Numerous studies have

corroborated the positive correlation between pharmacist-led interventions and increased knowledge among epilepsy patients, even when employing different assessment tools. The findings consistently align with research conducted by May et al[25] and Eshiet et al[24], where pharmacist-managed programs demonstrated a significant enhancement in patient knowledge. This reinforces the pivotal role of pharmacists in positively influencing patient understanding and consequently improving outcomes in epilepsy management.

In assessing seizure frequency outcomes, it was observed that following the multidisciplinary team intervention, patients without symptoms experienced a notable increase of 70.6% within a three-month period. Conversely, individuals who previously had three seizures in three months exhibited a decrease of 8.8%. These findings suggest that the intervention contributed to improved symptom control among patients. The results align with a study by Kanjanasilp et al[8], which similarly demonstrated significant differences pre- and post-pharmacist intervention. Prior to the study, 46.15% of patients were symptom-free, while 28.85% experienced high-frequency seizures. Following medical care, the percentage of patients without symptoms rose to 71.15%, and those with reduced seizure frequency increased to 13.46%. This consistency reinforces the positive impact of interventions provided by healthcare professionals.[8]

Following the intervention by the multidisciplinary team, the occurrence of DRPs notably decreased. Prior to the intervention, there were a total of 33 cases of DRPs, which significantly reduced to 14 cases after the intervention. The most commonly identified DRPs included drug interactions (14.7%), followed by overdosage (2.9%), adverse drug reactions such as weight gain (5.9%), and failure to receive prescribed drugs (13.2%). These findings align with a previous study by Kanjanasilp et al.[8] A few previous studies have demonstrated that MDT care, utilizing various tools to assess the quality of life in epilepsy patients, consistently leads to significant improvements. Our results align with research by Eshiet et al who used the QOL-10 to assess patients' quality of life through a different educational approach.[24] The consistent direction of educational outcomes suggests that epilepsy patients can achieve an enhanced quality of life. This observation is also corroborated by various studies utilizing different assessment tools, such as Kanchanasin et al[8] (QOLIE-31) and Zheng et al[16] (QOLIE-31), all indicating substantial improvements in patients' quality of life.

Importantly, these positive outcomes persist after patients receive pharmaceutical care provided by pharmacists, with significant differences observed (P-value < 0.01).[8,16]

Our study has certain limitations that should be acknowledged. Setthathirat Hospital lacked electronic medical records. With a lack of electronic recording of ADR or DRP related to antiepileptic drugs, the sole means of accessing patient records was through patients' books. Consequently, there was no existing record of ADRs or DRPs related to antiepileptic drugs. Future studies should include the collection of these data as part of the baseline. The unavailability of certain medications in the hospital could lead to medication changes (in 9 cases, from phenobarbital to valproic acid) during the visit in month 6. The lack of no control group could allow certain confounding. Future research could incorporate control group. Lastly, the study involved a relatively small number of epileptic patients, which could weaken the power of analysis and should be considered when interpreting the results.

In conclusion, the implementation of a multidisciplinary team care approach holds the potential to yield several significant benefits for epileptic patients. This is the first research about use of a multidisciplinary team for epilepsy management in LAOS PDR. The team can enhance their medication adherence and knowledge, reduce the frequency of seizures and the occurrence of drug-related problems, and ultimately improve their overall quality of life. Given the intricacies of treatment with antiepileptic drugs, it is crucial to maintain a heightened awareness of potential DRPs throughout their usage. Pharmacists are part of the team healthcare team dedicated to treating epileptic patients is essential in this regard. Epileptic patients should have access to multidisciplinary team care as a standard approach, as all antiepileptic drugs carry the potential for numerous drug-related problems. Our study demonstrated an effective intervention of MDT to comprehensively improve medication adherence, improved knowledge, and reduced seizure frequency, the occurrence of Drug-Related Problems (DRPs) markedly diminished subsequently and had a positive impact on the quality of life for patients with epilepsy in LAOS.

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