

# Quality of Life in Thai Intractable Epileptic Patients with and without Surgery

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**Objective:** Assess the quality of life (QoL) of epileptic patients who have and have not undertaken epilepsy surgery, in Thailand.

**Material and Method:** Refractory epileptic patients enrolled in the Epilepsy unit, King Chulalongkorn Memorial Hospital between 2007 and 2008. They were categorized by their history of epilepsy surgery into two groups. Sixty patients who had undergone epilepsy surgery for at least one year and another 60 patients who had no previous history of surgery, were recruited 60 cases each group from the registered list. Demographic data, illness history, psychosocial information, depressive state (Hamilton depressive rating scale, Thai-version), and quality of life (WHOQOL-BREF-26 Thai-version) were comparatively analyzed. The association between QOL and other factors was determined by t-test or one way ANOVA. Stepwise multiple regression also was performed to identify the predictive factor(s) for QoL.

**Results:** The outcome indicated that patients who had received surgery had significantly higher QoL scores than those without surgery in overall and specific domains including physical, psychological, social participating, and environmental domains. The mean QoL score in surgery group was also allocated in the level of good QoL, compared to Thai general population. There were six factors found that associated with QOL by univariate analysis. They were undertaken surgery, older age, seizure freedom, duration of illness, good relationship with family, and mild/absence of depression. However, the multivariate analysis shows that only surgery was predictive to improve QoL.

**Conclusion:** QoL of Thai intractable epileptic patients with surgery was much better than those without surgery in four main areas, which are physical, psychological, social, and environmental domains.

**Keywords:** Epilepsy, Surgery, Quality of life, Thai, Developing country

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Although the majority of epileptic patients respond well on antiepileptic drugs (AED), yet there are about 30 to 40% of cases who continue to have seizures<sup>(1)</sup>. Persistent seizures undermine physical, cognitive, psychological, education, occupational opportunities<sup>(2)</sup>, and impaired quality of life (QoL), in particular, in refractory cases<sup>(3)</sup>. Therefore, resective epilepsy surgery has become one of the best alternatives for these individuals. Most of the publications reported that QoL improved considerably after surgery even though one study showed that a combination of surgery and AED was 4.26 times more likely to achieve freedom from seizure compared to medication alone<sup>(4)</sup>. Surgery had significant improvements in the domains of work, activities, self-perception, and judgment of changes in handicap<sup>(5,6)</sup>.

In Thailand, more than 600,000 patients suffer from epilepsy. They suffer from disability, lack of opportunities, as well as discrimination in many aspects of life. Those are self-images (40% and 26% of Thai adolescents with epilepsy reported concerns in school performances and inadequate self-confidence; furthermore, 23% dared not disclose their illness to their friends<sup>(7)</sup>), employment, and study problems (*i.e.* limited resources make parents decide to choose other healthy children to study instead. Additionally, the Thai teachers are afraid to take care of them during their convulsion. They ask the students to terminate their study or place all children with epilepsy in a special classroom<sup>(8)</sup>). Ever since 1997, the comprehensive epilepsy surgery program in King Chulalongkorn Memorial Hospital had been established to diagnose epilepsy by 7-day video/EEG monitoring, high resolution MRI, ictal and interictal SPECT, Wada test, and offer epilepsy surgery. It is interesting to note that there are no studies in Thailand evaluating the impact of surgery versus non-surgery

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on the quality of life (QoL) in patients with intractable epilepsy despite the fact that the program has been running for more than 10 years. The authors would like to assess the impact of surgery compared to those without surgery to assess QOL in Thai patients with intractable epilepsy.

### **Material and Method**

This is a cross-sectional analytic study. Patients over the age of 18 between 2007 and 2008 were randomly recruited from the Chulalongkorn Comprehensive Epilepsy Program, Epilepsy Unit, King Chulalongkorn Memorial Hospital. Sixty epilepsy patients who had undergone surgery for at least a year were enrolled into one group in the present study. Another group was sixty intractable epileptic patients from the same program who were ineligible to surgery due to absence single seizure focus or unacceptable neurological risk. For both groups, patients with a history of psychiatric disorders before onset of seizure, changes of medication within three months and medical report of AED side effects were excluded from the present study. Patients with cognitive and memory impairment were also excluded, using the Chula Mental Test (CMT). CMT is a screening test for cognitive impairment in less developed countries with the sensitivity 100% and specificity 90% by comparison with the mini-Mental State Examination and the Abbreviated Mental Test<sup>(9)</sup>.

Informed consent was obtained from each patient after the procedures were fully explained and before entering the present study. The present study was approved by the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand.

### **Assessment**

All patients completed the questionnaires that assess the patients' personal, clinical, and psychosocial data, depression, and QoL. Hamilton rating scale for depression, Thai version was used to score for depression. This Thai version questionnaire had interrater reliability (kappa) 0.87, the validity (indicated by Spearman's correlation coefficient) compared to the Global Assessment Scale was 0.8293 ( $p < 0.0001$ ) and internal consistency using Cronbach's alpha coefficient was 0.7380<sup>(10)</sup>.

WHOQOL-BREF-26 Thai version was used to assess the four domains of QOL: physical, psychological, social relationship, and environment domains<sup>(11)</sup>. The internal consistency reliability tested

by Cronbach's alpha coefficient was 0.8406 and the validity was 0.6516 by comparison to WHOQOL-100 in the Thai general population.

### **Statistics**

During the entire period of the present study, both groups were evaluated cross-sectionally by SPSS 16.0. Basic personal, clinical, and psychosocial data were analyzed by descriptive analysis (percent, mean, SD). Univariate and multivariate analyses were used to analyze QoL. Student t-test and ANOVA were applied to define the associated factors to the differences of QoL as well as stepwise multiple regression was used to indicate predictive factor(s).

### **Results**

Table 1 shows the demographic, clinical, and psychosocial data of both groups. In general, there were no significant differences between both groups for most of the characteristics identified such as gender, marital status, family financial status, age of onset, relationship with family, conflict within the family, opportunities to study, drive, play sport, marry, and participate in social and family activities. On the other hand, there were a few differences detected between both groups. Most of the patients from the surgery group were older and had a longer history of epilepsy. Other differences seen were in employment, personal income, freedom from seizure, lacked opportunity to work and depression. Moreover, QoL scores for the surgery group were significantly higher in all domains compared to the non-surgery group (Table 2).

In Table 3, influence of potential parameters associated with QoL scores is presented. The following variables were analyzed by using univariate analysis such as t-test or ANOVA: have undergone epilepsy surgery, gender, age, marital status, employment status, personal income, family income, age of onset of different types of seizures, seizure frequency, duration of illness, family relationship, family conflict, lack of opportunities, and depression. There were no significant differences in marital status, employment status, personal income, family income, family relationship, family conflict, age of onset, seizure types, and lack of opportunities in various aspects of life. The factors significantly associated with increased QoL scores were surgery, older age, freedom from seizures, or infrequent number of seizures, short duration of illness (less than 10 years), having good relationship with the family, and mild or absence of depression. From the

**Table 1.** Demographic data of cases and controls

Characteristics	Epilepsy surgery (n = 60) number (%) or mean (SD)	Non-surgery (n = 60) number (%) or mean (SD)	p-value
Male	26 (43.3)	22 (36.7)	0.576
Age: mean (SD)	36.10 (8.76)	29.33 (6.85)	<0.001*
Married	22 (36.7)	19 (31.7)	0.824
Employed	47 (78.3)	35 (58.3)	0.043*
Personal income (Thai Baht): mean (SD)	6,952.33 (9514.14)	3,586.67 (5,305.56)	0.018*
Family income (Thai Baht): mean (SD)	16,643.33 (18,130.15)	14,716.67 (15,171.44)	0.529
Age of onset of epilepsy: mean (SD)	13.55 (8.01)	12.85 (6.54)	0.601
Free from seizures for 1 year	40 (66.7)	3 (5.0)	<0.001*
Duration of illness (years): mean (SD)	21.97 (9.06)	16.07 (7.37)	<0.001*
Good relationship with family	37 (61.7)	43 (71.6)	0.068
No/little conflict in the family	25 (41.7)	25 (41.7)	0.765
Lack opportunity to work	37 (61.7)	51 (85.0)	0.007*
Lack opportunity to drive	27 (45.0)	35 (58.3)	0.201
Lack opportunity to study	25 (41.7)	29 (48.3)	0.582
Lack opportunity to play sport	15 (25.0)	7 (11.7)	0.099
Lack opportunity to socialize	25 (41.7)	24 (40.0)	0.339
Lack opportunity to marry	24 (40.0)	18 (30.0)	0.339
Lack opportunity to participate in family	13 (21.7)	5 (8.3)	0.074
Depression score: mean (SD)	7.60 (3.27)	17.42 (7.10)	<0.001*

\* p-value < 0.05

T-test was used to analyze the characteristics between both groups

**Table 2.** Quality of life (QOL) in epileptic patients with and without surgery

Aspect of QOL	Epilepsy surgery group (n = 60) mean score (SD)	Non-surgery group (n = 60) mean score (SD)	t	p-value
Physical domain	27.45 (3.2)	16.32 (3.5)	18.206	<0.001*
Psychological domain	23.80 (3.2)	14.12 (3.4)	16.080	<0.001*
Social participation domain	9.53 (2.4)	7.75 (2.3)	4.130	<0.001*
Environmental domain	27.68 (5.2)	22.47 (4.4)	5.919	<0.001*
Overall QOL score	96.13 (13.44)	65.42 (11.81)	9.767	<0.001*

univariate analysis in Table 3, six parameters were significantly correlated to QoL.

The significant six parameters from the univariate analysis (undertaken surgery, age, frequency of seizure, duration of illness, relationship with family, and depression) were added to multivariate analysis. The stepwise multiple regression analysis revealed that only undertaken surgery was shown to be significantly associated with QOL ( $p < 0.001$ ). The regression was good fit (adjusted  $R^2 = 59.9\%$ ). With other variables held constant, surgery patients had higher QOL about

27.451 scores than non-surgery patients (B coefficient 27.451,  $t_{13,243} p < 0.001$ ).

### Discussion

The results of the present study strongly indicated that QOL in post-epilepsy surgery patients was significantly better in all domains when compared to the non-surgery group. This improvement is possibly due to multi-factorial causes such as the frequency of seizures post-surgery. It was shown that 66% of patients in the present study were free from seizures after having

**Table 3.** Factors associated with quality of life score (QOL)

Factors	Epilepsy patients (120 patients)	
	T / F	p-value
Undergoing surgery	13.299	<0.001*
Gender	0.249	0.084
Age	5.002	0.008*
Marital status	0.215	0.807
Educational level	0.918	0.435
Occupation	1.128	0.347
Personal income	1.446	0.233
Family income	1.153	0.331
Age at onset	0.857	0.427
Frequency of seizure	-10.316	<0.001*
Duration of illness	-2.995	0.004*
Pattern of seizure	0.808	0.448
Compliance to treatment	-0.135	0.893
Family relationship	3.167	0.046*
Family conflict	0.487	0.618
Depression	-20.278	<0.001*
Lack of opportunity		
in employment	-1.262	0.210
in driving	-1.501	0.136
in education	-0.508	0.613
in sport	-0.674	0.502
in married	-0.301	0.764
in financial security	-0.461	0.646

surgery compared to those in the non-surgery group who had fewer seizures free (5%). The seizure freedom rate in the present study is rather high compared to the 44% seizure free rate averagely in meta-analysis<sup>(4)</sup>. In addition, epilepsy surgery patients have significantly improved their employment and financial income. It has been reported in other studies that epileptic patients with surgery were capable of working in job finding, higher positioned occupations with a higher income bracket<sup>(12,13)</sup>.

Majority of basic factors in both groups were quite similar. Although the authors have randomized the list of patients who got surgery and non-surgery in comprehensive epilepsy program, the fundamental factors between both groups still showed naturally few differences, for instance: age at onset, marital status, quality of family relationship, seizure freedom, employment, personal income, and opportunities in working and depression scores. The data were collected

cross-sectional after the period that they already had or had not surgery. Therefore, some of these varieties seem to be correlated with post-operative condition because the sample receiving epilepsy surgery had higher personal income in spite of no significant difference of education or basic family financial status, they had a higher opportunity to work and employment in spite of no difference of education or opportunities to study.

To see the effect of surgery, the authors put “undergoing surgery” as one of potentially related factor to QoL. Regarding the univariate analysis, six factors (undergoing surgery, age, seizure frequency, duration of illness, family relationship and depression) correlating with high QoL in the present study were consistent with many QOL studies conducted in refractory epilepsy patients. The Norwegian study also reported that 1-year post-surgery QOL scores in 70% of the patients who were free of seizures were very close to the scores of the normal population<sup>(14)</sup>. In another study, patients with surgery maintaining seizure freedom for at least two years showed that they had equivalent levels in psychological function, education, employment status, and QoL post-surgery to the general population mean<sup>(15)</sup>. Nevertheless, the results from both the univariate and multivariate analysis showed that the patients with surgery had significantly better QoL scores.

The information in Table 4 demonstrated QoL, evaluated by WHOQOL-BREF-Thai, in various Thai study groups. The overall QoL in intractable epileptic patients after surgery was categorized in very good QoL level, the mean QoL scores were even higher than Thai female physicians group<sup>(16)</sup> which represented good quality of life in a Thai population. While the epileptic patients without surgery had been in low average QoL level, especially in physical and psychological domains. It should be noted that their overall QoL scores were lower than patients with mild cognitive impairment (MCI), cancer patients with radiotherapy<sup>(17,18)</sup>, and also be lower in some domains than HIV patients<sup>(19)</sup>.

Although surgery has been widely accepted to improve clinical outcome and QOL in patients with epilepsy, yet it is unfortunate that it is not utilized adequately<sup>(20)</sup>. One of the most common reasons for not having surgery is which the patients have to pay out of their own pockets. The cost for epilepsy surgery (directs costs, include surgery, hospitalization and medication costs) is between 100,000 and 150,000 baht, which are very high compared to per capita national

**Table 4.** Comparison mean (SD) of the quality of life scores (by WHOQOL-BREF THAI) in various groups of Thai people

	WHOQOL-BREF THAI mean scores in Thai people				
	Physical domain	Psychological relationship domain	Social domain	Environment domain	Overall
General Thai population					
Poor QOL	7-16	6-14	3-7	8-18	26-60
Average QOL	17-26	15-22	8-11	19-29	61-95
Good QOL	27-35	23-30	12-15	30-40	96-130
Thai female physicians	26.8 (3.3)	22.7 (3.0)	10.7 (1.6)	28.1 (4.1)	95.5 (10.8)
Mild cognitive impairment	22.9 (2.8)	20.5 (3.3)	9.4 (2.3)	26.8 (5.8)	79.9 (9.9)
Cancer with radiotherapy	20.9 (3.1)	21.3 (3.1)	9.4 (1.8)	25.7 (3.3)	83.4 (9.7)
HIV/AIDS	13.9 (2.3)	14.0 (2.7)	12.9 (2.9)	13.1 (2.1)	No data
Epilepsy with surgery	27.5 (3.2)	23.8 (3.2)	9.5 (2.4)	27.7 (5.2)	96.1 (13.4)
Epilepsy without surgery	16.3 (3.5)	14.1 (3.4)	7.8 (2.3)	22.5 (4.4)	65.4 (11.8)

income of Thai population about 114,441 baht/year<sup>(21)</sup>. In societal viewpoint, however, it is worth doing epilepsy surgery. A study from China illustrated that overall cost for active epilepsy (without surgery) heavily accounted for more than half of the mean annual income<sup>(22)</sup>. California Health Interview Survey 2003 reported that adults with active epilepsy spend almost two weeks per month of poor physical, mental health and activity limitation day compared with two to four days per month in those without epilepsy<sup>(23)</sup>. This illustrated how enormous epilepsy patients lost their benefit and happiness they could access if they had no epilepsy. Hence, to balance out the direct and indirect costs, national health care programs should consider subsidizing the budget for medical treatment in refractory patients. This provide treatment for the patients and, in the long run, will also reduce the burden shouldered by the community.

The limitation of the present study was due to the cross-sectional design of the study. Within the period of data gathering, patients who had already undergone surgery and patients who had never had surgery could be different in many basic factors between groups. Some of the differences might possibly be the impact of the operation and lead to changes in QoL. Another limitation should be acknowledged was the authors had not evaluated all risks that had been reported in the literature. Some of QoL related factors were excluded from the sample by intention to reduce the influencing of unsteady state from epilepsy treatment to QoL, such as AED side effect, recent AED changes, medical comorbidity or history of seizure-related accident<sup>(21,24-27)</sup>. Intractable patients without surgery group had more likely to be

adjusted or changed AED and received higher dosage of AED that means had more likely to have AED side effects than patients in the surgery group. The objective of the present study intended to compare the differences of their QoL due to life style more than unsteady physical state. Therefore, the present study could not mention whether the factors related to AED influenced QOL or not.

In conclusion, epileptic patients who got surgery had significantly higher QOL scores in all domains compared to the non-surgery group. Surgery is the most potent predictive factor for QOL and should be considered for the treatment in patients with intractable epilepsy, in either the quality of life aspect or economic aspect.

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#### Potential conflicts of interest

None.

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## ความแตกต่างของคุณภาพชีวิตในผู้ป่วยโรคลมชักชาวไทยที่ได้รับการผ่าตัดรักษาโรคลมชักและไม่ได้ รับการผ่าตัดรักษาโรคลมชัก

บุรณี กาญจนถวัลย์, รัศริน กาสลัก

**วัตถุประสงค์:** เพื่อประเมินคุณภาพชีวิตของผู้ป่วยโรคลมชักที่ได้รับการผ่าตัดรักษาโรคลมชัก และไม่ได้รับการผ่าตัดรักษาโรคลมชัก  
**วัสดุและวิธีการ:** ทำการศึกษาผู้ป่วยโรคลมชักที่ได้รับการรักษาที่คลินิกโรคลมชัก โรงพยาบาลจุฬาลงกรณ์ในระหว่างปี พ.ศ. 2550  
ถึง พ.ศ. 2551 ประกอบด้วย ผู้ป่วยโรคลมชักที่ได้รับการผ่าตัดรักษา และไม่ได้รับการผ่าตัดรักษา กลุ่มละ 60 คน เก็บข้อมูลส่วนบุคคล ข้อมูลโรคลมชัก ข้อมูลทางจิตสังคม ภาวะซึมเศร้า (Hamilton depressive rating scale, Thai version) และคุณภาพชีวิต (WHOQOL-BREF-26 Thai-version) วิเคราะห์ข้อมูลเปรียบเทียบความแตกต่างของคุณภาพชีวิตและปัจจัยที่เกี่ยวข้องโดย unpaired-t-test และ one-way ANOVA วิเคราะห์ปัจจัยพยากรณ์โดย stepwise multiple regression

**ผลการศึกษา:** พบว่าผู้ป่วยที่ได้รับการผ่าตัดรักษาโรคลมชักมีค่าคะแนนคุณภาพชีวิตที่สูงกว่าผู้ป่วยที่ไม่ได้รับการผ่าตัดรักษาโรคลมชักอย่างชัดเจนมีนัยสำคัญ ทั้งค่าคะแนนรวม และแยกด้านสุขภาพกาย ด้านจิตใจ ด้านสังคม และด้านสิ่งแวดล้อม โดยมีระดับคุณภาพชีวิตที่ดีเมื่อเทียบกับประชากรไทยทั่วไป ปัจจัยที่พบว่าเกี่ยวข้องกับคุณภาพชีวิตที่ดีของผู้ป่วยประกอบด้วย การได้รับการผ่าตัดรักษาโรคลมชัก อายุมาก มีช่วงหยุดชักต่อเนื่อง ช่วงเวลาป่วยไม่นานมาก ความสัมพันธ์ในครอบครัวดี การไม่มีภาวะซึมเศร้า โดยปัจจัยพยากรณ์ระดับคุณภาพชีวิตที่สำคัญที่สุดคือ การได้รับการผ่าตัดรักษาโรคลมชัก

**สรุป:** คุณภาพชีวิตของผู้ป่วยโรคลมชักด้อยกว่าที่ได้รับการผ่าตัดรักษาโรคลมชักดีกว่าผู้ป่วยโรคลมชักด้อยกว่าที่ไม่ได้รับการผ่าตัดอย่างชัดเจนทุกด้าน

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