



42 epilepsy is a neurologic disorder characterized by recurrent episode of seizure. The cause of epileptic seizure is  
43 often unknown but in some people the condition is inherited also it is caused by brain damage due to different  
44 causes [1].

## 45 2 E

46 Improving the diagnosis, treatment, prevention, and social acceptability are important factors in achieving the  
47 objective of the management of epilepsy. Quality of life is recognized as an important outcome in epilepsy  
48 treatment [9].

49 The investigator has come across a limited study done in Ethiopia addressing quality of life among epileptic  
50 patients. Thus main aim of this study was to determine cognitive, emotional, social, physical and psychological  
51 aspect of QOL by using Quality Of Life in Epilepsy Inventory-31(QOLIE-31) instrument among adult epileptic  
52 patients taking follow up care at Jimma University Medical Center (JUMC).

## 53 3 II.

### 54 4 Methods and Materials a) Study design and population b)

#### 55 Data collection instrument

56 The questionnaire had 5 parts, HRQOL instruments (QOLIE-31), Hospital Anxiety and Depression Scale  
57 (HADS), Sociodemographic, medical and personal factors.

58 In this study HRQOL was measured based on total score of Quality Of Life in Epilepsy (QOLIE)-31questionner.  
59 A QOLIE-31questionner-containing 31 items categorized under seven domains covering the following concepts  
60 of health: overall quality of life, cognitive functioning, emotional well-being, social functioning, energy/fatigue,  
61 seizure worry and medication effects.

62 Energy/fatigue scale Assess feelings of tiredness, loss of energy and the overall impact of this issue on life  
63 Emotional well being (mood) scale assess the mood of the client such as feeling of nervousness, being calm and  
64 peaceful, happiness Social functioning domain assess how the Health limited social activities (such as visiting with  
65 friends or close relatives) Cognitive functioning scale used to assess mental activity such as thinking, reading,  
66 concentrating and memory problems Medication effects scale assess the physical and mental effect of AED, as  
67 well as worries about the medication taken Seizure worry scale assess impact of seizures such as bothering and  
68 worries about having another seizure, hurting from seizure, embracement or social problems resulting from having  
69 seizure next time. Overall quality of life scale considers the above all domains or scales.

70 The score corresponding to each scale as well as QOLIE-31 total score was calculated for each patient. Each  
71 item is scored on a scale of 0 to 100, with a score of zero equivalent to maximum disability or worst quality of life  
72 and a score of 100 equivalent to no disability or a high quality of life. However, possible categories or response  
73 sets for scoring vary across questions. Examples of response sets used include (i) 0, 25, 50, 75, 100; (ii) 0, 20, 40,  
74 60, 80, 100; (iii) 0, 33,67, 100.

75 Questions on patient socio-demographics, personal factors such as (perceived stigma and sleeping pattern) and  
76 some clinical characteristics (such as partial or generalized epilepsy type) were also included in the integrated  
77 questionnaire. Medical records were reviewed to extract additional information pertaining to the date of initiation  
78 of AEDs, and type of therapy (poly-therapy or mono-therapy).

79 The questionnaire was administered by trained nurses hired from other hospitals and technical support was  
80 given by the Principal Investigator.

81 At time of data collection filled questionnaires was checked for completeness and consistency of information  
82 by the supervisor on daily basis and typing errors was manually edited.

83 Questionnaire was prepared in English and translated to local language. Questionnaire was pretested on 5% of  
84 sample size a week before actual data collection period in other public (Shenen Gibe) hospital and after pre-test  
85 necessary modification was done.

## 86 5 Data Analysis Procedure

87 The coded data was checked, cleaned and entered into Epi data version 3.1 and then analysed by SPSS window  
88 version 20.0.

89 Frequencies and percentages were used to summarize the Sociodemographic, personal factors and medical  
90 characteristics of the patients. A cross-sectional study was conducted in chronic illness clinics of JUMC between  
91 March 1/2015 -May1/ 2015. The study population was all people aged 18 years and above who had been on anti-  
92 epileptic drugs for at least 3 months with an expectation that patients would have a good experience on AEDs  
93 and possibly would knowledgeable describe seizure control features [10,25]. By using Single population formula  
94 a total of 314 samples were selected based on a study report which shows the proportion (P) of epileptic patients  
95 who are in lower Health Related Quality of Life (HRQOL) were 45.8% [17]. The estimated 5% margin error  
96 of the true HRQOL (on 0-100 scale) with 95% Confidence interval was used with 10% non-response rate. The  
97 hospital gives follow up care for epileptic patients every Thursday, thus using systematic sampling, a sampling  
98 interval of 3 patients were enrolled and interviewed on a weekly basis for a period of 8 weeks.

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99 Hospital Anxiety and Depression (HAD) Scale was used to measure patient's current comorbidity with anxiety  
100 and depression which may affect patient's quality of life [24].

101 Independent t test and one way Anova was done to compare means, and also Pearson correlation was done  
102 between the dependent and continuous independent variables. Then those variable with  $P < 0.2$  was selected for  
103 regression.

104 Linear regression was performed to assess the association between HRQOL and different explanatory variables.  
105 P value  $< 0.05$  was considered statistically significant in this study.

106 Finally the result was presented using statement, tables and figures.

## 107 **6 Ethical Approval**

108 Before the data collection, ethical clearance letter was obtained from ethical review committee of Jimma  
109 University College of public health and medical sciences. The letter was submitted to the JUMC management  
110 and permission was obtained to interview as well as access patients and their medical records. The respondents  
111 were informed about the purpose of the study, and their oral consent was obtained. The respondents' right  
112 to refuse or withdraw from participating in the interview was fully maintained and the information provided  
113 by each respondent was kept strictly confidential by making each questionnaire coded and not sharing personal  
114 information of any patient to the third party.

115 IV.

## 116 **7 Result**

117 From the total respondents, 100 (32.9%) of the respondents have expressed perceived stigma due to the disease  
118 (epilepsy); 266 (87.5%) of the respondents were reported they are compliant to self care and 259 (85.2 %)   
119 perform daily activities (work) independently. Also 227 (74.7 %) of clients have reported family support in their  
120 day to day life. Concerning substance abuse 66 (21.7%) of the client ever used substance and 47 (15.5 %) were  
121 using substances currently. Regular physical exercise and enjoying recreational activities are practiced among 52  
122 (17.1%) and 132 (43.4 %) of the respondents. 237 (78%) of clients get enough and regular sleep daily (Table 2).

123 According to Hospital Anxiety and depression scale (HAD scale, 106 (35%) and 88 (29 %) of patients has  
124 abnormal score of anxiety and depression respectively (Table 3).

## 125 **8 Socio-demographic, Clinical and Personal Characteristics of 126 the respondents**

127 From the total 314 study participants enrolled, 304 were interviewed. Of the total respondents, 177 (58.2%) were  
128 male; the average age was 28 years and only 133 (43.8%) were currently married. Majority of the participants,  
129 198(65.1%), at least able to read and right and 124 (40.8%) of them were Farmers; 207(68.1%) of them were  
130 Rural dwellers. Cost of treatment for epilepsy among 260 (85.5%) participants was free.

131 Regarding the seizure type, 271 (89.1%) subjects had generalized onset seizure and 33 (10.9%) has focal onset  
132 (partial) seizure. 260 (85.5%) respondents has at least one seizure per year and 44 (14.5%) of them were seizure  
133 free at least for a year. The average age of the respondents when they get epilepsy and age of the pt when AEDs  
134 started was 18 and 21 years respectively. Concerning the type of AEDs, 191 (62.8%) and 90 (29.9%) respondents  
135 take one and two AEDs respectively. Also 165 (54.3%) and 136 (44.7%) respondents take AEDs once and twice  
136 per day respectively. Out of the total respondents, 119 (39.1%) reported side effect of the AED treatment;  
137 104 (34.9%) of them reported complications related to epilepsy. 63 (20.7%) and 56 (18.4%) clients has current  
138 comorbidities (other than depression and anxiety) and previous history of hospital admission respectively (Table  
139 1).

## 140 **9 Factors associated with socio-demographic, personal charac- 141 teristic and clinical factors with the seven domains of QOL**

142 On bivariate analysis the factors found to fulfill the minimum requirement ( $p\text{-value} < 0.2$  in this study) were  
143 entered in to linear regression for further analysis in order to control confounding effects.

144 The results of linear regression analysis showed Sex, Residence of the client (urban or rural), occupational  
145 status, performing regular exercise, Doing daily activities independently, Sleep pattern, Frequency of AEDs  
146 taking/day, Side effect of the treatment, age of the patient when AEDs started, current co-morbidities and Level  
147 of anxiety and depression was significantly associated with at least one of the seven domains of QOL score (table  
148 4-8).

## 149 **10 Overall quality of life domain:**

150 was significantly associated with level of depression ( $P = 0.006$ ) (Table 6). Seizure worry domain: of quality of  
151 life was significantly associated with occupational status, performing regular exercise, Perceived stigma because  
152 of the illness, current co-morbidities, Level of anxiety and level of depression ( $P < 0.05$ ) (Table 4). Emotional  
153 wellbeing domain: was significantly associated with Sex, Perceived stigma because of the illness, Level of anxiety

154 and depression ( $P<0.05$ ) (Table 6). Energy/Fatigue domain: was significantly associated with Level of anxiety  
155 and depression ( $P<0.05$ ) (Table 6).

156 Cognitive Function domain: was significantly associated with Residence of the client (urban or rural), frequency  
157 of AEDs taking per day, Side effect of the treatment, current comorbidity, Having enough and regular sleep, and  
158 Level of anxiety and depression ( $P<0.05$ ) (Table 7). Medication effect domain: was significantly associated with  
159 level of anxiety and depression, Doing daily activities independently, Perceived stigma because of the illness  
160 and age of the patient when AEDs started ( $P<0.05$ ) (Table 8). Social functioning domain: was significantly  
161 associated with level of anxiety and depression, frequency of AEDs taking per day and current co-morbidity  
162 ( $P<0.05$ ) (Table 5). V.

## 163 11 Discussion

164 Epilepsy has a great influence on the three levels of quality of life (physical, mental and social health), where the  
165 social functioning has a significant role in obtaining a good QOL.

166 In the current study, sex is associated with emotional well-being function. It was found that among the Male  
167 patients emotional well-being domain of QOL score were higher than female a counterpart which is similar with  
168 the Indian studies [11,12]. These women came from both urban and rural areas in economic transition. This  
169 may indicate that biological and psychological factors (family issues, personal life, and motherhood) may play  
170 a more important role. Therefore, future studies need to find the reason for this lower quality of life in women  
171 with epilepsy.

172 In this study, residence of patient was associated with cognitive aspect quality of life. Those clients living  
173 in rural area has lower quality of life. This may be related to information difference about the disease and  
174 treatment, higher cost and distance to reach health institution among the rural residents and also may be higher  
175 social isolation in the rural area. This result is similar with previous studies done in Kenya and India [13,14].

176 Seizure worry domain of quality of life is associated with occupation of the patient. According to study  
177 quality of life is decreased among housewife and students. The groups are dependent to other family members  
178 for economic dependence. This study is similar with previous studies [13,15,16,25].

179 Regarding clinical factors, frequency of AEDs taking per day was a factor associated with cognitive function  
180 and social function domains. Quality of life is higher among patients who were taking AEDs once a day (QD)  
181 than two or greater times per day. Similarly different literatures [10,[15][16][17][18] suggested that polytherapy  
182 receiving patients had lower mean QOL score as compared to their counterpart.

183 In this study cognitive aspect of quality of life was associated with Side effect of the treatment. Those patients  
184 who reports side effect of current AEDs has lower quality of life. This finding is concurrent with previous study  
185 done including Uganda and South Korea with the same instrument [3, 10,19].

186 In current study medication effect and social function domain of quality of life has association with patient's  
187 age when AEDs started. Quality of life decreased as among clients who started AEDs at older age which is similar  
188 with study finding from South Korea [15] According to this study, overall HRQOL score and all domains of quality  
189 of life score is decreased among patients experiencing current comorbidity. Having current anxiety and depression  
190 decreased overall HRQOL score than those without anxiety and depression. This was consistent with the result  
191 of most studies which assessed comorbidities as well as level of anxiety and depression [17,[19][20][21][22][23].

192 Concerning personal factors of the patients, current experience of having enough and regular sleep associated  
193 with higher cognitive function domain of QOL. Also Emotional wellbeing, medication effect and social function  
194 domain of quality of life score was lower among patients who experienced perceived stigma because of the illness  
195 which is in line with previous studies [10,15,17]. Another finding of this study was performing regular exercise  
196 was associated with better score of seizure worry domain of quality of life scale. Also Medication effect domain  
197 was associated with doing daily activities independently.

## 198 12 VI. Conclusions And Recommendations

199 Being female, Rural residence, Taking AEDs several times per day, becoming older age, side effect of treatment,  
200 current comorbidity with anxiety and depression and other disease, and also those with perceived stigma were  
201 associated with lower quality of life. On the other hand performing regular exercise, performing daily activities  
202 and enough and regular pattern of sleep were related to better QOL.

203 It is evident that current management of epilepsy that focuses on only seizure control does not improve  
204 HRQOL of the patients receiving AEDs. In addition to controlling seizure and antiepileptic drugs side effects,  
205 the treatment of epilepsy should include clinical counseling and other interventions to address the physical, mental,  
206 psychological, social and emotional aspects for health wellbeing is likely to achieve better health outcomes for  
207 epileptic patients. Also recognition of co morbid psychiatric illness like depression and anxiety in people with  
208 epilepsy should be of great concern for health care providers.

## 209 13 a) Consent for publication

210 All authors are agreed to disseminate and publish the current research result

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211 **14 b) Availability of data and materials**

212 All the data sets used and/or analyzed during this study are included in the article.

213 **15 c) Author's contribution**

214 This work was carried out in collaboration between all authors. Author DS designed the study, performed the  
215 statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author EH managed the  
216 analyses of the study. Author DS managed the literature searches. Both authors read and approved the final  
manuscript.<sup>1</sup>

**1**

Variable	Categories	Frequency	Percentage %
Seizure type		271	89.1
		33	10.9
Seizure frequency	?1 seizure per year	260	85.5
	Seizure free for a year	44	14.5
Number of AEDs	One	191	62.8
	Two Three	91 20	29.9 6.6
	Four	2	0.7
Frequency of AEDs taken per day	One	165	54.3
	Two	136	44.7
	Three	3	1
History of current comorbidity	Yes	63	20.7
	No	241	79.3

Figure 1: Table 1 :

**2**

Variable	Categories	Frequency	Percentage %
Perceived self esteem	Yes	234	77
	No	70	23
Perceived Stigma	Yes	100	32.9
	No	204	67.1
Compliance to Self-care	Yes	266	87.5
	No	38	12.5
Family support	Yes	227	74.7
	No	77	25.3
Regular Exercise	Yes	52	17.1
	No	252	82.9
Recreational activities	Yes	132	43.4
	No	172	56.6
Enough and regular sleep	Yes	237	78.0
	No	67	22.0

Figure 2: Table 2 :

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3

Mean scores of QOL domains of QOLIE-31 among epileptic patients at JUMC, Jimma, Ethiopia, 2015. (n= 304)

The domains/subscales was as follows: Seizure worry (50.8±19.9); Overall QOL (59.8±20.0); Emotional wellbeing (59.1 ±14.8), Energy/fatigue (59.9 ±13.6), Cognitive function (56.0 ±15.5), Medication effects (61.5±19.4), Social functioning (63.6 ± 17.7) and total (Overall) quality of life (58.8±10.6). 153 (50.3%) have Overall HRQOL score of Greater than the mean and 151(49.7%) have Overall HRQOL score of less than the mean.

Variable	Categories	F
Level of anxiety	Normal	7
	Borderline abnormal	1
	Abnormal	1
Level of depression	Normal	9
	Borderline abnormal	1
	Abnormal	8
average total	QOL score of	

Figure 3: Table 3 :

4

QOLIE-31 domains	Variables	Unstandardized B	Standardized B	95% CI for B	
				Lower Bound	Upper Bound
	Constant	48.568	.000	32.502	64.635
	Current	-	.001*	-	-
		9.889		15.548	4.229
	co-morbidities				
	Yes				
	No				
	Performing regular physical exercise	6.409	.040*	.305	12.513
	Yes				
	No				
Seizure worry	Housewife	-	.001*	-	-
		18.154		29.010	7.298
	Non housewife (ref)				
	Student	-	.028*	-	-.970
		8.753		16.536	
	Non student (ref)				
	Anxiety	-	.012*	-	-
		7.653		13.606	1.700
	No anxiety(ref)				
	Depression	-	.005*	-	-
		8.598		14.591	2.605
	No depression(ref)				

Dependent variable: Seizure worry domain

Non housewives: Those without occupation, Merchants, Farmers, Daily laborers, Governmental employees and

Non students: Those without occupation, Merchants, Farmers, Daily laborers, Governmental employees and

Note: \*represents variables having statistically significant association. ref: Represents "reference"

Figure 4: Table 4 :

5

QOLIE-31 domains	Variables	Unstandardized B	p	95% CI for B	
				Lower Bound	Upper Bound
	Constant	78.122	.000	71.392	84.851
	Frequency of AED taking /day	5.581	.004*	1.769	9.393
Domain Social functioning	Once/day ?2 times/day				
	No Yes Current comorbidities	-6.060	.011*	-10.731	-1.389
	Anxiety	-8.365	.002*	-13.602	-3.128
	No Anxiety(ref)				
	Depression	-6.485	.017*	-11.809	-1.160
	No depression(ref)				

Dependent variable: social functioning domain

Note: \*represents variables having statistically significant association.

ref: Represents "reference"

Figure 5: Table 5 :

6

Year	QOLIE-31 domains	Variables	Constant	Unstandardized	P	95% CI for B
2018		Sex		B	.000	
12				60.594	.007*	
Volume XVIII				4.368		
Issue III						
Version I						
D D D		Male Female(ref)				
D )						
(	Emotional	Perceived stigma		-6.406	.000*	-9.733
Medical Re-search	wellbeing domain	Yes No Anxiety		-8.528	.000*	-12.705
		No anxiety(ref)		-9.481	.000*	-13.739
		Depression No		67.487	.000	64.024
		depression(ref)				
		Constant				
Global Journal of	Energy/ Fatigue domain	Anxiety No		-5.136	.014*	-9.212
	Overall QOL domain	Anxiety(ref)		-8.112	.000*	-12.356
		Depression No		48.954	.000	37.354
		depression(ref)		-6.899	.006*	-11.807
		Constant				
		Depression No				
		depression(ref)				

Dependent variable: Emotional wellbeing domain, Energy/Fatigue domain, Overall QOL domain

Note: \*represents variables having statistically significant association.

ref: Represents "reference"

Figure 6: Table 6 :

7

QOLIE-31 domains	Variables	Unstandardized B	P	95% CI for B	
				Lower Bound	Upper Bound
	Constant	85.745	.000	72.511	98.979
	Residence Rural	-5.255	.003*	-8.722	-1.788
	Urban (ref)				
	Frequency of AEDs tak- ing/day				
	Once/day	4.122	.011*	.941	7.302
	?2 times /day (ref)				
	Side effects of AEDs	-3.568	.029*	-6.766	-.370
Cognitive function do- main	Yes No Current comorbidi- ties	-4.997	.014*	-8.987	-1.008
	Yes				
	No				
	Enough and regular sleep				
	Yes	3.866	.046*	.062	7.669
	No				
	Anxiety	-6.792	.002*	-11.126	-2.457
	No anxiety (ref)				
	Depression	-11.902	.000*	-16.278	-7.526
	No depression (ref)				

Dependent variable: Cognitive function domain

Note: \*represents variables having statistically significant association.

ref: Represents "reference"

Figure 7: Table 7 :

8

QOLIE-31 domains	Variables	Unstandardized B	P	95% CI for B	
				Lower Bound	Upper Bound
	Constant	77.888	.000	69.932	85.844
Doing daily activities	Independently	7.496	.012*	1.678	13.314
	Yes				
	No				
	Perceived stigma	-5.372	.019*	-9.838	-.906
Medication effect domain	Yes				
	No				
	Age of the patient	-.723	.020*	-1.329	-.116
when AEDs started	Anxiety	-11.375	.000*	-17.249	-5.501
	No Anxiety(ref)				
	Depression	-7.926	.006*	-13.567	-2.286

No depression (ref)

Dependent variable: Medication effect domain

Note: \*represents variables having statistically significant association

ref: Represents "reference"

Figure 8: Table 8 :



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## 15 C) AUTHOR'S CONTRIBUTION

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