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Psychometric Properties of the Persian Version of the Quality of Life in Epilepsy Inventory in the Later Life

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Background and Purpose: The reports indicate on the incidence of seizure disorder about 1.5 per cent of the normal elderly population. The Quality of Life in Epilepsy Inventory (QOLIE-31) has been pervasive simple tool to screen seizure in the busy neurophysiological settings and monitoring. It was constructed as self-administered tool in two formats, 89 and 31-items. To the reliability and validity of the QOLIE-31 across older adults in the southwest Iran and discuss its role in the detection of health-related quality of elderly patients with epilepsy.

Methods: About 73 older adults (mean age = 66.3 ± 1.71) were sampled from the eight hospitals and caring centres. They replied to the QOLIE-31. External and criterion validity was calculated by correlation to the SF-36 questionnaire, to check and validate the epilepsy specific dimensions. The QOLIE-31 includes seven subscales: overall quality of life, seizure worry, emotional well-being, energy/fatigue, cognitive, medication effects, and social function.

Results: There was significant difference within sample groups regarding main variables ($p < 0.05$). The coefficients of Cronbach's alpha ($\alpha = 0.76$), convergent validity (0.81), divergent validity (-0.21), external validity with overall score of SF-36 (0.87), and criterion validity (0.78) were estimated, which were significant at $p < 0.01$. The exploratory factor analysis demonstrated that the QOLIE-31 is organized into six factors, which clarifies 92 per cent of the scale's variance. Second-order confirmatory factor analysis pointed out that the factor is well matched up onto a principal factor. Consequently, the 6-factors model was well appropriate for the data by the fit index techniques for adjusting the scale (AGFI = 0.94, GFI = 0.96, RMSEA = 0.003, IFI = 0.90, NFI = 0.95, CFI = 0.95).

Conclusions: The results pointed to the well-adjusted reliability and psychometric properties of the QOLIE-31 and its usefulness for the relevant studies as well. **(2016;6:61-67)**

Key words: Validity & reliability, QOLIE-31, SF-36, Epilepsy, Seizure, Older adults, Iran

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Introduction

Epilepsy is a condition of decreasing neuronal system that usually begins to occur at any years of age. It is the most common neurological disorder-affecting people of all ages and is important to understand that epilepsy is a physical rather than mental disorder. There may be a problem by refusing to even talk about the symptoms. There are many different types of seizure, which are divided into two main groups i.e. generalized seizures, which occur when the disturbance is spread across all of the brain, and the second is partial seizures when only part of the brain is affected.[1,2] Epilepsy can affect anyone at any time of life. It is more usually diagnosed in people under the age of 20 or those aged over 60. Most seizures are short-lived and need no medical attention.[3-7] Over ten thousand articles on seizure (or epilepsy) for juveniles and youths can be found, but relatively less has been conducted on the older adults' equivalent.[8-10] The ratio of published studies of seizure within young adults to older adults is approximately 1:100.[4,11-13] Attaining knowledge regarding epilepsy among elderly people will help the caregivers and gerontologists to achieve the ultimate goal of a dignified healthy ageing,[14-17] and maintain the highest quality of life.[8,18-21] Thus, it is adding life to years and not simply years to life.[22,23] While

ignorance about elderly seizure, having an instrument turns out to be a necessity.[9,24-27] It is helpful even in the clinical treatment as well.[28] The study was investigated to the standards of quality of life in epilepsy inventory in the later life, the shortened version (QOLIE-31) (1993, 2005) within older adults to introduce a relevant criterion. The measurement of external validity had contained correlating relation of the SF-36 and QOLIE-31 Inventories, to check the properties of the epilepsy specific dimensions.

Methods

About 73 men and women with age range of 57 to 91 and with the mean age of 66.3 ± 1.71 were sampled with the cluster-ratio sampling method from the eight medical centres and hospitals of Khuzistan province in the southwest Iran. The aged samples replied to the 31 items of QOLIE-31. The QOLIE-31 questionnaire mainly consists of a 31-item disability/symptom scale regarding epilepsy that

Table 1. Frequency distribution and comparison of seniors' demographic and background profiles by gender (n = 73, $p \leq 0.05$)

Categories	Sub Items	n	%	Male	Female	χ^2/p-value
Gender	Male	45	79.56	-	-	1.105/
	Female	28	20.44	-	-	0.000
Age (Mean = 66.3, SD = 1.71)	60-70 (young old)	36	49.32	20	16	2.125/ 0.000
	71-80 (middle old)	21	28.77	13	8	
	≥ 81 (old old)	16	21.92	8	8	
Ethnicity	Persian	30	41.10	15	15	4.142/ 0.000
	Arab	22	30.14	18	4	
	Lor	21	28.77	16	5	
Educational status	No formal school	52	71.23	21	31	12.5/ 0.000
	Only reading	17	23.29	10	7	
	Primary	2	2.74	2	0	
	Middle school	1	1.37	1	0	
	High school	0	0.00	0	0	
	Graduated	1	1.37	1	0	
Marital status	Divorced	1	1.37	1	0	32.4/ 0.000
	Widowed	21	28.77	7	14	
	Separated	0	0.00	0	0	
	Married	43	58.90	31	12	
	Never married	2	2.74	0	2	
	Living with other	6	8.22	0	6	
Length of married time (Mean = 29.3, SD = 3.27) [national range: Mean = 25.1 and SD = 3.1]	≤ 10 year	9	12.33	9	0	21.61/ 0.000
	11-20 year	15	20.55	10	5	
	21-30 year	47	64.38	33	14	
	≥ 31 year	2	2.74	0	2	
Family members (Mean = 5.7, SD = 1.34)	≤ 5 persons	41	56.16	20	21	23.8/ 0.005
	≥ 6 persons	32	43.84	15	17	
Economic support and pensioning	Nothing	52	71.23	12	40	21.3/ 0.000
	Public	19	26.03	10	9	
	Private	2	2.74	2	0	
Range of financial support upon urban poverty ratio* (Mean = 936439.79, SD = 1.48)	Nothing	48	65.75	36	12	23.5/ 0.000
	≤ 990,000	10	13.70	5	5	
	1000000-4500000	8	10.96	8	0	
	4510000-7990000	5	6.85	5	0	
	≥ 8000000	2	2.74	2	0	
Municipal zones†	1= Middle Class	12	16.44	6	6	34.01/ 0.059
	2= Developed	8	10.96	5	3	
	3= Developed	8	10.96	3	5	
	4= Undeveloped	13	17.81	10	3	
	5= Undeveloped	7	9.59	4	3	
	6= Middle Class	4	5.48	2	2	
	7= Middle Class	9	12.33	5	4	
	8= Undeveloped	12	16.44	5	7	

* Based on Iranian Rials currency and 1 US$= 29060 IR Rials in 2014.
†They are economically divided into three parts i.e. poor and undeveloped = 29.6% (zone 4, 5, & 8), middle class= 48.6% (zone 1, 6, & 7), wealthy and developed = 21.8% (zone 2 & 3) regarding income of citizens and urban facilities based on Provincial Report of KSCC (2011).

was investigated by authors and literature reviews.[2,4,7,12,13,20,22,24,27,29] It was developed in three version i.e. 89, 31, and 10 items. The 31 items is most common used version of QOLIE-31. Each item in the scale has several responses i.e. six response options from 1 = all of the time to 6 = none of the time severe (Item No: 2-12), four response options from 1 = very fearful to 4 = not fearful at all (Item No: 15-24). In addition, other formats have five response options from 1=not at all bothersome to 5=extremely bothersome (Item No: 25-30), and three closed-form and shaped items. If the 31 items are completed, a scale score ranging from 25 (no symptoms) to 125 (most severe symptoms), can be calculated. The QOLIE-31 contains 31 items on the following domains: overall quality of life (OQ), emotional wellbeing (EW), energy-fatigue (EF), cognitive functioning (CF), medication effects (ME), seizure worry (SW), and Social functioning (SF).

External and Criterion Validity: It was estimated by the correlations of overall scores of QOLIE-31 and its domains to other similar instrument like SF-36. The Pearson's correlation coefficients was used to measure the relationship between scales of QOLIE-31 and SF-36. Strong correlations were expected between domains and scales with the same content. The SF-36 range from 0 to 100, with 100 representing the highest level of functioning possible in the QoL.

Translating the Instrument: Psychometric properties of the QOLIE-31 was evaluated in several divergent backgrounds and cultural groups i.e. Spanish, German, Thai, Norwegian, French, Italian, Portuguese, Serbian, Bulgarian, and Czech context.[2,19,30-35] The study translated it into Persian from its English version[4,12] by three instructors and an English language expert. The four translated versions were compared by the authors, and the researchers developed a common Persian text from them. Afterwards, the Persian version of the QOLIE-31 was translated back into English by an English language expert who had not seen the original English text and by a linguist. The English statements of the questionnaire that had been translated from Persian into English were compared with the original version, and any necessary revisions were made as well.

Setting and Participants: From the eight medical centres and hospitals of Khuzistan province in the southwest Iran, about 80 aged men who had been constant patients at the centers responded to the Iranian version of the QOLIE-31. Of the 80 responders, 73 had responded to all of the 31 items used in the inventory and included in the analysis. The mean age of the samples was 66.3 ± 1.71 (range 57-91) years.

Table 2. Frequency distribution and comparison of seniors' clinical characteristics profiles by gender (n = 73, $p \leq 0.05$)

Categories	Sub Items	n	%	Male	Female	χ^2/p-value
Type of epilepsy	Tonic-clonic	31	42.47	17	14	21.01/0.009
	Partial	20	27.4	4	16	
	Absence	13	17.81	10	3	
	Others	9	12.33	6	3	
Etiology	Idiopathic	22	30.14	16	6	32.00/0.001
	Symptomatic	38	52.06	15	23	
	Cryptogenic	13	17.81	11	2	
Seizure type	Absence	7	9.59	3	4	13.8/0.001
	Myoclonic	11	15.07	5	6	
	Primarily generalized tonic-clonic	14	19.18	6	8	
	Simple partial	18	24.66	11	7	
	Complex partial	9	12.33	8	1	
	Secondarily generalized tonic-clonic	14	19.18	9	5	
Seizure severity	Controlled	18	24.66	10	8	22.08/0.000
	Low	13	17.81	9	4	
	Moderate	18	24.66	5	13	
	High	10	13.70	7	3	
	Very High	14	19.18	10	4	
Antiepileptic drugs	Therapy withdrawn	38	52.06	17	21	12.00/0.010
	Monotherapy	24	32.88	11	13	
	Polytherapy	11	15.07	8	3	
Duration	Total = Mean: 17.02 years, Range: 2-63 year Male = Mean: 19.11 years, Range: 1-63 years Female = Mean: 16.13 years, Range: 3-56 years					14.04/0.000

Results

About 73 elderly patients were the samples of the study, 45 men (79.5%) and 28 women (20.4%) with a mean age of 68.9 years of old (standard deviation [SD] = 7.77). All of patients were replied to both inventories of study, QOLIE-31 and SF-36. The demographic characteristics are shown in Table 1 and clinical characteristics in Table 2. The comparing QOLIE-31 overall score made between elderly males and females regarding their health status, education, occupation, marital status, and other demographic characteristics, type of epilepsy, etiology, seizure type, seizure severity, and antiepileptic drugs, revealed statistically significant difference within samples.

Internal Consistency: The coefficients of Cronbach's alpha (α = 0.89), convergent validity (0.81), divergent validity (-0.21), and criterion validity (0.78) were estimated, which were significant at $\rho <$ 0.01. The discriminative power in the QOLIE-31 of sub-scales with overall score using Kolmogorov-Smirnov and Shapiro-Wilk tests of normality demonstrated an almost normal distribution (Table 3). Mean overall score was 52.5 (CI = 38-67) and SD = 19.42. Discriminative power testing showed that domains showed an almost normal distribution (Table 3).

Regarding criterion validity, Pearson's correlation coefficients were significant and appropriate for all sub-domains of QOLIE-31 and SF-36. This finding could suggest some specificity of these domains. Table 4 summarizes the appropriate correlation of the two questionnaires' subscales.

Contrast Validity: The exploratory factor analysis demonstrated that the 31-items of QOLIE-31 for aged samples are organized into seven factors (factor 1: seizure worry, factor 2: overall QoL, factor 3: emotional wellbeing, & factor 4: energy/fatigue, factor 5: cognitive, factor 6: social functioning, and factor 7: medication effects) which clarify 94 percent of the scale's variance. Second-order confirmatory factor analysis pointed out that the factors were well matched up onto a principal factor. According to the Table 5, the rotated factor matrix pattern of Varimax for the QOLIE-31's subscale questions was considered. Those questions with factor loadings above 0.80 were selected.

Table 3. Descriptive statistics and discriminative power in the QOLIE-31 of sub-scales with overall score

Domains (Item Number)	No. of items	Mean (95%CI) *	Median	SD	Cronbach's α	KS†	SV‡	df	ρ-value
Seizure worry (11,21,22,23,25)	5	54.5 (28-81)	53	26.04	0.83	0.094	0.089	72	0.0001
Overall QoL (1,14)	2	53.2 (21-72)	47	28.01	0.85	0.074	0.087	73	0.0001
Emotional well-being (3,4,5, 7,9)	5	58.7 (39.2-87.2)	65	21.01	0.79	0.149	0.152	72	0.0001
Energy/fatigue (2,6,8,10)	4	20.0 (11.25-28.75)	53	19.21	0.73	0.092	0.071	72	0.0001
Cognitive functioning (12,15,16,17,18,26)	6	50.7 (32.8-68.6)	47	13.30	0.81	0.073	0.088	73	0.0002
Medication effects (24,29,30)	3	42.28 (13.86-70.7)	33	22.82	0.87	0.147	0.133	72	0.0001
Social functioning (13,19,20,27,28)	5	59.84 (37.42-82.26)	54	25.33	0.88	0.148	0.145	72	0.0001
Total score	30	52.5 (38-67)	53	19.42	0.89	0.083	0.091	71	0.0001

* The score range = 0-100. n = 73. †Kolmogorov-Smirnov test of normality. ‡Shapiro-Wilk test of normality.

Table 4. Pearson correlations between QOLIE-31 and SF-36 sub-domains ($\rho <$ 0.05)

SF-36/QOLIE-31	SW	OQoL	EWB	E/F	CF	ME	SF	TQoLIE
BP	0.501	0.474	0.577	0.501	0.106	0.543	0.405	0.675
GH	0.479	0.438	0.571	0.469	0.436	0.589	0.416	0.723
MH	0.498	0.585	0.484	0.349	0.514	0.444	0.580	0.689
PF	0.478	0.458	0.371	0.435	0.446	0.433	0.414	0.771
RE	0.548	0.324	0.266	0.441	0.438	0.437	0.497	0.623
RP	0.578	0.458	0.371	0.435	0.446	0.533	0.514	0.771
SF	0.501	0.474	0.577	0.601	0.306	0.543	0.505	0.699
VT	0.479	0.438	0.471	0.569	0.486	0.389	0.516	0.723
TSF-36	0.378	0.458	0.571	0.535	0.446	0.433	0.414	0.871

BP, bodily pain; GH, general health; MH, mental health; PF, physical functioning; RE, role emotional; RP, role physical; SF, social functioning; VT, vitality; SW, seizure worry; OQoL, overall quality of life; EWB, emotional well-being; E/F, energy/fatigue; CF, cognitive functioning; ME, medication effects; SF, social functioning; TQoLIE, total scores of overall QoLIE-31, TSF, total scores of SF-36.

Table 5. Varimax rotated factors matrix of the QOLIE-31 (only factor loadings ≥ 5)

Domain	No. of Item	Mean	SD	Components						
				Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
SW	11	0.40	0.49	0.83						
SW	21	0.29	0.46	0.84						
SW	22	0.31	0.47	0.87						
SW	23	0.31	0.47	0.83						
SW	25	0.16	0.47	0.90						
OQoL	1	0.29	0.37		0.88					
OQoL	14	0.40	0.46		0.89	0.80				
EWB	3	0.24	0.40			0.81				
EWB	4	0.33	0.49			0.82				
EWB	5	0.36	0.43			0.93				
EWB	7	0.09	0.47			0.80				
EWB	9	0.33	0.48			0.89		0.80		
E/F	2	0.24	0.24				0.95			
E/F	6	0.28	0.47				0.88			
E/F	8	0.17	0.43				0.86			
E/F	10	0.09	0.38				0.82			
CF	12	0.09	0.28					0.83		
CF	15	0.40	0.46					0.94		
CF	16	0.24	0.40					0.90		
CF	18	0.33	0.49					0.91		
CF	26	0.36	0.43					0.88		0.80
SF	13	0.09	0.47						0.80	
SF	19	0.33	0.48						0.80	
SF	20	0.24	0.24						0.81	
SF	27	0.28	0.47						0.83	
SF	28	0.32	0.47						0.87	
ME	24	0.27	0.38							0.94
ME	29	0.31	0.46							0.92
ME	30	0.33	0.31							0.91

SW, seizure worry; OQoL, overall quality of life; EWB, emotional well-being; E/F, energy/fatigue; CF, cognitive function; ME, medication effects; SF, social function.

Table 6. The goodness of fit indexes model

Indexes	χ^2	df	χ^2/df	AGFI	GFI	RMSEA	IFI	NFI	CFI
Value	131.81	72	1.83	0.94	0.96	0.003	0.90	0.95	0.95

There are covariate between some items i.e. item No. 14 between factors No. 2 and 3, item No. 9 between factors No. 3 and 5, item No. 26 between factors No. 5 and 7 in Persian version of QOLIE-31. It may acclaim that covariate item of the factors like overall QoL, emotional wellbeing, cognitive, and medication effects could be reconstructed as well.

Consequently, the 7-factor model was appropriate for the data and the fit index techniques for adjusting the scale. The indexes of the model's goodness of fit refer to the integrity of the 7-factor model with data. The χ^2 to degrees of freedom is less than 2 in efficient models. It is closer to zero and will be closer. The root mean square error of approximation (RMSEA) and standardized root mean residual (SRMR) must be less than 0.05 that indicate to good models. The model pointed out the goodness of fit of the model in the study (AGFI = 0.94, GFI = 0.96, RMSEA = 0.003, IFI = 0.90, NFI = 0.95, CFI = 0.95).

As closer measure to 1 in the normed fit index (NFI), the comparative fit index (CFI), goodness-of-fit statistic (GFI), the incremental fit index (IFI), and the adjusted goodness of fit index (AGFI), they refer to the goodness and fit of model. They were more than 0.90 (Table 6).

Discussion

The aim of the study is to look for the relevant instrument regarding common symptoms of an nervous-related issue called Epilepsy

within aged people in the Iranian social context, even the issue still is challengeable.[3,4,9,13,20,21,26] So, the quality of life in epilepsy questionnaire (QOLIE-31, 1993 & 2005) was used and evaluated. The results stated to the well-adjusted psychometric properties, discriminative statistic, reliability, and validity of QOLIE-31 and usefulness of it in the relevant studies too. Regarding the external validity, correlation coefficients were significant and appropriate all sub-domains of QOLIE-31 with SF-36 as well. Therefore, future researchers should not limit themselves to the western scales,[7,21] but should also consider specific cultural factors.

Persian-language version of QOLIE-31 illustrated appropriate satisfactory psychometric statistics, good reliability, high internal consistency, valuable discriminative characteristics. It has applicable level in the conceptual similarity to the original English-language version. Comparing the results of the study to other similar research indicated to adapting the measures to English, Italian, Bulgarian, Serbian, and French version of QOLIE-31.[2,19,30-35]

Regarding the findings of the study, the QOLIE-31 is appropriate for validity and reliability in the aged community of the Iranian society and it can be employed to measure quality of life of aged patient with seizure symptoms. Additionally, it is applicable by gerontologists, neuropsychologists, neurophysiologists, geronto-psychiatrics, and neurologists for the future studies as well as to the geriatrics in their diagnostics. Regarding the divergent background, it is first time suggested that in the future studies, the gender-related symptoms of epilepsy and moderating the seizure experience within minorities groups, which are compatible with communities like Iran's native culture, be conducted and evaluated as well.

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References

1. Vickery BG, Perinne KR, Hays RD, et al. Quality of Life in Epilepsy QOLIE-89 (Version 1.0): scoring manual and patient inventory. Santamonica, CA: 1993. Available at: https://www.rand.org/content/dam/rand/www/external/health/surveys_tools/qolie/qolie89_scoring.pdf.
2. Beghi E, Niero M, Roncolato M. Validity and reliability of the Italian version of the Quality-of-Life in Epilepsy Inventory (QOLIE-31). *Seizure* 2005;14:452-8.
3. Vickery BG, Perrine KR, Hays RD, Hermann BP, Cramer JA, Gordon J, Meador KJ, Davinsky O. Scoring Manual For the QOLIE-89, Version 1.0. RAND: 1993.
4. Perrine KR. A new quality-of-life inventory for epilepsy patients: interim results. *Epilepsia* 1993;34 Suppl 4:S28-33.
5. Moghaddasi M, Joodat R, Ataei E. Evaluation of short-term mortality of status epilepticus and its risk factors. *J Epilepsy Res* 2015;5:13-6.
6. Jehi L, Schuele S. Sudden death in epilepsy Where is the "heart" of the problem? *Neurology* 2015;85:208-9.
7. Weise S, Syrbe S, Preuss M, Bertsche A, Merkenschlager A, Bernhard MK. Pronounced reversible hyperammonemic encephalopathy associated with combined valproate-topiramate therapy in a 7-year-old girl. *Springerplus* 2015;4:276.
8. Anastassopoulos K, Velez F, Sousa R, et al. Impact of seizure frequency reduction on health-related quality of life among clinical trial subjects with refractory partial-onset seizures: a pooled analysis of phase III clinical trials of eslicarbazepine acetate. *Neurology* 2014;82(10 Suppl):P6. 180.
9. Baldin E, Hauser WA, Buchhalter JR, Hesdorffer DC, Ottman R. Yield of epileptiform electroencephalogram abnormalities in incident unprovoked seizures: a population-based study. *Epilepsia* 2014;55:1389-98.
10. Borghs S, de la Loge C, Cramer JA. Defining minimally important change in QOLIE-31 scores: estimates from three placebo-controlled lacosamide trials in patients with partial-onset seizures. *Epilepsy Behav* 2012;23:230-4.
11. Devinsky O, Vickrey BG, Cramer J, et al. Development of the quality of life in epilepsy inventory. *Epilepsia* 1995;36:1089-104.
12. Geffrey A, Vega M, Armacost M, et al. Quality of life of underserved hispanics with intractable epilepsy improves one year after surgical intervention. *Arch Clin Neuropsychol* 2014;29:596.
13. Kubota H, Awaya Y. Assessment of health-related quality of life and influencing factors using QOLIE-31 in Japanese patients with epilepsy. *Epilepsy Behav* 2010;18:381-7.
14. Ae-Ngibise KA, Akpalu B, Ngugi A, et al. Prevalence and risk factors for Active Convulsive Epilepsy in Kintampo, Ghana. *Pan Afr Med J* 2015;21:29.
15. Melbourne Chambers R, Morrison-Levy N, Chang S, Tapper J, Walker S, Tulloch-Reid M. Cognition, academic achievement, and epilepsy in school-age children: a case-control study in a developing country. *Epilepsy Behav* 2014;33:39-44.
16. Gilliam, F, Cheng H, Blum D. Changes in quality of life (QoL) and depressive symptoms in a long-term open-label extension (OLE) of eslicarbazepine acetate (ESL) monotherapy studies in adults with refractory partial-onset seizures (POS). *Neurology* 2015;84(14 Suppl):P1. 234.
17. Parisi P, Striano P, Negro A, Martelletti P, Belcastro V. Ictal epileptic

headache: an old story with courses and appeals. *J Headache Pain* 2012;13:607-13.
18. Whatley AD, Dilorio CK, Yeager K. Examining the relationships of depressive symptoms, stigma, social support and regimen-specific support on quality of life in adult patients with epilepsy. *Health Educ Res* 2010;25:575-84.
19. Todorova KS, Velikova VS, Tsekov ST. Psychometric properties of the Bulgarian version of the Quality of Life in Epilepsy Inventory (QOLIE-31). *Epilepsy Behav* 2013;28:203-10.
20. Tekeli H, Yasar H, Alay S, et al. Quality of life and sleep in young male patients with epilepsy. *Neurology* 2014;82(10 Suppl):P6. 181.
21. Pohlmann-Eden B, Crocker CE, Legg KT, Schmidt MH. The term "epilepsy in the elderly" is conceptually irrelevant and needs to be replaced by an etiology-driven classification system in the aging brain. *Canadian J Neurologic Sciences* 2015;42 Suppl:S26.
22. Kose-Ozlece H, Ilık F, Cecen K, Huseyınoglu N, Serım A. Alterations in semen parameters in men wıth epilepsy treated with valproate. *Iran J Neurol* 2015;14:164-7.
23. Ngugi AK, Bottomley C, Fegan G, et al. Premature mortality in active convulsive epilepsy in rural Kenya Causes and associated factors. *Neurology* 2014;82:582-9.
24. Picot MC, Crespe A, Daurès JP, Baldy-Moulinier M, E Hasnaoui A. Psychometric validation of the French version of the quality of life in epilepsy inventory (QOLIE-31): comparison with a generic health-related quality of life questionnaire. *Epileptic Disord* 2004;6:275-85.
25. Cramer JA, Westbrook LE, Devinsky O, Perrine K, Glassman MB, Camfield C. Development of the quality of life in epilepsy inventory for adolescents: The QOLIE-AD-48. *Epilepsia* 1999;40:1114-21.
26. Finetti C. P90. Transcutaneous vagus nerve stimulation (t-VNS) in a child with dravet syndrome- a case report. *Clinic Neurophysiol* 2015;126:e147.
27. Helo N, Rhee K, Dugum M. An intriguing case of bright red blood per rectum. Pneumatosis cystoids. *Gastroenterology* 2015;149:e1-2.
28. Asadollahi A, Saberi LF, Faraji N. Validity and reliability of male andropause symptoms self-assessment questionnaire among elderly males in Khuzestan province of Iran. *J Midlife Health* 2013;4:233-7.
29. Chawla MK, Penner MR, Olson KM, Sutherland VL, Mittelman-Smith MA, Barnes CA. Spatial behavior and seizure-induced changes in c-fos mRNA expression in young and old rats. *Neurobiol Aging* 2013;34:1184-98.
30. Greiner HM, Holland K, Leach JL, Horn PS, Hershey AD, Rose DF. Nonconvulsive status epilepticus: the encephalopathic pediatric patient. *Pediatrics* 2012;129:e748-55.
31. Martinović Z, Milovanović M, Tosković O, et al. Psychometric evaluation of the Serbian version of the Quality of Life in Epilepsy Inventory-31 (QOLIE-31). *Seizure* 2010;19:517-24.
32. Torres X, Arroyo S, Araya S, de Pablo J. The Spanish Version of the Quality-of-Life in Epilepsy Inventory (QOLIE-31): translation, validity, and reliability. *Epilepsia* 1999;40:1299-304.
33. Stavem K, Bjørnaes H, Lossius MI. Reliability and validity of a Norwegian version of the quality of life in epilepsy inventory (QOLIE-89). *Epilepsia* 2000;41:91-7.
34. da Silva TI, Ciconelli RM, Alonso NB, et al. Validity and reliability of the Portuguese version of the quality of life in epilepsy inventory (QOLIE-31) for Brazil. *Epilepsy Behav* 2007;10:234-41.
35. Asawavichienjinda T, Phanthumchinda K, Sitthi-Amorn C, Love EJ. The Thai version of the quality-of-life in epilepsy inventory (QOLIE-31-Thai version): translation, validity and reliability. *J Med Assoc Thai* 2005;88:1782-9.