

# Health related quality of life in patients admitted for video-electroencephalography monitoring diagnosed with epilepsy or psychogenic non-epileptic seizures

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## ABSTRACT

**الأهداف:** لتحديد نوعية الحياة المرتبطة بالصحة (HRQOL) في المرضى الذين يعانون من الصرع أو التشنجات غير الصرع النفسي (PNES).

**الطريقة:** أجريت هذه الدراسة المستعرضة خلال الفترة ما بين ديسمبر 2010م وديسمبر 2014م في قسم علم الأعصاب والطب النفسي، كلية الطب، جامعة باسكنت، أضنة، تركيا. وطلب من المرضى الذين تم قبولهم لرصد الفيديو كهربية وتشخيص نوبات الصرع أو PNES لاستكمال استبيان من منظمة الصحة العالمية لجودة الحياة، وتشخيص الأمراض النفسية المصاحبة باستخدام للمقابلة الإكلينيكية المقيدة للدليل التشخيصي والإحصائي للاضطرابات العقلية الإصدار الرابع.

**النتائج:** وجد أن المرضى الذين يعانون من الصرع وPNES تشابه في HRQOL في المجالات المادية والنفسية والاجتماعية، والبيئية. ومع ذلك، كانت نسبة الاضطرابات النفسية المرضية مرتفعة في المرضى الذين يعانون من PNES من المرضى الذين يعانون من الصرع.

**الخلاصة:** المرضى الذين يعانون من الصرع وPNES يكونون متشابهين في HRQOL، ومقاومة PNES العلاجات الطبية الموحدة المستخدمة لعلاج نوبات الصرع. عواقب عدم تشخيص PNES المبكر تساوي عواقب الصرع المستعصي. ومن أجل فهم أفضل لتأثير مظاهر PNES والصرع فإنه يساعد على توفير الرعاية الطبية والنفسية والاجتماعية المناسبة.

**Objective:** To determine the health related quality of life (HRQOL) in patients with epilepsy or psychogenic non-epileptic seizures (PNES).

**Methods:** This cross-sectional study was carried out between December 2010 and December 2014 in the Department of Neurology and Psychiatry, Faculty of Medicine, Baskent University, Adana, Turkey. Patients who were admitted for video-electroencephalography monitoring and diagnosed of epileptic seizures or PNES were asked to complete a questionnaire from the World Health Organization Quality of Life,

and psychiatric comorbidities were diagnosed using the structured clinical interview for Diagnostic and Statistical Manual of Mental Disorders Fourth Edition.

**Results:** Patients with epilepsy and PNES were found to have similar HRQOL in physical, psychological, social, and environmental domains. However, the percentage of comorbid psychiatric disorders were higher in patients with PNES than patients with epilepsy.

**Conclusion:** Patients with epilepsy and PNES have similar HRQOL, and PNES are resistant to the standard medical therapies used for the treatment of epileptic seizures. The direct lifetime cost of undiagnosed PNES may be of equal with intractable epilepsy. A better understanding of the impact of PNES manifestations and epilepsy would help to provide appropriate clinical, psychological and social care.

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Epilepsy is a chronic brain disease characterized by recurrent seizures and is associated with profound physical, psychological, and social consequences. Psychogenic non-epileptic seizures (PNES) can be defined as paroxysmal involuntary behaviors without an organic cause and mimic epileptic events. The incidence of PNES is 4.9/100.000/year and it is estimated that approximately 20-30% of patients referred to tertiary care epilepsy centers for refractory seizures have both epilepsy and PNES, and approximately 17-30% had PNES.<sup>1</sup> Psychogenic non-epileptic seizures frequently coexists with psychiatric diseases such as anxiety, depression, posttraumatic stress disorder, suicidal attempts, or other psychological disorders.<sup>2</sup> Psychiatric comorbidities are present in a significant number of people with epilepsy.<sup>3</sup> Patients with PNES have poorer health-related quality of life (HRQOL) than patients with epilepsy.<sup>4,5</sup> The HRQOL questionnaire includes 4 domains: physical health, psychological health, social relations, and environment.<sup>6</sup> In this study, we aimed to evaluate the HRQOL of patients admitted to the video-electroencephalography (EEG) monitoring unit diagnosed with epilepsy or PNES, and to find out any differences between epilepsy and PNES regarding HRQOL as suggested in previous studies.<sup>4,5</sup> We also aimed to evaluate the comorbid psychiatric disorders in both groups and compare with previous studies. The question of necessity of considering PNES as important as epilepsy has been discussed.

**Methods.** This cross-sectional study included 125 adult patients admitted for video/EEG monitoring and diagnosed with epilepsy (n=64) or PNES (n=54). This study was carried out in the Department of Neurology and Psychiatry, Faculty of Medicine, Baskent University, Adana, Turkey, between December 2010 and December 2014. The study protocol followed the ethical guidelines of the most recent Declaration of Helsinki and was approved by the Baskent University Institutional Review Board and Ethics Committee of the Baskent University, Adana, Turkey. Written consent was obtained from all the patients. Parents were asked to signed the consent form for patients under the age of 18 years. Exclusion criteria included schizophrenia, schizophreniform disorder, bipolar affective disorder, mental retardation, other neurological disorders, age <15 years, a history of any serious and progressive organic disease, and pregnant or breastfeeding mother.

All patients diagnosed with epilepsy or PNES were examined by a neurologist. They responded to questions regarding their age, gender, educational level, personal and family medical history, duration of epilepsy, age

at the onset of epilepsy, frequency of seizures, and drug usage. Differential diagnosis was made by the histories, physical and neurological examinations, and investigations (electroencephalography [EEG], and magnetic resonance imaging (MRI), and so forth] according to international guidelines. Classification of seizure types was in accordance with the classification of epileptic seizures proposed by the International League Against Epilepsy.<sup>7</sup> When no typical events were recorded during video/EEG monitoring, patients were classified and identified by recording at least 3 events observed and recorded by the accompanying person. The types of seizures were categorized as following: generalized (tonic-clonic, atonic, myoclonic and absence), and partial (simple partial, complex partial and secondary generalized) seizures. The duration of the disease was classified as follows: <1 month, 1 month-1 year, 1-5 years, and >5 years. The frequency of seizures was classified into: very frequent (every day - 7 days), frequent (7 - 30 days), rare (31 days -1 year), very rare (less than 1 per year).

After neurological evaluation, stressful life events such as business, education, finance, health, financial, social and marital problems and traumatic events were evaluated in detail by the psychiatrist. Psychiatric comorbidities were diagnosed using the structured clinical interview for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV).<sup>8</sup> The patients were provided with a questionnaire containing the brief version of the World Health Organization Quality of Life (WHOQOL)-BREF.<sup>6</sup> They were encouraged to complete the questionnaires during inpatient visits at the Epilepsy Monitoring Unit. Seven patients were excluded (3 patients had both epilepsy and PNES and 4 had syncope).

Sociodemographic data, Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I), and (WHOQOL)-BREF questionnaire were used. Socio-demographic information was gathered by the consulting neurologist and the psychiatrist. Data regarding age, gender, occupation, marital status, consanguinity, family history of psychological disorders, and stressful life events were collected.

Diagnosis was determined using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I).<sup>9</sup> The SCID-I is a structured clinical interview to diagnose the presence of Axis I psychiatric disorders.<sup>9</sup> It consists of 6 modules examining diagnostic criteria for a total of 38 Axis I disorders. Two modules assess for mood episodes/disorders, 2 modules assess for psychotic symptoms/disorders, and 2 further modules

assess for anxiety disorders, and substance abuse or other disorders. The Turkish version has been assessed for validity and reliability.<sup>10</sup>

The WHOQOL-BREF is a 26 item scale widely used to measure the quality of life, and it is a generic QOL instrument developed by the WHO.<sup>6</sup> Acceptable validity and reliability has been reported in various populations. We used the Turkish version of the WHOQOL-BREF validated for use on the Turkish population.<sup>11</sup> The WHOQOL-BREF Turkish version, each item was scored from 1-5, with 5 representing very satisfied/very good. The questionnaire includes 4 domains: physical health, psychological health, social relations, and environment. The scores are interpreted as following: 0 being the least required and 100 being the most required.

**Sample size estimation.** The Win Epi 2.0 program was used for sample size estimation. Our calculations indicated that 31 subjects for each group would allow 95% confidence intervals and 80% power.

**Statistical method.** The Statistical Package for Social Sciences software (SPSS Inc., Chicago, IL, USA) version 17.0 was used for data analysis. Categorical measurements were summarized as number and percentage, whereas continuous measurements were summarized as mean and standard deviation (median and minimum - maximum when necessary). For the comparison of categorical variables, Chi-square or Fisher test statistics was used. For the comparison of continuous measurements between groups, distributions were controlled in terms of normality according to the numbers of variables, and Student T test was used for the parameters that showed normal distribution, and Mann Whitney U test was used for the parameters that did not show normal distribution. For all analyses, a  $p < 0.05$  was considered statistically significant.

**Results. Socio-demographic variables.** The study comprised 125 subjects, of which 64 were diagnosed with epilepsy and 54 with PNES. The mean age of the epileptic patients was  $27.5 \pm 11.2$  years (range: 16-66), the mean age of patients with PNES was  $30 \pm 10.2$  years (range: 16-62). There was no statistically significant difference between the 2 groups in terms of age ( $p = 0.238$ ). There was no gender difference in epilepsy group; however, females were higher than males in PNES group ( $p = 0.03$ ). The 2 groups were similar in terms of personal and family history, marital status, educational level, and vocational features ( $p > 0.05$ ). Consanguinity was present in 23.4% of the patients with epilepsy and

**Table 1** - Sociodemographic characteristics of 125 adult patients admitted for video/EEG monitoring and diagnosed with epilepsy.

Sociodemographic	Epilepsy (n=64)	PNES (n=54)	P-values*
Age (years) (mean±SD)	27.5 ± 11.2	29.9 ± 10.3	0.238
<b>Gender (%)</b>			0.017†
Female	37 (57.8)	42 (77.8)	
Male	27 (42.2)	12 (22.2)	
<b>Education (%)</b>			0.219
<8 years	21 (32.8)	24 (44.4)	
8-11 years	25 (39.1)	14 (25.9)	
>11 years	18 (28.1)	16 (29.6)	
<b>Vocation (%)</b>			0.559
Housewife	16 (25.0)	17 (31.5)	
Employed	14 (21.9)	12 (22.2)	
Retired	3 (4.7)	3 (5.6)	
Student	24 (37.5)	12 (22.2)	
Clerical	1 (1.6)	1 (1.9)	
<b>Marital status (%)</b>			
Single	37 (57.8)	26 (48.1)	
Married	25 (39.1)	28 (51.9)	0.195
Divorced	2 (3.1)	0 (0.0)	
Consanguinity	15 (23.4)	15 (27.8)	0.673

\*Kruskal-Wallis test ( $p < 0.05$ ), † $p < 0.05$ , PNES - psychogenic non-epileptic seizures

27.8% of the patients with PNES, consecutively, and there was no statistical difference ( $p = 0.673$ ) (Table 1).

**Clinical characteristics.** Neurological examination revealed postural tremor in hands in 3 of the epileptic patients, left hemiparesis (4/5) in one, and gait disorder and head titubation in one. The rest of the epileptic patients revealed normal findings. One patient with PNES had postural tremor in hands and one had gait disorder related with hip trauma.

Cerebral MRI revealed abnormal findings in 12 patients with epilepsy as following: Dandy-Walker and colpocephaly, signal intensity compatible with demyelinating lesions, millimetric nonspecific intensities in bilateral frontal and parietal subcortical areas and deep white matter, right mesial temporal sclerosis, bilateral frontobasal gliosis associated with trauma, right temporoparietal cortico-subcortical encephalomalacia, bilateral mesial temporal sclerosis, left temporoparietal mass lesion, right hippocampal sclerosis, cavernoma in left postcentral gyrus, left frontoparietal schizencephaly, and parietooccipital leukomalacia related with sequelae of hypoxia. One patient with PNES had multiple cavernomas and one had left arachnoid cyst on cerebral MRI.

Table 2 summarizes the onset age of the seizures. There was a statistical difference between groups in terms of disease duration ( $p = 0.052$ ). The duration of the disease in the epilepsy group was <1 month ( $n = 1$ ),

one month to one year (n=23), 1 to 5 years (n=16), and >5 years (n=24). In the PNES group, the duration of the disease was <1 month (n=1), one month to one year (n=21), 1 to 5 years (n=19), and >5 years (n=29). Approximately 62.5% of the patients diagnosed with focal epilepsy and 37.5% had generalized epilepsy. Pseudoseizure classification of patients with PNES was focal spells in 53.8%, generalized spells in 40.7%, and 5.6% were unclassified. In terms of seizure frequency, no statistically significant difference was found between epilepsy and PNES groups ( $p=0.125$ ) (Table 2). While 33 of the epileptic patients were under anti-epileptic drug therapy, 14 of the patients with PNES were under anti-epileptic drug therapy.

The duration of video-EEG monitorization in epileptic patients was  $64.9 \pm 25.4$  (24-120) hours and  $58.7 \pm 23.6$  (24-120) hours in patients with PNES, and there was no a statistical difference between the groups ( $p=0.174$ ). The number of recorded seizures in video-EEG monitoring unit was 1-3 in 26.6% of the epileptic patients (n=17), and >3 in 21.9 % of the epileptic patients (n=14). In PNES group, in 22.2% (n=12) of the patients, seizure numbers recorded were 1-3, and in 25.9% (n=14) of them, seizure numbers were >3. No recorded seizure in the video-EEG monitoring unit in 51.6% of the epileptic patients and 51.9% in PNES. These patients were classified and identified by recording at least 3 events observed by the accompanying person as typical who knew the patients and observed the patients' seizures and recorded video of the seizures. There was no a statistical difference between the groups in terms of number of seizures recorded ( $p=0.808$ ) (Table 2).

**Psychiatric findings.** The percentage of comorbid psychiatric disorders was higher in patients with PNES (68.5%) than patients with epilepsy (18.1%) ( $p<0.05$ ). Comorbid psychiatric disorders were depression, anxiety disorder, somatoform disorder in epileptic patients, and 71.9% have no any psychiatric disorder. In PNES group, depression, anxiety disorder, somatoform disorder were established. There was a statistical difference between groups in terms of comorbid psychiatric disorder ( $p=0.0001$ ) (Table 2). In the ratio of stressful life events, there was no statistically significant difference between epilepsy and PNES groups ( $p=0.539$ ). Patients with epilepsy and PNES were found to have similar HRQOL in physical, psychological, social, and environmental domains (Table 3).

**Discussion.** The HRQOL is affected in patients with PNES as in patients with epilepsy. Previous studies,<sup>4,5,12</sup> have reported that patients with PNES have

**Table 2 -** Clinical findings of patients 125 adult patients admitted for video/EEG monitoring and diagnosed with epilepsy.

Clinical findings	Epilepsy (n=64)	PNES (n=54)	P-values*
Seizure onset age, mean age (SD)	20.9 (12.4)	26.3 (11.1)	0.015†
Duration of disease, mean years (SD)	2.9 (1.05)	2.5 (0.9)	0.052†
Video/EEG period, mean hours (SD)	64.9 (25.4)	58.7 (23.6)	
<i>Number of seizures in video/EEG unit, n (%)</i>			0.808
None	33 (51.6)	28 (51.9)	
1-3 seizures	17 (26.6)	12 (22.2)	
>3 seizures	14 (21.9)	14 (25.9)	
<i>Epileptic seizure type, n (%)</i>			0.145
Generalized	24 (37.5)	25 (45.6)	
Partial	40 (62.5)	29 (53.8)	
<i>Seizure frequency, n (%)</i>			0.125
Very frequent (every day-7 days)	19 (29.7)	25 (46.3)	
Frequent (7-30 days)	23 (35.9)	20 (37.0)	
Rare (31-days to 1 year)	16 (25.0)	7 (13.0)	
Very rare (more than one year)	6 (9.4)	2 (3.7)	
<i>Psychiatric comorbidities, n (%)</i>			0.000†
None	46 (71.9)	17 (31.5)	
Depressive disorders	7 (10.9)	6 (11.2)	
Anxiety disorders	7 (10.9)	5 (9.3)	
Somatoform disorders	4 (6.3)	26 (48.2)	
Stressful life events	10 (15.6)	9 (16.7)	0.539

\*Kruskal-Wallis test ( $p<0.05$ ), † $p<0.05$ , PNES - psychogenic non-epileptic seizures

**Table 3 -** Comparison of the quality of life between groups according to the brief version of the World Health Organization Quality of Life-BREF.

Variables	Epilepsy (n=64)	PNES (n=54)	P-values*
Physical	13.1 ± 2.33	12.7 ± 1.89	0.378
Psychological	13.6 ± 2.69	13.6 ± 2.45	0.974
Social	14.3 ± 3.88	13.4 ± 3.41	0.187
Environmental	13.7 ± 2.08	13.3 ± 3.41	0.329

Mann Whitney U test  
PNES - Psychogenic non-epileptic seizures

poorer HRQOL than patients with epilepsy. Szafarski et al<sup>4</sup> evaluated 45 patients with PNES and 40 patients with epilepsy in terms of quality of life with epilepsy specific quality of life instrument (QOLIE-89). They found significant impairment in quality of life in patients with PNES, especially in physical function and physical role limitation. Karakis et al<sup>13</sup> found significant impairment in overall quality of life score and social functioning domain in PNES patients.

In this study, the comorbid psychiatric disorders were more frequent in the PNES group (68.5%) compared with the epileptic (18.1%), which is similar



with previous study.<sup>1</sup> Psychiatric diagnosis types were similar in the PNES and epilepsy groups. Depression, anxiety, disorder, and somatoform disorders were determined, consecutively. Turner et al,<sup>1</sup> reported psychiatric disorders in 100% of patients with PNES and 52% of patients with epilepsy. They found that most of the patients with epilepsy have a diagnosis of depressive and anxiety disorders, while the patients with PNES are more affected by dissociative and somatoform disorders, and cluster B personality disorders. The disease onset age was smaller, and the duration of the disease was longer in epileptic patients than PNES group. Marital status, education, and vocation were not associated with diagnosis of epilepsy or PNES. In the PNES group, females were more dominant compared with males, which is in accordance with other study.<sup>4</sup> In this study, the HRQOL is similar in those patients with PNES and epilepsy. This cannot be explained by the severity of the epilepsy, as the studied patients have intractable epilepsy.<sup>4</sup> Multiple factors play a role such as drug usage, seizure types and frequency, concomitant psychiatric disease, and so forth. In this study, seizure frequency rates were similar in PNES and epilepsy group; however, in other study,<sup>5</sup> seizure frequency rates were reported higher in patients with PNES than epileptic patients. Similarly, the ratio of comorbid psychiatric disorder was higher in patients with PNES than in epileptic patients; however, the ratio in patients with PNES in this study was 68.5% and 100% in the study by Turner et al.<sup>1</sup> And also, while psychiatric diagnosis types were similar in the PNES and epilepsy groups in our study, they were different compared with the study by Turner et al.<sup>1</sup>

**Study limitations.** Limitations of this study include: being cross sectional design, selecting patients from a single center, obtaining information on stressful life events and family history via the patients' retrospective recollection. The seizures of 51.6% epileptic patients and 51.9% with PNES were classified and identified by recording at least 3 events by the accompanying person, and seizures were recorded by video were also considered as a limitation of the study.

Psychogenic non-epileptic seizures are resistant to the standard medical therapies used for the treatment of epileptic seizures and the direct lifetime cost of undiagnosed PNES may be of equal with intractable epilepsy. The appropriate diagnosis and management of PNES can lead to resolution, and improvement of PNES and decrease of health care utilization.<sup>12</sup> The result of this study suggests that HRQOL being affected

with PNES as in patients with epilepsy indicates the importance of caring PNES as epilepsy. The path toward a better understanding of the impact of PNES manifestations and epilepsy would help to provide appropriate clinical, psychological, and social care.

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