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Marital status of patients with epilepsy: Factors and quality of life

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ABSTRACT

Purpose: The study investigated how marital status relates to clinical aspects and quality of life (QOL) in patients with epilepsy (PWE).
Method: The clinical data and Quality of Life in Epilepsy Inventory (QOLIE-31) scores of 252 PWE were regressed against their marital status with a significance level of 5% ($p < 0.05$).
Results: Logistic regression for single and married PWE revealed that singles had more abnormalities in the neurological examination ($p = 0.029$) and earlier seizure onset ($p < 0.001$), while for married and divorced PWE revealed the latter more psychiatric comorbidities ($p = 0.002$) and longer disease duration ($p = 0.011$). Regarding QOL score, linear regression showed that psychiatric comorbidity was the only factor ($p < 0.001$).
Conclusion: The marital status of PWE is negatively associated with clinical aspects of epilepsy.

1. Introduction

Epilepsy is still plagued by myths and prejudice [1]. The aspects stigma and social exclusion are frequently found in patients with epilepsy (PWE) living in different cultures, but they occur more often in developing countries [2] and in those with less social support [3]. People still have a negative attitude toward PWE despite the advances reported in recent studies [1,4]. The stigma perceived by PWE affects their self-esteem, family, social life, work, and marital perspectives, and has a negative impact on their quality of life (QOL) [5].

Marriage is less common in PWE than in individuals with other chronic diseases or from the general population [6–8], and the negative impact of the disease is greater when it begins in the first decade of life [8–10]. Studies in many countries and cultures describe that families still object to their children marrying PWE, even those with controlled epileptic seizures (ES), because of the belief that PWE will pass the illness to their children or because PWE may not fulfill their social and economic roles and obligations [8,11–13]. Female PWE are less likely to tell their future spouses about their epilepsy than male PWE [14,15]. PWE have the highest divorce rates [4,14,16,17]. Longitudinal studies have found that epilepsy has an adverse impact on marriage, even among individuals with controlled ES or who have not taken antiepileptic drugs (AED) for years [10,18,19]. Female PWE are less likely to marry, have more marital problems, and divorce more than male PWE with similar clinical conditions [2,20]. The marital relationship is an important component of family and social support, and failure to reach or maintain marriage goes against social norms and expectations. In the general population, married individuals report greater life satisfaction and better physical and psychological health [21]. The spouse is often the caregiver of PWE [4]. Poor social integration in epilepsy can lead to loneliness, social maladjustment, inappropriate behaviors, and social exclusion [22].

Studies on the marriage rates and maintenance of PWE are few, and findings are likely to be strongly influenced by culture. There is only limited knowledge about the implications of the clinical aspects of epilepsy, such as age at onset, seizure type and frequency, epilepsy duration, use of antiepileptic drugs (AED), and epileptic syndrome, on marital adjustment and status. In epilepsy, recognizing the psychosocial and emotional aspects that affect marital status is important to reduce its negative impact on QOL and to help to improve the treatment and counseling of these individuals. It is known that epilepsy has a great impact on the QOL [23,24]. However, it is not yet clear how sociodemographic variables and clinical aspects of epilepsy compromise QOL [23,24]. In the literature there are controversies regarding the association between lower global QOL scores and sociodemographic factors, such as marital status [24,25]. Few studies have assessed how the QOL of PWE relates to their marital status and especially to the occurrence of epilepsy-related marital problems [26].

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This study hypothesizes that the marital status of PWE is associated with the clinical aspects of epilepsy and quality of life. There are rare studies that investigated the relationship between these factors. Hence, the objectives of this study were to assess epilepsy related factors that might have impact on marital status, and also the factors (including marital status) that influence quality of life.

2. Methods

2.1. Patients

PWE were recruited from March to July 2013 at the epilepsy outpatient clinic of the Hospital e Maternidade Celso Pierro (PUC-Campinas), Campinas, São Paulo, Brazil.

Epilepsy was diagnosed according to the International Classification of Epilepsies and Epileptic Syndromes (ILAE) [27] criteria. Patients with symptomatic focal epilepsies included a subgroup of surgery-naive patients with mesial temporal lobe epilepsy with hippocampus sclerosis (MTLE-HS) characterized by their clinical aspects, namely the presence of hippocampus atrophy and loss of digitations of the hippocampal head and definition of internal structure in magnetic resonance imaging. Epilepsy was considered to be under control when the individual did not have an ES in the last 12 months.

Patients who had difficulty understanding the questions in the instruments because of low education level or mental disability were excluded, as well as those with cancer and stroke.

The study was approved by the Human Research Ethics Committee of PUC-Campinas, and the patients signed an informed consent form.

2.2. Procedure

The following procedures were performed:

1. Interview with patients and family members to collect sociodemographic (age, gender, education level, and marital status) and clinical (age at onset, seizure type and frequency, epilepsy duration, neurological antecedents, antiepileptic drugs (AED), and epileptic syndrome) data. The interview was conducted by the author GMAS Tedrus who is an expert in epilepsy and responsible for the medical care provided at the facility.
2. Investigation of psychiatric comorbidity according to the DSM-IV and ICD-10 criteria. The patients were classified into two groups: with and without psychiatric comorbidity.
3. Specific questionnaire on marital status with the following polar (yes–no) questions: 1. Did the ES begin before marriage? 2. Did you tell your spouse about the epilepsy before marriage? 3. Are you single because of epilepsy? 4. Did the ES begin after marriage? 5. Do you have epilepsy-related marital problems? 6. Did you get a divorce because of epilepsy? The patients included in this study had no difficulty understanding the questions in the questionnaire that was administered by the author GMAS Tedrus.
4. Quality of Life in Epilepsy Inventory (QOLIE-31) [28]: epilepsy-specific QOL inventory validated in Brazil by Silva et al. [29]. This inventory has seven domains: worry about seizure, overall quality of life, emotional wellbeing, energy-fatigue, cognitive functioning, medication effects, and social functioning. The overall score ranges from 1 to 100. A higher score indicates higher QOL.

2.3. Data analysis

The patients were classified as single, married, divorced and widowed according to the Interview with patients and family members.

The continuous variables were expressed as mean and standard deviation (SD), and the categorical variables were expressed as frequencies (%). The student's *t*-test, analysis of variance (ANOVA), and Pearson chi-squared test were used to compare the continuous variables and categorical variables.

Logistic regression and multiple regression were used to determine the relationship between predictor variables and binary or continuous outcome variables (dependent variables) using variables with $p < 0.10$ in the respective prior correlation analyses (independent variables). The data were treated by the software IBM SPSS Statistics, version 22. The significance level was set at 5%.

It was investigated how marital status-related data associated with the clinical aspects of epilepsy and the QOLIE-31 scores at a significance level of 5% ($p < 0.05$).

The effect size was measured by calculating Cohen's f^2 within a multiple regression model (Cohen [30]).

Table 1
Sociodemographic and clinical aspects by marital status.

	Single ($n = 57$)	Married ($n = 131$)	Divorced ($n = 47$)	Widowed[a] ($n = 17$)	Single × married *p* value	Married × divorced *p* value
Age (years)	40.3 (14.2)	47.4 (13.7)	48.1 (12.3)	57.8 (13.3)	0.001*	0.775
Gender (male)	49.1%	53.4%	61.7%	35.2%	0.870	0.098
Education level (years)	5.8 (4.2)	6.1 (3.7)	4.9 (3.7)	3.5 (3.6)	0.659	0.069
Employed/	78.6%	90.9%	75%	60%	0.101	0.193
Age at first ES (years)	16.0 (12.7)	27.6 (18.8)	21.5 (15.9)	31.6 (22.0)	0.001*	0.055
Epilepsy duration (years)	24.3 (14.9)	19.8 (14.7)	26.5 (14.0)	26.8 (19.4)	0.061	0.009*
Seizure type partial	71.9	83.9	74.5	76.5	0.056	0.157
MTLE-HS/other epileptic syndromes	24.6	25.2	40.4	23.5	1.000	0.080
Antiepileptic drugs - one	71.9	71.8	48.9	64.7	1.000	0.009*
Epileptic seizure frequency - *Uncontrolled*	59.6	45.0	61.7	64.7	0.092	0.066
Neurological examination abnormalities *present*	54.4	28.2	25.5	29.4	0.001	0.846
Psychiatric comorbidity–*Present (entre* 195 cases)	37.5	38.2	65.8	16.6	1.000	0.004*
QOLIE-31 overall score ($n = 197$)	62.7 (12.4)	60.0 (16.0)	55.4 (17.7)	54.6 (17.5)	0.380	0.201

MTLE-HS: mesial temporal lobe epilepsy with hippocampal sclerosis. When the means are shown, the standard deviations are in brackets.
* *t*-Test or Pearson chi-squared test, $p < 0.05$.
[a] Not included in statistical analysis.

3. Results

Table 1 shows sociodemographic data, epilepsy characteristics, and the presence of neurological examination abnormalities and psychiatric comorbidity.

The study included 252 PWE aged 18–78 years (51.1% were females). The mean age of the sample was 46.7 (±14.1) years and the mean education level, 5.6 (±3.8) years.

The epilepsies included generalized idiopathic epilepsy in 18 (7.1%) cases; symptomatic focal epilepsy and probably symptomatic focal epilepsy in 151 (59.5%) and 83 (32.9%) cases, respectively; MTLE-HS in 70 (27.7%) cases.

The mean age at ES onset was 24.1 (±18.1) years and the mean disease duration was 22.6 (±15.3) years. Generalized, focal complex and focal simple seizures were experienced by 53, 122, and 77 patients, respectively. The ES in 119 (47.2%) cases had been under control for 1 year or more, and 169 (67%) patients took one AED.

Eighty-five patients (33.7%) had neurological examination abnormalities.

Psychiatric comorbidity was found in 42.6% of the 195 study cases. The most common psychiatric comorbidities were: depressive disorder, anxiety disorder.

Table 1 shows the marital status of the PWE.

3.1. Sociodemographic and clinical aspects by marital status

Gender was not associated with marital status or education level. The mean age, education level, age at first ES, and epilepsy duration of the various marital status groups differed significantly (Table 1). The Duncan's post hoc test found that singles were younger and widowers were older than the other groups. Married and divorced PWE had similar ages. Single and divorced PWE had similar ages at their first ES, and both were younger than married and widowed PWE at their first ES (Duncan's post hoc test). Married PWE had the shortest disease durations (*t*-test, $p = 0.003$).

Psychiatric comorbidity and use of two or more AED differed significantly among the different marital status groups (Table 1).

3.2. Comparison between single and married PWE

There was no significant difference between single and married PWE for the variables gender, ES frequency, epileptic syndrome, ES type, and occurrence of psychiatric comorbidity (Table 1).

Logistic regression was used for determining the factors that potentially affected the status of being married (single as reference). The variables age at first ES, ES type, ES frequency, epilepsy duration, and neurological examination abnormalities were included in the model (Table 2). Four factors were significantly associated with the status of being married (single as reference). The odds of being married increased with age at first ES, and increased 3.3-fold in patients with partial ES. Uncontrolled ES and neurological examination abnormalities were inversely associated with being married. Epilepsy duration was not significant in the model. The effect size can be considered small to medium for this model (Nagelkerke $R^2 = 0.303$).

Singles (12, 21.0%) reported not getting married "because of epilepsy".

3.3. Comparison between married and divorced PWE

The proportion of divorced to married PWE (47/131 – 35.9%) is greater than the 8.5% found in the general population of Campinas according to the Census of 2010 [31].

Epilepsy duration differed significantly between married and divorced PWE, (*t*-test, $p = 0.009$), as did the presence of psychiatric comorbidity (chi-square, $p = 0.002$) and antiepileptic drugs use (chi-square, $p = 0.009$) (Table 1).

The logistic regression model for determining the factors that potentially affected the status of being divorced (married as reference) included the variables ES type, ES frequency, epilepsy duration, antiepileptic drugs, and psychiatric comorbidity (Table 3). Two factors were significantly associated with the status of being divorced (married as reference). Greater epilepsy duration was associated with an increase in the odds of being divorced, and psychiatric comorbidity increased the odds of being divorced 3-fold. The effect size can be considered small for this model (Nagelkerke $R^2 = 0.193$).

Most patients (81.1%) had informed their spouse before marriage about their condition. Having informed the future spouse about the disease did not affect divorce rate.

Epilepsy was referred as the "cause of divorce" by 11 (23.4%) divorced PWE.

3.4. PWE reports of marital problems during marriage

Epilepsy was referred as the "cause of marital problems" by 15 (11.4%) of the married PWE.

Psychiatric comorbidity (chi-square test, $p = 0.004$) and use of two or more AED (chi-square test, $p = 0.023$) were significantly more prevalent in PWE who reported marital problems.

3.5. Marital status and its relationship with QOLIE-31

The overall QOLIE-31 scores by marital status are shown in Table 1.

Table 2
Adjusted odds ratio for factors that potentially affected the status of being married (single as reference)[a] in 188 PWE.

Variable	Odds ratio	95% CI	*p*-value
Age at first ES (years)	1.054	1.021–1.088	0.002
Seizure type (*partial/exclusively generalized*)[b]	3.260	1.210–8.783	0.019
Epileptic seizure frequency (*uncontrolled/controlled*)[c]	0.288	0.123–0.673	0.004
Epilepsy duration (years)	1.005	0.975–1.036	0.749
Neurological examination abnormalities (*present/absent*)[d]	0.250	0.119–0.525	$p < 0.001$
Constant	0.829		0.107

[a] Coted as married = 1 and not married = 0.
[b] Seizure type partial = 1and exclusively generalized = 0.
[c] Seizure frequency uncontrolled = 1 and controlled = 0.
[d] Neurological examination abnormalities present = 1 and absent = 0

Table 3
Adjusted odds ratio for factors that potentially affected the status of being divorced (married as reference)[a] in 178 PWE.

Variable	Odds ratio	95% CI	*p*-value
Seizure type (*partial/exclusively generalized*)[b]	0.506	0.164–1.563	0.236
Epileptic seizure frequency (*uncontrolled/controlled*)[c]	1.157	0.438–3.061	0.768
Epilepsy duration (years)	1.033	1.004–1.063	0.024
Antiepileptic drugs (*≥2/one*)[d]	1.734	0.709–4.315	0.225
Psychiatric comorbidity (*present/absent*)[e]	2.920	1.271–6.711	0.012
Constant	0.140		$p = 0.001$

[a] Coted as divorced = 1 and married = 0.
[b] Seizure type partial = 1and exclusively generalized = 0.
[c] Seizure frequency uncontrolled = 1 and controlled = 0.
[d] Antiepileptic drugs ≥2 = 1 and one = 0.
[e] Psychiatric comorbidity present = 1 and absent = 0

Table 4
Multiple regressions for the Quality of Life in Epilepsy Inventory scores: predictor variable with significant effects for the 195 PWE assessed.

Significant predictor	Coefficient	Standardized coefficient	95% CI for coefficient	*p*-value	Cohen's f^2
Model				$p < 0.001$	0.215
Marriage status (*single*/*others*)[a]	−2.372	−0.058	−9.273 to 4.530	0.497	
Seizure type (*partial*/*exclusively generalized*)[b]	−1.429	−0.038	−8.070 to 5.211	0.571	
Epileptic seizure frequency (*uncontrolled*/*controlled*)[c]	−1.624	−0.050	−7.824 to 4.576	0.605	
Epilepsy duration (years)	−0.038	−0.035	−0.292 to 0.216	0.768	
Psychiatric comorbidity[d]	−13.910	−0.427	−19.598 to −8.222	$p < 0.001$	

[a] Marriage status single = 1 and others = 0.
[b] Seizure type partial = 1and exclusively generalized = 0.
[c] Seizure frequency uncontrolled = 1 and controlled = 0.
[d] Psychiatric comorbidity present = 1 and absent = 0.

Regression analysis was performed by entering the model.

The regression equation showed that the only significant factor was the occurrence of psychiatric comorbidity (Table 4). There was a significant reduction in the mean QOLIE-31 score of PWE with psychiatric comorbidity. Marital status, employment status, age of first seizure, disease duration, epileptic syndrome, and number of AED were excluded from the equation because they were not significant. The Cohen's *d* index of 0.272 is considered of medium to large effect.

4. Discussion

4.1. Clinical aspects of epilepsy and the marital status of PWE

This study used a specific questionnaire to assess the marital status of PWE aged 18 years or more with mean epilepsy duration of 22 (±15.3) years and related the findings with the patients' clinical aspects of the disease and QOL.

Our findings suggest that clinical aspects of epilepsy, such as age at first seizure, epilepsy duration, presence of psychiatric comorbidity, and use of two or more AED differed significantly by marital status.

Twenty-one percent of the single patients reported not getting married because of epilepsy. Similarly, Kim et al. [17] reported that one-third of single patients blame their marital status on epilepsy. One possibility is that epilepsy-linked internalized or externalized stigmata, or both, rather than epilepsy per se, influence the marital status of PWE.

Earlier ES onset, occurrence of neurological examination abnormalities, and uncontrolled ES are more common in single PWE than in married PWE. These findings corroborate the finding that epilepsy with onset in the first decades of life reduces marriage rate [9,10]. Childhood-onset epilepsy may negatively impact psychosocial maturation and personality, which may be associated with low family expectations and overprotection, and negative societal attitude [18]. The higher percentage of single PWE with neurological examination abnormalities may suggest that aspects related to their basic neurological condition, whether related to epilepsy or not, can have a negative influence on their marital status.

The percentage of divorced PWE was high compared with the general population [31] and was not affected by age, gender, and employment status. As described earlier our findings suggest higher divorce rates among PWE with premarital ES onset than among those with postmarital ES onset [17,30].

Twenty-three percent of the cases blamed their divorce on epilepsy, which is corroborated by some studies [14,32] but not by others, which blamed nearly all divorces on epilepsy [17]. Regardless, these findings suggest that epilepsy has a strong impact on marriage maintenance.

Our findings suggest that the clinical aspects of epilepsy, such as epilepsy duration and presence of psychiatric comorbidity have positive association with divorce. Prior research on the association between seizure-related factors and marital adjustment has been very limited [13]. Other aspects such as ES type and remission status apparently had no negative influence on marital status, a finding corroborated by other studies [13,14,17,18]. Some studies found divorced PWE to have the highest MTLE-HS prevalence [14], but others found no influence of different epileptic syndromes on marital status [20].

Affirmative answers to the study question of whether epilepsy has a negative impact on marriage correlated with specific clinical aspects of epilepsy, such as use of two or more AED and presence of psychiatric comorbidity. These aspects may be associated with marital problems and thus hinder the couples' adjustment.

4.2. QOL, marital status, and epilepsy

The variable most strongly associated with lower QOL (total score) in our patients was the presence of psychiatric comorbidity. The presence of psychiatric comorbidity among PWE has been described, and the importance of depression as a predictor of QOL has been pointed out [23–25] but these findings contradict previous reports [24].

In this study QOL (total score) and marital status were not significantly associated, demonstrating that the perception of better marital adjustment among PWE does not translate to better QOL. Other studies have indicated that marital status in PWE has been associated with lower QOL [32], that married PWE have better QOL than those who are not married [26], and that better marital adjustment is positively associated with better perception of QOL in married PWE [3,13].

4.3. Limitations of the study

Although the study assessed little studied aspects and used a standardized and scientifically validated instrument (QOLIE-31), we believe that there are certain limitations regarding the number of cases and the fact that the groups were not divided equally in terms of diagnosis of epileptic syndromes. The study was from a single center; hence, cross-cultural comparison was not possible.

5. Conclusions

The study was performed at an epilepsy service and shows a greater occurrence of divorce in PWE than in the general Brazilian population, as has been found in other cultures.

It was possible to verify the relationship between some clinical aspects of epilepsy, such as psychiatric comorbidity and epilepsy duration, and disease duration, divorce, marital maladjustment, and worse QOL. The study also verified the relationship between remaining single with earlier seizure onset and anomalies in the neurological examination.

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Conflicts of interest

The authors declare no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

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