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Clinical and social determinants of quality of life in patients with epilepsy

Ľudmila Majerníková*, Andrea Obročníková†, and Anna Hudáková†

Department of Nursing, Faculty of Health Care, University of Presov, Presov, Slovakia

Abstract

Introduction: Epilepsy is one of the most common chronic neurological disorders. The condition is characterized by recurrent epileptic seizures and can negatively impact patients' quality of life, particularly in its social dimension.

Objective: This study analyzes the influence of clinical factors and social determinants on the quality of life of individuals with epilepsy.

Methods: The study included 89 individuals with a diagnosis of epilepsy. Data were collected using the Quality of Life in Epilepsy Inventory questionnaire, supplemented by items on sociodemographic characteristics and social determinants.

Results: The findings revealed that the overall quality of life of patients with epilepsy was at a moderate level, with the lowest scores observed in the domains of energy/fatigue and seizure-related worry. Overall quality of life was positively correlated with social functioning ($p < 0.001$), cognitive functioning ($p < 0.001$), emotional well-being ($p < 0.001$), and perceived medication effects ($p < 0.001$). Recent seizures were associated with lower overall Quality of Life in Epilepsy Inventory-31 scores ($p < 0.05$).

Conclusion: The quality of life of individuals with epilepsy is influenced by a complex set of clinical, psychological, and social determinants, with social functioning representing a key integrative factor. Comprehensive, patient-centered care is recommended, addressing not only seizure control but also psychological well-being, treatment tolerability, and social participation.

Keywords: Epilepsy; Quality of life; Social support; Clinical factors; Quality of Life in Epilepsy Inventory-31 questionnaire

1. Introduction

Epilepsy is a chronic neurological disorder of the brain characterized by an enduring predisposition to generate epileptic seizures and by the neurobiological, cognitive, psychological, and social consequences of this condition. According to the International League Against Epilepsy, epilepsy is diagnosed when an individual has: (i) at least two unprovoked (or reflex) seizures occurring more than 24 hours apart, (ii) one unprovoked seizure with a high probability (≥60%) of recurrence over the next 10 years, or (iii) a diagnosis of an epilepsy syndrome.[1,2]

Epilepsy involves recurrent unprovoked seizures with heterogeneous clinical presentations impacting sensory, cognitive, psychological, and motor domains.[3] The incidence of epilepsy is strongly age-dependent, with the highest occurrence observed in children under one year of age and in older adults.[4] In developed countries, approximately

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†These authors contributed equally to this work.

***Corresponding author:**
Ľudmila Majerníková
(ludmila.majernikova@unipo.sk)

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45–50 new cases of epilepsy are diagnosed annually per 100,000 population.[5] Epilepsy represents a major global neurological condition, affecting an estimated 50–70 million individuals worldwide.[6] In Slovakia, the number of individuals with epilepsy is estimated at approximately 60,000 patients, representing about 0.5–1% of the population.[7] Epilepsy, therefore, represents a significant medical and societal issue with a considerable impact on patients' everyday lives.

The quality of life (QoL) of individuals with epilepsy is influenced not only by the frequency and severity of epileptic seizures but also by a range of psychological, social, and environmental factors.[8,9] Epilepsy significantly affects health-related QoL (HRQoL), and it can be further impacted by seizure-related complications, emotional changes (e.g., depression and anxiety), perceived stigma, and low social support or social isolation.[10,11] Poor treatment efficacy and longer disease duration are consistently associated with lower HRQoL in epilepsy. Major determinants include seizure-related anxiety, adverse drug effects, functional limitations in daily life, and persistent social stigma.[12,13] Social support, family environment, employment status, and patients' psychological well-being play a crucial role and can significantly affect the subjective perception of QoL.[6,11]

Despite the growing body of international research on HRQoL in individuals with epilepsy, data specific to Slovak patients remain limited. Differences in access to healthcare, availability of specialized epilepsy centers, social welfare provisions, cultural perceptions of epilepsy, and socioeconomic conditions may result in distinct patterns of HRQoL in Slovakia that cannot be directly inferred from international studies.[6,10]

Cultural attitudes toward epilepsy, public awareness, and stigma may also affect social participation, employment opportunities, and the psychological well-being of Slovak patients.[11] The present study addresses this gap by investigating how both clinical factors (e.g., seizure characteristics, antiepileptic drug use) and social determinants (e.g., social support, employment status, participation in self-help groups) relate to HRQoL in a Slovak cohort using the Quality of Life in Epilepsy Inventory (QOLIE-31). Understanding these relationships can help to tailor patient-centered care and psychosocial interventions to improve the daily functioning and well-being of people living with epilepsy in Slovakia.

2. Methodology

This study analyzed the impact of selected clinical factors (e.g., frequency of epileptic seizures, type of epilepsy, and use of antiepileptic drugs) and social determinants (e.g., social support, employment status, educational level, and participation in self-help groups) on the QoL of patients with epilepsy.

2.1. Participant recruitment

The inclusion criteria for the study sample were as follows:

(i) Age ≥ 18 years.
(ii) A confirmed diagnosis of epilepsy made by a neurologist.
(iii) Duration of epilepsy ≥ 1 year.
(iv) Clinical stability at the time of data collection.
(v) Ability to understand and complete the questionnaire.
(vi) Provision of written informed consent to participate in the study.

Participants were excluded if they had:

(i) A simple or complex partial seizure within four hours prior to questionnaire completion.
(ii) A generalized tonic–clonic seizure within the 24 h prior to questionnaire completion.
(iii) Another severe chronic neurological disorder or a diagnosed psychiatric illness that could significantly affect QoL assessment.

2.2. Data collection

Data were collected using the standardized QOLIE-31 questionnaire developed by Vickrey *et al.*,[14] which consists of 31 items assessing multiple domains of QoL in patients with epilepsy. Cronbach's alpha for the QOLIE-31 was 0.70 and ranged between 0.68 and 0.89 for the seven subscales.[15] The QOLIE-31 questionnaire was administered in Czech, using a version that has been formally validated. Participants completed the questionnaire in Czech, as no Slovak validation of the instrument was available. Responses were recorded using Likert-type scales. The standardized questionnaire was supplemented with 17 additional items focused on sociodemographic characteristics and social determinants.

The QOLIE-31 questionnaire was evaluated according to the official scoring manual. Statistical analysis was performed using descriptive statistics, including the calculation of mean values and standard deviations (SDs), to assess the relationship between selected clinical and social factors and QoL in patients with epilepsy.[14,15]

2.3. Statistical analysis

Descriptive statistics, including absolute frequencies, percentages, means, and SDs, were used to characterize the sociodemographic and other features of the study sample. Relationships between variables were assessed using Spearman's rank correlation coefficient (ρ). Multiple regression analysis was performed to examine the associations between overall QoL score and the selected independent variables. A significance level of $p = 0.05$ was applied for all analyses. Data were analyzed using Microsoft Excel ((Microsoft Corporation, Redmond, WA, USA) and STATISTICA 14.0.1 (TIBCO Software Inc., Palo Alto, CA, USA).

3. Results

3.1. Participant characteristics

The study included 89 patients with epilepsy, of whom 60% were male and 40% were female. Based on Table 1, the majority of participants were aged 41–50 years (46%), followed by those aged 31–40 years (28%) and 21–29 years (26%). Nearly half of the participants had been diagnosed with epilepsy within the past 1–9 years (46%), with 44% having a disease duration of 10–19 years, and 10% living with epilepsy for more than 20 years.

Epilepsy with generalized seizures was the most prevalent type (52%), while partial seizures accounted for 28%. Unknown or unclassified epilepsy accounted for 18% of cases, representing patients in whom seizure onset could not be clearly determined. Additionally, 2% of patients were classified according to specific etiological modifiers, reflecting toxic or metabolic causes, rather than distinct epilepsy types. Most patients (74%) had experienced their last seizure within the past two years. Antiepileptic medication was used by 82% of patients, and 24% reported adverse effects, which affected the social lives of 86% of those experiencing them.

Regarding education, 72% had completed secondary school, 20% had primary education, and 8% had completed university studies. Two-thirds of the patients were employed (66%), while 34% were unemployed; among the unemployed, disability pension recipients accounted for 47%, students for 17%, those registered at the employment office for 30%, and part-time working students for 6%. Slightly more than half of the participants resided in rural areas (52%), with 48% living in urban settings.

3.2. Clinical- and care-related characteristics of the participants

Based on Table 1, the majority of respondents reported having access to healthcare services (92%), indicating generally good availability of medical care within the study sample. Regarding functional autonomy, 40% of participants held a valid driving license. Among these individuals, 64% reported regular use of a personal car for transportation.

In terms of psychosocial resources, most respondents perceived their level of social support from family members or close persons as sufficient (74%). In contrast, participation in structured peer or self-help groups was relatively low, with only 18% of respondents reporting involvement in such groups.

Overall, these findings suggest that while access to healthcare and informal social support networks are well established in this cohort, engagement in organized peer support remains limited. Variability in functional autonomy and psychosocial resources may represent clinically relevant contextual factors influencing QoL outcomes in patients with epilepsy.

3.3. Use of antiepileptic drugs and associated adverse effects

Based on Table 1, the majority of the sample reported current use of antiepileptic medication (82%). Among those using antiepileptic drugs, 24% experienced adverse effects related to their medication. Of those reporting side effects, 86% indicated that these adverse effects negatively impacted their social lives, whereas 14% reported no such impact.

These findings indicate that while antiepileptic drug therapy is widely utilized in this cohort, a proportion of patients experience clinically relevant side effects that may interfere with social functioning. This finding highlights the importance of monitoring treatment tolerability and its potential psychosocial consequences in individuals with epilepsy.

3.4. Domain-specific quality of life scores

The results of the overall assessment using the QOLIE31 questionnaire indicate a moderate level of QoL in the studied sample (Table 2). The overall QoL had a mean score (M) of 60.19 (SD = 19.74), suggesting a slightly reduced subjective evaluation relative to the maximum possible score of the questionnaire. The relatively high SD indicates considerable variability in individual perceptions of QoL among participants. Emotional well-being showed a lower mean score (M = 52.59; SD = 25.65), which may reflect emotional burden, such as anxiety, depressive symptoms, or concerns related to the disease. Similarly, energy/fatigue was among the lowest-rated domains (M = 46.35; SD = 21.61), indicating a pronounced sense of tiredness and reduced vitality in participants.

Cognitive functioning reached a mean score of 55.61 (SD = 28.66), suggesting mild limitations in attention, memory, and concentration. The increased variability

Table 1. Sociodemographic and clinical characteristics of individuals with epilepsy

Indicator	Number (*n*)	Percentage (%)
Gender		
Male	53	60
Female	36	40
Age (years; mean age = 37.5)		
21–29	23	26
31–40	25	28
41–50	41	46
Duration of epilepsy (years; mean disease duration = 12.54 years)		
≥20	9	10
10–19	39	44
1–9	41	46
Type of epilepsy		
Generalized epilepsy (generalized tonic–clonic seizures)	46	52
Focal epilepsy	25	28
Unknown/unclassified epilepsy	16	18
Etiology (optional)	2	2
Time since the last epileptic seizure		
More than 2 years	23	26
Less than 2 years	66	74
Use of antiepileptic drugs		
Yes	73	82
No	16	18
Adverse drug effects		
Yes	21	24
No	68	76
Impact of adverse effects on social life (*n* = 21)		
Yes	18	86
No	3	14
Education		
Primary	18	20
Secondary	64	72
University	7	8

(*cont'd...*)

Table 1. (*Continued*)

Indicator	Number (*n*)	Percentage (%)
Employment		
Employed	59	66
Unemployed	30	34
Reason for unemployment (*n* = 30)		
Student	5	17
Disability pension	14	47
Student + part-time job	2	6
Registered at employment office	9	30
Residence		
Rural	46	52
Urban	43	48
Access to healthcare		
Yes	82	92
No	7	8
Driver's license		
Yes	36	40
No	53	60
Use of personal car (*n* = 36)		
Yes	23	64
No	13	36
Social support		
Sufficient	66	74
Insufficient	23	26
Participation in self-help group		
Yes	16	18
No	73	82

Table 2. Quality of Life in Epilepsy Inventory-31 scores

Variable	Mean	Standard deviation
Overall quality of life	60.19	19.74
Emotional well-being	52.59	25.65
Energy/fatigue	46.35	21.61
Cognitive functioning	55.61	28.66
Seizure-related worry	46.99	24.19
Social functioning	54.95	22.12
Medication effects	53.99	28.42

of responses may be related to individual differences in disease course or the effects of antiepileptic treatment.

The seizure-related worry domain recorded one of the lowest scores (M = 46.99; SD = 24.19) and simultaneously showed relatively high variability, highlighting differences in fear and uncertainty among participants. This domain represents an important factor negatively affecting QoL.

Social functioning had a mean score of 54.95 (SD = 22.12), indicating mild limitations in social activities and interpersonal relationships. The medication effects domain scored 53.99 (SD = 28.42), with high variability reflecting diverse perceptions of adverse effects of pharmacotherapy and their impact on daily functioning.

Overall, these findings suggest that the most negatively affected domains of QoL in the studied sample are energy/fatigue and seizure-related worry, whereas overall QoL and social functioning were relatively better rated, although substantial inter-individual variability was present even in these domains.

3.5. Correlations between overall quality of life and its domains

Table 3 presents Spearman's correlation coefficients between overall QoL, its individual domains, and the variable "last epileptic seizure."

Based on Table 3, moderate to strong positive correlations were observed between overall QoL and all examined QoL domains. The strongest association was identified with social functioning ($r_s = 0.754$; $p < 0.001$), followed by energy/fatigue ($r_s = 0.698$; $p < 0.001$), cognitive functioning ($r_s = 0.689$; $p < 0.001$), emotional well-being ($r_s = 0.662$; $p < 0.001$), medication effects ($r_s = 0.650$; $p < 0.001$), and seizure-related worry ($r_s = 0.623$; $p < 0.001$). These findings indicate that higher scores across individual QoL domains are consistently associated with better overall QoL in individuals with epilepsy.

3.6. Intercorrelations among quality-of-life domains

Based on Table 3, significant positive intercorrelations

Table 3. Correlations among quality-of-life variables in individuals with epilepsy

Variables	**Overall QoL (r_s)**	**Emotional well-being (r_s)**	**Energy/fatigue (r_s)**	**Cognitive functioning (r_s)**	**Seizure-related worry (r_s)**	**Social functioning (r_s)**	**Medication effects (r_s)**	**Time since the last seizure (r_s)**
Overall QoL	1.000	0.662***	0.698***	0.689***	0.623***	0.754***	0.650***	−0.333*
Emotional well-being	0.662***	1.000	0.756***	0.699***	0.643***	0.769***	0.564***	−0.214
Energy/fatigue	0.698***	0.756***	1.000	0.644***	0.671***	0.757***	0.765***	−0.351*
Cognitive functioning	0.689***	0.699***	0.644***	1.000	0.741***	0.800***	0.656***	−0.431**
Seizure-related worry	0.623***	0.643***	0.671***	0.741***	1.000	0.787***	0.591***	−0.475***
Social functioning	0.754***	0.769***	0.757***	0.800***	0.787***	1.000	0.773***	−0.469**
Medication effects	0.650***	0.564***	0.765***	0.656***	0.591***	0.773***	1.000	−0.564***
Time since the last seizure	−0.333*	−0.214	−0.351*	−0.431**	−0.475***	−0.469**	−0.564***	1.000

Notes: r_s indicates Spearman's rank correlation coefficient. *$p < 0.05$, **$p < 0.01$, and ***$p < 0.001$ indicate statistical significance.
Abbreviation: QoL: Quality of life.

were also observed among the individual QoL domains. The strongest relationships were found between social functioning and cognitive functioning ($r_s = 0.800$; $p < 0.001$), social functioning and seizure-related worry ($r_s = 0.787$; $p < 0.001$), social functioning and emotional well-being ($r_s = 0.769$; $p < 0.001$), medication effects and energy/fatigue ($r_s = 0.765$; $p < 0.001$), and emotional well-being and energy/fatigue ($r_s = 0.756$; $p < 0.001$). These results highlight the strong interrelatedness of psychosocial, cognitive, and treatment-related aspects of QoL in individuals with epilepsy.

3.7. Association between time since the last seizure and quality of life

The variable "last epileptic seizure" demonstrated negative correlations with all examined QoL domains, indicating that a more recent seizure occurrence is associated with poorer perceived QoL. The strongest negative association was observed with medication effects ($r_s = -0.564$; $p < 0.001$), followed by seizure-related worry ($r_s = -0.475$; $p < 0.001$), social functioning ($r_s = -0.469$; $p < 0.01$), and cognitive functioning ($r_s = -0.431$; $p < 0.01$). Weaker but statistically significant negative correlations were identified with energy/fatigue ($r_s = -0.351$; $p < 0.05$) and overall QoL ($r_s = -0.333$; $p < 0.05$). However, the association with emotional well-being was weak and did not reach statistical significance ($r_s = -0.214$).

Overall, these findings suggest that seizure recency is broadly associated with diminished QoL across multiple domains, particularly in relation to treatment burden, cognitive functioning, social participation, and seizure-related concerns.

3.8. Relationship between perceived medication effects and overall quality of life

To further explore factors influencing overall QoL, Figure 1 illustrates the relationship between perceived medication effects and overall QoL in individuals with epilepsy. The graph shows a positive association—patients who perceive medication effects more favorably tend to report higher overall QoL scores. The distribution across epilepsy duration groups suggests that this relationship is consistent across different subgroups.

These descriptive findings are further supported by Figure 2, which visualizes the same association by gender and includes a linear regression line ($R^2 = 0.99$, $p < 0.001$). This analysis indicates that perceived medication effects are strongly associated with overall QoL, regardless of gender.

3.9. Predictors of overall quality of life: Multiple regression analysis

A multiple regression analysis was conducted to examine associations between selected variables and overall QoL in individuals with epilepsy. The model was statistically significant ($F[6,43] = 7.896$; $p < 0.001$) and explained approximately 52.4% of the variance in overall QoL ($R^2 = 0.524$, adjusted $R^2 = 0.458$).

Among the examined variables, medication effects showed the strongest positive association with overall QoL, with a standardized $\beta = 0.643$ ($p < 0.001$). The unstandardized coefficient B = 4.63 had a 95% confidence interval (CI) of 4.45–4.81, indicating high precision and a clear positive association. This suggests that patients who perceived more favorable effects of their treatment tended to report higher overall QoL (Table 4).

Other variables—including gender, time since the last seizure, drug use, employment, and social support—did not demonstrate statistically significant associations with overall QoL, as their 95% CIs included zero. For example, social support had a standardized $\beta = -0.123$ and a 95% CI for B of −13.09 to 11.19, suggesting no clear association with overall QoL in this sample. Similarly, time since the last seizure and employment status showed only weak and non-significant associations, with CIs overlapping zero.

These findings indicate that, in this cohort of individuals with epilepsy, the subjective perception of medication effects is the factor most strongly associated with higher overall QoL. Other demographic and clinical variables, such as gender, employment, or time since the last seizure, did not show clear or significant associations. The inclusion of 95% CIs provides additional information on the precision and reliability of the estimated regression coefficients, allowing for a more robust interpretation of the observed associations.

In addition to statistical significance and regression coefficients, we assessed the stability of the model using the variance inflation factor for all included predictors. The variance inflation factor values were <2 for all variables, indicating low multicollinearity and suggesting that the estimates of the standardized β coefficients are reliable and the model is stable.

These findings support the interpretation that perceived medication effects represent the strongest factor associated with overall QoL, while the other variables (e.g., gender, time since the last seizure, employment, social support,

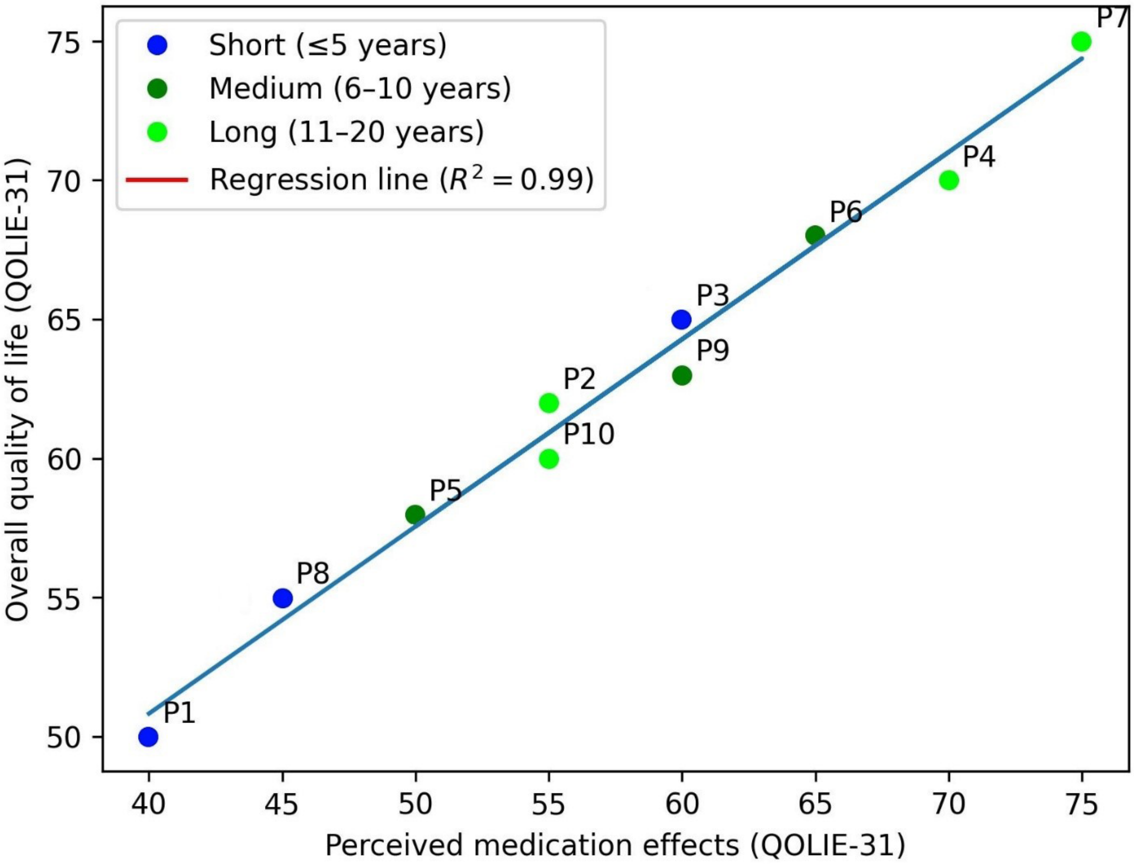

Figure 1. Relationship between perceived medication effects and overall quality of life in individuals with epilepsy by epilepsy duration
Abbreviation: QOLIE-31: Quality of Life in Epilepsy Inventory-31.

Table 4. Results of multiple linear regression analysis predicting overall quality of life in individuals with epilepsy

Predictor	β[a]	SE β[a]	B[b]	SE B[b]	*t*	*p*	95% CI for B[b]	VIF
Intercept	-	-	45.73	13.40	3.41	0.001	18.66–72.80	-
Medication effects	0.643	0.139	4.63	0.092	4.63	<0.001	4.45–4.81	1.32
Gender	−0.035	0.120	−0.29	4.95	−0.29	0.772	−10.21–9.63	1.11
Time since the last seizure	−0.009	0.125	−0.073	0.90	−0.073	0.942	−1.84–1.69	1.25
Drug use	0.063	0.109	0.57	5.76	0.57	0.570	−11.98–13.12	1.18
Employment	−0.045	0.119	−0.38	5.10	−0.38	0.709	−10.58–9.82	1.09
Social support	−0.123	0.130	−0.95	6.01	−0.95	0.349	−13.09–11.19	1.21

Notes: [a]Standardized regression coefficient, [b]Unstandardized regression coefficient. Model statistics: $R = 0.724$; $R^2 = 0.524$; adjusted $R^2 = 0.458$; F(6,43) = 7.896; $p < 0.001$.
Abbreviations: CI: Confidence interval; SE: Standard error; VIF: Variance inflation factor.

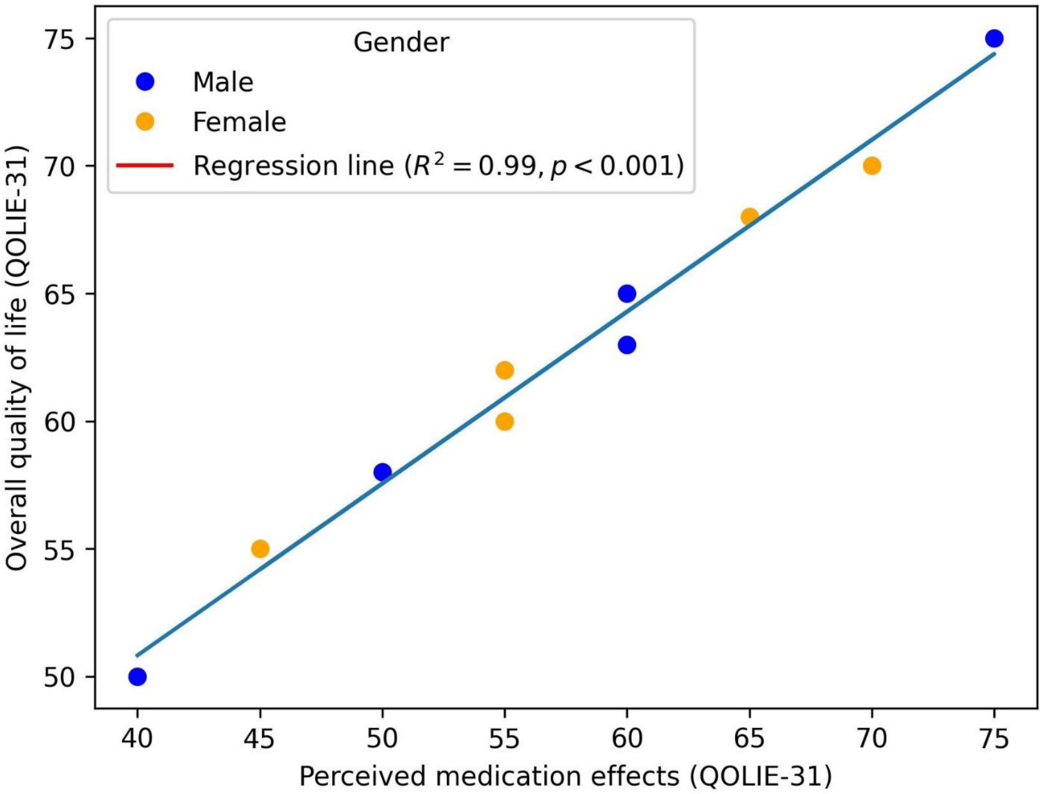

Figure 2. Relationship between perceived medication effects and overall quality of life in individuals with epilepsy by gender
Abbreviation: QOLIE-31: Quality of Life in Epilepsy Inventory-31.

antiepileptic drug use) did not show statistically significant associations within this model.

4. Discussion

This study explored the associations between clinical and social factors and QoL in individuals with epilepsy using the QOLIE-31 questionnaire. The findings highlight that the impact of epilepsy extends far beyond seizure frequency, influencing emotional health, cognitive abilities, energy and fatigue, social engagement, and treatment-related experiences.

4.1. Overall quality of life and affected domains

The overall QoL in the studied sample reached a moderate level, with the lowest scores observed in the domains of energy/fatigue and seizure-related worry. These findings are consistent with prior research indicating that chronic fatigue and persistent fear of seizures represent some of the most burdensome aspects of living with epilepsy.[8,9] Fatigue may be related not only to seizure activity but also to adverse effects of antiepileptic medication and psychological distress, which together contribute to reduced vitality and daily functioning. Seizure-related worry was also among the most negatively evaluated domains, highlighting the ongoing uncertainty and fear associated with the unpredictable nature of epileptic seizures. This observation is also consistent with previous studies demonstrating that fear of seizures significantly limits autonomy, social engagement, and overall well-being, even in patients with relatively well-controlled epilepsy.[10]

4.2. Interrelationships among quality-of-life domains

The correlation analysis revealed strong positive associations between overall QoL and all QOLIE-31 domains, particularly social functioning, energy/fatigue, and cognitive functioning. These findings emphasize the multidimensional and interrelated nature of QoL in epilepsy. Social functioning showed strong correlations with cognitive functioning, emotional well-being, and seizure-related worry, suggesting that social participation may reflect a broader integration of psychological, cognitive, and health-related factors. Similar patterns have been reported in previous studies, where limitations in cognitive performance and emotional distress were closely linked to reduced social engagement and poorer QoL.[16,17] The strong intercorrelations observed in the present study underscore the need for comprehensive, multidisciplinary approaches addressing not only seizure control but also psychosocial and cognitive aspects of care.

4.3. Association between seizure recency and quality of life

The variable "last epileptic seizure" demonstrated consistent negative associations with overall QoL and all its domains, with the strongest correlations observed for medication effects, seizure-related worry, social functioning, and cognitive functioning. These results indicate that more recent seizure occurrence is associated with poorer perceived QoL across multiple dimensions.

These findings are consistent with prior research showing that individuals who experience recent seizures report significantly lower QOLIE-31 scores than those in seizure remission.[17-22] Importantly, our results suggest that seizure recency is not only associated with increased seizure-related fear but also with broader impairments in cognitive and social functioning, further reinforcing the central role of seizure control in improving QoL.

4.4. Medication effects and quality of life

Among the examined variables, perceived medication effects showed the strongest association with overall QoL in both correlation and regression analyses. Patients who reported more favorable medication effects tended to report higher overall QoL, highlighting the importance of treatment tolerability in epilepsy management.

This finding is consistent with prior studies, suggesting that adverse effects of antiepileptic drugs are a major determinant of reduced QoL, sometimes even outweighing the impact of seizure frequency itself.[16,23] While medication adherence was high in the present sample, the relatively small proportion of non-adherent patients limited the statistical power to detect associations between adherence and QoL, which should be considered when interpreting these results.

4.5. Sociodemographic factors and quality of life

No statistically significant associations were observed between overall QoL and gender, employment status, or social support in the multiple regression analysis, although correlation analyses suggested potentially meaningful relationships, particularly between social support and several QoL domains. The lack of significance in the regression analysis may be partly attributable to the relatively small sample size and limited variability within some sociodemographic categories.

Previous studies have reported mixed findings regarding gender differences in QoL among individuals with epilepsy. For example, Liu *et al.*[24] found no significant gender differences in overall QoL but identified gender-specific associations with anxiety, depression, and sleep quality. In contrast, our results suggest slightly lower QoL scores in women across certain domains, although these differences did not reach statistical significance.

Similarly, employment status has been identified as an important factor influencing QoL in larger samples,[25] where employed patients consistently reported higher QOLIE-31 scores across all domains. While our descriptive findings point in the same direction, the absence of significant associations in the regression analysis suggests that employment status may interact with other factors, such as disease severity, social support, or cognitive functioning.

Several studies highlight the importance of sociodemographic characteristics in the assessment of QoL in individuals with epilepsy. Older age, higher educational attainment, and stable partnerships have been associated with better QoL, particularly in the domains of psychosocial functioning and disease coping.[26,27] These findings suggest that life experience, social support, and more effective coping strategies may mitigate the negative impact of epilepsy on everyday life.

Socioeconomic factors also play a significant role, particularly regular employment and higher socioeconomic status, which have been linked to higher QoL scores across multiple domains.[28] Financial stability and labor market participation not only reduce the economic burden associated with epilepsy but also enhance social integration and a sense of personal value. Conversely, limited employability and job insecurity remain substantial challenges that may negatively affect QoL in individuals with epilepsy.[29]

These factors are closely interrelated with social stigma, which continues to represent a major barrier to full social and occupational participation for people with epilepsy.[29] Stigmatization may adversely affect employment opportunities, interpersonal relationships, and social networks, thereby indirectly contributing to poorer QoL. Overall, QoL in individuals with epilepsy appears to result from a complex interaction of clinical, sociodemographic, and socioeconomic factors, which should be considered when planning comprehensive patient-centered care.[26-31]

4.6. Determinants of quality of life in individuals with epilepsy in the context of previous research

This study adds to the expanding literature highlighting that QoL in individuals with epilepsy is a multidimensional phenomenon, shaped by the interplay of clinical, cognitive, psychological, and social factors. Our results, showing strong links between overall QoL and specific domains—particularly social functioning, emotional well-being, energy/fatigue, cognitive performance, and medication effects—are consistent with prior research examining the determinants of QoL in epilepsy.

Among the assessed domains, social functioning demonstrated the strongest relationship with overall QoL. This observation is consistent with Fiest *et al.*,[32] who reported that improvements in social aspects of QoL were observed following epilepsy surgery, coinciding with reductions in seizure frequency. While the cross-sectional nature of these studies precludes causal conclusions, both sets of findings indicate that better seizure control may be closely linked to increased social engagement and interpersonal functioning, reinforcing the role of social functioning as a central determinant of perceived QoL.

In addition to clinical factors, psychological and personality traits have been recognized as influential determinants. Demirci *et al.*[33] reported that temperament and character traits are associated with perceived social support and QoL in individuals with epilepsy, independent of seizure frequency. This is consistent with the present study, where emotional well-being showed strong associations with social functioning and overall QoL, suggesting that individual psychological characteristics may shape how patients perceive and respond to the impact of epilepsy in daily life.

Ridsdale *et al.*[34] further supported the association between psychosocial burden, perceived stigma, and QoL. Although their self-management intervention did not yield significant improvements in overall QoL, they documented high levels of psychological distress and stigma among patients with poorly controlled epilepsy. In the present study, negative correlations between the time since the last seizure and several QoL domains—including social functioning, cognitive abilities, and medication effects—further reinforce the importance of ongoing seizure activity as a determinant of both psychosocial well-being and perceived QoL.

Lifestyle-related and often underrecognized factors, such as sleep quality and sexual functioning, have also been shown to contribute to QoL in individuals with epilepsy. Rozenek *et al.*[35] demonstrated that difficulties in sleep and sexual functioning are associated with multiple QOLIE-31 domains, including social functioning, emotional well-being, and energy/fatigue. These findings are consistent with our results, in which energy/fatigue and emotional well-being were strongly interrelated with social functioning and overall QoL, suggesting that daily functioning and intimate aspects of life represent important, yet frequently overlooked, determinants of QoL.

Recent research has increasingly emphasized the role of social cognition as a determinant of QoL in epilepsy. Yogarajah and Mula[36] reported that deficits in social cognition contribute independently to poorer QoL, even after accounting for seizure frequency, mood disorders, and other cognitive impairments. Similarly, Jasionis *et al.*[37] identified deficits in social cognition in individuals with focal epilepsy, particularly in temporal and extratemporal lobe epilepsy. These deficits may negatively influence interpersonal relationships, employment opportunities, and social integration, thereby reinforcing the central role of social functioning as a determinant of QoL observed in the present study.[38-40]

The findings of this study suggest that assessment and intervention in individuals with epilepsy should extend beyond seizure control alone and systematically incorporate social, psychological, and cognitive domains of functioning. Particular attention should be given to supporting social functioning and interpersonal relationships, with self-help groups playing a potentially important role by providing opportunities for sharing experiences, strengthening social support, and reducing perceived stigma.[41-43] The integration of self-help groups into comprehensive care may contribute to improvements in emotional well-being, self-esteem, and active disease management, thereby enhancing overall QoL. Clinical practice should therefore promote a multidisciplinary approach that, in addition to medical treatment, includes psychological support, assessment of social cognition, and recommendations for participation in community-based and self-help programs.[34] Future research should focus on longitudinal and interventional studies evaluating the effects of self-help groups and their relationships with clinical and psychosocial determinants of QoL in individuals with epilepsy.

5. Limitations of the study

Overall, the findings of this study suggest that QoL in epilepsy is a complex, multidimensional construct shaped by the interplay of clinical, psychological, and social factors. Seizure recency and perceived medication effects appear to be particularly important determinants of QoL, while other sociodemographic factors may exert more subtle or indirect influences.

Several limitations should be acknowledged. The cross-sectional design precludes causal inference, and the use of self-reported measures may introduce response bias.

Additionally, the relatively small sample size limits the generalizability of the findings and reduces statistical power to detect small effects, particularly in regression analyses. Future studies with larger samples and longitudinal designs are needed to better understand the dynamic relationships between seizures, treatment, psychosocial factors, and QoL over time.

Despite these limitations, this study contributes valuable data from a Slovak patient population and supports the growing body of evidence emphasizing the need for patient-centered epilepsy care that addresses not only seizure control but also treatment tolerability, psychological well-being, and social participation.

A limitation of this study is that epilepsy was analyzed as a single heterogeneous condition, encompassing different epilepsy types, which may have distinct clinical characteristics and QoL profiles, potentially influencing the observed associations.

6. Conclusion

The findings of this study, in combination with evidence from previous research, indicate that QoL in individuals with epilepsy is shaped by more than seizure-related factors alone. A range of psychosocial, cognitive, and emotional factors plays a substantial role, with social functioning standing out as a key integrative component. It reflects not only seizure management and emotional health, but also cognitive performance, treatment demands, and social skills. These findings highlight the importance of adopting a holistic, patient-focused approach to care that addresses both medical and psychosocial needs. Regular assessment of QoL, including social engagement, mental well-being, and treatment impact, is essential. Enhancing social support, patient education, and minimizing adverse medication effects can significantly improve everyday functioning and overall life satisfaction and well-being.

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Conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Author contributions

Conceptualization: Ľudmila Majerníkov, Anna Hudáková
Data curation: Ľudmila Majerníkov
Formal analysis: Ľudmila Majerníkov, Andrea Obročníková
Methodology: Ľudmila Majerníkov
Supervision: Andrea Obročníková, Anna Hudáková
Writing – original draft: Ľudmila Majerníková, Anna Hudáková
Writing–review & editing: Andrea Obročníková

Ethics approval and consent to participate

The study was approved by the Ethics Committee of the J. A. Reiman Faculty (No.49/EK/2025). All procedures related to this cross-sectional study were conducted in accordance with the ethical standards of the institutional and national research committees, as well as the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Consent for publication

Written informed consent for publication was not required, as the manuscript contains no identifiable patient data or images. Participant privacy and confidentiality were fully maintained throughout the study.

Availability of data

Data is available from the corresponding author upon reasonable request.

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