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I would be better off dead: investigating suicidal ideation in people with epilepsy

Eu preferiria estar morto: avaliando a ideação suicida em pessoas com epilepsia

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Abstract

Background It is known that the risk of suicidal behavior in adult people with epilepsy (PWEs) is high. However, the associated clinical and psychosocial factors are still being discussed.

Objective To assess the risk of suicide in PWEs and relate it to resilience and quality of life (QoL) as well as with clinical variables.

Methods The item "I'd be better off dead" of the Neurological Disorders Depression Inventory for Epilepsy (NDDI-E) was related to the resilience scale, clinical aspects, the presence of depression, and the Quality of Life in Epilepsy Inventory (QOLIE-31) scores of PWEs, with a $p < 0.05$.

Results A total of 271 PWEs were assessed, 50.6% were female, with a mean age of 46.6 ($\pm$ 15.8) years, and a mean age at 1st seizure of 24.1 ($\pm$ 18.5) years. Risk for suicide occurred in 50 (19.3%) cases. In multiple logistic regression, the factors that explain the risk of suicide were female sex, depression, and lower scores on the QOLIE-31 and on the resilience scale. In the classification and regression trees, the order of importance of the variables was depression > resilience > age > QoL > age at 1st seizure.

Conclusion The risk of suicide was high, and it was associated with demographic aspects, clinical variables, QoL, and resilience. A higher risk of suicide was associated with lower resilience regardless of the presence or absence of depression. In the presence of depression, a higher risk of suicide was associated with the early onset of epilepsy. In the absence of depression, the risk of suicide was associated with low QoL in young adults.

Keywords
- Epilepsy
- Suicide
- Resilience, Psychological
- Quality of Life

Resumo

Antecedentes É sabido que o risco de comportamento suicida é elevado em pessoas adultas com epilepsia (PCEs); entretanto, ainda são discutidos quais são os fatores clínicos e psicossociais associados.

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Objetivo Avaliar o risco de suicídio em PCEs e relacioná-lo com a resiliência e a qualidade de vida (QV) e com as variáveis clínicas.

Métodos Foi relacionado o item – "Eu preferiria estar morto" do inventário de depressão em transtornos neurológicos para a epilepsia (IDTN-E) com a escala de resiliência, os aspectos clínicos, a presença de depressão e com o inventário de qualidade de vida na epilepsia (QOLIE-31) de PCEs, com $p < 0.05$.

Resultados Foram avaliados 271 PCEs, 50.6% dos quais eram do sexo feminino. A idade média foi de 46.6 ($\pm$ 15.8) anos, e idade na 1ª crise 24.1 ($\pm$ 18.5) anos. O risco de suicídio ocorreu em 50 (19.3%) casos. Na regressão logística múltipla, os fatores que explicaram o maior risco de suicídio foram o sexo feminino, a depressão, e os menores escores no QOLIE–31 e na escala de resiliência. Na árvore de classificação e regressão, a ordem de importância das variáveis foi depressão > resiliência > idade > QV > idade na 1ª crise.

Conclusão O risco de suicídio foi elevado e associou-se com aspectos demográficos, variáveis clínicas, a QV e a resiliência. O maior risco de suicídio associou-se à menor resiliência, independente da presença de depressão. Na presença de depressão, o maior risco de suicídio associou-se ao início precoce da epilepsia. Na ausência de depressão, o risco de suicídio associou-se à baixa QV em adultos jovens.

Palavras-chave
- Epilepsia
- Suicídio
- Resiliência Psicológica
- Qualidade de Vida

INTRODUCTION

Adult people with epilepsy (PWEs) have a high risk of suicide[1,2] and suicidal behavior, which varies depending on the sample and the social and cultural context, and it is two to three times greater than that observed in other chronic diseases and in the general population.[2–6]

In epilepsy, suicidal behavior is related to the clinical variables of seizures, such as high frequency, type, earlier onset,[3,7,8] temporal lobe epilepsy with hippocampal sclerosis (TLE-HS),[8] and newly diagnosed epilepsy.[4,9] In PWEs, the presence of psychiatric disorder, particularly the presence of depression, is related to suicidal ideation, and with suicide,[3,7,9,10] and the presence of mental disorders increases 20-fold the risk of suicidal ideation.[11]

In 2008, antiseizure medicine (ASM) were implicated in a suicide alert by the US Food and Drug Administration. Despite the growing interest in this area of study, the relationship between ASM and suicidal behavior has not yet been fully established.[1,12–15]

In epilepsy, psychosocial and socioeconomic aspects, perception of stigma, family stress, and loss of independence, in addition to clinical variables, can lead to a significant risk of suicide.[4,7,16] However, there are still questions about the factors associated with an increased risk of suicide in epilepsy.

On the other hand, it is known that quality of life (QoL) can be compromised in epilepsy,[17] and that PWEs with a high level of resilience can better deal with the limitations and challenges associated with their condition.[17–19] In turn, data on the relationship between resilience and QoL and the risk of suicide in epilepsy are still limited.

The identification of PWEs and the factors related to the risk of suicide is essential as a diagnostic and prevention strategy for suicidal behavior. Thus, the aim of this study was to assess the risk of suicide in PWEs and relate it to the perception of resilience and QoL and to clinical variables.

METHODS

The present study assessed consecutive PWEs, aged over 18 years, being followed-up at the neurology clinic of the PUC-Campinas Hospital, in the city of Campinas, SP, Brazil, between January 2018 and December of 2019. For the diagnosis of epilepsy, the criteria of the International Classification of Epilepsies and Epileptic Syndromes[20] were used.

On the day of their outpatient follow-up visits, the PWEs were invited to participate in this study, and those who accepted the invitation answered a questionnaire on demographic and clinical aspects of epilepsy (age of onset, frequency and type of seizures, and number of ASM taken). Data from imaging exams and electroencephalogram (EEG) were collected from the hospital records. The service was individual in an isolated room. People with epilepsy with difficulties in understanding the questions of the instruments were excluded. The Human Research Ethics Committee of the university approved the study. The participants were informed of the research protocol and signed the consent form.

The PWEs were submitted to:

- Quality of Life in Epilepsy Inventory (QOLIE–31)[21]: this instrument is an epilepsy-specific QoL inventory. Higher scores indicate better QoL. This inventory has been validated in Brazil[22];
- Resilience Scale (RS)[23]: a scale composed of 25 items on a 7-point Likert scale (strongly disagree - strongly agree). The total score varies between 25 and 175 points, and the higher the score, the greater the resilience. The version adapted for the Brazilian culture was used[24];

- Neurological Disorders Depression Inventory for Epilepsy (NDDI-E)[25]: a 6-item questionnaire, which is rated on a 4-point Likert scale (ranging from "never" [1] to "always or often" [4]), which accurately assesses the patient's affective experience. The scores were added together, with higher scores representing higher depression symptoms. In the Brazilian validation, the presence of depression is suspected when the score is > 15[26];
- Suicidality: Scores > 2 for the item 4 of the NDDI-E (which corresponds to the answers: rarely, sometimes, and always, in the question - "I'd be better off dead") were considered risk of suicide. The NDDI-E has good psychometric properties as a suicide screening instrument.[1,26–29]

Statistical analysis

The presence of depression was considered when the total NDDI-E score was > 15 and there was confirmation of the diagnosis of depression (depressive episode, 10th revision of the International Statistical Classification of Diseases and Related Health Problems [ICD-10] code F32) by the psychiatry service.

The risk for suicide (score > 2 in the question - I'd be better off dead, from the NDDI-E) was related to clinical variables, demographic aspects, the presence of depression, the QOLIE-31 (total score), and the total score on the resilience scale.

The variables were expressed as mean and standard deviation (SD), and the qualitative variables were expressed as frequency and percentage values (%). The Student *t*-test was applied to compare continuous variables. The verification of possible associations between quantitative variables was estimated using the Pearson correlation coefficient.

The multiple analysis of logistic regression (with stepwise selection criteria) was performed to assess demographic data (sex, age), the clinical variables (age at first seizure, number of ASMs taken, TLE-HS, NDDI-E scores, the QOLIE-31 [total score]) and resilience scale were related to the risk of suicide.

To assess factors related to the risk of suicide, logistic regression classification tree models were used. The Classification and Regression Trees (CART) was used to build the decision and prediction of disease tree and its outcomes. Binary decision trees are represented by a set of questions that divide the sample into smaller parts. The questions are yes/no questions. The CART algorithm assessed the variables and possible values to find the best division: the question that divides the data into two parts with maximum homogeneity within the parts and heterogeneity between the parts. The process was then redone for each of the resulting fragments.

The IBM SPSS Statistics for Windows, version 22.0 was used for statistical analysis. Statistical significance was set at a p-value < 0.05.

RESULTS

Demographic aspects and clinical variables

A total of 271 PWEs were assessed, with a mean age of 46.6 ($\pm$15.8) years, with 5.9 ($\pm$3.9) years of formal education and having suffered with the disease for 22.5 ($\pm$15.2) years. The demographic data and clinical variables are shown in ►**Table 1**.

The mean total score on the NDDI-E was 10.8 ($\pm$3.9). Scores < 15 occurred in 220 (81.1%) cases and scores > 15 (presence of depression) occurred in 51 (18.8%) cases.

The answer to the question "I'd be better off dead" was without risk of suicide in 221 (81.5%) cases, and with risk of suicide in 50 (19.3%) cases (►**Table 1**).

Risk of suicide: clinical variables, depression, resilience, and QoL

In the simple logistic regression to assess factors associated with risk of suicide in 50 PWEs, the equation included the female sex, a younger age, a younger age at the time of the first seizure, the presence of depression, the use of more than one ASMs, the TLE-HS, and lower scores on the QOLIE-31 and on the resilience scale (►**Table 2**).

In the multiple logistic regression, the sex, depression, QoL, and resilience variables are the factors that, together, best explain the chance of risk of suicide, with the highest risk occurring in the female group, in cases with depression, and in those with lower scores on the QOLIE-31 and on the resilience scale (►**Table 3**).

In the model that used the classification and regression trees presented in ►**Figure 1**, the clinical variables were considered, and the model chose depression, the resilience scale scores, the total QOLIE-31 score, and age at the time of the first seizure for the classification of PWEs as with and without risk of suicide. In this model, the order of importance of the variables was depression $>$ resilience $>$ age $>$ QoL $>$ age at the time of the first seizure. Each of the terminal nodes of the tree describes risk of suicide (0 = no, 1 = yes) and the percentage of the sample classified in the group of combinations of variables.

In the patients with depression, those with resilience scores < 118 have a 73% chance of risk of suicide and represent 11% of the sample. Patients with depression, with resilience scores $\geq$ 118, and younger than 12 years old at their first seizure have a 62% chance of risk of suicide and represent 3% of the sample. Patients with depression, with resilience scale scores $\geq$ 118, and older than 12 years old at their first seizure have a 15% chance of risk of suicide and represent 5% of the sample.

Patients without depression, with scores on the resilience scale < 98, have a 71% chance of risk of suicide and represent 3% of the sample. Patients without depression, with resilience scale scores $\geq$ 98, total QOLIE-31 score < 53, and age < 43 years have a 62% chance of risk of suicide and represent 3% of the sample. Patients without depression, with resilience scores $\geq$ 98, total QOLIE-31 score < 53, and age ≥ 43 years have a 12% chance of risk of suicide and represent 10% of the sample. Patients without depression, with resilience scores $\geq$ 98, and total QOLIE-31 score $\geq$ 53 have a 4% chance of risk of suicide and represent 66% of the sample.

DISCUSSION

In this study, a high risk of suicide in PWEs was observed when using the NDDI-E as a rapid suicide screening tool, as described in different samples and cultures.[1–29]

Table 1 Demographic aspects, clinical variables, and the QOLIE-31 (total score), resilience scale, and NDDI-E scores of people with epilepsy (n = 271)

		N (SD or %)
Age (years), mean ± SD		46.6 ± 15.8
Sex: female		137 (50.6%)
Age at first seizure (years), mean ± SD		24.1 ± 18.5
Seizure	Focal	218 (80.4%)
	Generalized	53 (19.6%)
Seizure frequency in the last year	Monthly (≥ 1 time per month)	73 (26.9%)
	Other frequencies	198 (73.1%)
Number of ASMs taken	One	165 (60.9%)
	≥ two	106 (39.1%)
Epileptic syndrome	Genetic	25 (9.2%)
	Focal unknown etiology	71 (26.2%)
	Focal structural	175 (64.6%)
TLE-HS		90 (51.4%)
Laterality: right/left		42/48
QOLIE-31 (total score), mean ± SD		54.1 ± 18.4
Resilience scale (total score), mean ± SD		124.6 ± 21.2
NDDI-E (total score), mean ± SD		10.8 ± 3.9
I'd be better off dead	Never	221 (81.5%)
	Rarely	21 (7.7%)
	Sometimes	19 (7.0%)
	Always	10 (3.7%)

Abbreviations: ASM, antiseizure medicine; NDDI-E, Neurological Disorders Depression Inventory for Epilepsy; QOLIE–31, Quality of Life in Epilepsy Inventory; SD, standard deviation; TLE-HS, temporal lobe epilepsy and hippocampus sclerosis.

Table 2 Simple logistic regression to assess the factors associated with the risk of suicide

Variable		Risk of suicide		*p*-value	OR	LL	UL
		No (*N* = 221)	Yes (*N* = 50)				
Sex	Male	116 (52.5%)	18 (36.0%)	–	–	–	–
	Female	105 (47.5%)	32 (64.0%)	0.037*	1.964	1.051	3.767
Age		47.7 (16.1)	42.0 (13.3)	0.023*	0.977	0.957	0.996
Age at 1st seizure		25.5 (19.4)	18.2 (12.6)	0.015*	0.974	0.974	0.994
Number of ASMs taken	One	143 (64.7%)	22 (44.0%)	–	–	–	–
	≥ two	78 (35.3%)	28 (56.0%)	0.008*	2.333	1.256	4.387
TLE-HS	No	155 (70.1%)	26 (52.0%)	–	–	–	–
	Yes	66 (29.9%)	24 (48.0%)	0.015*	2.168	1.157	4.059
Depression	No	199 (90.0%)	21 (42.0%)	–	–	–	–
	Yes	22 (9.95%)	29 (58.0%)	< 0.001*	12.5	6.2	26.0
QOLIE-31 (total score)		65.2 (±15.7)	54.1 (±18.5)	< 0.001*	0.961	0.940	0.982
Resilience scale (total score)		129 (±17.7)	107 (±26.1)	< 0.001*	0.949	0.931	0.965

Abbreviations: ASM, antiseizure medicine; LL, lower limit; OR, odds ratio; QOLIE-31, quality of life in epilepsy inventory; TLE-HS, temporal lobe epilepsy and hippocampus sclerosis; UL, 95% confidence interval upper limit.
*$p < 0.05$.

Table 3 Multiple logistic regression to assess the factors associated with the risk of suicide

Factor	OR	LL	UL	*p*-value
Female sex	2.66	1.08	7.16	0.041
Depression (yes)	7.79	3.02	20.90	< 0.001
QOLIE-31 (total score)	0.973	0.948	0.998	0.039
Resilience scale (total score)	0.970	0.948	0.991	0.008

Abbreviatios: LL, lower limit; QOLIE–31, Quality of life in epilepsy inventory; UL, 95% confidence interval upper limit.

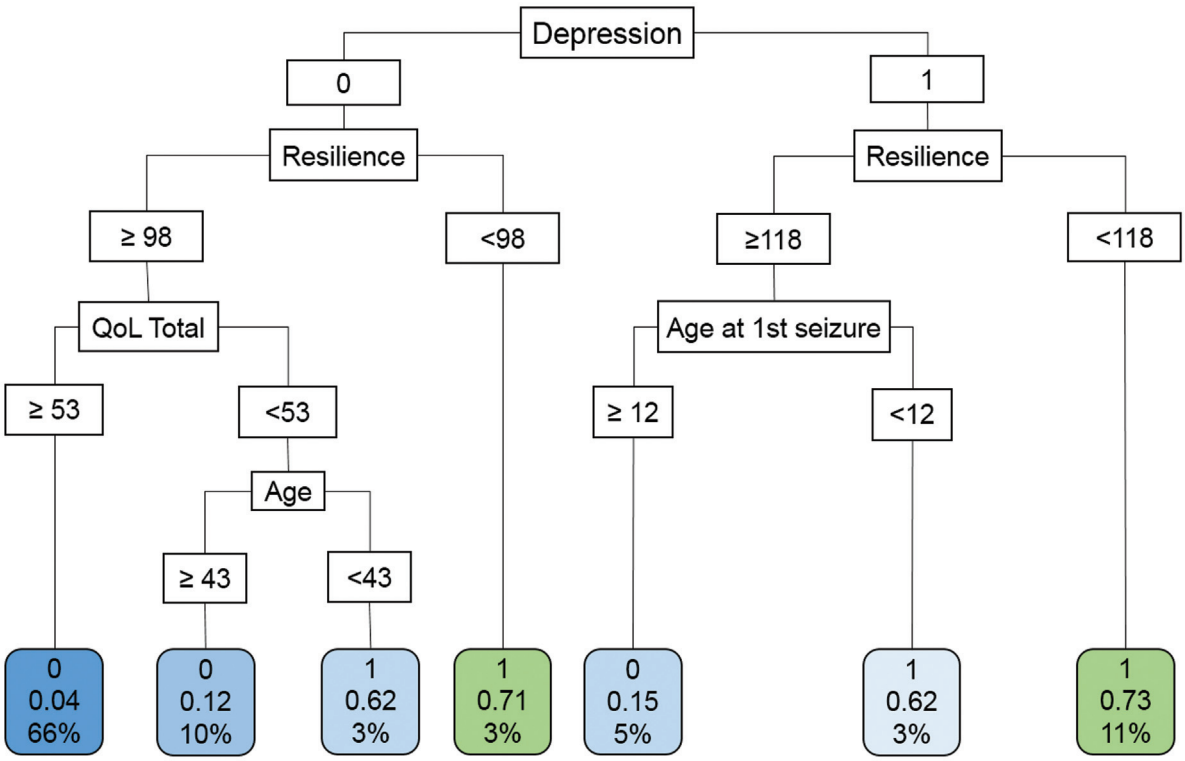

Figure 1 Decision tree. 0: no; 1: yes.

In our sample, female sex and age, and epilepsy variables such as age at first seizure, depression, polytherapy, TLE-HS, and QOLIE-31 and resilience scale scores were associated with a higher risk of suicide in the simple regression analysis; however, age, polytherapy, and TLE-HS lost statistical significance in the multiple regression analysis. Different studies have produced divergent results, and, thus, some factors related to suicidal behavior in epilepsy remain unclear.

In several studies on epilepsy and in individuals from the general population, depression has been established as a strong psychopathological predictor of suicidal behavior.[3,5] However, other studies describe that the risk of suicide did not significantly differ with the presence or absence of psychiatric disorders and between sex.[4,30]

In our sample, we observed that a low QoL perception is significantly associated with a higher risk of suicide. In patients with refractory epilepsy, Andrade-Machado et al. described that a reduction in QoL significantly increases the chances of risk of suicide.[31]

We observed that a higher risk of suicide is related to low resilience, associated or not with the presence of depression, which suggests that resilience is a strong predictive factor for a higher risk of suicide, regardless of the presence of depression.

In the PWEs with depression and average resilience scores, a higher risk of suicide was associated with the early onset of epilepsy. These data suggest that epilepsy variables, in addition to depression, are significantly associated with risk of suicide.

A significant chance of risk of suicide in the PWEs without depression was associated with low QoL in young adults, even with higher levels of resilience. These data suggest that in the absence of depression, other factors and clinical variables contribute to the increased risk of suicide in epilepsy.

Our data suggest that PWEs with greater resilience have a greater perceived ability to overcome difficulties and to have personal and social resources and help to face adversities related to life and the disease. Resilience acts as a protective

factor, and to develop psychological skills to reduce suicidal ideation and risk.

Thus, lower QoL and resilience levels are associated with greater vulnerability to suicidal intentions in PWEs. This suggests that the relationship between epilepsy and the psychological pain of the suicide phenomenon is complex and has a multifactorial origin with the involvement of psychosocial and neurobiological aspects.[32] Thus, it is suggested the need for greater attention to the relationship between resilience and QoL and the risk of suicide in epilepsy.

In conclusion, the risk of suicide was high and associated with demographic aspects and clinical variables with the perception of low QoL and lower resilience.

Limitations

This study has some limitations. Although the study used a standardized and scientifically validated instrument, there are certain limitations regarding what the sample refers to as a single institution. Therefore, a cross-cultural comparison was not possible. Another limiting aspect was the relatively small sample size. The sample was composed of different types and numbers of ASM, which may indicate a bias due to the positive and/or negative effects of the drugs. The cross-sectional nature of this study may have limited our conclusions, and further investigation is needed to better assess the role of factors related to the risk of suicide.

Authors' Contributions

GMAST: is the lead author of the project; GMAST, DCMS: were responsible for the data collection and for writing the manuscript.

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Conflict of Interest

The authors have no conflict of interests to declare.

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