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Loneliness, Anxiety and Depression among Patients with Epilepsy

Samotność, lęk i depresja wśród pacjentów z padaczką

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Abstract

Introduction. Epilepsy is one of the most common neurological disorders. The unpredictability of epileptic seizures can lead to feelings of loneliness, social isolation and stigmatisation. Due to the nature of this syndrome, patients may also show symptoms of depression.
Aim. The aim of the study was to determine the prevalence of anxiety, depression and loneliness, and the relationship between loneliness and depression among adult patients with epilepsy.
Material and Methods. This was a cross-sectional, observational study. A total of 206 patients with epilepsy participated in the study. The study was conducted using a website dedicated for persons with epilepsy. Data was collected from November 2021 to March 2022. Two research tools were used in the study: DeJong Gierveld Loneliness Scale (DJGLS) and the Hospital Anxiety and Depression Scale (HADS-M) and an author-developed demographic questionnaire to characterise the study group.
Results. The prevalence of depressive symptoms and borderline abnormalities was 51.5%, 22.8%, respectively. In the depression subscale, 48.1% of the respondents had depressive symptoms and 22.1% had borderline abnormalities. The anxiety and irritability subscales showed disorders in 34.5% and 69.4% of the respondents, respectively. A very high and high level of loneliness was found in 17% and 26% of respondents, respectively. A moderate level of loneliness was reported by 40% of respondents. In terms of emotional loneliness, severe and moderate loneliness affected 52% and 21% of respondents, while severe and moderate social loneliness was reported by 41% and 28% of respondents.
Conclusions. The study showed relatively high levels of loneliness and depressive symptoms. A significant correlation was found between the level of loneliness and the intensity of depressive symptoms. **(JNNN 2023;12(1):34–43)**
Key Words: adults, anxiety, depression, epilepsy, irritability, loneliness

Streszczenie

Wstęp. Padaczka jest jednym z najczęstszych schorzeń neurologicznych. Nieprzewidywalność napadów epilepsji może doprowadzić do poczucia samotności, izolacji społecznej oraz stygmatyzacji. Ze względu na charakter tego zespołu chorobowego pacjenci mogą manifestować objawy depresji.
Cel. Celem badania było określenie częstości występowania lęku, objawów depresji i poczucia samotności oraz zależności pomiędzy samotnością a depresją wśród dorosłych pacjentów z padaczką.
Materiał i metody. Było to przekrojowe badanie obserwacyjne. W badaniu wzięło udział 206 osób cierpiących z powodu padaczki. Badanie było zrealizowane przy użyciu strony internetowej, w grupie zrzeszającej pacjentów z padaczką. Dane zbierano od listopada 2021 r. do marca 2022 r. Do przeprowadzenia badania wykorzystano dwa standaryzowane narzędzia

badawcze: skalę pomiaru poczucia samotności autorstwa de Jong Gierveld (DJGLS) oraz Szpitalną Skala Lęku i Depresji (HADS-M) — Hospital Anxiety and Depression Scale i metryczkę własnego autorstwa charakteryzującą badaną grupę.
Wyniki. Częstość występowania objawów depresji wśród badanych wynosiła 51,5%, u 22,8% stwierdzono stany graniczne. W podskali depresji u 48,1% badanych występowały objawy depresji, u 22,1% stany graniczne. W podskali lęku występowanie zaburzeń zanotowano u 34,5% badanych, natomiast w podskali rozdrażnienia u 69,4% osób. Bardzo poważny i poważny poziom samotności odczuwało (17%, 26%) badanych. U 40% zaobserwowano umiarkowany poziom samotności. W zakresie samotności emocjonalnej z powodu poważnej i umiarkowanej samotności cierpiało (52%, 21%) badanych, natomiast z powodu poważnej i umiarkowanej samotności społecznej (41%, 28%) osób.
Wnioski. W badaniu uzyskano dość wysokie wyniki w zakresie poziomu samotności i częstości występowania objawów depresji. Stwierdzono istotną zależność pomiędzy poziomem samotności a natężeniem objawów depresji. **(PNN 2023;12(1):34–43)**
Słowa kluczowe: dorośli, lęk, depresja, padaczka, rozdrażnienie, poczucie samotności

Introduction

Epilepsy is a symptom complex with multiple risk factors and strong genetic predisposition, and is one of the key brain disorders affecting over 70 million people worldwide [1]. Although epilepsy can affect any age group, it is most common in children and elderly people [2].

There is a strong relationship between epilepsy and both depression [3,4] and anxiety, which are the most common mental disorders in epileptic patients [5]. Epilepsy is an important risk factor for depression, and depression is the most common comorbidity in persons with epilepsy. Patients with epilepsy are up to five times more likely to develop a depressive syndrome and commit suicide compared to the general population [4]. The prevalence of depressive symptoms varies among epileptic patients. It is estimated to range from 10.7% to 44%, with the highest rates in patients suffering from refractory epilepsy (54%) [6]. However, according to the data published by Błaszczyk and Czuczwar [7], up to 62% of patients with epilepsy experience episodes of depression. The prevalence of anxiety disorders ranges from 30% to 47%, depending on the region [2]. Studies have shown a bidirectional relationship between epilepsy and depression, including both biological and psychosocial factors [8,9]. Hormonal disorders induced by the destructive impact of epileptic seizures and interictal epileptiform discharges on the hypothalamic-pituitary-adrenal axis probably lead to a high rate of depression in epilepsy [10]. Thus, the presented scientific evidence shows that depression is not simply a comorbidity of epilepsy [11], but it shares a common pathophysiological background with epilepsy and can lead to adverse consequences in many respects. Depression may precede, intensify or follow seizures, but in all cases it has a significant impact on the quality of life of patients and epileptic prognosis. Therefore, it is strongly recommended to perform regular psychiatric assessment in newly diagnosed patients and to continue periodic check-ups to detect depressive disorders and provide guidance in the selection of antiepileptic and antidepressant drugs [12]. However, depression remains undiagnosed or untreated in many patients with epilepsy. Physicians, concerned about potential interactions between antiepileptic and antidepressant agents, are reluctant to initiate antidepressant pharmacotherapy. This, however, leads to a vicious circle and further exacerbates both disorders, thus increasing the risk of death [6]. Therefore, cooperation of many specialists, including neurologists, psychiatrists, neurosurgeons, psychologists, nurses and pharmacists, is needed for early detection, prevention and treatment of depressive disorders in patients with epilepsy. Epilepsy treatment aims to reduce the number and frequency of seizures, which can improve mood disorders. Studies have shown a correlation between excellent seizure control and a sustained improvement of mood disorders. This translates into a better quality of life, improved interpersonal interactions and reduced fear of seizures. Therefore, efforts should be made to achieve good neurological control and prevention of depression [4].

Stigmatisation of epilepsy is still a very important and unresolved problem. Despite the currently available pharmacology and relatively good treatment outcomes, misconceptions and prejudices continue to shape false attitudes towards persons with epilepsy. In many countries, epileptic individuals are perceived as disabled. They are often discriminated against and misjudged, mainly in terms of education, employment or healthcare opportunities. These factors disrupt the daily routine of patients and shape their worldview. This is often associated with a sense of loneliness, increased levels of anxiety and depression, lack of understanding, as well as lower self-esteem, self-efficacy and quality of life. Elimination of misconceptions and misinformation that contribute to identity problems and deteriorate the quality of life of patients with epilepsy is of key importance [13].

Chronic epilepsy can significantly affect human development in several dimensions. Patients with epilepsy are less likely to be satisfied with their social life and more likely to experience loneliness [14]. The feeling of loneliness is described as an unpleasant experience of lacking desired quantity and/or quality of social relationships. It is also understood as a mis-match between a person's actual social relationships and their desired

social relations [15]. We can distinguish emotional loneliness, which is associated with a sense of isolation, and social loneliness, which is identified with the lack of social integration relationships [16,17]. The authors indicate that adults with childhood-onset epilepsy were less socially active, less educated, and less likely to marry. Overall, they had difficulties participating in everyday activities compared to healthy adults [18,19]. Geerlings et al. [14] showed in their study among patients with epilepsy that 32.2% of respondents aged 25–30 years relied on their parents and were not independent. Individuals who scored higher for social loneliness and total loneliness correlated with unsuccessful transition to independence. The results also showed that patients with unsuccessful transition were not satisfied with their friendships or their situation, and continued to live at home with their parents.

Due to the frequent coexistence of anxiety and depression in persons with epilepsy, as well as their consequences for the treatment of both disorders, it is of key importance to regularly perform screening tests to identify mental disorders among the epileptic population [20].

The aim of the study was to determine the prevalence of anxiety, depressive symptoms and loneliness, and to assess the relationship between loneliness and depression among adult patients with epilepsy.

Material and Methods

This was a cross-sectional, observational study conducted using a Polish-language questionnaire, created using Google Forms, and then posted on a website dedicated for patients with epilepsy. Data was collected from November 2021 to March 2022. A total of 206 returned questionnaires were included in the analysis. The inclusion criteria were age over 18 years, diagnosed epilepsy, no communication difficulties related to completing the questionnaire, and informed consent to participate in the study. The exclusion criteria were age under 18 years, lack of consent to participate in the study, communication difficulties and malignant epilepsy syndromes with intellectual disability.

Data collection was in accordance with ethical principles, including informed consent, confidentiality and the right to withdraw from the study at any time without giving a reason. Respondents were informed about the purpose of the study and that the data would be used for scientific purposes only, as well as received instructions on how to complete the questionnaire. Voluntary participation in the study was considered informed consent. The names of the respondents were not included in the questionnaire, which made the data anonymous.

The study group was characterised based on sociodemographic variables, including sex, age, education, place of residence, marital status, occupational status, as well as data on the duration of the disease, the frequency of epileptic seizures and the use of psychological counselling.

Screening Questionnaire (HADS-M)

HADS-M (Hospital Anxiety and Depression Scale — Modified Version) was used to assess mental health (symptoms of anxiety, depression and irritability). The original version was developed by Zigmond and Snaith [21]. The Polish version was developed by Majkowicz de Walden-Gałuszko and Chojnacka-Szawłowska [22]. The HADS-M scale consists of 16 questions divided into 3 subscales: depression, anxiety and irritability (each answer can be scored from 0 to 3). Possible answers are "definitely yes", "probably yes", "probably not", and "definitely not". The maximum score is 21 separately for anxiety (7 questions) and depression (7 questions), and 6 for irritability (2 questions). According to the key, the following interpretation of the scores was adopted: for the anxiety/depression subscale: 0–7 normal (no disorders), 8–10 borderline states, 11–21 abnormal (disorders); for the irritability subscale: 0–2 normal, 3 borderline states, 4–6 abnormal.

HADS validation in epilepsy patients by Al-Asmi et al. [23] showed that a cut-off of 7 or 8 gave a sensitivity of 99% for depression and 83–91% for anxiety, and a specificity of 87.5–100% for depression and 85–94% for anxiety. Validation of HADS-D conducted among Polish patients showed good psychometric properties for the cut-off point ≥7 and ≥6, with sensitivity of 82.5–90.5%, specificity of 70.7–73.2%, positive predictive value of 68.8–46.3% and negative predictive value predictive of 96.4–85.4% for depressive disorders [24]. In the case of anxiety disorders, HADS-A showed the best psychometric properties for the cut-off point ≥10, with a sensitivity of 81.3%, specificity of 70.0%, positive predictive value of 31.5% and negative predictive value of 94.9% [25]. In this study, the internal agreement of HADS-M using Cronbach's alpha was 0.91 for the total score, 0.85 for the anxiety subscale, 0.85 for the depression subscale, and 0.85 for the irritability subscale.

HADS-M scores are not synonymous with the diagnosis of depressive disorders; HADS-M is a screening tool that indicates the problem of depressive symptoms. However, a specialist consultation is necessary to reach the final diagnosis.

Screening Questionnaire (DJGLS)

The de Jong Gierveld scale (DJGLS) was the second tool used to assess loneliness in persons with epilepsy [26]. The Polish adaptation was developed by Grygiel, Humenny, Rębisz, Świtaj, and Sikorska [27]. The tool consists of 11 statements, of which 6 contain negatively formulated sentences describing the lack of satisfaction with social contacts, and 5 positively formulated sentences measuring satisfaction with interpersonal relationships. Each of the statements can be answered on a 5-point scale: from "definitely yes" to "definitely no". Based on the interpretation of scores for the whole scale, the following categories of loneliness were defined: not lonely (0–2); moderate loneliness (3–8); severe loneliness (9–10); very severe loneliness (11). The loneliness scale includes two subscales, i.e. emotional loneliness (questions 2, 3, 5, 6, 9, 10) and social loneliness (questions 1, 4, 7, 8, 11). On the emotional loneliness subscale, these include: not lonely (0–2), moderately emotionally lonely (3–4) and severely emotionally lonely (5–6 points). On the social loneliness subscale, these include: not lonely (0–1), moderately socially lonely (2–3) and severely socially lonely (4–5).

In this study, the internal consistency of the DJGLS using Cronbach's alpha was 0.92 for the total score, 0.90 for emotional loneliness and 0.85 for social loneliness.

Data Analysis

The results were analysed statistically. Descriptive statistics were calculated. The distribution of the analysed variables and the assumptions of the statistical tests were verified. The normality of the distributions was tested with the Shapiro–Wilk test. The Student's T-test for independent samples was used for comparisons of two means, while the Kruskall–Wallis test was used for comparisons of a greater number of variables (due to the equality of groups).

Pearson's r correlations were performed. The significance level of statistical inference was set at $p<0.05$. Calculations were made using STATISTICA 13 by StatSoft.

Ethics Approval

The study was approved by the Bioethics Committee at the Medical University of Warsaw (approval no AKBE/215/2021). All eligible participants were informed about the aims of the study. They were also assured of voluntary participation and confidentiality of information.

Results

The study included 206 participants, 81.1% of whom were women. More than half of respondents (52.4%) were aged 26–39 years, 27.2% were aged 18–25 years. Almost half of the surveyed population (45.6%) had higher education, whereas 35.9%, 10.2%, and 8.3% of respondents declared secondary, vocational, and primary education, respectively. Most respondents (63.1%) were professionally active, whereas 29.1% were unemployed, and 7.8% were either retired or received a disability pension. Most of respondents (59.7%) declared being in a relationship and 40.3% were single. Rural and urban (>300,000 inhabitants) respondents accounted for 27.7% and 23.8%, respectively. More than half of the study group (51.5%) suffered from epilepsy for more than ten years, while 5.8% for less than a year. Epileptic seizures occurred once a year or more often in one in three respondents (33%), whereas 30.1% of respondents declared at least one seizure a month. Most of the respondents (73.8%) did not use psychological counselling. A higher intensity of loneliness was shown by persons from smaller towns ($p=0.013$) (Table 1).

Overall, HADS-M findings revealed disorders and borderline abnormalities in 51.5% (M=31.02; DS=5.06) and 22.8% (M=21.31; SD=1.38) of respondents, respectively. In the anxiety subscale, disorders and borderline abnormalities were found in 34.5% (M=29.07; SD=6.32) and 18.1% (M=19.20; SD=3.63) of respondents, respectively; whereas the depression subscale revealed disorders in 48.1% (M=33.56; SD=5.67) of respondents. The percentage of individuals with disorders in the irritability subscale was 69.4% (M=26.01; SD=8.25) (Table 2).

The overall DJGLS score indicated very severe loneliness in 17.00% (M=34.94; DS=9.49), severe loneliness in 26.00% (M=34.75; SD=10.09), and moderate loneliness in 40.0% (M=32.10; SD=10.58) of respondents. In the emotional loneliness subscale, severe loneliness was found in 52.00% (M=17.59; SD=6.19) of respondents, while the subscale of social loneliness showed loneliness in 41.00% (M=17.04; SD=4.17) of respondents (Table 3).

Table 1. Sociodemographic variables and HADS-M/DJGLS scores (N=206)

Participants	N	%	HADS-M			DJGLS		
			$\bar{x}$	SD	t/H/p	$\bar{x}$	SD	t/H/p
Gender								
Women	167	81.1	22.37	9.49	t=–0.461 p=0.645	33.85	9.89	t=1.357 p=0.176
Men	39	18.9	23.17	10.99		31.43	10.60	
Age								
18–25 years	56	27.2	22.80	10.70	H=0.726 p=0.696	32.76	10.59	H=0.296 p=0.862
26–40 years	108	52.4	22.87	9.07		33.67	9.81	
41–65 years	42	24.4	21.22	10.49		33.52	10.14	
Place of residence								
Village	57	27.7	24.21	7.60	H=7.415 p=0.116	32.45	9.11	H=12.751 p=0.013
City up to 50,000 inhabitants	30	14.6	23.70	9.17		28.56	9.09	
City from 51,000 to 150,000 inhabitants	29	14.1	24.20	10.63		34.14	10.96	
City from 151,000 to 300,000 inhabitants	41	19.9	19.31	9.47		36.17	9.31	
City over 300,000 inhabitants	49	23.7	21.55	11.52		34.69	10.85	
Education								
Elementary	17	8.3	22.52	7.96	H=3.687 p=0.297	32.00	8.14	H=4.523 p=0.210
Vocation	21	10.2	21.04	9.81		33.33	6.82	
Secondary	74	35.9	24.20	11.25		31.86	10.69	
Higher	94	45.6	21.51	8.69		34.87	10.35	
Occupational								
Employed	130	63.1	23.71	9.30	H=1.010 p=0.603	31.00	9.80	H=5.242 p=0.073
Unemployed	60	29.1	22.05	10.16		34.67	10.41	
Retired/disability pension	16	7.8	21.93	8.28		32.00	5.54	
Marital status								
Relationship	123	59.7	21.69	9.39		35.94	9.35	
Single	83	40.3	23.77	10.24		29.62	9.91	
Duration of epilepsy								
≤1 year	12	5.8	23.75	8.67	H=0.292 p=0.990	38.25	10.67	H=3.566 p=0.468
>1 year to 2 years	14	6.8	22.71	8.97		34.35	10.73	
>2 years to 5 years	36	17.5	21.94	8.67		32.63	8.35	
>5 years to 10 years	38	18.4	22.31	9.58		33.84	9.89	
>10 years	106	51.5	22.64	10.52		32.82	10.48	
Seizure frequency								
<1 a year	51	24.7	21.33	9.42	H=4.737 p=0.315	34.07	10.77	H=2.195 p=0.700
≥1 a year	68	33.0	21.70	10.02		34.25	10.07	
≥1 a month	62	30.1	23.06	9.43		32.82	9.66	
≥1 a week	16	7.8	25.56	8.99		31.37	9.56	
≥1a day	9	4.4	26.44	12.87		30.66	10.07	
Psychological counselling								
Yes	54	26.2	26.72	8.68	t=–0.461 p=0.645	28.64	7.94	t=1.357 p=0.176
No	152	73.8	21.03	9.72		35.08	10.20	

$\bar{x}$ — mean; SD — standard deviation; t-Student value; H — Kruskal–Wallis test; p — statistical significance (p<0.05)

Table 2. HADS-M scores of respondents

Scale	Parameter	N	%	$\bar{x}$	SD	Me	Min	Max
HADS-M	Anxiety subscale							
	No disorders	97	47.1	10.02	5.02	9.50	0.00	20.00
	Borderline abnormal	38	18.1	19.20	3.63	19.00	11.00	26.00
	Presence of disorders	71	34.5	29.07	6.32	29.50	14.00	45.00
	Depression subscale							
	No disorders	60	29.1	15.39	6.86	17.00	0.00	29.00
	Borderline abnormal	47	22.8	25.90	4.28	26.00	14.00	33.00
	Presence of disorders	99	48.1	33.56	5.67	33.50	15.00	45.00
	Irritability subscale							
	No disorders	34	16.5	12.71	8.47	11.50	0.00	27.00
	Borderline abnormal	29	14.1	16.86	7.51	17.00	5.00	33.00
	Presence of disorders	143	69.4	26.01	8.25	26.00	4.00	45.00
	Total score							
	No disorders	53	25.7	11.72	5.04	13.00	0.00	18.00
	Borderline abnormal	47	22.8	21.31	1.38	22.00	19.00	23.00
	Presence of disorders	105	51.5	31.02	5.06	31.00	24.00	45.00

$\bar{x}$ — mean; SD — standard deviation; Me — median; Min — minimum value; Max — maximum value

Table 3. DJGLS scores of respondents

Tool	Parameter	N	%	$\bar{x}$	SD	Me	Min	Max
DJGLS	Emotional loneliness subscale							
	Not lonely	56	27.0	17.09	6.15	16.50	6.00	30.00
	Moderate loneliness	44	21.0	16.59	6.53	15.00	6.00	30.00
	Severe loneliness	106	52.0	17.59	6.19	17.00	6.00	30.00
	Social loneliness subscale							
	Not lonely	64	31.0	15.25	4.32	15.50	6.00	24.00
	Moderate loneliness	57	28.0	16.63	4.98	18.00	5.00	25.00
	Severe loneliness	85	41.0	17.04	4.17	17.00	8.00	25.00
	Total score							
	Not lonely	36	18.0	32.94	9.18	32.00	18.00	54.00
	Moderate loneliness	83	40.0	32.10	10.58	33.00	12.00	55.00
	Severe loneliness	53	26.0	34.75	10.09	32.00	16.00	55.00
	Very severe loneliness	34	17.0	34.94	9.49	34.00	19.00	53.00

$\bar{x}$ — mean; SD — standard deviation; Me — median; Min — minimum value; Max — maximum value

In the HADS-M scale, statistically significant differences were observed in the marital status of the respondents ($p=0.036$). Depressive symptoms were related in direct proportion to the frequency of seizures ($p=0.047$) and the use of psychological counselling ($p<0.001$). On the other hand, DJGLS revealed differences in the level of loneliness in relation to marital status ($p=0.027$), occupational status ($p<0.005$) and the use of psychological counselling ($p<0.005$) (Table 4).

All correlations between emotional and social loneliness as well as the overall loneliness score (DJGLS) and the subscales of depression, anxiety, irritability and the overall disorder score (HADS-M) were statistically significant at the level of $p<0.00$. The intensity of symptoms of depression, anxiety, irritability and the general level of depressive symptoms increased along with the increase in emotional and social loneliness, as well as the general level of loneliness (Table 5).

Table 4. Sociodemographic and clinical variables in HADS-M; DJGLS

Parameter	HADS-M	DJGLS
Sex		
Pearson's r	0.032	–0.095
Significance (p-value)	0.645	0.176
Age		
Pearson's r	–0.049	0.020
Significance (p-value)	0.487	0.773
Place of residence		
Pearson's r	–0.035	0.098
Significance (p-value)	0.619	0.160
Education		
Pearson's r	–0.71	0.103
Significance (p-value)	0.313	0.139
Occupational status		
Pearson's r	–0.105	0.309**
Significance (p-value)	0.134	<0.001
Marital status		
Pearson's r	–0.146*	0.154*
Significance (p-value)	0.036	0.027
Duration of epilepsy		
Pearson's r	–0.07	–0.094
Significance (p-value)	0.925	0.181
Seizure frequency		
Pearson's r	0.139*	–0.095
Significance (p-value)	0.047	0.175
Psychological counselling		
Pearson's r	0.256**	–0.282**
Significance (p-value)	<0.001	<0.001

r — Pearson's r correlation coefficient; *p<0.05; **p<0.001 — correlations were statistically significant

Table 5. Correlations between loneliness and anxiety, depression and irritability

Scale HADS-M	Scale DJGLS		
	Emotional loneliness	Social loneliness	Total Score
1	2	3	4
Depression subscale			
Pearson's r	–0.598	–0.541	–0.615
Significance (p-value)	<0.001	<0.001	<0.001
Anxiety subscale			
Pearson's r	–0.495	–0.512	–0.393
Significance (p-value)	<0.001	<0.001	<0.001
Irritability subscale			
Pearson's r	–0.206	–0.311	–0.286
Significance (p-value)	<0.001	<0.001	<0.001
Total Score			
Pearson's r	–0.483	–0.588	–0.583
Significance (p-value)	<0.001	<0.001	<0.001

r — Pearson's r correlation coefficient, p<0.001 — correlations were statistically significant

Discussion

The aim of this study was to assess the prevalence of anxiety, depression and loneliness, as well as the relationship between loneliness and depression among adult patients with epilepsy. Our results showed that about 50% of epileptic individuals presented with depressive symptoms (51.5%), while the anxiety subscale revealed disorders in 34.5% of respondents. The irritability subscale showed disorders in 69.4% of respondents. Furthermore, we observed relatively high levels of loneliness, both emotional (severe loneliness — 52%, moderate loneliness — 21%), as well as social (severe loneliness — 41%, moderate loneliness — 28%) and overall loneliness (very severe loneliness — 17%, severe loneliness — 26%, moderate loneliness — 40%). Additionally, loneliness was significantly correlated with depressive symptoms. These results are very important and should prompt regular screening tests to assess the severity of depression and loneliness in all patients with epilepsy. The majority of respondents (73.8%) did not use psychological counselling.

According to the current findings by Ratnayake et al., who investigated Asian patients with epilepsy, the incidence of depressive symptoms was 29.8% [28]. Viguera et al. [29] (US) found depressive symptoms in 33.1% of patients with epilepsy. However, Fiest et al. [3] showed in their meta-analysis that depression affected 23.1% of epileptic patients. We also compared our findings with those obtained by other researchers who used the same tool (HADS) to investigate anxiety and depression. Anxiety and depression affected 39.4% and 24.4% of patients in Brazil [30], 39% and 20% in Thailand [31], 33.5% and 32.8% in Ethiopia [32], respectively. In Australia, anxiety and depression affected 46.8% and 24.8% of women, as well as 47.1% and 34.2% of men, respectively [33]. Unfortunately, we did not find many Polish studies on the prevalence of mental disorders among epileptic patients to compare our results. Only Wiglusz et al. [24,25] found major depressive disorders in 22% and any depressive symptom in 41.6%

of patients with epilepsy during the validation of HADS. Anxiety disorders were observed in 16.7% of respondents. It should be noted, however, that patients with more than 10 seizures in the past month were excluded from the study. Our results for the prevalence of depressive symptoms among patients with epilepsy are definitely higher than in the cited studies, while the level of anxiety reached similar values. Only Australian researchers observed higher levels of anxiety. Obtaining such high values in our study is all the more alarming that, depending on the severity, depression was found in 0.5% (severe) to 11.9% (mild) of the general Polish population. Moderately severe and moderate disease was observed in 1.0% and 2.8% of the patients, respectively [34]. However, according to the data of the World Health Organization, depression affects 5% of the global population and 5.1% of the Polish population [35,36]. The reasons for the high rates of depressive disorders are linked to rare or incorrect diagnoses, which makes it difficult to initiate therapeutic intervention in a timely manner. It may also result from improper management of psychiatric care, i.e. difficult access to treatment, as well as a limited number of medical personnel, stigmatisation of patients, or underestimating the problem [37]. WHO experts believe that up to 75% of persons with mental disorders in low — and middle-income countries do not receive therapeutic support [35]. This situation is extremely unfavourable for patients with epilepsy.

In this study, we observed a relationship between seizure frequency and depressive symptoms. Similar results were obtained by Ratnayake et al. [28], Tegegne et al. [32], and Owolabi et al. [38]. This observation is very important due to the good control of epileptic seizures, which may intensify as a result of depressive symptoms, and the increasing frequency of epileptic seizures may in turn exacerbate depressive symptoms [39]. Since both epilepsy and depression reduce the quality of life [4], it is extremely difficult to treat patients with both conditions. Therefore, early detection of depressive symptoms and initiation of appropriate treatment is a key aspect of the screening of patients with epilepsy.

We found no relationship between depressive symptoms and age or sex of respondents, but there was a relationship with marital status. The same conclusions were reached by Thompson et al. In our study, education and occupational status had no impact on the rates of depressive symptoms, while Thompson et al. [40] found these factors to be related to the intensity of depression. The duration of epilepsy was found to be unrelated to the symptoms of epilepsy in our study. Opposite conclusions were reached by Owolabi et al. [38], where the duration of epilepsy correlated with depressive symptoms. In our study, we also paid attention to the frequency of using psychological counselling. It was found that three quarters of respondents did not use such help, while those who used presented with lower intensity of symptoms of depression and loneliness. Meanwhile, in order to improve mental health and prevent its deterioration, psychological interventions should be initiated immediately after the diagnosis [41]. Perhaps the insufficient level of education is the cause of knowledge deficits on the available methods of psychological therapy that can support standard treatment.

In our study, very severe, severe and moderate loneliness affected a large group of respondents and, additionally, it was correlated with the rates of depressive symptoms. It can be assumed that social problems, namely fear and shame of rejection as well as social stigmatisation are the reason for the high level of loneliness. These factors may intensify mental health problems, social isolation and loneliness in persons with epilepsy [42]. Furthermore, loneliness is a major predictor of mental disorders such as depression, stress and anxiety [16], which was also confirmed in our study. Epilepsy itself can also be a direct cause of loneliness [43]. On the other hand, loneliness can exacerbate chronic diseases and contribute to a worse perception of one's own health. Bad perception and negative thinking can lead to social withdrawal. It has been shown that a higher level of loneliness negatively affects the patient's perception of the disease [44]. Healthcare professionals should be aware of the impact of psychosocial factors on patients' functioning and the supportive role of medical personnel, which may support the treatment of epilepsy [45]. Although much attention has been paid to the causative factors of loneliness, only few reports have assessed the level of loneliness among persons with epilepsy. According to the data presented by Dutch researchers Geerlings et al. [14], 27.1% of respondents suffered from moderate loneliness, while severe and very severe loneliness affected 8.5% and 1.7% of respondents, respectively. This study used the same tool that we used, but only for one age group (25–30 years old). However, we decided to cite their findings, because, as we mentioned, only few reports assessed the level of loneliness. Additionally, we intended to emphasise that we obtained significantly higher values compared to this study, and our respondents from a similar age group (26–40 years old) accounted for 52.4% of the study population.

Our study has several limitations. It was a cross-sectional study that did not consider causal effects. Additionally, not all answers to the questions, such as those concerning the clinical treatment of respondents or the type of epilepsy, have been exhausted, which should be taken into account in future research. Furthermore, the study was conducted via the Internet, which may be important in terms of identification of respondents. On the other hand, the survey questionnaire was posted on websites dedicated to persons with epilepsy, sharing

problems related to the disease, which could facilitate openness and honesty of answers. On the other hand, online surveys have higher data reliability, probably due to lesser concerns of respondents about their privacy [46]. Despite its limitations, this study provides an insight on the estimated risk of depression and anxiety. We were the first to assess the level of irritability in this group of patients. Furthermore, our study delivers new data on the relationship between depression and loneliness in patients with epilepsy.

Conclusions

Almost half of our respondents with epilepsy experienced symptoms of depression, one third of them experienced anxiety, and high scores were also obtained in the irritability subscale. Depression has been found to be linked to the frequency of seizures. A relatively high level of both emotional and social loneliness was found, which was experienced by almost half of respondents at a very severe and severe level. A relationship was also found between loneliness and depressive symptoms. Importantly, lower scores for depressive symptoms and the level of loneliness were reported for persons using psychological counselling and those in relationships. Therefore, the key role of medical personnel should be to educate not only epileptic patients, but also the entire society, to regularly perform screening to identify psychosocial problems in persons with epilepsy, and to actively support this group of patients.

Implications for Nursing Practice

We believe that our study can be used by medical personnel to better understand people with epilepsy. It may help plan and implement holistic care for such patients, which can result in early detection of symptoms of depression, anxiety, loneliness and timely implementation of appropriate management. Empathy of medical personnel towards persons with epilepsy may increase patients' trust in doctors, as well as improve control of both neurological and depressive symptoms, and thereby patient's well-being. The study can also be a source of information about epilepsy for the public and help eliminate misconceptions about persons with epilepsy. It is necessary to educate people and change their perception of epilepsy to avoid further stigmatisation. The role of doctors, nurses and psychologists is to help patients and their families cope with the disease in the best possible way.

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