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Examination of the Effects of Protective Factors for Psychological Resilience on the Personal Impact of Epilepsy in Patients with Epilepsy

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Abstract

Objective: This study aims to examination of the effects of protective factors for psychological resilience on the personal impact of epilepsy in patients with epilepsy.

Methods: This descriptive cross-sectional study involved 107 individuals who attended the neurology clinic of a university hospital and met the inclusion criteria and agreed to participate. Data were collected using the Personal Identification Form, the Protective Factors for Resilience Scale (PFRS), and the Personal Impact of Epilepsy Scale (PIES).

Results: The mean PFRS score was 77.24±12.90, and the mean PIES score was 34.31±15.62. Weak to moderate negative correlations were found between PFRS total and subscale scores and PIES total and subscale scores ($p<0.05$). Regression analyses revealed that both models were statistically significant [PFRS: $F(21, 85)=3.603$, $p<0.001$, $R^2=0.340$; PIES: $F(21, 85)=3.192$, $p<0.001$, $R^2=0.303$). Brain trauma-related etiology was a significant predictor, being negatively associated with PFRS scores ($\beta=-0.215$, $p=0.018$) and positively associated with PIES scores ($\beta=0.219$, $p=0.018$).

Conclusion: The findings demonstrate an inverse relationship between protective factors for psychological resilience and the perceived impact of epilepsy. Strengthening resilience through psychosocial support, particularly involving family and social environments, may help reduce the burden of epilepsy.

Keywords: Epilepsy, psychological resilience, protective factors

INTRODUCTION

Around the world, approximately 50 million people have epilepsy, which is characterized by recurrent seizures and a chronic course. Epilepsy is a common neurological disorder worldwide. The estimated rate for active epilepsy in the general population is between 4 and 10 per 1000 people. Epilepsy affects approximately 5 million people worldwide every year. It is most common in low- and middle-income countries, where around 80% of people with the condition live.[1] People with epilepsy also have a lifestyle associated with isolation in social life, dependency in behavior, low marriage rates, reduced potential for employment, and low quality of life.[2] Studies have found that higher psychological resilience is significantly associated with a better quality of life.[3-5] Psychological resilience, which plays an essential role for patients with epilepsy, encompasses various processes that are crucial for understanding health and disease and for supporting recovery and healing. These processes encompass biological, psychological, social, and spiritual factors and mechanisms that regulate the relationship between the disease, on the one hand, and a positive, favorable, or desired outcome, on the other.[6] Resilience is the use of mental processes to protect oneself from the adverse effects of stress. While these mental processes contribute to resilience, coping strategies are realized through psychological protective factors. Protective factors are personal, familial, and social factors.[7] Individuals may encounter numerous challenging and stressful life events throughout their lives. While some individuals are negatively affected by stressful and traumatic situations, others can quickly overcome the mental state caused by such negative experiences and return to their everyday lives thanks to resilience.[8] Although previous studies have examined psychological resilience and quality of life in individuals with epilepsy,

the specific role of protective factors that underlie resilience in shaping the personal impact of epilepsy remains insufficiently explored. In particular, there is a lack of integrative studies that simultaneously evaluate resilience-related protective mechanisms and the multidimensional impact of disease.[3,4] Therefore, this study was conducted to investigate, within a comprehensive framework, how protective factors for psychological resilience relate to the perceived personal burden of epilepsy.

METHODS

Research Design

This cross-sectional descriptive study was designed to investigate the effects of protective factors for psychological resilience on the personal impact of epilepsy on patients.

Population and Sample of the Study

This study included 107 patients who attended the epilepsy polyclinic at a university hospital between December 2024 and February 2025, met the research criteria, and volunteered to participate. Power analysis was conducted using G*Power 3.9.1. The minimum number of patients with epilepsy required to find a statistically significant medium effect size (ρ=0.37) in determining the relationship between protective factors for psychological resilience in patients with epilepsy and the epilepsy's personal impact was defined as 52 (α=0.05; 1-β=0.80).[9] A total of 107 patients who met the inclusion criteria were enrolled at the neurology polyclinic of a university hospital between December 2024 and March 2025. Data were collected face-to-face, and the data collection sessions lasted 20-25 minutes on average.

Inclusion criteria are: (1) a diagnosis of epilepsy for at least 6 months; (2) age of at least 18 years; (3) no diagnosed psychiatric disease; (4) no mental insufficiency and no communication problems; and (5) voluntary agreement to participate in the research. Exclusion criteria are: (1) having been diagnosed with a psychiatric disorder and (2) having communication problems.

Data Collection Tools

The "Person Identification Form", "Protective Factors for Resilience Scale (PFRS)", and "Personal Impact of Epilepsy Scale (PIES)" were used to collect data.

Person Identification Form: This information form consists of 11 questions, including sociodemographic characteristics and disease-related information, and was developed based on the literature.[10,11]

Protective Factors for Resilience Scale (PFRS): A measurement tool designed to assess protective factors that influence psychological resilience. The scale, developed by Harms et al.,[12] consists of 15 items and three subscales: personal resources, social resources (peers), and social resources (family). The Turkish validity and reliability study was conducted by Tanko et al.[13] There are no reverse-scored items in the scale. The scale, which has a 7-point Likert structure, is scored between "strongly disagree (1)" and "strongly agree (7)", and a high score indicates a high level of resilience. High scores on the scale indicate a high level of protective factors for psychological resilience.[13] In the study by Özer et al.,[14] the Cronbach's alpha coefficient for the scale was 0.93. In this study, the Cronbach's alpha value for the scale was 0.84.

Personal Impact of Epilepsy Scale (PIES): The scale, developed by Fisher et al.,[15] was used to measure the effect of epilepsy on patients with epilepsy. Its validity and reliability in Turkish were studied by Bahcecioğlu Turan et al.[16] This scale contains 25 items and three subscales. The items on the scale are evaluated using a 5-point Likert scale ranging from 0 to 4. An increase in the score indicates a more severe negative effect of epilepsy. The subscales are: seizures (items 1-9), side effects (items 10-18), and comorbidities (items 19-25). In general, scores between 0 and 25 are considered very low, 25 and 49 are low, 50 and 69 are medium, 70 and 89 are high, and 90 and 100 are very high.[15,16] In the study of Bahcecioğlu Turan et al.[16] the Cronbach's alpha of the scale was 0.95. In this study, the Cronbach's alpha of the scale was 0.84.

Ethics

The study was conducted permission (approval no: HRÜ/24.21.52, date: 30.12.2024) from the Harran University Clinical Research Ethics Committee, and after obtaining written consent from the institution. The study was conducted in accordance with the Declaration of Helsinki, which establishes ethical standards for research involving human subjects. Before data collection began, the study was explained orally to the volunteers and written consent forms were collected.

Statistical Analysis

Analyses were performed using SPSS (version 22). The data were analyzed using descriptive statistics, including the mean, standard deviation, count, and percentage. The Kolmogorov-Smirnov test was used to determine whether the data conformed to a normal distribution. Since the data were not normally distributed, Spearman's correlation was used. Multiple linear regression was performed to examine whether various independent variables affected the total average scores on the PFRS and PIES. The significance level was set at $p<0.05$.

RESULTS

Of the individuals participating in the study, 58.9% were male, 64.5% were married, 53.3% were high school graduates, 45.8% were workers, 50.5% had income equal to their expenses, 49.5% had focal seizures, 58.9% had epilepsy of unknown etiology, and 72.9% had no other illnesses. The average age of the patients with epilepsy was 32.91±14.61 years, and the time from diagnosis was 5.96±5.09 years (Table 1).

MAIN POINTS

- Weak to moderate negative correlations were found between the total score and subscale mean scores of the Protective Factors for Resilience Scale and the total score and subscale mean scores of the Personal Impact of Epilepsy Scale.
- Educational level, employment status, epilepsy etiology, and the presence of comorbidities are the main factors influencing protective factors for resilience.
- Employment status and epilepsy etiology are the main factors influencing the personal impact of epilepsy.

Table 1. Sociodemographic and disease-related characteristics of the patients with epilepsy

Characteristics		
	n=107	**%**
Gender		
Female	44	41.1
Male	63	58.9
Marital status		
Single	38	35.5
Married	69	64.5
Educational level		
Primary school	18	16.8
High school	57	53.3
Associate degree	23	21.5
Bachelor's degree or higher	9	8.4
Occupation		
Civil servant	12	11.2
Worker	49	45.8
Retiree	9	8.4
Self-employed	13	12.1
Housewife	10	9.3
Unemployed	14	13.1
Economic level		
Income is less than the expenses	46	43
Income is equal to the expenses	54	50.5
Income is more than the expenses	7	6.5
Seizure types		
Focal	53	49.5
Focal onset bilateral	19	17.8
Generalized tonic-clonic seizure		
Generalized	23	21.5
Myoclonic	12	11.2
Epilepsy etiologies		
Cerebrovascular disease	13	12.1
Brain trauma	13	12.1
Brain tumor	8	7.5
Other	10	9.3
Unknown	63	58.9
Comorbidity		
Present	29	27.1
Absent	78	72.9
	X̄±SD	
Age	32.91±14.61	
Duration of the diagnosis (years)	5.96±5.09	
Total	107	100

X̄: Mean, SD: Standard deviation

The PFRS average score was 77.24±12.90. When the PFRS subscales' average scores were examined, the average scores for personal resources, social resources-peers, and social resources-family were 25.95±6.76, 25.31±5.16, and 25.97±4.73, respectively. The PIES average score was 34.31±15.62. The average scores for the PIES subscales were 12.14±6.62 for seizures, 10.49±4.92 for side effects, and 11.67±6.97 for comorbidities (Table 2).

The correlation analysis revealed a weak positive relationship between age and duration of diagnosis ($p<0.05$). A weak negative correlation was found between the duration of diagnosis and the mean total PFRS score and the PIES side effects subscale ($p<0.05$) (Table 3).

A weak negative correlation was observed between the mean score of the personal resources subscale of the PFRS and the mean scores of the comorbidities subscale and total scores of the PIES ($p<0.05$). A weak negative correlation was found between the PFRS social resources-peers subscale and the mean scores of all PIES subscales, and a moderate negative correlation was found with the total mean score of PIES ($p<0.05$). A weak negative correlation was found between the PFRS social resources-family subscale and the PIES seizures, side effects subscales, and comorbidities; a moderate negative correlation was found with the total mean score of the PIES ($p>0.05$). The PFRS total mean score was found to have a weak negative correlation with the seizures and side effects subscales of the PIES, and a moderate negative correlation with the comorbidities subscale and total mean score of the PIES ($p<0.05$) (Table 3).

To assess multicollinearity in the model, the variance inflation factor (VIF) was examined. VIF values for all independent variables are close to 1, and none exceed 10, indicating that there is no multicollinearity in the model and that the analysis results are reliable (Table 4). A multiple regression analysis estimating the relationships between gender, marital status, educational level, occupation, economic level, seizure types, epilepsy etiologies, comorbidities, and the PFRS total average score indicated that the model was statistically significant overall [$F(21, 85)=3.603$, $p<0.001$, $R^2=0.340$]. This indicates that the independent variables explained 34.0% of the variance in the PIES total average score. To assess multicollinearity in the model, the VIF was examined. VIF values for all independent variables are close to 1, and none exceed 10, indicating no multicollinearity in the model and supporting the reliability of the analysis results (Table 4).

Table 2. The PFRS, PIES, and their subscales' mean scores

Scales			
	Min	**Max**	**X̄±SD**
PFRS			
Personal resources	13	75	25.95±6.76
Social resources-peers	7	35	25.31±5.16
Social resources-family	15	35	25.97±4.73
Total mean score	47	115	77.24±12.90
PIES			
Seizures	0	29	12.14±6.62
Side effects	0	29	10.49±4.92
Comorbidities	0	23	11.67±6.97
Total mean score	0	71	34.31±15.62

X̄: Mean, SD: Standard deviation, Min: Minimum, Max: Maximum, PFRS: Protective Factors for Resilience Scale, PIES: Personal Impact of Epilepsy Scale

According to the regression analysis results, the mean PFRS scores of patients with epilepsy who had a high school education were significantly higher than those of patients with epilepsy who had a primary education (β=0.523, p<0.001). The average PFRS scores of the patients with epilepsy who were civil servants were significantly higher than those of the unemployed patients with epilepsy (β=0.311, p=0.008). Patients with epilepsy whose etiology was brain trauma had significantly lower average PFRS scores than patients with epilepsy whose etiology was unknown (β=-0.215, p=0.018). Patients with epilepsy and comorbid non-epileptic diseases had significantly lower PFRS mean scores than those without such diseases (β=-0.386, p<0.001). The remaining independent variables did not significantly affect the average scores obtained on PIES (p>0.05) (Table 4).

The selection of independent variables for the regression models was guided by both theoretical considerations and the literature, aiming to capture demographic, clinical, and psychosocial factors potentially associated with resilience and the personal impact of epilepsy. Given the multidimensional nature of these constructs, a relatively comprehensive set of variables was included to avoid omitting relevant predictors. The literature emphasizes that the psychosocial effects of epilepsy on individuals are significantly determined by individual characteristics and clinical factors related to the disease.[4,17,18] Multiple regression analysis estimating the relationships between gender, marital status, educational level, occupation, economic level, seizure types, epilepsy etiologies, comorbidities, and the PIES total average score showed that the model was statistically significant [F(21, 85)=3.192, p<0.001, R^2=0.303). This means that the independent variables explained 30.3% of the variance in the PIES total average score. To assess multicollinearity in the model, the VIF was examined. The VIF values for all independent variables are close to 1 and none exceed 10, indicating that there is no multicollinearity in the model and that the analysis results are reliable (Table 5).

According to the regression analysis results, patients with epilepsy who were employed received significantly higher average scores on the PIES than those who were unemployed (β=0.362, p=0.014). Retired patients with epilepsy had significantly higher PIES scores than unemployed patients with epilepsy (β=0.382, p<0.001). Patients with epilepsy whose etiology was brain trauma received significantly higher PIES scores than patients with epilepsy whose etiology was unknown (β=0.219, p=0.018). The remaining independent variables did not significantly affect the average scores obtained from the PIES (p>0.05) (Table 5).

DISCUSSION

In chronic diseases, resilience refers to an individual's ability to maintain adequate functioning while coping with adverse conditions and to adapt successfully by employing skillful behavioral patterns. Psychological protective factors are characteristics and variables that buffer, enhance, or modify individuals' responses to stressors.[7]

Table 3. Relationships between age, duration of the diagnosis, and scales

Variables		PFRS					
		Age	**Duration of the diagnosis**	**Personal resources**	**Social resources-peers**	**Social resources-family**	**Total**
Age	r	1.000	**0.377****	-0.009	-0.023	-0.111	-0.047
	p		**0.000**	0.925	0.811	0.256	0.628
Duration of the diagnosis	r	**0.377****	1.000	-0.084	-0.069	-0.038	**-0.212***
	p	**0.000**		0.389	0.483	0.697	**0.028**
PIES seizures	r	0.004	-0.169	-0.160	**-0.350****	**-0.412****	**-0.375****
	p	0.971	0.082	0.099	**0.000**	**0.000**	**0.000**
Side effects	r	-0.098	**-0.291***	-0.148	**-0.310****	**-0.489****	**-0.381****
	p	0.316	**0.002**	0.128	**0.001**	**0.000**	**0.000**
Comorbidities	r	-0.044	-0.143	**-0.204***	**-0.394****	**-0.374****	**-0.402****
	p	0.650	0.141	**0.035**	**0.000**	**0.000**	**0.000**
Total	r	-0.050	-0.182	**-0.206***	**-0.422****	**-0.496****	**-0.458****
	p	0.609	0.061	**0.033**	**0.000**	**0.000**	**0.000**

*: p<0.05, **: p<0.001, Spearman correlation analysis, PFRS: Protective Factors for Resilience Scale, PIES: Personal Impact of Epilepsy Scale

Table 4. Multiple linear regression analysis on the effects of independent variables on the PFRS

	B	**Std. error**	**Beta**	**t**	**Sig.**	**95% CI**	
						Lower	**Upper**
(Constant)	75.923	4.657		16.303	<0.001	66.664	85.183
Educational level (high school)	13.481	3.847	0.523	3.504	**<0.001**	5.832	21.129
Occupation (civil servant)	12.654	4.661	0.311	2.715	**0.008**	3.388	21.920
Epileptogenic disease (brain trauma)	-8.442	3.484	-0.215	-2.423	**0.018**	-15.370	-1.514
Comorbidity (present)	-11.171	2.705	-0.386	-4.129	**<0.001**	-16.550	-5.792

Note: The expressions in parentheses indicate the categories whose effects are compared with the reference category. CI: Confidence interval, Std: Standard, Sig.: Significance, PFRS: Protective Factors for Resilience Scale

Table 5. Multiple linear regression analysis on the effects of independent variables on the PIES

	B	Std. error	Beta	t	Sig.	95% CI	
						Lower	Upper
(Constant)	18.317	5.796		3.161	0.002	6.794	29.841
Occupation (worker)	11.298	4.522	0.362	2.498	**0.014**	2.307	20.288
Occupation (retiree)	21.397	6.482	0.382	3.301	**0.001**	8.510	34.285
Epileptogenic disease (brain trauma)	10.441	4.336	0.219	2.408	**0.018**	-2.510	14.432

Note: The expressions in parentheses indicate the categories whose effects are compared with the reference category. CI: Confidence interval, Std: Standard, Sig.: Significance, PIES: Personal Impact of Epilepsy Scale

In this study, the total average score for PFRS was 77.24±12.90. When the PFRS subscales were examined, the average scores were 25.95±6.76 for personal resources, 25.31±5.16 for social resources-peers, and 25.97±4.73 for social resources-family. Epilepsy, a chronic neurological disorder characterized by seizures, negatively affects the daily lives of individuals with the condition. Seizures, adverse effects of antiepileptic drugs, and comorbidities are among the most significant factors contributing to this impact.[4]

In the present study, the PIES total average score was 34.31±15.62, while the PIES subscale averages were 12.14±6.62 for seizures, 10.49±4.92 for side effects, and 11.67±6.97 for comorbidities. Considering the highest possible total and subscale scores, these results suggest that the protective factors for psychological resilience among patients with epilepsy were moderate, and that the personal impact of epilepsy was likewise moderate. In a study by Bahcecioglu Turan et al.,[16] similar results were reported for the comorbidities subscale, whereas lower scores were observed in other domains. In contrast, Reyes-Miranda et al.[19] reported substantially higher PIES total and subscale scores in a veteran population. These findings indicate that the level of personal impact experienced by patients with epilepsy can vary considerably depending on demographic, clinical, and contextual factors such as disease duration, treatment adherence, comorbidities, and social support. Furthermore, consistent with previous literature, stronger social and family support systems appear to play a buffering role by reducing the negative personal impact of chronic diseases like epilepsy and by enhancing psychological resilience.[20,21]

The correlation analysis conducted in this study revealed a weak positive relationship between age and duration of diagnosis. A weak negative correlation was observed between the duration of diagnosis and the total PFRS score and the side effects subscale of the PIES. Similarly, a study conducted by Reyes-Miranda et al.[19] on veterans with epilepsy reported that total and subscale scores on the PIES were significantly lower in older individuals. In the present study, a significant negative relationship was also found between the PFRS total and subscale scores and the PIES total and subscale scores. A review of the literature reveals that Dias and Cadime[22] a positive relationship between psychological resilience and supportive environmental factors. In the context of epilepsy, peer support and individual psychological characteristics are emphasized as playing an essential role in disease management and the individual's adaptation process.[23] From a neuropsychological perspective, resilience in epilepsy may involve cognitive flexibility, executive functioning, and emotional regulation processes that enable individuals to better manage uncertainty and stress.[24]

Various studies of chronic neurological diseases have shown that strong social networks and effective coping mechanisms buffer the adverse effects of these diseases. For example, Elliott et al.[20] showed that perceived social support and psychological resilience are significant predictors of quality of life in adult patients with epilepsy; low levels of social support are associated with higher seizure-related stress and lower treatment adherence. Similarly, Lin et al.[25] reported that resilience mediates the relationship between social support and psychological well-being in individuals with chronic illness. Taken together, these findings indicate that protective factors associated with psychological resilience—particularly family and peer support—play a critical role in reducing the adverse effects of epilepsy in individuals with epilepsy. Therefore, psychosocial interventions focused on strengthening coping strategies, increasing family involvement, and supporting social connectedness are thought to significantly improve the overall well-being and disease management of patients with epilepsy.

The regression analysis conducted in this study revealed that seizure characteristics were not significantly associated with psychological resilience (PFRS) or the personal impact of epilepsy (PIES). Some studies in the literature report that seizure control is associated with higher psychological resilience and that the personal impact of epilepsy is related to seizure status, seizure type, seizure frequency, and seizure history in the past year.[3,16,19,26] However, as in this study, research conducted by Tombini et al.[4] also determined that seizure-related clinical characteristics did not significantly affect resilience. This finding suggests that adaptation to epilepsy may depend not only on clinical features but also on psychosocial resources, coping strategies, and environmental support systems.

In this study, mean scores on both the PFRS and PIES were significantly affected in individuals with a history of brain injury. Patients with epilepsy and brain trauma had low mean PFRS scores and high mean PIES scores. This finding suggests that epilepsy associated with brain trauma may be linked to lower resilience and a higher personal burden of disease due to both its negative effects on neurological function and its psychosocial consequences. In line with existing literature, our findings suggest that neurological deficits following traumatic brain injury may impair cognitive flexibility, thereby simultaneously lowering resilience scores and intensifying the perceived burden of the disease.[27-29]

Comorbidities in epilepsy are essential factors that worsen both the clinical course and the psychological burden of the disease. Keezer et al.[30] reported that comorbidities accompanying epilepsy have a significant negative impact on disease burden, treatment compliance, and quality of life. In the present study, 27.1% of patients with epilepsy had at least one additional disease. This finding indicates that comorbidities associated with epilepsy

impose an additional burden on individuals and may be linked to lower levels of psychological resilience.

Study Limitations

This study is limited by its cross-sectional design, single-center setting, and, consequently, its small sample size. However, given the relatively high number of independent variables in the regression models compared with the sample size, certain methodological limitations should be acknowledged. Therefore, the findings of this study should be interpreted with caution, particularly regarding the predictive relationships identified in the regression analyses. Future studies with larger sample sizes and more parsimonious models are needed to confirm these associations. This study cannot be generalized to all patients with epilepsy because of its small sample size and the heterogeneity of psychological resilience factors. Despite these limitations, it can serve as a valuable resource for future studies. Future research may benefit from employing longitudinal designs and model validation techniques to better assess the stability and generalizability of these findings.

CONCLUSION

This study revealed that protective factors for psychological resilience in patients with epilepsy were moderate, and the disease's impact on these patients was low. In this study, the mean scores of PFRS and its subscales were negatively correlated with those of PIES and its subscales. This result shows that the protective factors of psychological resilience are significantly related to individuals' subjective experience of the burden of epilepsy. Strengthening resilience through psychosocial support, particularly involving family and social environments, may help reduce the burden of epilepsy. In addition, it was observed that patients with epilepsy due to brain trauma have lower psychological resilience and greater personal impact of epilepsy compared to patients with epilepsy of unknown etiology. Based on this result, it has been clearly shown that patients whose epilepsy has a traumatic etiology constitute the most vulnerable group with respect to psychological resilience and that this group requires specialized psychosocial support programs.

Ethics

Ethics Committee Approval: The study was conducted permission (approval no: HRÜ/24.21.52, date: 30.12.2024) from the Harran University Clinical Research Ethics Committee, and after obtaining written consent from the institution.

Informed Consent: Before data collection began, the study was explained orally to the volunteers and written consent forms were collected.

Footnotes

Authorship Contributions

Concept: R.G., M.K., Design: R.G., M.K., İ.Ç., T.G.D., Data Collection or Processing: R.G., M.K., İ.Ç., Analysis or Interpretation: R.G., İ.Ç., Literature Search: R.G., M.K., T.G.D., Writing: R.G., M.K., İ.Ç., T.G.D.

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