



# Self-compassion and depression, anxiety, and resilience in adults with epilepsy



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## ARTICLE INFO

### Article history:

Received 24 July 2018

Revised 20 November 2018

Accepted 21 November 2018

Available online 14 December 2018

### Keywords:

Epilepsy  
Self-compassion  
Depression  
Anxiety  
Resilience

## ABSTRACT

**Background:** Research suggests that people with epilepsy (PWE) are more likely to experience depression and anxiety than the general population. Given the adversity associated with the condition, resilience may also be important. However, to date, resilience has been largely overlooked in the epilepsy literature. Self-compassion has been widely associated with improved psychological wellbeing and, to a lesser extent, resilience. However, the relationship between self-compassion and depression, anxiety, and resilience in PWE has not been examined. **Objectives:** Using a quantitative cross-sectional survey design, the aim of the present study was to examine the extent to which self-compassion predicted depression, anxiety, and resilience when controlling for demographic and illness-related variables.

**Methods:** Adults with epilepsy were invited to take part in a survey online or in epilepsy or neurology clinics. Two-hundred and seventy participants completed the survey, and data were analyzed using hierarchical multiple regression models.

**Results:** In this sample of PWE, self-compassion significantly predicted lower depression and anxiety and higher resilience when other significant sociodemographic and illness-related variables had been taken into account.

**Conclusions:** The findings of the present study indicate that self-compassion could be an important factor in determining psychological outcomes for adults with epilepsy, and its role is worthy of further exploration to help improve psychological outcomes for PWE.

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## 1. Introduction

### 1.1. Epilepsy and psychological wellbeing

Epilepsy is a chronic neurological condition characterized by recurrent seizures that can affect sensory, motor and autonomic function, consciousness, emotional state, memory, cognition, and behavior [1,2]. Depression is highly prevalent in people with epilepsy (PWE) [3], and a biopsychosocial model has been proposed for understanding this phenomenon [4,5]. Some common pathogenic mechanisms for depression and epilepsy have been proposed [6], and seizure frequency and seizure recency may be important predictors, although their precise role remains debated [4]. Epilepsy medications can contribute to depression or alternatively enhance mood [7–9]. Sociodemographic factors including age, gender, education, employment, and income have also predicted depression in some studies but not all [4]. Promising psychological variables may include emotional aspects of recovery from seizures, fear of injury, activity restriction, embarrassment, social

support, neuroticism, stressful life events, and a past history of psychological difficulties [4,10] although psychological variables generally have not been well researched [4].

Anxiety is also highly prevalent in PWE [11], even for those whose seizures are well-controlled [12] and again is probably best understood from a biopsychosocial perspective. Indeed, many PWE experience both anxiety and depression [6]. Common pathogenic mechanisms have been suggested for anxiety and epilepsy [6,12], and seizure frequency and certain types of epilepsy are associated with higher anxiety in some studies, but findings are not consistent [11,13–17]. Female gender, unemployment, and lower education have been associated with anxiety in some studies but not all [14,16–21]. Age of onset [16,20,22] and duration similarly are not consistent predictors [13,14,18]. Medication can reduce or increase anxiety [12], and perceived medication side effects can be associated with anxiety [17,23]. Sleep [24] and exercise [25] may also be important. Possible psychological predictors include health locus of control, impact of epilepsy, mood-related constructs (including neuroticism and self-esteem), stigma, coping, illness representations, accepting responsibility, self-efficacy, self-illness enmeshment, and social support [8,14,21,23], although coping is the only psychological variable to have been consistently studied [8].

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## 1.2. Self-compassion and psychological wellbeing

One psychological variable, which may be important for PWE, is self-compassion. Self-compassion has been defined as the act of being kind and understanding towards oneself in the face of difficult experiences, recognizing one's own experiences as part of the shared human condition rather than viewing them as isolating, and sitting mindfully with painful thoughts or feelings rather than overidentifying with them [26]. In the general population, self-compassion has been shown to predict improved psychological wellbeing and reduced distress [27–31]. It is particularly important in protecting against feelings of shame and negative self-evaluation [32–34], which can be a problem for PWE [35,36], and thus, self-compassion could be important for PWE; those who are high in self-compassion should experience greater psychological wellbeing e.g., [37,38].

## 1.3. Resilience

In addition to reducing depression and anxiety, self-compassion has been associated with resilience [39–41], although few studies have measured this directly. Resilience has been defined simply as “an outcome of successful adaptation to adversity” [42]. Within this definition, two elements are important: recovery, or how people “bounce back” from a stressful event [43], and sustainability, or the capacity to continue forward in the face of adversity [44]. While it has been examined for example, in other health conditions [45–47], it has been largely overlooked in the epilepsy literature [48].

## 1.4. Research aims and hypotheses

Using a quantitative design, the aim of the current study was to identify whether self-compassion predicted additional variance in measures of depression, anxiety, and resilience when other sociodemographic and illness-related variables, previously shown to be possible predictors of depression and anxiety had been accounted for. It was hypothesized that self-compassion would be negatively associated with depression and anxiety and positively associated with resilience, even when other potential influencing sociodemographic variables had been taken into account.

## 2. Method

### 2.1. Design

The study used a quantitative cross-sectional survey design to examine predictors of depression, anxiety, and resilience in PWE. Feedback on the design was obtained from a panel of service user representatives from the UK Charity Epilepsy Action (the Epilepsy Action Research Network; EARN).

### 2.2. Participants and recruitment

A predictive power calculation for a linear multiple regression with six predictors suggested that to achieve a power of 0.8 with a medium effect size of 0.2 (as indicated in other studies of self-compassion e.g., [28]) at a probability level of  $p = .05$ , 75 participants are required. Epilepsy Action supported recruitment by advertising the study on their website, newsletter, and social media channels. Recruitment took place between October 2016 and January 2017. Participants were asked to read a patient information sheet and to provide consent by completing a consent form. A debrief sheet was provided at the end of the survey.

To be eligible for inclusion, participants were required to self-report a diagnosis of epilepsy, to be at least 18 years old, and to be able to understand English and complete a survey. People who had experienced seizures but did not have an epilepsy diagnosis were excluded. The

questionnaires used were not all validated in other languages; therefore, non-English speakers were not able to take part.

### 2.2.1. Data collection and measures

Data were collected via a survey comprising questions about sociodemographic and clinical information alongside the standardized measures outlined below. Electronic versions of the measures were administered using the Qualtrics platform, a web-based survey and data collection software licensed for use by Lancaster University staff and students.

**2.2.1.1. The Liverpool Seizure Severity Scale 2.0 (LSSS, [49]).** The LSSS is a 13-item scale designed to quantify a PWE's own perceptions of their typical seizure severity. Items include ratings of loss of consciousness, headaches, injuries, and confusion. This measure has been used in previous epilepsy research (e.g., [50]) and has demonstrated high internal consistency ( $\alpha = 0.66$ – $0.87$ ).

**2.2.1.2. The Neff Self-Compassion Scale (SCS, [26]).** The SCS is a 26-item scale designed to measure three elements of self-compassion: self-kindness, mindfulness, and a sense of common humanity. No research has been identified into self-compassion in PWE, therefore, no precedent has been set for the use of this measure. However, this is a widely used measure of self-compassion [51,52] and has demonstrated high internal consistency ( $\alpha = 0.92$ ).

**2.2.1.3. The Hospital Anxiety and Depression Scale (HADS, [53]).** The HADS is a 14-item scale designed to measure depression and anxiety in clinical populations. The measure contains 7 items relating to anxiety and 7 items relating to depression. This measure has been used in previous epilepsy research (e.g., [4,8]) and has been shown to have satisfactory construct validity and psychometric properties in PWE [54]. The HADS-D has also been shown to be a valid and reliable psychometric instrument in terms of screening for depressive disorders in PWE [55].

**2.2.1.4. The Brief Resilience Scale (BRS, [56]).** The BRS is a 6-item scale designed to measure resilience. The measure includes items designed to assess a person's ability to bounce back or recover from stress. There is a lack of research into resilience in populations with epilepsy [57], therefore, no precedent has been set with regard to suitable measures. However, this measure has been identified as one of the most reliable scales measuring this construct [58].

### 2.3. Analysis

Statistical analyses were completed using IBM SPSS Statistics, Version 22. Correlation analyses were completed for all of the main variables. Normality of the distributions was checked by examining the skew and kurtosis of data. The LSSS was not normally distributed, therefore, non-parametric Spearman's rho tests of correlation were used.

Clinical and sociodemographic variables that were found to be significantly associated with each of the outcome variables were then entered into a hierarchical regression model for that outcome, followed by self-compassion as the main predictor variable of interest. In order to input nonbinary categorical variables into the regression model (i.e., employment status, level of education, and relationship status), these were recoded into binary categorical variables in SPSS (i.e., employed/unemployed, higher education/below higher education, in a relationship/not in a relationship). The predictor variables were entered into the model in three steps: 1) Sociodemographic variables – age, employment status, 2) Illness-related variables – seizure severity (LSSS), seizure type, and 3) Self-compassion (SCS). The outcome variables were: 1) Depression (HADS), 2) Anxiety (HADS), and 3) Resilience (BRS).

## 2.4. Ethical considerations

Participant wellbeing and issues of data protection were considered carefully throughout. Ethical and research governance approval to complete the research and recruit from the hospital was provided by a National Health Service (NHS) Research Ethics Committee and local Research and Development department via the UK Health Research Authority integrated system.

## 3. Results

A total of 327 participants consented to take part in the study. Of these, 305 were recruited online and 22 from epilepsy clinics. Independent *t*-tests were carried out to compare the variable means of the clinical and online samples; no significant differences were identified between the two groups in relation to all of the main variables ( $p > .01$ ), with the exception of level of education, which was found to be higher in the online sample ( $t = 3.141, p = .004$ ). Of the 327 survey responses, 59 contained missing data. Fifty-seven were excluded from statistical analyses because of missing data on three or more main variables. Many of these participants did not complete demographic questions; therefore, it was not possible to compare those with missing data with those who completed the survey. In the remaining two cases, data were imputed for missing BRS responses using mean substitution. This provided a total of 270 responses that were included in statistical analyses.

### 3.1. Sample characteristics

An overview of the sociodemographic and clinical characteristics of the sample are provided in Table 1.

Descriptive statistics and Cronbach's  $\alpha$  coefficients for the standardized questionnaires are provided in Table 2. The mean seizure severity score of the sample was 32.93 out of 100, which was marginally lower than other similar studies of populations with epilepsy [59,60]. However, for participants who had not experienced a seizure in the last four weeks, a score of zero was indicated on the LSSS, as per the authors' guidelines [49]. This applied to 41% of the sample, lowering the overall average score of seizure severity. The mean depression score of 7.94 placed this above the recommended clinical cut-off score of  $\geq 7$  for depression in a population with epilepsy [55,61]; this was higher than other similar studies (e.g., [62,63]). The mean anxiety score was higher still at 11.01, placing this in the moderate clinical range and well above the recommended cut-off score of  $\geq 8$  in a population [55,61]; this was again higher than other similar studies [62,63]. The  $\alpha$  coefficients for responses observed in the present study (0.83–0.94; see Table 2) indicated high internal consistency.

### 3.2. Correlational analyses

Spearman's rho correlations between all demographic, illness, and outcome variables are provided in Table 3.

Several demographic variables were found to correlate with the outcome variables. Employment status was correlated with depression (being employed was associated with lower depression;  $\rho = -0.183, p < .005$ ) and resilience (being employed was associated with higher resilience;  $\rho = 0.158, p < .01$ ), but not anxiety. Age was positively correlated with resilience ( $\rho = 0.138, p < .05$ ) and negatively correlated with anxiety ( $\rho = -0.197, p = .001$ ), but not depression. Gender, level of education, and relationship status were not correlated with any of the main outcome variables. Illness-related variables were found to be significant. Seizure severity was positively correlated with depression ( $\rho = 0.255, p < .001$ ) and anxiety ( $\rho = 0.202, p = .001$ ) and negatively correlated with resilience ( $\rho = -0.208, p = .001$ ). Seizure type also correlated with anxiety (generalized seizures were positively associated with anxiety;  $\rho = 0.142, p < .05$ ) but not depression or resilience. Medication use was not associated with any of the main outcome

**Table 1**

Sociodemographic and clinical information (N = 270) n (%).

Age	
18–25	39 (14.4)
26–30	42 (15.6)
31–40	57 (21.1)
41–50	61 (22.6)
51–60	49 (18.1)
61–70	20 (7.4)
71 or over	2 (0.7)
Gender	
Male	64 (23.8)
Female	206 (76.2)
Relationship status	
Single	89 (33.1)
Married or cohabiting	157 (58.0)
Other	24 (8.9)
Highest level of education	
Degree or above	110 (40.7)
A-Level, trade or other higher education	85 (31.3)
GCSE or NVQ	50 (18.7)
Other, level unknown	9 (3.3)
No qualifications	16 (6.0)
Employment status	
Employed	122 (45.0)
Unemployed	75 (27.9)
Other	73 (27.1)
Medication	
Yes	257 (95.2)
No	13 (4.8)
Most common seizure type	
Focal (partial)	122 (45.1)
Generalized	148 (54.9)
Nationality	
British	209 (77.4)
Irish	34 (12.6)
Other	27 (10)
Ethnicity	
White – English/Welsh/Scottish/Northern Irish/British	197 (72.9)
White – Irish	37 (13.7)
Any other White background	19 (7)
White and Black Caribbean	4 (1.5)
White and Black African	1 (0.4)
Any other Mixed/Multiple ethnic background	4 (1.5)
Indian	1 (0.4)
Pakistani	3 (1.1)
Chinese	1 (0.4)
Any other ethnic group	3 (1.1)

variables. Self-compassion was significantly negatively correlated with depression ( $\rho = -0.585, p < .001$ ) and anxiety ( $\rho = -0.608, p < .001$ ) and positively correlated with resilience ( $\rho = 0.595, p < .001$ ). Self-compassion and seizure severity were not significantly correlated ( $p = .466$ ).

### 3.3. Hierarchical multiple regression analyses

Variables that were found to be significantly correlated with the outcome variables depression, anxiety, and resilience were entered as

**Table 2**

Descriptive statistics – reliability values, means, and standard deviations of main variables.

	$\alpha$	M	SD
1. Seizure severity	0.86	32.93	32.10
2. Self-compassion	0.94	2.61	0.68
3. Depression	0.84	7.94	4.70
4. Anxiety	0.83	11.01	4.60
5. Resilience	0.87	2.74	0.86

**Table 3**  
Spearman's Rho correlations between variables.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Self-compassion	–	–0.585**	–0.608**	0.595**	–0.029	0.190**	0.089	0.094	0.095	–0.123*	–0.045	–0.082
2. Depression		–	0.589**	–0.500**	0.011	–0.014	–0.183**	–0.041	–0.093	–0.073	0.255**	0.005
3. Anxiety			–	–0.524**	0.02	–0.197**	–0.116	0.0	–0.068	0.027	0.202**	0.142*
4. Resilience				–	–0.04	0.138*	0.158**	0.06	0.086	–0.02	–0.208**	–0.068
5. Gender					–	–0.140*	–0.018	0.027	0.167**	–0.078	–0.047	0.007
6. Age						–	0.033	0.08	–0.074	0.014	–0.031	–0.049
7. Employment status							–	0.146*	0.222**	0.063	–0.177*	–0.025
8. Relationship status								–	0.041	–0.058	0.001	0.047
9. Level of education									–	–0.083	–0.031	0.03
10. Medication										–	–0.147*	0.067
11. Seizure severity											–	–0.072
12. Seizure type												–

\*\*  $p \leq .01$ .  
\*  $p \leq .05$ .

predictor variables into the regression models. Sociodemographic variables were entered into the first stage of the models, followed by illness-related variables in the second stage, and self-compassion in the third and final stages as the main variable of interest. The regression models were therefore structured as follows:

Predictor variables:

- 1) Sociodemographic variables: age, employment status
- 2) Illness-related variables: seizure severity (LSSS), seizure type
- 3) Self-compassion (SCS)

Outcome variables:

- 1) Depression (HADS)
- 2) Anxiety (HADS)
- 3) Resilience (BRS).

The results of the multiple hierarchical regression analyses are provided in Tables 4a–4c.

The data were checked in SPSS to ensure that the main assumptions of multiple regression were met (dependent and independent variables were linearly related, residual terms were uncorrelated, no heteroscedasticity was present, errors were normally distributed, and no multicollinearity was present).

The regression analyses for depression indicated that Steps 1 and 2 of the model accounted for 10.8% of the variance in the outcome. Self-compassion was found to increase the explanatory power of the final model to 44.6%. Self-compassion therefore explained 33.8% of the variance in depression ( $R^2$  change), and the overall model was

significant ( $F = 39.942, p < .001$ ). In the final model, the variables that were found to be significant were seizure severity ( $\beta = 0.252, p < .001$ ), employment status ( $\beta = -0.115, p < .01$ ), and self-compassion ( $\beta = -0.596, p < .001$ ).

The regression analyses for anxiety indicated that Steps 1 and 2 of the model accounted for 10.9% of the variance in the outcome. Self-compassion was found to increase the explanatory power of the final model to 42.8%. Self-compassion therefore explained 31.9% of the variance in anxiety ( $R^2$  change), and the overall model was significant ( $F = 37.127, p < .001$ ). In the final model, the variables that were found to be significant were seizure severity ( $\beta = 0.182, p < .001$ ), seizure type ( $\beta = 0.102, p < .01$ ), and self-compassion ( $\beta = -0.579, p < .001$ ).

Finally, regression analyses for resilience indicated that Steps 1 and 2 of the model accounted for 8.7% of the variance in the outcome. Self-compassion was found to increase the explanatory power of the final model to 42.2%. Self-compassion therefore explained 33.4% of the variance in resilience ( $R^2$  change), and the final model was again significant ( $F = 36.150, p < .001$ ). In the final model, the variables that were found to be significant were seizure severity ( $\beta = -0.176, p < .001$ ) and self-compassion ( $\beta = 0.593, p < .001$ ).

**4. Discussion**

*4.1. Self-compassion and psychological wellbeing in epilepsy*

The aim of the current study was to identify whether self-compassion predicted additional variance in measures of depression, anxiety, and

**Table 4a**  
Results of hierarchical multiple regression for depression.

	B	SE	Beta	t	p	$R^2$ $\Delta R^2$	Adj. $R^2$	F
Step 1						0.043	0.035	5.572*
Socio-demographic variables						0.043*		
Age	–0.166	0.191	–0.054	–0.868	0.386			
Employment status	–2.053	0.643	–0.197	–3.192	0.002			
Step 2						0.108	0.094	7.546**
Illness-related variables						0.066**		
Age	–0.157	0.185	–0.051	–0.847	0.398			
Employment status	–1.476	0.638	–0.142	–2.313	0.022			
Seizure severity	0.038	0.009	0.263	4.277	0.000			
Seizure type	0.292	0.563	0.031	0.519	0.604			
Step 3						0.446	0.435	39.942**
Self-compassion						0.338**		
Age	0.212	0.149	0.069	1.419	0.157			
Employment status	–1.200	0.504	–0.115	–2.379	0.018			
Seizure severity	0.037	0.007	0.252	5.186	0.000			
Seizure type	–0.040	0.445	–0.004	–0.089	0.929			
Self-compassion	4.231	0.344	–0.596	–12.301	0.000			

\*  $p < .01$ .  
\*\*  $p < .001$ .

**Table 4b**  
Results of hierarchical multiple regression for anxiety.

	<i>B</i>	SE	<i>Beta</i>	<i>t</i>	<i>p</i>	<i>R</i> <sup>2</sup> $\Delta R^2$	Adj. <i>R</i> <sup>2</sup>	<i>F</i>
Step 1						0.059	0.052	7.901**
Socio-demographic variables						0.059**		
Age	−0.652	0.183	−0.218	−3.561	0.000			
Employment status	−1.012	0.616	−0.101	−1.642	0.102			
Step 2						0.109	0.095	7.606**
Illness-related variables						0.050*		
Age	−0.632	0.179	−0.211	−3.529	0.000			
Employment status	−0.575	0.616	−0.057	−0.933	0.352			
Seizure severity	0.027	0.009	0.193	3.144	0.002			
Seizure type	1.233	0.543	0.136	2.269	0.024			
Step 3						0.428	0.417	37.127**
Self-compassion						0.319**		
Age	−0.285	0.147	−0.095	−1.945	0.053			
Employment status	−0.316	0.495	−0.031	−0.638	0.524			
Seizure severity	0.026	0.007	0.182	3.696	0.000			
Seizure type	0.921	0.437	0.102	2.108	0.036			
Self-compassion	−3.974	0.338	−0.579	−11.765	0.000			

\* *p* < .01.\*\* *p* < .001.

resilience when other sociodemographic and illness-related variables had been accounted for. The findings showed that self-compassion predicted additional variance in each of the three models (anxiety, depression, and resilience).

These findings may be explained in part by the protective role of self-compassion. Self-compassion can reduce self-criticism, shame, and negative self-evaluation, which PWE can experience as a result of their condition and stigmatizing attitudes they encounter [36,64,65]. People with epilepsy can experience high levels of enacted stigma, including social exclusion, negative attitudes, and discrimination [64,66]. This can be then internalized as felt stigma, which includes shame and a fear of enacted stigma [64,66], which can be accompanied by physiologic and psychological threat responses [66]. Stigma is known to be related to depression in PWE [67]. However, there is an increasing body of evidence that suggest that self-compassion can help to protect against shame and negative self-evaluation and lead to better mental health outcomes [32–34]. Thus, treating oneself with kindness, being mindful, and recognizing common humanity, which are aspects of self-compassion [26], may help self-soothing [33] and reduce threat responses and therefore, reduce felt stigma and depression.

The impact of self-compassion on depression may also be explained in part by the effect of rumination. In the general population, rumination mediates the relationship between self-compassion and depression, whereby those higher in self-compassion ruminate less and thus, experience lower depression [68]. Thus, increased self-compassion may also lead to reduced rumination and therefore, reduced depression for PWE.

The findings also indicate that higher levels of self-compassion are associated with lower levels of anxiety in this population. This partially replicates previous findings from a study of people diagnosed with social anxiety, where self-compassion was found to be lower in those with a clinical diagnosis of social anxiety disorder; lower self-compassion was also associated with greater fear of evaluation from others [69]. These findings may be explained in part by the impact of self-compassion on cognitive processing. In the general population, the relationship between self-compassion and anxiety has been shown to be mediated by positive and negative automatic thoughts [70] in one study and by worry and rumination in another [68]. Those who are high in self-compassion, experience fewer negative automatic thoughts, more positive automatic thoughts, and less rumination and

**Table 4c**  
Results of hierarchical multiple regression for resilience.

	<i>B</i>	SE	<i>Beta</i>	<i>t</i>	<i>p</i>	<i>R</i> <sup>2</sup> $\Delta R^2$	Adj. <i>R</i> <sup>2</sup>	<i>F</i>
Step 1						0.052	0.044	6.847*
Socio-demographic variables						0.052*		
Age	0.095	0.035	0.169	2.751	0.006			
Employment status	0.277	0.117	0.146	2.378	0.018			
Step 2						0.087	0.073	5.952**
Illness-related variables						0.036*		
Age	0.093	0.034	0.165	2.729	0.007			
Employment status	0.201	0.118	0.106	1.706	0.089			
Seizure severity	−0.005	0.002	−0.187	−3.008	0.003			
Seizure type	−0.111	0.104	0.065	−1.069	0.286			
Step 3						0.422	0.410	36.150**
Self-compassion						0.334**		
Age	0.026	0.028	0.047	0.947	0.345			
Employment status	0.151	0.094	0.079	1.604	0.110			
Seizure severity	−0.005	0.001	−0.176	−3.546	0.000			
Seizure type	−0.051	0.083	−0.030	−0.612	0.541			
Self-compassion	0.767	0.064	0.593	11.972	0.000			

\* *p* < .01.\*\* *p* < .001.



worry, which in turn leads to lower anxiety. Thus, a similar mechanism may be operating for PWE.

A further important finding of this study was that self-compassion predicted increased resilience. People with epilepsy typically face high levels of adversity and, therefore, resilience is likely to be valuable to protect against feelings of depression and anxiety often associated with the condition. It has been suggested that increased resilience in other populations may be explained by self-compassion acting as an adaptive emotional regulation strategy which protects against the activation of negative schemas triggered by adverse experiences [71]. Self-compassionate thoughts may also promote an acceptance of suffering as something that is universal, and people may, therefore, be less likely to attend to the negative aspects of their situation; they may instead be better able to control negative reactions to experiences that cause discomfort [72]. Self-compassion has also been shown to reduce the tendency for harsh self-criticism [73] and to increase the capacity for optimism and feelings of self-efficacy [41,74,75].

Given this is a simple cross-sectional study, all the mechanisms proposed above can only be tentatively suggested and further research would be needed to indicate the direction of these relationships and certainly some may be bidirectional. Similarly, the details of these causal mechanisms require further exploration.

#### 4.2. Limitations

The majority of the sample was recruited online and probably largely via a UK charity, thus it was not possible to verify with certainty that all respondents met the inclusion criteria. Mainly online recruitment is likely to have biased the sample, and it may not be representative of the PWE population. For example, approximately 76% of the sample was female whereas females have a marginally lower risk of developing epilepsy than males [76]. Furthermore, 73% of participants identified as White British, therefore, other ethnic backgrounds were comparatively underrepresented. Only 8.1% of participants were aged over 60 years, even though the incidence of epilepsy is higher in older adults [77], and the mode categorical age (31–50 years) was comparable with means of other studies e.g., [78,79]. Finally, the sample were highly educated (approximately 40% of participants were educated to degree level or above, with only 6% having no qualifications).

The use of self-report measures is open to bias [80] and is sensitive to culture [81]. Although the HADS has been utilized in many previous studies in epilepsy [4,8], and its use here enables comparisons with other findings, a recent study has queried its utility as a screening tool in clinical practice suggesting it may not be adequately sensitive [14] and may not capture all aspects of anxiety in PWE.

While the proportion of the sample taking medication was recorded, we did not note whether participants were taking multiple medications, which may hinder comparisons with other similar studies.

#### 4.3. Further research

This study highlights a possible link between self-compassion and better psychological outcomes in PWE which is worthy of further investigation. It could be useful to better understand how self-compassion is experienced in PWE via qualitative research, perhaps involving samples of PWE identified as being either high or low in self-compassion. This could be followed up with additional quantitative research to examine predictors of self-compassion in PWE, incorporating longitudinal methods which would allow researchers to examine causal relationships between these variables [82]. Studies in the general population are beginning to elucidate psychological mechanisms involving self-compassion which contribute to reduced distress, for example by exploring the role of rumination and negative automatic thoughts [68,70], and such studies could also be usefully replicated and extended with PWE.

While it would perhaps be premature to suggest any interventions based on the findings of this one small cross-sectional study, it is perhaps worth noting here that compassion-focused therapy has been found to reduce shame and negative self-evaluation and improve mood for those with mental health problems [38,83,84] as well as in brain injury [85] and chronic pain [86]. This therapy aims to develop self-soothing and foster self-compassion [37]. Should further work extend our study and find a protective role for self-compassion for PWE, this therapy may also be worth future exploration for this population.

#### 4.4. Conclusions

The findings of the present study suggest that self-compassion may be an important factor in determining psychological outcomes for adults with epilepsy. While sociodemographic and illness-related variables have been demonstrated here and elsewhere to contribute to the wellbeing of people in this population, the present study suggests that higher self-compassion is associated with improved psychological outcomes such as lower depression and anxiety and higher resilience. However, this study was cross-sectional, with some limitations regarding the sample, and thus, further investigation of the role of self-compassion in PWE is warranted.

#### Conflict of interest

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

#### Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

#### Acknowledgments

We would like to thank Epilepsy Action and their research network, EARN, for their invaluable support in the design and recruitment of the study. Thank you also to the staff at Salford Royal Hospital for their help with clinic recruitment. Finally, we would like to thank all participants who gave their time to take part in the study.

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