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An Association Of Social Anxiety With Emotional Regulation In Patients With Psychogenic Non-Epileptic Seizures(Pnes): A Correlation Study

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Abstract

The exploratory study aimed to examine the correlation of two variables i.e. Social Anxiety and Emotion Regulation in the patients diagnosed with psychogenic non-epileptic seizures, temporal lobe epilepsy, and social anxiety disorder using the State Social Anxiety Questionnaire (SSAQ) and State Emotional Regulation Questionnaire (SERQ), This patient group has not used this screening tool. Seventy-five patients were recruited in this study during the course of the study with their medical history, diagnosis, and encephalography. The patients were recruited from the Department of Psychiatry and Neurology – Faculty of Medicine, Menoufia University of age between 18 to 60 with an average of 31.8 and standard deviation of 10.66. Further psychological assessments were conducted for further confirmation and complaints. The participants provided their responses on the questionnaire carrying demographic information and item set of both the administrative tools. Correlation calculated through Pearson's method on patients with PNES patients was positively moderate i.e. 0.528 and patients with Temporal Lobe Epilepsy were slightly strong i.e. 0.754 similarly, patients with social anxiety disorder were positively moderate i.e. 0.547. The result analysis proved the presence of a positive moderate correlation between both the variables; Social Anxiety and Emotional Regulation in the psychogenic non-epileptic seizure patients and social anxiety disorder and slightly strong in patients with temporal lobe epilepsy. The findings suggest that psychosocial factors are more frequently linked to emotional over-control than to emotional lack of control.

Keywords: Temporal Lobe Epilepsy, Social Anxiety, Social Anxiety Disorder, Emotion Regulation, Expressive Suppression, Cognitive Appraisal, & Psychogenic Non-Epileptic Seizures (PNES).

1. Introduction

1.1. Social Anxiety

Mankind is a sociable creature by nature; in contrast, our dependence on social relationships has been demonstrated to help us live longer (Holt-Lunstad et al., 2015; Rico-Uribe et al., 2018). In social contexts, Social Anxiety (SA) is a frequent human emotion defined by an overwhelming dread of being judged by others (Morrison & Heimberg, 2013).

The methods through which an individual influence which emotions people feels when those feelings are experienced, and how those emotions are experienced and expressed have been termed as emotion regulation (Gross 1998). Social anxiety is characterized by severe discomfort in social interactions, as well as a desire to avoid such circumstances for fear of being judged by others. The range of emotions is wide, ranging from mild discomfort to functional impairment (Kollman et al., 2006; but see also Weeks et al., 2010). Social anxiety is maintained

by problems in emotion management. Emotion regulation issues modify the link between social anxiety and dissociation, making the association stronger at greater degrees of emotion regulation difficulties (Cook & Newins, 2021).

Excessive and unreasonable anxieties of unfavorable judgment by others, leading to social exclusion, classify dysfunctional social anxiety (American Psychiatric Association, 2013; Norton & Abbott, 2016). People who are socially anxious assume that negative feedback from others will reinforce their perception of themselves as faulty and imperfect (Gregory & Peters, 2017; Moskovitch, 2009).

With a lifetime prevalence rate of roughly 12 percent and a 12-month prevalence rate of approximately 7%, social anxiety disorder (SAD) is the third most common mental condition in the United States (Kessler et al., 2012; Ruscio et al, 2008). People with specific anxiety symptoms frequently avoid social or performance settings, and when they are unable to prevent them, they suffer them with severe worry and discomfort (Beidel & Turner, 2007). Folks with relatively high degrees of social anxiety are frequently unable to avoid stressful social encounters and must suffer through them in excruciating pain (Beidel & Turner, 2007). Teenagers who are at risk of becoming addicted can benefit from mindfulness-based cognitive therapy and emotion control training (Kashefinishabouri et al., 2021).

An interpersonal style defined by a fear of showing emotion is linked to social anxiety (Davila & Beck, 2002; Grant et al., 2007) and a pervasive propensity to suppress or restrict emotional expression (Kashdan & Breen, 2008; Kashdan & Steger, 2006).

1.2. Emotional Regulation

Emotion regulation is an essential aspect of socioemotional functioning. It consists of techniques that aid in the monitoring and evaluating of feelings and emotions, along with tactics for changing the strength, duration, and valence of emotions (Gross & John, 2003). People's methods, on the other hand, differ in terms of their success and impact on daily life. Individuals who crave emotional development are more likely to have more intense and long-lasting dysregulated emotions, as well as to suffer from a number of mental illnesses such as depression (CampbellSills & Barlow, 2007; Gross & Munoz, 1995), personality disorders (Putnam & Silk, 2005), and anxiety (Mennin et al., 2005).). In psychosis, persons with psychotic diseases are thought to have trouble regulating their emotions (Opoka et al., 2021).

Emotion regulation is more than a coherent system; it's an omnibus word that encompasses a slew of interconnected activities. Emotion recognition, judgment, and execution abilities are among them (Gross, 2015).

Empirical data imply that inadequate or inflexible ER is linked to the development of psychopathology, if not causative (Aldao et al., 2010). For instance, there are strong links between psychopathologies and ER complexities such as depression (Betts et al., 2009), generalized anxiety disorder (GAD) (Mennin, 2006), and social anxiety disorder (SAD) (Turk et al., 2005). Individuals who are socially apprehensive may restrict the expression of their experiences and emotions in order to avoid rejection. There is less viewable material that could be rejected by others if less emotion is exhibited (Spokas et al. 2009).

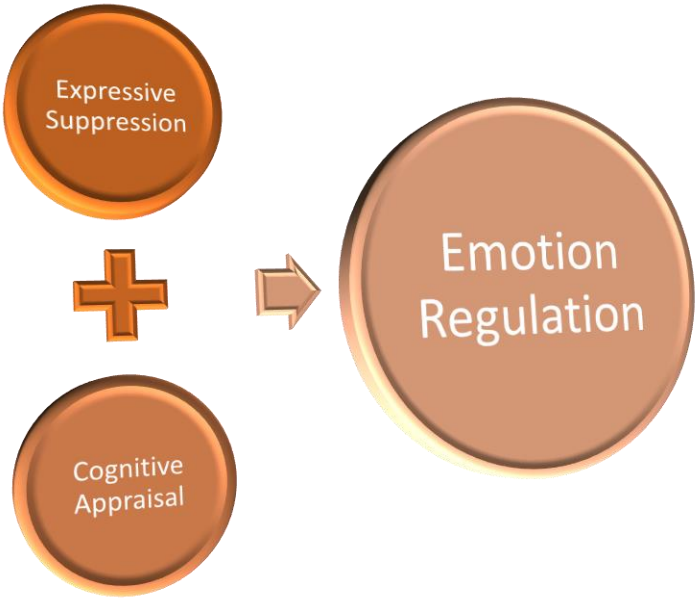

Figure. 1. Sub-Classification of Emotion-Regulation

As shown in **Figure 1.** Emotion regulation is divided into two sub classifications.

1.3. Expressive Suppression

While concerned, ES denotes the withholding of external emotional responses, such as "putting a smirk on" or wearing a "stone face" when delighted (Gross, 2014). The response modulation category of the process model of emotion regulation includes ES. Because it is often used to regulate emotion after the feeling has already been formed, it is called a response-focused method (i.e., late in the emotion generative process; Gross, 2014). ES is designed to control the external (behavioral) emotional reaction, but it may be ineffective in controlling the internal emotional response. Using ES to control negativity like melancholy or anxiety has been proven to increase the severity of negativity, whereas using ES to regulate happy emotions like happiness has been shown to reduce the intensity of pleasant emotions (Campbell-Sills et al., 2006; Gross, 2014; Gross & John, 2003; Kalokerinos et al., 2014). The cognitive effects of emotional suppression have also been demonstrated to affect learning and memory in interpersonal contacts, with more frequent emotional suppression being linked to disadvantaged social memory (Richards & Gross, 2000) and increased distraction during interactions (Butler et al., 2003).

1.4. Cognitive Reappraisal

Cognitive reappraisal denotes an attempt to alter one's assessment of a mood scenario in order to alter its psychological resonance (Gross, 2014; Gross & John, 2003). For example, if a person is apprehensive about a business meeting, he might remind himself that the meeting is "an opportunity to grow more with respect to firm," which helps motivate him to cope with some of his anxiety (Gross, 2014). CR is classified as an antecedent-focused approach in Gross's process model of emotion regulation, as it is utilized early in the emotion-generation process before the emotional response is completely triggered (Gross & John, 2003).

Emotional regulation decreases the strength of negative emotions and replaces them with even more pleasant experiences. Emotional regulation has been defined in a variety of manners. Some researchers concentrate on identifying certain regulatory skills that are lacking in clinically diagnosed illnesses (Gratz & Roemer, 2004). Yet, in terms of social anxiety, the Revised Process Paradigm of Emotion Regulation (RPMER; Gross, 2015) is the paradigm that has received the most attention (Dryman & Heimberg, 2018).

When a circumstance is assessed as directly relevant to one's aims, and emotional state is elicited. Emotions are made up of a jumble of sensory, behavioural, and physiological reactions. The ambition of being accepted by others generates anxious emotion in social anxiety. Because the person believes he or she is unable to acquire such acceptance, this desire is coupled with a dread of unfavorable appraisal. (Bates et al., 1996; Schlenker & Leary, 1982).

Adults with elevated amounts of insecurely anxious attachment have been significantly more likely than individuals with low levels of attachment anxiety to express their emotions, experience more strong emotions, and control feelings of discomfort within interpersonal interactions by using emotion-focused coping (Black et al., 2005; Grabill C. & Kems K. 2000; Safarstein et al., 2005). Such tactics only serve to exacerbate their suffering.

The capacity to control one's emotions begins in childhood and continues to grow throughout one's life (Cole et al., 2004). Emotion regulation in infants and early children is greatly impacted by direct family interaction (e.g. parents comforting their kid, however, older children rely on peer influences rather than their parents (Thompson, 1994). Children's emotion control becomes more differentiated when they reach primary school, and they gain greater abilities for applying cognitive emotion management techniques in particular (Morris et al., 2011; Thompson, 1994).

Butler et al. identified cognitive-behavioral therapy (CBT) as one of the most well-validated psychosocial therapies for psychological illnesses (Butler et al., 2006), particularly anxiety and mood disorders (Hofmann & Smits, 2008).

Recurrent, spontaneous seizures are a symptom of epilepsy, a persistent neurological illness. After headaches, epilepsy is the second most prevalent ailment seen in neurology offices (Altintas et al., 2015). Epilepsy has varying degrees of impact on not just the sufferer, but also the patient's cohabiting family. Individuals suffering from epileptic seizures report significant levels of stress, and moms of epilepsy patients frequently express sadness and decreased family activities. Social anxiety disorders must be diagnosed and treated since they can result in social impairment, loss of self-esteem, adrenergic aversion, a hampered livelihood, dread of having a seizure in public, and social stigmatization.

Because the limbic system is involved in both seizure genesis and effect and mood modulation, temporal lobe epilepsy (TLE) is traditionally thought to be a relatively distinct risk factor, particularly for affective disorders (Swinkels et al., 2006). TLE (temporal lobe epilepsy) is linked to cognitive dissonance (Oyegbile et al., 2004) and depression, social anxiety, the subjectivity of stigmatization, social isolation, and interpersonal problems are all examples of psychosocial challenges (Moore & Baker, 2002).

PNES (psychogenic non-epileptic seizures) are ictal episodes that aren't caused by epilepsy or other physiological apoplexy. Spontaneous, unexpected changes in behavior, sensations, muscle movement, mental processing, or immune modulation characterize them. In around a quarter of patients assessed at epilepsy referral centers, the diagnosis is confirmed by teleradiology (Benbadis 2004). PNES has been connected to a malfunction in the processing of emotional or behavioral discomfort on an

etiological level (La France & Barry, 2005; Baslet, 2011).

Individuals with PNES may have changes in certain areas of the brain. Emotion processing and movement control may be engaged in areas with hypo-connectivity, whereas inhibition of undesirable motions and cognitive processes may be involved in areas with hyper-connectivity (Amiri et al., 2021).

There is no specific epileptological or brain pathology profile that puts epilepsy patients at risk for more PNES. Individuals with epilepsy and PNES, on the other hand, had worse educational attainment and more mental comorbidities than patients with epilepsy alone (Liampas et al., 2021).

Positive results are linked to awareness of one's psychological response to stress, as well as patterns of emotion management. Those with PNES, on the other hand, are a diverse group with varying extents of neuropsychiatric symptoms and somatic symptoms (Baslet et al.,2010; Quinn et al., 2008). According to a new study, individuals with PNES and only patients with PNES with epilepsy are at the same risk of dying prematurely as patients with epilepsy (Nighscales et al., 2020).

Because PNES may be viewed as an externalized type of faulty emotion regulation, additional study into mood synthesis, perception, modulation, and manifestation mechanisms in PNES patients, as well as the interplay of emotion processing difficulties with other psychological variables, is clearly needed (Novakova et al., 2015). This study, therefore, aims to provide literature and statistically analyzed evidence on the association of social anxiety and emotion regulation in patients with psychogenic non-epileptic seizures (PNES). The main objective of this study is to find the relation between social anxiety and emotional regulation in psychogenic non-epileptic patients than patients with temporal lobe epilepsy and healthy patients. Based on this we proposed following hypothesis;

1. There will be a correlation between Social Anxiety and Emotion Regulation in Patients with Non-Epileptic Seizures.
2. There will be a correlation between Social Anxiety and Emotion Regulation in Patients with Temporal Lobe Epilepsy.
3. There will be a correlation between Social Anxiety and Emotion Regulation in Patients with Social Anxiety Disorder

2. Research Methodology

2.1. Subjects

The total study sample consisted of (75) participants ranging from 18-50 years. (25) of them were patients with Psychogenic Non-Epileptic patients, (25) of the participants were patients with diagnosed Temporal Lobe Epileptic patients, and the rest of (25) were patients with Social Anxiety Disorder. The patients participating in this research frequented the outpatient clinic in the Department of Psychiatry and Neurology - Faculty of Medicine, Menoufia University. The following criteria were taken into consideration in their selection:

1. Obtaining verbal consent from the epilepsy patient to participate in the treatment.
2. Diagnose the patient according to the medical history and electroencephalogram.
3. The period of illness is two years or more.
4. The frequency of seizures is 1 or more per month.
5. Educational level, diploma, or higher.
6. He does not suffer from learning difficulties, head injury, or any brain surgery to treat epileptic seizures.
7. All patients with epileptic seizures take anticonvulsants.

2.2. Design & Procedure

The cross-sectional study was conducted on the patients recruited from the Department of Psychiatry and Neurology – Faculty of Medicine, Menoufia University. Medical History was obtained from the premises and further screenings were conducted to test the presence of PNES. Drafts were provided to the participants containing enough information regarding the test. Few assessments were scheduled of the participants by the psychotherapist before the test to screen no serious mental health and psychiatric conditions. Oral and written informed consent was taken before the survey. Participants who agreed were handed over the administrative tools to read the directions and fill the document carefully.

2.3. Measures

2.3.1. Demographics

The data was collected on questionnaires completed by the participants and the referring nurse. The referral questions were obtained on the questionnaire before the subject items. Names were not collected due to confidentiality purposes. Further information like gender, age, and education was questioned in the demographics. The frequency seizures were collected on the demographic sheet as well of both PNES and Temporal Lobe Epileptic patients.

State Social Anxiety & State Emotional Regulation Questionnaire

The research instruments were combined to show that those with higher levels of dispositional social anxiety had a less positive affect and are more inclined to repress feelings. Individuals who reported feeling less socially uncomfortable were more inclined to accept emotional experiences.

A (5) point scale consisting of (7) items that measure social anxiety over one day. 0.91 is the acceptable reliability of the scale that demonstrates The State Social Anxiety Questionnaire (SSAQ) and strong convergent validity. On the other hand, a (7) point scale consisting of (8) items that measure both two factors of State Emotion Regulation Questionnaire (SERQ) i.e. emotion suppression (item 2, 4, 5, and 7) and cognitive reappraisal (item 1, 3, 6, and 8). 0.97 is the acceptable reliability of the scale that demonstrates The Emotion-Regulation.

2.4. Statistical Analyses

After the compilation of data, SPSS was used for the analysis and to see the association between Social Anxiety and Emotion Regulation. The Descriptive Method was used to analyze the average and frequency among demographic characteristics. Two-Tailed Pearson's Correlation method was run on the two variables i.e. Social Anxiety (SA) and Emotion Regulation (ER) on PNES. Linear regression was used to calculate the significance between both dependent and independent variables.

3. RESULTS

The data of a total (75) participants was recorded. 37 (n=49.3%) males and 38 (n=50.7%) of age between 18-60 (Median = 27, Interquartile Range = 10.5) were reviewed for the results. 25.3% of the patients reported seizures once a month, 37.3% of them reported once every week, 29.3% of the participants reported seizures twice a week and the rest of the 9% sample revealed seizure attacks every day.

Table. 1. Item Descriptive analysis of the variables.

Items	N	Mean	Variance	Std. Deviation

Social Anxiety				
I worried about what other people thought of me.	75	3.69	1.33	1.15
I was afraid other people noticed my shortcomings.	75	3.83	1.26	1.12
I was afraid that others did not approve of me.	75	3.49	1.53	1.24
I was worried that I would say or do the wrong things.	75	3.77	1.30	1.14
When I was talking to someone, I was worried about what they were thinking of me.	75	3.60	1.47	1.21
I felt uncomfortable and embarrassed when I was the center of attention.	75	3.85	1.46	1.21
I found it hard to interact with people.	75	3.51	1.58	1.26
Emotion Regulation				
When I wanted to feel more positive emotions (such as joy or amusement), I changed what I was thinking about.	75	3.48	1.32	1.15
I kept my emotions to myself.	75	3.75	1.39	1.18
When I wanted to feel less negative emotion (such as sadness or guilty), I changed what I was thinking about.	75	3.57	1.52	1.23
When I feel positive emotions, I was careful not to express them.	75	3.71	1.38	1.17
I controlled my emotions by not expressing them.	75	3.48	1.61	1.27
I controlled my emotions by changing the way I thought about the situation I was in.	75	3.43	1.55	1.25
When I was feeling negative emotions, I made sure not to express them.	75	3.49	1.56	1.25
When I wanted to feel less negative emotion, I changed the way I was thinking about the situation.	75	3.51	1.42	1.19

Table 1. shows the frequency of the items of both variables in the study. A total of 75 responses were collected in every item of the study. None of the items were left undone with a total average of 3.16 of every item.

Table 2. shows the correlation calculated using Bivariate Pearson's method between Social Anxiety and Emotion Regulation in patients with psychogenic non-epileptic seizures is 0.528, which is considered to be positively moderate. The resulting digit shows that there is a positive moderate relationship between the two variables i.e. Social Anxiety and Emotion regulation in the patients with psychogenic non-epileptic seizures. In patients with Temporal Lobe Epilepsy, the correlation calculated between social anxiety and emotion regulation is 0.754, which is considered to be slightly strong. Hence, there is a positively strong relationship between Social Anxiety and Emotion Regulation in Patients with Temporal Lobe Epilepsy. Similarly, Bivariate Pearson's correlation coefficient resulted in Patients with Social Anxiety Disorder being 0.547. There is a positive moderate relationship between Social Anxiety and Emotion Regulation between patients with Social Anxiety Disorder.

Table. 2. Bivariate Correlation between Social Anxiety (SSAQ) and Emotion Regulation (SERQ) in Patients with Psychogenic Non-Epileptic Seizures (PNES), Temporal Lobe Epilepsy (TLE), & Social Anxiety Doctor (SAD).

Variables	n	Mean	Std. Dev	1	2	3	4	5
Social Anxiety in PNES patients	25	3.5886	.93161					
Emotion Regulation in PNES patients	25	3.4300	.95612	**0.528**				
Social Anxiety in TLE patients	25	3.4229	.73480	-0.007	-0.186			
Emotion Regulation in TLE patients	25	3.4050	.70275	-0.053	-0.191	**0.754**		
Social Anxiety in SAD patients	25	4.0229	.88610	-0.015	-0.175	-0.017	-0.044	
Emotion Regulation in SAD patients	25	3.8200	.77062	0.016	0.036	0.174	0.128	**0.547**

All values are standardized. All bold values are statistically standardized (*$\rho < 0.01$).

4. DISCUSSION

The aim of the study was to check the relationship between social anxiety and emotion regulation in patients diagnosed with non-epileptic seizures, Temporal Lobe Epilepsy, and Social Anxiety Disorder. The results support the hypothesis of the study. the correlation calculated between both variables shows moderate and strong relation positively. People with high levels of social anxiety have their social lives influenced by emotion control tactics. We discovered that social anxiety affects the frequency, kind, and consequences of reported emotion management techniques using a continuous process-oriented approach. Positive suppression was used more frequently by those with high levels of social anxiety, and it resulted in less strong pleasant feelings and somewhat less positive social engagements (Farmer et al., 2012).

People with high levels of social anxiety did not benefit from the cognitive reappraisal method, which is a general adaptive emotion control strategy. Individuals with poor social anxiety had a spillover advantage of less negative social experiences on days after using cognitive reappraisal to relieve discomfort; on the other hand, people with high social anxiety had equal levels of negative social events regardless of whether they used cognitive reappraisal. This disparity might be attributable to a lack of expertise in successfully executing the strategy or a biomedical variation in how the brain reacts to societal stressors (Goldin, Manber-Ball, et al., 2009; Goldin, Manber, et al., 2009).

Individuals who are socially anxious have problematic attitudes about emotional display. Those with high levels of social anxiety, in particular, agreed that it is critical to keep emotional responses under control, that social ostracization is a result of emotional responses, and that exposing one's feelings is a sign of weakness. Given the evidence that emotional repression is linked to weaker relationships, these ideas are perplexing (e.g., Gross & John, 2003). Furthermore, believing that controlling one's emotions is vital and that emotional outpouring is a sign of weakness helps to explain the link

between social anxiety and emotional repression (Spokas et al., 2009).

Patients with PNES had a favorable relationship with self-reported seizure severity. The degree to which individuals are upset by their seizures is similarly linked to their beliefs about emotions. This is in line with prior research that found a link between high seizure frequency, somatic symptoms, and related complications (Ruber et al., 2003). The present study's findings also demonstrated that the amount to which patients with PNES managed their emotions was much stronger than in the control condition, corroborating prior findings (Robert et al., 2012; Prigatano et al., 2009). Patients with PNES are more likely to report physical symptoms than stress or psychological reasons, according to literature (Stone et al., 2004).

Patients with PNES have a strong inclination to conceal emotions and avoid circumstances that may elicit them, as do patients with other psychosomatic diseases such as pain. Despite their best attempts, they occasionally encounter emotions that are overwhelming and uncontrolled. This shows that the dread of unbearable feelings may be at the root of the desire to avoid experiencing and processing them, and that, on the other hand, emotions that are not confronted, identified, and processed may pile up until they are uncontrolled (Novakova et al., 2015).

The development of anxiety disorders and the activation of neurotransmitter pathways in epilepsy patients may be influenced by a number of variables. Problems with employment and stigmatization, a loss of self-esteem, overprotective family behavior, and conditioning from previous encounters with sudden seizures (Gaitatzis et al., 2015).

5. Conclusion

Finally, this research found a modest link between social anxiety and emotion control in patients. Patients with PNES have impaired emotion processing, which is linked to emotional discomfort, a negative perception of their condition, and a higher number and intensity of somatic complaints in addition to seizures. Social anxiety is favorably related to emotion regulation in individuals with PNES, but emotion processing deficiencies were substantially associated with decreased mental health efficiency. The data imply that psychosocial variables are most often related to over-control of emotions rather than a lack of control of emotions. Patients with epilepsy and their families had greater levels of anxiety than healthy control people, according to research (Altintas et al., 2015). Humans stress the need of recognizing and treating these groups in order to avoid them from becoming marginalized in societal structure. Apart from our study, previous research has primarily focused on epilepsy patients; thus, future research including diverse categories of relatives and more participants will give more definitive evidence on anxiety in epilepsy healthcare practitioners.

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None

8. Conflicts of interest

The authors declare that no conflicts of interest related to that work

9. Consent for publication

All authors accept the final version submitted to the journal.

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