

# Navigating Social Phobia And Emotional Regulation In Patients Afflicted By Psychogenic Non-Epileptic Seizures (PNES) And Temporal Lobe Epilepsy: An In-Depth Exploration

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## Summary:

*The aim of this research was to explore the link between social anxiety and the challenge of managing emotions in individuals diagnosed with psychogenic non-epileptic seizures (PNES) and temporal lobe epilepsy (TLE), employing the State Social Phobia Questionnaire (SSAQ) and the State Emotional Regulation Questionnaire (SERQ). This approach to screening had not previously been applied to such patient groups. The study comprised fifty participants, whose inclusion was based on a review of their medical records, diagnoses, and EEG results. These individuals were recruited from the Psychiatry and Neurology Department of the School of Medicine at Menoufia University. The average age of the participants was 31.8, with a standard deviation of 10.66, among the total group (n=50), divided between 22 individuals with TLE and 28 with PNES, with their ages ranging from 18 to 50. Additional psychological assessments were conducted to confirm and address the issues identified. The participants completed questionnaires that collected demographic information and responses to items from both assessment tools. Analysis using Pearson's method identified a moderately significant relationship ( $r = 0.528$ ) between those with PNES and TLE patients ( $r = 0.754$ ). Likewise, a positive relationship was observed between social anxiety and emotion regulation among both groups, indicating that psychological and social factors are more closely linked to the control of emotions rather than a lack of such control.*

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

## Introduction:

Epilepsy is characterized by uncontrollable seizures, marking it as a common and debilitating neurological condition (Novakova et al., 2015). <sup>1</sup>Although 65% of those with epilepsy manage to control their seizures with ongoing antiepileptic medication, a third of sufferers find no relief from these treatments (Bewley et al., 2005). The impact of seizures on quality of life is overshadowed by psychosocial challenges like loneliness, depression, and anxiety once seizure control is achieved (Myers et al., 2013).

Psychogenic non-epileptic seizures (PNES) are characterized by involuntary reactions to stimuli that mimic epileptic seizures without the abnormal EEG activity seen in epilepsy (Reuber & Brown, 2017). The DSM-5 lists PNES within the conversion disorder spectrum,

highlighting its association with somatic symptom disorders (American Psychiatric Association, 2013).

Despite their relatively low incidence rate in the general population (approximately 33 out of every 100,000 people), PNES represent a significant health issue, incurring costs for individuals, healthcare systems, and society at large that are on par with those associated with epilepsy (Szaflarski et al., 2018). Individuals with PNES are more prone to have histories of abuse, trauma, and stress when compared to those with epileptic seizures or the general population (Myers et al., 2019).

These individuals often experience numerous negative life events, tend to perceive such events as highly stressful, are more likely to engage in maladaptive thinking and rumination about stress, have an increased likelihood of stress-related illness, face more social pressures, have heightened health-related anxiety (particularly among men), and less perceived parental support (reflected in insecure or disorganized attachment styles).

Links between stress, anxiety, challenges in managing emotions and cognitive functions, and experiences of neglect and abuse are well documented (Kozłowska et al., 2015). The limbic system's critical role in both seizure generation in temporal lobe epilepsy (TLE) and in mood and affect regulation positions TLE as a unique risk factor for mood disorders. Studies indicate that individuals with TLE are at a higher risk of developing psychiatric conditions compared to those with other forms of epilepsy (Quiske et al., 2000). Temporal lobe epilepsy (TLE), particularly its subtype mesial temporal lobe epilepsy (MTLE), often responds poorly to antiepileptic drugs (AEDs), especially in cases involving mesial temporal sclerosis (MTS) (Engel et al., 1997; Bertram, 2009). The term "limbic epilepsy" is preferred by some researchers to emphasize the systemic nature of MTLE over its structural aspects.

Social phobia, or the persistent fear of social interaction due to the anticipation of being negatively evaluated by others, can significantly affect one's life, causing them to avoid or endure social situations with intense anxiety (Gross, 1998; Cook & Newins, 2021). Research shows that epilepsy can affect not just the individual but also their family members, with evidence suggesting higher levels of depression and anxiety among family members compared to the general population (Altintas et al., 2015).

The relationship between social anxiety and emotional expression, where those with social anxiety may fear negative evaluation and thus limit their emotional expression, underscores the complexity of social anxiety disorder (SAD). SAD, one of the most common mental health conditions in the U.S., affects approximately 12% of the population at some point in their lives, manifesting as a significant fear of social interactions or performances (Kessler et al., 2012; Beidel & Turner, 2007).

### *1.1. Emotional Regulation*

Emotional regulation is the process of controlling one's emotional responses so that they are appropriate for social situations and productive in dealing with one's experiences. Emotion regulation is the use of both automatic and deliberate processes to modify components of emotional experience or behavior. Many theories of PNES and many theories of conversion and dissociation include emotional regulation as a key component, if not a stated one (Roberts & Reube.,2014). Emotional dysregulation is associated with a wide range of pathologies in the mind. Few studies have examined how people with PNES take in and make sense of emotional data. Although individuals with PNES show better conscious awareness during their seizures than epilepsy patients, both impaired awareness and poor self-control are hallmarks of most PNESs. Little is known about the neurobiology of PNES or the awareness shifts that accompany it. Emotion processing, such as knowing the sensory, situational, and emotional stimuli of PNES; knowing the emotional and physiological changes during attacks; and knowing the emotional reaction patterns and organizational ability, could help explain the discrepancies between the subjective impairment of consciousness and the lack of objective neurobiological changes in PNES (Roberts & Reube.,2014). The purpose of this research (Krámská, Hřeková, Vojtchb, Krámská, & Myers.,2020) was to examine the prevalence of maladaptive emotional regulation in people with PNES vs healthy volunteers. Patients were evaluated while staying at the Epilepsy Center at the Na Homolce Hospital in Prague (N=64; F:M 52:12; mean age 35.5%; duration > 2 years). Normal electroencephalogram results, regular seizure capture, suggestive seizure provocation, cognitive evaluation, and patient history all contributed to the diagnosis of PNES. To complement the clinical sample, healthy volunteers (N=64; F:M 52:12; mean age 35.8 years) were also analyzed. The Czech research versions of the ASQ and DERS were used to examine the existence of maladaptive emotional regulation. Conclusions Patients with PNES exhibited more severe deficits in emotion regulation compared to a healthy control group. However, the effectiveness and relevance of people's approaches vary. People who have a strong need for personal growth are more likely to experience intense and long-lasting dysregulated emotions and a variety of mental health issues, including depression (CampbellSills & Barlow, 2007; Gross & Munoz, 1995), personality disorders (Putnam & Silk, 2005), and anxiety (Putnam & Silk, 2005). (Mennin., Heimberg., Turk, & Fresco, 2005). It is believed that people with psychotic disorders have difficulty maintaining emotional stability (Opoka Sundag., Riehle., & Lincoln., 2021). The term "emotion regulation" refers to more than just one unified process; it's a catchall term for a wide range of related behaviors. Skills in emotional awareness, evaluation, and action are only a few examples (Gross, 2015). Research suggests that poor or inflexible ER is associated with, if not causal of, the development of psychopathology (Aldao et al., 2010). Depression (Betts et al., 2009), generalized anxiety disorder (GAD) (Mennin, 2006), and social anxiety disorder (SAD) are just a few examples of psychopathologies that have been linked to ER complexity (Turk et al., 2005). Individuals who are socially hesitant may limit the expression of their experiences and feelings in order to prevent rejection. A lack of emotional display makes for less content that might be rejected by others. Authors: Spokas, Luterek, and Heimberg Year: 2009).

emotions Regulating involves adjusting how we react emotionally to better fit social contexts and effectively manage our experiences. It encompasses both unconscious and intentional strategies to alter aspects of our emotional state or actions. Emotional regulation is considered a crucial element in various theories related to psychogenic non-epileptic seizures (PNES) as well as theories on conversion and dissociation. Emotional dysregulation is linked to a broad spectrum of psychological issues. The way individuals with PNES perceive and process emotional information has not been extensively studied. Notably, those with PNES may demonstrate greater conscious awareness during their episodes compared to those with epilepsy, yet challenges with awareness and self-regulation are common traits in PNES. The underlying neurobiology and shifts in awareness associated with PNES remain largely unexplored. Understanding the sensory, contextual, and emotional triggers of PNES, along with the emotional and physiological changes during episodes, and patterns of emotional responses, could clarify why subjective

experiences of altered consciousness don't align with observable neurobiological changes (Roberts & Reube, 2014).

This study aimed to assess the frequency of unhelpful emotional regulation strategies among individuals with PNES versus healthy subjects. The assessment took place at the Epilepsy Center at Na Homolce Hospital in Prague, involving 64 participants (52 women and 12 men, average age 35.5 years, with conditions lasting over two years), diagnosed with PNES based on normal EEG readings, seizure monitoring, provocation tests, cognitive assessments, and medical histories. Additionally, 64 healthy volunteers (52 women and 12 men, average age 35.8 years) were evaluated for comparison. The Czech versions of the ASQ and DERS scales were utilized to identify maladaptive emotional regulation strategies. The findings indicated that those with PNES had significantly more issues with emotional regulation than the control group.

However, the success and applicability of emotional regulation strategies can differ greatly among individuals. Those with a strong inclination toward self-improvement may face prolonged periods of emotional instability and a range of psychological conditions, including depression, personality disorders, and anxiety. This instability is notably prevalent among individuals with psychotic disorders, who often struggle to maintain emotional equilibrium (Opoka Sundag, Riehle, & Lincoln, 2021).

Emotion regulation encompasses a broad array of related actions beyond a single process, including skills in recognizing, evaluating, and managing emotions (Gross, 2015). Evidence suggests that ineffective or rigid emotion regulation strategies may contribute to or cause various mental health conditions, such as depression, generalized anxiety disorder (GAD), and social anxiety disorder (SAD). Those with social reticence might suppress their emotional expressions to avoid rejection, reducing the likelihood of negative feedback from others (Spokas, Luterek, & Heimberg, 2009).

### *1.2. Expressive Suppression*

During times of anxiety, expressive suppression (ES) involves concealing one's emotional expressions, such as forcing a smile or maintaining a neutral facial expression to conceal feelings of joy. Within the framework of emotion regulation theory, ES is identified as a method of modulating responses. This technique is described as being focused on responses, as it is typically employed to manage emotions that have already fully developed, thus occurring later in the emotion generation process. While the primary aim of ES is to control the external manifestation of emotions, its efficacy in adjusting internal emotional states is questionable. Utilizing ES to diminish negative emotions such as sadness or anxiety can actually intensify

these feelings. Conversely, when used to reduce positive emotions, the result can often be a diminution of their strength. Additionally, the act of suppressing emotions has been found to adversely affect learning and memory in social contexts, with an increased propensity for emotional suppression linked to poorer social recall and heightened distractibility during social interactions.

### 1.3. Cognitive Reappraisal

Cognitive reappraisal involves actively changing one's interpretation of an emotional situation to modify its emotional impact (Gross, 2014; Gross & John, 2003). For instance, if an individual feels anxious about an upcoming business meeting, reminding themselves that the meeting presents an opportunity for professional growth can help mitigate some of their anxiety (Gross, 2014). This strategy, identified as an antecedent-focused technique within Gross's model of emotion regulation, is applied before the full emotional response has developed, aiming to influence emotional experience from the onset (Gross & John, 2003).

Emotion management reduces the intensity of negative emotions and fosters the generation of more positive feelings. Various methods have been outlined for emotion regulation, with certain studies focusing on identifying essential regulatory skills missing in recognized clinical disorders (Gratz & Roemer, 2004). The Revised Process Model of Emotion Regulation (RPMER; Gross, 2015) has particularly drawn attention in relation to social anxiety (Dryman & Heimberg, 2018).

Emotional responses are triggered when a situation is perceived as relevant to one's goals, encompassing a combination of sensory, behavioral, and physiological components. The desire for social acceptance can provoke anxiety in those with social anxiety disorder, stemming from a fear of negative evaluation due to perceived inability to secure approval (Bates et al., 1996; Schlenker & Leary, 1982).

Adults with a high level of insecure-anxious attachment are more inclined to exhibit their emotions, experience intensified feelings, and employ emotion-focused coping strategies to manage discomfort within interpersonal relationships, compared to those with lower levels of attachment anxiety (Black et al., 2005; Grabill & Kerns, 2000; Saffran et al., 2005). Such strategies tend to exacerbate distress.

The capacity for emotion regulation develops early in life and continues to evolve, significantly influenced by direct familial interactions in infancy (e.g., parental comforting). As children age, peer influences become more crucial than parental influence (Thompson, 1994). During elementary school, children gain more sophisticated emotion regulation strategies, particularly cognitive strategies (Morris et al., 2011; Thompson, 1994). Cognitive-Behavioral Therapy (CBT) is recognized as one of the most validated psychosocial treatments for psychological conditions, especially for anxiety and mood disorders (Butler et al., 2006; Hofmann & Smits, 2008).

Epilepsy, characterized by recurrent spontaneous seizures, is a chronic neurological condition second only to headaches in prevalence within neurology clinics (Altintas et al., 2015). The condition affects not just the individual but also their family, leading to significant stress for those with epilepsy and emotional despair among their family members. Addressing social anxiety disorders is crucial as they can lead to social impairment, lowered self-esteem, lifestyle limitations, public seizure fears, and stigmatization.

Temporal lobe epilepsy (TLE) is considered a distinct risk factor for affective disorders due to the involvement of the limbic system in both seizure genesis and mood regulation (Swinkels et al., 2006). TLE is linked to cognitive dissonance and presents various psychosocial challenges, such as depression, social anxiety, perceived stigmatization, and social isolation (Moore & Baker, 2002).

Psychogenic non-epileptic seizures (PNES) are episodes not caused by epilepsy or other physiological conditions, marked by spontaneous and unpredictable changes in behavior, sensations, muscle activity, cognitive function, or immune response. These seizures, diagnosed in about a quarter of patients at epilepsy referral centers through video-EEG monitoring, are thought to stem from maladaptive emotional or behavioral processing (Benbadis, 2004; La France & Barry, 2005; Baslet, 2011).

Individuals with PNES might exhibit anomalies in specific brain areas related to emotion processing and movement control, with underconnectivity in some regions and overconnectivity in others affecting the suppression of unwanted movements and cognitive processing (Amiri et al., 2021).

Epilepsy and PNES patients show differences in educational achievement and mental health comorbidities, indicating a need for understanding the role of emotion regulation in PNES. Given PNES can reflect dysfunctional emotion regulation, further investigation into emotional processing, regulation mechanisms, and their interaction with psychological factors is essential (Novakova et al., 2015). This study aims to provide insights and data on the relationship between social anxiety and emotion regulation in people with PNES. The major purpose of this research is to determine the association between social anxiety and emotional control in psychogenic non-epileptic patients than patients with temporal lobe epilepsy and healthy people. Based on this we offered following hypothesis;

1. There will be a relationship between Emotion Regulation and Social phobia in Patients with psychogenic non-epileptic seizures.
2. There will be a relationship between Emotion Regulation and Social phobia in Patients with Temporal Lobe Epilepsy.

## **2. Research Methodology**

### **2.1. Subjects**

The study included fifty participants aged between 18 and 50. Among these, 28 were identified with psychogenic non-epileptic seizures, comprising 16 males and 12 females. Additionally, 22 participants were diagnosed with temporal lobe epilepsy, with a demographic breakdown of 5 males and 17 females. Regular visits and evaluations were conducted at the outpatient clinic associated with the Department of Psychiatry and Neurology, Faculty of Medicine, Menoufia University. Diagnosis was confirmed through a review of medical histories and EEG analyses, revealing distinct patterns in those with temporal lobe epilepsy and those displaying psychogenic non-epileptic seizures, which mimicked epileptic seizure symptoms. For epileptic patients, antiepileptic medications were prescribed. Selection criteria for inclusion in the epileptic group included:

1. Receiving oral consent from the patient with epilepsy for participation.
2. Diagnosis based on medical history and EEG findings.
3. A minimum illness duration of two years.

4. At least one seizure per month.
5. A minimum education level of a diploma.
6. Absence of learning disabilities, head injuries, or any neurosurgical interventions for epilepsy.

## 2.2. Design & Procedure

Research participants were enlisted from the Psychiatry and Neurology Department at the Faculty of Medicine, Menoufia University. This investigation adopted a cross-sectional design. Comprehensive medical records were compiled, alongside additional evaluations to ascertain the presence of PNES and temporal lobe epilepsy. Test outlines, replete with detailed examination guidelines, were distributed to the candidates. To confirm the absence of significant mental or psychiatric conditions, the psychotherapist arranged preliminary assessments for the participants. Consent was verbally secured from each participant following a thorough briefing. Those who agreed to partake were equipped with the necessary administrative materials to accurately complete the questionnaire and adhere to the provided instructions..

## 2.3. Assessment Tools

2.3.1. Participant Demographics Information was collected through questionnaires completed by the participants and the referring nurse. Initial sections of the questionnaire addressed referral-related inquiries before moving to topic-specific questions. Anonymity was preserved by not collecting names. The demographic questionnaire sought additional details, such as gender, age, and education level. The frequency of seizures was noted for individuals identified with PNES and Temporal Lobe Epilepsy on this form.

Statewide Survey on Social Anxiety and Emotional Regulation Aggregated study outcomes indicated that individuals with higher innate levels of social phobia exhibited reduced positive emotions and a higher inclination towards emotion suppression. Conversely, those reporting lesser social discomfort showed a greater willingness to confront emotionally challenging situations. The assessment utilized a five-point scale with seven items to gauge social phobia within a single day, achieving a reliability score of 0.91, confirming the State Social Phobia Questionnaire (SSAQ)'s reliability and strong validity. Additionally, a seven-point scale with eight items assessed emotion suppression (items 2, 4, 5, and 7) and cognitive reappraisal (items 1, 3, 6, and 8), showing a reliability score of 0.97, affirming the reliability of the State Emotion Regulation Questionnaire (SERQ).

2.4. Data Analysis Complete data collection was followed by analysis using SPSS to explore the potential correlation between social anxiety and emotion regulation. The descriptive analysis technique was employed to examine demographic data averages and distributions. The Pearson's Correlation method, applying a Two-Tailed approach for PNES, was utilized to investigate the relationship between social anxiety (SA) and emotion regulation (ER), determining the significance of these correlations through linear regression analysis.

## 3. RESULTS

Data was collected from all 50 participants. The participant group consisted of 21 males (49.3%) and 29 females (50.7%), ranging in age from 18 to 50 years (median age = 27,

interquartile range = 10.5). Among them, 25.3% experienced seizures monthly, 37.3% weekly, 29.3% twice a week, and 9% reported daily seizures.

Table 1: Descriptive Analysis of Variables

<b>Variables</b>	<b>Count</b>	<b>Average</b>	<b>Variance</b>	<b>Standard Deviation</b>
<b>Emotion Regulation</b>				
Altering thoughts for more positive feelings	50	3.48	1.32	1.15
Retaining emotions privately	50	3.75	1.39	1.18
Modifying thoughts to reduce negative feelings	50	3.57	1.52	1.23
Being cautious in expressing positive emotions	50	3.71	1.38	1.17
Managing emotions through non-expression	50	3.48	1.61	1.27
Adjusting thoughts to control emotions	50	3.43	1.55	1.25
Ensuring negative emotions are not expressed	50	3.49	1.56	1.25
Changing thoughts to lessen negative emotions	50	3.51	1.42	1.19
<b>Social Phobia</b>				
Concern over others' perceptions	50	3.69	1.33	1.15
Fear of others noticing flaws	50	3.83	1.26	1.12
Fear of disapproval by others	50	3.49	1.53	1.24
Anxiety about saying or doing the wrong thing	50	3.77	1.30	1.14
Concern over others' thoughts during conversations	50	3.60	1.47	1.21
Discomfort being the focus of attention	50	3.85	1.46	1.21
Difficulty in social interactions	50	3.51	1.58	1.26

The data analysis revealed that all items were adequately addressed by participants, with a cumulative average score of 3.16 for each item, indicating comprehensive engagement with the study's components.

Table 2: Correlation Analysis

A moderate to strong positive correlation was identified between social phobia and emotion regulation among patients. Specifically, for those with psychogenic non-epileptic seizures (PNES), the correlation was found to be moderately positive at 0.528. Conversely, the relationship between social anxiety and emotion regulation in patients with temporal lobe epilepsy (TLE) was stronger, with a correlation coefficient of 0.754. This signifies a



noteworthy positive link, illustrating that individuals with TLE demonstrate a significant relationship between social phobia and their capacity to regulate emotions.

<b>Variable Comparison</b>	<b>n</b>	<b>Average</b>	<b>Standard Deviation</b>	<b>Correlation Coefficients</b>
Social Phobia in PNES	28	3.5886	.93161	—
Emotion Regulation in PNES	28	3.4300	.95612	0.528
Social Phobia in TLE	22	3.4229	.73480	—
Emotion Regulation in TLE	22	3.4050	.70275	0.754

Correlation values are given a significant level of consideration, with bold values indicating statistical significance (\*p < 0.01).

#### 4. DISCUSSION

This study aims to explore the potential association between social phobia and emotion regulation abilities in individuals diagnosed with PNES (Psychogenic Non-Epileptic Seizures) and TLE (Temporal Lobe Epilepsy). Our results lend support to the hypothesis that informed our investigation, indicating a moderate to strong positive link between social phobia and emotion regulation. We observed that emotion management tactics significantly influence the social interactions of individuals experiencing high social phobia levels. Our methodology, focused on a continuous process, led us to understand that social phobia influences the frequency, type, and impact of reported emotion management strategies. Individuals with elevated social anxiety levels tended to adopt positive suppression more frequently, resulting in diminished joy and less favorable social engagements. Conversely, those unaffected by social phobia engaged in positive suppression less frequently.

For individuals with significant social anxiety, the general adaptive strategy of cognitive reappraisal did not offer the expected relief, likely due to its lack of specificity to their needs. Those with minimal social anxiety noted fewer negative social encounters after employing cognitive reappraisal to alleviate distress. However, those with intense social anxiety reported no change in the frequency of negative social interactions, whether or not they practiced cognitive reappraisal. This discrepancy may stem from an inability to implement the strategy effectively or from inherent biological or genetic differences in responding to social stressors.

Furthermore, individuals with PNES demonstrated a direct link between the severity of self-reported seizures and their emotional distress levels, supporting previous findings of a connection between frequent seizures, physical symptoms, and related challenges. The study revealed that PNES patients engaged in more extensive emotion regulation than the control group, affirming previous research. It has been noted that PNES sufferers are more prone to attribute their physical symptoms to stress or psychological factors rather than physiological causes.

Moreover, individuals with PNES and those with other psychosomatic issues, like chronic pain, often suppress emotions and avoid triggering situations. This avoidance suggests that an

underlying fear of unmanageable emotions drives the suppression and lack of processing, leading to unaddressed emotions accumulating to unmanageable levels.

Lastly, the development of anxiety disorders and the activation of epilepsy-related neurotransmitter pathways may be influenced by various factors, including employment challenges, societal stigma, reduced self-esteem, familial overprotection, and the conditioning effects of unexpected seizures.

## 5. Conclusion

In conclusion, our research highlighted a fragile link between social phobia and the capability of patients to regulate their emotions effectively. Individuals diagnosed with Psychogenic Non-Epileptic Seizures (PNES) demonstrate challenges in processing emotions, leading to heightened emotional distress, negative views about their condition, and an increased number of physical complaints alongside seizures, with these complaints often being more severe. A notable positive relationship was observed between social anxiety and emotional regulation capabilities in people with PNES. Moreover, difficulties in managing emotions were significantly linked to reduced well-being. Our findings suggest that issues related to psychosocial well-being are frequently connected to overly stringent emotional control rather than a lack thereof. Research indicates that individuals with epilepsy, along with their families, tend to experience elevated levels of anxiety compared to the general population (Altintas et al., 2015), underlining the importance of recognizing and addressing the needs of these groups to avoid societal exclusion. While existing research has largely focused on individuals with epilepsy, future studies incorporating a broader spectrum of epilepsy patients' families and a larger participant base are essential for a more comprehensive understanding of the anxiety experienced by those involved in epilepsy care.

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

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