

Psychogenic Nonepileptic Seizures and Psychosocial Management: A Narrative Review

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Abstract

Psychogenic non-epileptic seizure (PNES) is a common disorder that imitates epileptic seizures and has its etiological roots in psychological distress. Due to its “epileptic” similarity, it is often dealt with not only by mental health professionals but also by physicians, pediatricians and neurologists. There is a growing consensus towards the psychotherapeutic treatment of the disorder, albeit a lack of clarity in choosing a gold-standard approach. This paper seeks to serve as a compendium of different psychotherapeutic approaches and their efficacy in the management of PNES. The paper employed the search strategy by selecting the keywords: “Psychogenic Non-Epileptic Seizures (PNES) and psychosocial management”, “PNES Treatment approach”, “PNES and psychotherapy” in PUBMED, EBSCO host, PsycINFO, and SCOPUS database. Eventually, specific therapies were cross-searched with PNES for an exhaustive review. Several studies were found employing various psychotherapeutic approaches for the treatment of PNES in pilot studies, randomized controlled, or open uncontrolled trials. Cognitive Behavior Therapy was demonstrated as an efficacious treatment for PNES in a randomized controlled trial (RCT). Other approaches that were effective in ameliorating the symptoms were psychodynamic therapies or psychoeducation based group therapies. Some therapies like Novel Integrative psychotherapy, Eye Movement Desensitisation Therapy and Mindfulness-based therapies require further exploration in larger clinical trials. The findings demonstrate that psychological intervention for PNES is a promising alternative treatment approach with a need for more RCTs with a larger sample and robust methodology for better generalization.

Keywords: Cognitive behavior therapy, mindfulness-based therapy, PNES

INTRODUCTION

A paroxysmal event, inclusive of minor or major movements or lapses in attention, that is not an outcome of an epileptic disorder can be designated a non-epileptic seizure (NES).^[1] An event that is a somatic manifestation of psychological origin is denoted as a psychogenic non-epileptic seizure (PNES). In other words, PNES mimics epileptic seizures in “movement, sensation, or behavior” but is the result of underlying psychological distress rather than abnormal cortical discharges.^[2] The usage of the term PNES was unanimously approved by the international community in 2012 over the formerly used term “pseudoseizure” which was perceived as inappropriate and offensive.^[3] PNES was ranked among the top three neuropsychiatric disorders in an international consensus clinical practice statement issued in 2011.^[4] Around 25% of patients referred to epilepsy centers are likely to be diagnosed as PNES.^[5] Among them, 10–23% of children and around 20–40% of adult patients have a diagnosis of PNES. The prevalence range of PNES is 2–33/100,000 and the incidence is 1.4–4.9 cases/100,000 people per year. However, approximately 5 to 50% of patients diagnosed with PNES have comorbid epilepsy.^[6,7] A high proportion of patients i.e., approximately 75% with PNES are young adult women. PNES are rare under 6 and after 50 years of age. Unlike adults, female preponderance is typically not found in children.^[8]

SEARCH METHODOLOGY

The current study employed the search strategy by selecting the keywords “Psychogenic Non-Epileptic Seizures (PNES) and psychosocial management”, “PNES Treatment approach”, “PNES and psychotherapy” in PUBMED, EBSCO host, PsycINFO, and SCOPUS database. Eventually, specific therapies such as ‘Cognitive Behavior Therapy’, ‘Mindfulness-based Therapy’, ‘Novel Integrative psychotherapy’, ‘Eye Movement Desensitisation Therapy’ etc., were cross-searched with “PNES” for an exhaustive review.

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DIAGNOSTIC ISSUES

There is lack of consensus on diagnostic criteria and definition for PNES among the international community. The reason for this variation is due to the presumed causal relationship between psychosocial factors and precipitation of the disease. Some clinicians do not consider PNES as a primary disease, but a representation of dissociative symptoms. In fact, some patients with PNES may be diagnosed with a conversion disorder. PNES can be conceptualized as a biopsychosocial disorder.^[1] Stress, conversion, and dissociation are commonly considered the underlying psychopathological mechanisms precipitating the episodes. Epilepsy can also function as a risk factor in the development of PNES because the exposure to epileptic seizures may provide an opportunity for vicarious learning.^[9] As it is challenging to clinically differentiate PNES from epilepsy, misdiagnosis is common. Hence, video-EEG (VEEG) monitoring with ictal recording is considered the most accurate test for the diagnosis of PNES.^[10] PNES was recognized as a disorder in medical literature as early as the 1700s. In the 1980s, major diagnostic advances began with the advent of VEEG monitoring. Regardless of this, treatment of PNES has lagged significantly. Also, the lack of ownership of PNES by psychiatrists and other mental health professionals has been a major contributing factor for the dearth of research studies focused on psychological therapies and advances. PNES is often referred to as a borderland disorder by clinicians.^[11]

Research suggests that prognosis for people with PNES is poor as the diagnosis is primarily focused on the distinction of epileptic from nonepileptic seizures, and subsequently, PNES is considered a “benign” condition. The diagnosis of PNES is often surrounded by stigma along with poor understanding, knowledge, and care for the condition.^[12] Hence, patients may not be referred to mental health services.^[13] In a study by Reuber *et al.*, 71% of patients continued to have seizures for more than four years beyond PNES diagnosis, and nearly half of those seizure-free continued to experience other psychiatric conditions such as somatization, dissociation or personality disorders.^[14] Hence, remission of seizures does not definitively signify a favorable medical or psychosocial outcome.^[14] Schmutz *et al.* have suggested that PNES should be considered as a psychiatric symptom rather than a primary diagnosis.^[15]

REVIEW OF PSYCHOLOGICAL INTERVENTIONS

Psychological treatment options for PNES are still in their infancy. Several approaches provide psychological intervention for the remission of symptoms and underlying psychopathology [Table 1].

The findings from various research studies have indicated psychotherapy as an effective treatment modality to alleviate symptoms of PNES. Various forms of psychotherapy are available for this condition. Cognitive Behavioral Therapy (CBT) is among one of the most exhaustively studied treatment modalities so far. Other therapies such as exposure therapy, group therapy, and psychoeducation have also been

used. This paper will provide a detailed description of various treatment protocols being used and recent advances in the non-pharmacological treatment of PNES.

Cognitive behaviour therapy (CBT)

Behaviour therapy was used for the first time to treat a child with psychogenic seizures in the 1960s.^[16] CBT has been successful in the treatment of various somatic conditions but its efficacy as a treatment modality for various psychogenic disorders is lesser explored.^[17] Goldstein *et al.* conducted a pilot randomized controlled trial on 66 patients comparing CBT with standard medical care as a treatment for psychogenic nonepileptic seizures.^[18] The treatment was aimed primarily at reducing seizure frequency and improving overall psychosocial functioning. The basis of this approach lies in the fear-avoidance model. This model explains the occurrence of seizures as a patient’s response to fearful events which he/she is unable to confront.^[19] A 12-session therapy module was developed that focused on eliminating positive reinforcers which triggered non-epileptic seizures, along with graded exposure to the avoided stimuli.^[20]

Another uncontrolled CBT trial was conducted by Lafrance *et al.* based on Beck’s model of CBT.^[21] This time-limited individual-oriented therapy focussed on stimulating behavior changes while addressing environmental triggers, cognitive distortions, and somatic misconceptions. In this trial, 12 individual sessions were given to 21 patients on a weekly basis of whom 17 completed the sessions. This therapy was found to be effective in reducing the seizure frequency, comorbid psychiatric symptoms, and overall improvement in the quality of life. CBT is a promising treatment for patients with PNES which reduces seizure frequency and also improves overall psychosocial functioning.^[22]

Psychodynamic therapy

Psychodynamic therapies aim at enabling patients with PNES who are aware of maladaptive behavioral patterns. According to the psychodynamic viewpoint, symptoms, and behaviors are the results of early childhood experiences or internal unresolved conflicts of which the patient is majorly unaware. With its foundation in Psychodynamic Interpersonal Therapy, an augmented treatment model of Brief Psychodynamic Therapy with essentials from Cognitive Behavioural Therapy and Somatic Trauma Therapy was developed. It involves delivering 20 sessions of this augmented therapy. After formulating the case, based on an initial semistructured assessment, therapy sessions were initiated. If needed, cognitive-behavioral approaches such as relaxation techniques, techniques to deal with a panic attack or flashbacks, exposure techniques, keeping an emotional diary were used to alleviate various symptoms. The 20 session treatment protocol was completed by 47 patients; 19 experienced up to 50 percent reduction in seizure frequency in comparison with baseline.^[23] Similarly, a group-based psychodynamic approach was also used by Barry *et al.* in the treatment of PNES.^[24] The goal of this 32-week long psychodynamically oriented therapy

Table 1: Treatment trials in various forms of psychotherapy in PNES

Author/Year	Study Design	Sample size analyzed	Intervention	Assessment tools used	Data collection method	Results	Pros and cons of the study
Goldstein <i>et al.</i> /2010 ^[18]	Randomized controlled	64	CBT arm: 12 weekly or fortnightly hour-long sessions Standard Medical Care (SMC): supportive sessions with psychoeducation and AED withdrawal	Monthly seizure frequency, Work and Social Adjustment Scale, Hospital Anxiety and Depression Scale, a modified Client Service Receipt Inventory	Pre- and post-treatment assessment at 6 months	Reduction in seizure frequency with participants in CBT arm experiencing 3 months of seizure-free period. Both groups exhibited some improvement in health service use and on Work and Social Adjustment Scale. Secondary measures like mood showed no change.	CBT + SMC relative to SMC alone significantly reduced the seizure frequency. Benefits were maintained over 6 months followup with an overall improvement on self reported social functioning. Blinding was missing for therapist providing services. Sample selection bias in favour of difficult to treat chronic patients. Sample selection bias in favour of difficult to treat chronic patients. SMC group was not controlled
LaFrance <i>et al.</i> /2009 ^[21]	Prospective, uncontrolled	20	12 weekly hour-long CBT sessions	Weekly seizure frequency, BDI, Modified HDRS, Davidson Trauma Scale, DES, BIS, Family Assessment Device, SCL-90, Oxford Handicapped Scale, Ways of Coping, QOLIE-31	Seizure frequency was noted for a week before commencement of treatment, weekly during the treatment, and after treatment completion on 6 months follow up. Measures like BDI, DES etc were also obtained while beginning the treatment, while discharging and on follow up sessions	Decline in seizure frequency observed at the end of treatment. Except HDRS & DES, most scales showed improvement in scores from baseline to final session. 50% decline in seizure frequency was observed in 11 of 17 patients who completed treatment	Results demonstrated the viability of CBT for PNES and reported seizure cessation among patients who completed the sessions. Patients with VEEG record were included in study which increases the accuracy of diagnosis. The study lacked a control group.
Mayor <i>et al.</i> /2010 ^[45]	Retrospective, uncontrolled	47	20 sessions of brief augmented psychodynamic interpersonal therapy	Monthly Seizure Frequency, SF-36 health survey, PHQ-15, CORE-OM	66 consecutive patients. Pre and post intervention questionnaires about current seizure frequency, employment status, health care utilization 42 months after the end of therapy (range 12-61 months)	Around 25% of patients seizure free at follow-up; another 40% achieved more than half seizure reduction Healthcare use also decreased significantly	Reduction in seizure frequency and health care utilization. No control group was there. Contact with other health care professionals and antidepressant treatment might have influenced seizure cessation. Sample selection bias was present
Barry <i>et al.</i> /2008 ^[24]	Prospective, uncontrolled	7	90-minute group psychodynamic psychotherapy sessions for 32 weeks	Weekly seizure frequency, BDI, SCL-90	Data collected at the beginning of the treatment, weekly monitoring of seizure frequency, and at 16, 32 weeks	6/7 reported decreased in seizure frequency. 4/7 were seizure free. 5 remained seizure-free several months after treatment. BDI scores also reduced. Changes in 10 of 12 SCL-90 subscale was also observed.	Post-intervention reduction in seizure frequency was observed Small sample size limited the generalizability of results. No control group was there Out of 5 patients one was receiving antidepressants which might have an impact on results.

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Table 1: Contd...

Author/ Year	Study Design	Sample size analyzed	Intervention	Assessment tools used	Data collection method	Results	Pros and cons of the study
Baslett <i>et al.</i> /2020 ^[26]	Uncontrolled	26	12 sessions of mindfulness-based therapy program	Weekly seizure log, BDI-II, DASS-A, PHQ-15, QOLIE-10	Baseline PNES frequency, intensity and duration collected at the first follow-up post-diagnosis. Frequency was obtained at each subsequent MBT session and analyzed over time with median regression analysis. Outcomes for other measures were collected at the last MBT session and compared with baseline.	70% of participants experienced reduction in PNES frequency to half. Completion cessation reported by 50% at treatment end.	VEEG confirmed diagnosis. Individualized MBT based therapy resulted in decreased seizure frequency and overall improvement in quality of life. Lack of controlled intervention, small sample size and convenience sample bias limit the study.
Barrett <i>et al.</i> /2018 ^[31]	Non-concurrent case series design	6	A six week guided self-help acceptance commitment therapy (ACT) Intervention	DASS-20, QOLIE10, CompACT AAQII, weekly seizure frequency	Quality of life, psychological health, psychological flexibility, seizure frequency preintervention, postintervention, and at 1-week and 1-month follow-up. CompACT also done on a weekly basis.	Reliable and clinically significant changes in psychological flexibility, quality of life, and psychological health observed in the most patients. Self-reported seizure frequency also reduced.	A self help, cost- effective intervention targeting psychological flexibility, psychological health & seizure reduction. A controlled study with larger sample is needed to validate the efficacy of the treatment protocol.
Zaroff <i>et al.</i> /2004 ^[33]	Prospective, uncontrolled	7	10 weekly sessions of group psychoeducational interventions	Seizure frequency, Coping Inventory for Stressful Situations, Davidson Trauma Scale, Curious Experiences Survey, STAXI-2, QOLIE-31	Seizure frequency pre- and post-treatment	4 individuals had no change in seizure frequency; 2 had a decreased and one had an increase in frequency. Significant decline occurred in posttraumatic and dissociative symptoms and emotionally-based coping mechanisms	Each patient had VEEG confirmed diagnosis. Small sample size and three out of seven patients were seizure free at the time of treatment initiation limits the generalizability of results
Chen <i>et al.</i> /2014 ^[34]	Randomized, controlled	41	Brief group psychoeducation intervention. 1.5 hr long sessions for 3 successive weeks	Seizure Log, Work and Social Adjustment Scale (WSAS) Structured Inventory of Malingered Symptomatology (SIMS), The Health History Checklist, The Health Attitudes Survey, BDI-II	Pre- and post-intervention questionnaires at at 3 months and 6 months assessing for:(1) primary outcomes that include a measure of psychosocial functioning, interval difference in seizure frequency/ intensity; and (2) interval seizure-related emergency room visits/hospitalizations, development of new symptoms, and knowledge and perception outcomes	Patients in the intervention group showed significant improvement on the Work and Social Adjustment Scale (WSAS) scores at 3 and 6 months follow-up	Through this group therapy approach, larger number of patients benefited from the intervention. Small sample size limits the efficacy of intervention.

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Author/ Year	Study Design	Sample size analyzed	Intervention	Assessment tools used	Data collection method	Results	Pros and cons of the study
Myers <i>et al.</i> / 2017 ^[36]	Uncontrolled	16	12-15 weekly sessions of prolonged Exposure Therapy	Seizure Log Trauma Symptom Inventory (TSI-2), Post-traumatic Stress Disorder Diagnostic Scale (PDS), Beck Depression Inventory II (BDI II)	Seizure frequency, mood and PTSD symptomatology at baseline and at the final session	13/16 of those who completed therapy had no seizures at the end of therapy; 3 had a decline. Mean BDI II scores showed significant improvement Gains maintained on follow-up in 14 participants	Patients with dual diagnosis of PNES and PTSD can be treated through this treatment modality Small sample size and lack of randomized and controlled study design Psychological measures used in the study were not administered on followup.
Kelley <i>et al.</i> /2007 ^[38]	A qualitative uncontrolled multiple revelatory case design	8	8 phase Eye Movement desensitization (EMDR) protocol for more than 12 months	Traumatic Experience Report, the Hamilton Anxiety and Depression scales and the Steinberg dissociation scale. Validity of cognition scale (VOC) and Subjective unit of distress (SUD's)	Traumatic Experience Report, the Hamilton Anxiety and Depression scales along with sociodemographic measures were used as baseline as well as post treatment measures. VOC & SUD's were used during the sessions.	With EMDR targeting trauma and dissociative symptoms in three patients, PNES ceased in two These continued to be seizure-free at 12 to 18 months	This study suggests that EMDR can be used as a treatment modality for trauma based PNES. Larger sample size is required for establishing the efficacy of this intervention.
Moene <i>et al.</i> /2003 ^[39]	Randomized controlled	44	10 weekly sessions lasting 1 hour of hypnotherapy	Video rating scale for motor conversion symptoms (VRMC), the International classification of impairments, Disabilities and Handicaps (ICIDH), The Dutch version of Symptom Checklist (SCL-90)	Participants were assessed at pre- treatment session (3-5 days prior the commencement of first session), after 3-5 days of 10 th session and at follow-up after 6 months of last session	The hypnosis-condition patients more improved relative to baseline and the waiting-list controls Improvement observed in behavioral symptoms associated with the motor conversion and extent of motor disability At 6-month follow-up, improvement was sustained	First randomized controlled study with well defined sample of conversion patients Standardized and validated evaluation measures were used Small sample size decreased the power of study Video taped therapy sessions were not monitored for treatment integrity.
Ataoglu <i>et al.</i> /2003 ^[40]	Randomized controlled	30	Paradoxical Intention therapy sessions in inpatient setting for 3 weeks and after 3 weeks compared to control arm (diazepam)	Hamilton Rating Scale for Anxiety (HSRA), Seizure Frequency	Anxiety scores and seizure frequency compared	Paradoxical intention-treated patients better in anxiety scores and conversion symptoms than diazepam-treated patients	This study suggested that paradoxical intention is a cost effective short term psychotherapy. It works on generating insight about the anxiety arising symptoms and sense of control in patients. A study conducted on larger sample size is needed to validate the efficacy of intervention

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Table 1: Contd...

Author/Year	Study Design	Sample size analyzed	Intervention	Assessment tools used	Data collection method	Results	Pros and cons of the study
Ben-Naim et al. /2020 ^[43]	Retrospective within group pre and post treatment, uncontrolled study	22	Therapy included presenting diagnosis, psychoeducation, seizure reduction behavioral techniques, coping with past and present stressors.	Global Assessment of Functioning (GAF) Scores, Self-reported Seizure diary	Changes in the patient's GAF score, reduction in seizure frequency pre- and post-intervention	36% patients became seizure free at end of therapy; another 54% experiences significant seizure reduction (> 70%), GAF scores improved from mean 43 to a mean of 73 at end of therapy.	Utilized individualized treatment approach depending on patient's coping strategies and stressors No strict inclusion and exclusion criteria followed Patients with psychiatric comorbidities and epilepsy were also included therefore increasing the generalizability of protocol. Lack of control group

AED, antiepileptic drug; BDI, Beck Depression Inventory; BIS CBT, cognitive behavioral therapy DES, Dissociative Experiences Scale; BIS, Barrett Impulsivity Scale HDRS, Hamilton Depression Rating Scale; PHQ-15, Patient Health Questionnaire 15-Item Somatic; QOLIE-31, Quality of Life in Epilepsy Inventory 31; SCID-I, Structured Clinical Interview for DSM-IV Axis I Disorders; SCL-90, Symptoms Checklist-90; SF-36, 36-Item Short Form Health Survey; SMC, standard medical care; STAXI-2, State-Trait Anger Expression Inventory-2; ; CompACT = comprehensive acceptance and commitment therapy processes; AAQ II = acceptance & action questionnaire; ; DASS 21 = depression anxiety & stress scale; QOLIE-10 = quality of life in epilepsy inventory; The Clinical Outcomes in Routine Evaluation =COREOM

was to make the patients aware of events/cues in others or themselves which trigger and terminate seizure episode. Verbal expression of interpersonal conflicts and traumatic experiences was emphasized. Learning new adaptive coping strategies to eliminate passive-avoidant behavior was also taught. Six out of seven enrolled individuals experienced a decline in seizure frequency. Four achieved complete remission on treatment completion along with improvement in other comorbid symptomology.

Mindfulness-based therapy

Mindfulness-based therapies (MBT) have also been found to be efficacious in the management of various neuropsychiatric conditions. Mindfulness can be defined as “paying attention in a particular way: on purpose, in the present moment and non-judgmentally.”^[25] The 12-session mindfulness-based protocol developed by Baslet included components from various MBT approaches.^[26] This approach aimed at reducing seizure frequency, duration, and other psychiatric comorbidities along with improvement in overall quality of life. In a study done by Baslet *et al.*, out of 49 enrolled patients, only 26 completed the protocol and at the end of 12 sessions, they showed significant reduction in seizure frequency.^[26]

Acceptance commitment therapy

Acceptance Commitment Therapy (ACT) is a hybrid therapy which derives its components both from CBT and MBT. ACT has demonstrated efficacy in the treatment of depression, post-traumatic stress disorder and other dissociative conditions where avoidance of unwanted stimulus was involved; psychogenic seizures are also a kind of experiential avoidance.^[27-29] It focuses on enhancing the individual's psychological flexibility by employing techniques to change the patient's relationship with his/her own thoughts, emotions, and bodily sensations along with decreasing the incidents of experiential avoidance.^[30] A small study investigated the efficacy of guided self help ACT-based intervention with the aim of improving psychological flexibility and overall quality of life and mental health. Six participants completed the study and showed clinically significant improvement in psychological flexibility and reduction in seizure episodes.^[31]

Psychoeducation-based therapeutic approach

Psychoeducation is a form of psychosocial treatment that has been used as an adjunct treatment modality along with pharmacotherapy in many psychiatric and other physical illness conditions such as cancer. It is a treatment modality comprising a flexible model based on the confluence of therapeutic and educational interventions.^[32] This approach focuses on imparting illness-related information along with managing the surrounding circumstances.

A group-based psychoeducation interventional study was conducted on 10 patients with PNES of whom 7 individuals completed the sessions. The focus of the sessions was largely specific to discussions related to PNES and the underlying issues causing PNES. Additionally, other comorbid issues such as depression, anger, and isolation experienced by patients were

also discussed. The intervention was based on the assumption that on successful completion of sessions, coping mechanisms will be more task-based than emotion focussed. Additionally, a decrease in symptoms will be observed, along with overall improvement in the quality of life. The results of this study revealed a significant decrease in dissociative symptoms but the study was limited by small sample size.^[33]

Another randomized trial used brief psychoeducation group-based intervention; 34 patients received therapy while 30 patients formed the control group. Functional improvement was noted among patients in the treatment group. Thus, initial results from these studies seem promising enough to consider psychoeducation as a potential cost-effective treatment modality for PNES.^[34]

Prolonged exposure therapy

A diagnosis of PNES is often accompanied by a comorbid diagnosis of post-traumatic stress disorder (PTSD). Prolonged Exposure Therapy is a form of CBT. It is an empirically validated treatment modality to treat patients with a dual diagnosis of PNES and PTSD.^[35] This therapy targets avoidance strategies adopted by patients to curb anxiety triggered by cues related to trauma or by flashbacks of the experience itself. A study was conducted on 16 patients diagnosed with PNES and comorbid PTSD. After completing 12-15 weekly sessions, a significant reduction in seizure frequency and PTSD symptoms was observed and follow-up findings suggest maintenance of these improvements for a longer period.^[36]

Eye movement desensitization and reprocessing (EMDR)

Eye Movement Desensitization Therapy (EMDR) is an empirically validated treatment for PTSD. The core principle involved in EMDR is an emphasis on the information processing system. Thus, this eight-phase model focuses on reprocessing memories of events related to underlying current symptoms in order to bring the patient back to a psychologically healthy state. The distinguishing feature of EMDR involves using bilateral physical stimulation (such as side to side eye movements, alternate hand movements etc.) as the patient focusses mentally on his/her life experiences.^[37] This treatment modality has been successfully employed in alleviating symptoms in patients with PNES who have an underlying traumatic experience. EMDR therapy was given to eight patients having PNES related to past traumatic experiences. Post-intervention, two patients experienced complete cessation of seizures and remained seizure-free for a period of 12–18 months. Thus, further controlled and longitudinal studies involving a larger sample are required to establish the role of EMDR in trauma-related PNES.^[38]

Hypnotherapy

Hypnosis is one of the oldest therapeutic approaches for conversion disorders since the time of seminal practitioners such as Jean Charcot and Sigmund Freud. The latest neuroimaging findings reveal that the neural processes involved in conversion symptoms and hypnotic mechanisms are the same. Based on these assumptions, Moen *et al.* conducted a

study on 44 patients (20 in the treatment group and 24 in the control group) of conversion disorder with various somatic symptoms.^[39] The patients were trained for self-hypnosis in order to equip them to deal with conversion symptoms on their own. The treatment protocol comprised 10 weekly sessions of 1-hour duration and homework assignments, ensuring that the patient learns to practice self-hypnosis independently. The results of the study reported significant improvement in conversion symptoms in the treatment-group participants.

Paradoxical Intention therapy

Paradoxical Intention Therapy (PIT) builds upon a deliberate undertaking of the targeted activity or behavior in order to identify, and eventually remove it. PIT is indicated specifically for psychiatric cases with low patient opposition and a lack of control on symptoms. Hence, PIT is well suited for PNES. The best-suited technique in such cases is ‘symptom prescription’ i.e., persuading the patient to engage in continuous worsening of the symptoms.^[40] However, not much literature is available in the area. Chapleau *et al.* presented a 15-session descriptive case of a 23-year-old female with a long history of PNES concurrent with a borderline personality disorder.^[41] The patient in the case was motivated and guided to mimic the episodes and later the therapist discussed the emotions involved around them. Once, the outcome was achieved, the patient continued psychotherapy for other issues and was given 2 booster sessions over a period of some months. Improvement was seen at 3, 6, and 9-month follow up. Ataoglu *et al.* carried out the intervention on 15 individuals and suggested that 14 of them responded favorably as compared to pharmacotherapy.^[40]

Novel integrative psychotherapy

Up to 93% of PNES diagnosis is often accompanied by another comorbid psychiatric diagnosis.^[42] Every patient has exclusive semiology, triggering or maintaining factors. Hence, a uniform therapeutic approach might not be efficacious for all patients. Novel Integrative Psychotherapy is based on a bio-psycho-social approach to treatment. This therapy is aimed at providing individualized case-specific treatment to each patient. The therapeutic plan includes presenting diagnosis to the patient, psycho-educating them regarding nature, course, and prognosis of the illness. It also involves using behavioral techniques in order to reduce the seizure frequency and equipping patients with coping techniques to deal with current and past stressors. A case-specific study using this therapeutic approach was conducted on 22 patients. It demonstrated a reduction in episodes of psychogenic seizures along with an improvement on global assessment of functioning scores.^[43]

After a patient is diagnosed with PNES by a neurologist ruling out the possibility of true seizures or even in case of comorbidity, detailed psychological history is required. An in-depth exploration of personal history or interpersonal issues is also required. Further, eliciting other comorbid conditions such as personality disorders, anxiety, depression is also required. However, as every patient with a diagnosis of PNES would present a unique etiology, any one particular

Table 2: Suggested treatment steps to be followed in the management of PNES

Treatment steps	Description
Multidisciplinary approach	Both the neurologist and the mental health professional who will follow up the case should work in collaboration in planning treatment
Confirming PNES diagnosis	The diagnosis should be confirmed using objective measures such as VEEG
Assessing for any comorbidities	The patient should be assessed for possible neurological and psychiatric comorbidities
Communicating the diagnosis	The diagnosis should be communicated both to the patient and the family focusing on explaining the nature of PNES It should be emphasized that the attacks are still real and involuntary
Psychotherapy referral	A referral for psychotherapeutic management should be made for the management of psychological aspects involved
Role of neurologist post-diagnosis	The neurologist should be actively involved even after the diagnosis of PNES to monitor patients outcome, withdrawing ASMs, treating any neurologic comorbidities or managing any new symptoms which appear during the course of treatment.

ASM= anti-seizure medication; VEEG= Video electroencephalography

approach to treat the symptoms or to know the etiology will not be workable. In this paper itself, we have talked about how a multidisciplinary approach is needed and have been found to be successful in certain trials where various therapies have been combined and tailored as per patients' needs. Additionally, in the area of PNES management, there is lack of knowledge concerning what specific therapies suit a certain type of patients. Extant evidence suggests that underlying etiological factors determine the best treatment approach for the patient which is not the same for every individual. Future research further needs to identify which treatment works best for whom.

We have summarized the potential treatment steps in Table 2.

FUTURE DIRECTIONS

In view of the burgeoning burden on healthcare as well as the multitude negative consequences on patients and their families, the need for the hour is a consultation-liaison among neurologists, pediatricians, and mental health professionals to combat this highly prevalent condition. A multidisciplinary approach can help in ensuring the correct and timely diagnosis and management of PNES. Moreover, along with a lack of proper consultation-liaison and psychotherapeutic services there exists severe ignorance and stigma concerning PNES. If patients and their caregivers are psychoeducated and motivated at the outset to pursue psychosocial treatment by their treating physician when disclosing the diagnosis, it may improve the treatment adherence. Subsequently, therapeutic techniques to improve adherence to psychological treatment are also being administered such as motivational interviewing. Tolchin *et al.* have conducted an RCT integrating motivational interviewing to the treatment schedule to increase treatment adherence among patients with PNES. The findings of their study revealed that patients who received motivational interviewing showed better adherence to treatment and a decrease in seizure frequency along with an improved quality of life.^[44]

Other than that, it should be taken into account that the etiology and risk factors of PNES are different in children than in adults. Therefore, there is an urgent need to develop interventions catering specifically to the pediatric population. In this light, an intervention model encompassing strategies and techniques

from various therapeutic schools can be integrated. Such a model should take into account the cultural and age difference, along with focusing on promoting treatment adherence as well. It's also imperative that the intervention designed should be of minimal sessions in order to be cost-effective which discourages high attrition. Consequently, some elements of the therapy can also be administered in group form. Hence, in order to plan a successful treatment a patient's detailed psychological history, interpersonal issues along with his/her current level of functioning must be taken into account.

CONCLUSION

In this paper, we have critically evaluated literature on various psychosocial interventions for the management of PNES. Most of these interventions consist of observational studies or pre-/post-intervention studies without any healthy controls involved in the trial. Additionally, most of the studies are based on small sample sizes. Amongst most, CBT and psychodynamic therapeutic approaches are the only ones whose efficacy has been evaluated in a randomized control study design. Other than the aforementioned approaches, certain novel approaches like prolonged exposure therapy, EMDR, MBT, and Paradoxical Intention has also yielded positive results, albeit having been conducted as small pilot studies. The promising results of the Novel Integrative Psychotherapy, which is based on the biopsychosocial approach, point towards its flexibility in treating PNES by adjusting the therapy as per the patient's needs. The findings from this review highlight the importance of psychological interventions as a treatment approach for PNES. Additionally, this paper establishes a need for future research exploring a wide range of treatment modalities with more robust methodological designs.

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There are no conflicts of interest.

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