Brief group psychoeducation for psychogenic nonepileptic seizures: A neurologist-initiated program in an epilepsy center


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SUMMARY

Objective: To evaluate therapeutic efficacy upon augmenting the initial communication to patients regarding the diagnosis of psychogenic nonepileptic seizures (PNES) with a novel, brief group psychoeducation administered by the same team that provided the video–electroencephalography (VEEG) confirmed diagnosis and within 4 weeks of the diagnosis.

Methods: Prior to discharge from the epilepsy monitoring unit (EMU), a standardized communication strategy was utilized to explain the diagnosis of PNES to all patients prior to enrollment. Enrolled patients were then randomized to either participation in three successive and monthly group psychoeducational sessions (intervention group), or routine seizure clinic follow-up visits (control group). Both groups completed questionnaires at time of enrollment, and then at approximately 3 months (follow-up 1) and 6 months (follow-up 2) after discharge, assessing for: (1) primary outcomes that include a measure of psychosocial functioning, as well as interval difference in seizure frequency/intensity; and (2) secondary outcomes that include interval seizure-related emergency room visits or hospitalizations, development of new and medically unexplained symptoms, and results of an internal measure of knowledge and perception outcomes.

Results: The majority (73%) of patients from the intervention group commenced on therapy sessions within 4 weeks after learning of the diagnosis. Although we did not observe significant group difference in seizure frequency/intensity, patients from the intervention group showed significant improvement on the Work and Social Adjustment Scale (WSAS) scores at both follow-up 1 (p = 0.013) and follow-up 2 (p = 0.038) after discharge from the EMU. In addition, we observed a trend toward lesser likelihood for seizure-related emergency room visits or hospitalizations for the intervention group (p = 0.184), as well as meaningful insights from an internal measure of intervention outcomes.

Significance: These findings suggest that our cost/resource effective, brief group psychoeducational program, when administered early and by the same team who confirmed and communicated the diagnosis of PNES, may contribute to significant functional improvement among participating patients.

KEY WORDS: Psychogenic nonepileptic seizures, Psychotherapy, Psychoeducation, Work and Social Adjustment Scale, Psychosocial functioning.
Psychogenic nonepileptic seizures (PNES) are neurobehavioral paroxysms that, although resembling epileptic seizures, are thought to emerge from psychopathologic etiologies rather than abnormal electrical discharges in the brain. These paroxysms are typically confirmed in the epilepsy monitoring unit (EMU) based on a combination of the patient’s historical presentation, event semiology, and video-electroencephalography (VEEG) recording data. Upon VEEG confirmation, the explanation of the diagnosis of PNES by the neurologist represents an important initial “stepping stone” in the treatment of PNES, without which the patient cannot determinately pursue mental health treatments. Explanations with the support of VEEG results and from seizure experts may be more influential, as patients with PNES are paradoxically more likely to resist the consideration of stress or emotional factors as the cause of seizures than patients with epilepsy. When this explanation is appropriately communicated, the patient’s acceptance of the PNES diagnosis can influence the outcome, sometimes even without additional intervention. However, unless the EMU is concurrently staffed by mental health therapists, the therapeutic impact gained from this initial diagnostic alliance may diminish as the patient is referred to outside, unaffiliated institutions for mental health intervention, often with significant time delay. Indeed, interventions for PNES provided by psychotherapists who are affiliated with a comprehensive epilepsy center, when compared to those who are not, have been shown to yield superior outcomes. Motivated by these observations, we pursued this study to evaluate the potential benefit when an epilepsy center plays a greater role in the initiation of preliminary treatment for patients with newly diagnosed PNES.

Pilot studies have shown promising benefit of individual cognitive behavioral therapy (CBT) in reducing event frequency of patients with PNES. Although this individual-based treatment approach may be effective, CBT requires a significant dedication of time and effort from both the therapist and patient, requiring typically 9–12 sessions over a period of months for each patient. This resource-intensive and costly intervention may frequently not be available to patients of lower socioeconomic status with more limited insurance benefits or resources—the predominant demographics of patients with PNES. It is therefore not uncommon for these patients to feel “abandoned” from both neurologists who are unable to adequately manage the patients’ psychiatric conditions, and mental health specialists who cannot sufficiently manage the patients given constraints of the health care delivery system.

The group-based treatment approach takes advantage of an economy-of-scale principle to expand the treating capacity of the therapist who allies group members in the counseling process. In addition to being cost/resource effective, several pilot group therapy studies for PNES have shown favorable results in terms of either reduced PNES frequency, enhanced functionality/coping, or diminished somatic preoccupation. A limitation, however, is that none of these group therapy studies utilized randomized controlled methodology in their investigation. Building on these studies, we pursued a pilot randomized controlled study of a neurologist-initiated, group intervention program with the goals of improving overall functionality in patients with PNES and/or reducing seizure frequency/intensity. More specifically, we aimed to enhance the initial impact from the patient’s learning of the diagnosis of PNES with a novel, brief group psychoeducation administered by the same team that provided the VEEG-confirmed diagnosis and within 4 weeks of the diagnosis.

**Methods**

**Enrollment**

We prospectively recruited patients who were admitted to the epilepsy monitoring unit (EMU) of the Michael E. DeBakey VA Medical Center from June 2011 through October 2012. To be eligible for inclusion, patients must have demonstrated VEEG-confirmed nonepileptic events of interest, which were interpreted to be of psychogenic origin based on combined features of ictal semiology, psychosocial history, and the results from psychological screening instruments.

The following exclusion criteria were also applied: (1) main place of dwelling beyond commutable distance (patients referred from outside VA medical centers); (2) suspected mixed disorder of PNES and epilepsy (patients with prior EEG documentation of electrographic seizures or ictal epileptiform abnormalities); and, (3) Mini-Mental Status Exam score of <25, when assessed during the EMU admission.

Prior to enrollment, explanation of the diagnosis of PNES utilizing a standardized communication strategy was conveyed to all patients by the same physician (DKC). We employed a modified Shen protocol, emphasizing the following points: (1) Attacks are not epileptic. (2) Attacks have a psychogenic cause. (3) Having a psychogenic cause in no way implies that the patient has sole blame. (4) Internalized or suppressed conflicts are frequently the driving forces behind these events. (5) Acceptance of self-responsibility toward progress will be instrumental in achieving event control (internalizing locus of control).

Upon obtaining informed consent, patients were then given an initial set of questionnaires to establish baseline measures that were analogous to subsequent outcome measures (see below). Consecutively in the order of enrollment, patients were each independently designated a computer generated random number whereupon even
number patients were assigned to receive the study intervention, while odd number patients were assigned to the nonintervention group. All patients were instructed to carefully document further breakthrough seizures on standardized event logs.

**Brief group psychoeducation (intervention)**

Patients allocated to the study intervention underwent a novel, abbreviated treatment program consisting of three successive monthly, 1.5 h long group sessions. Patients’ significant others were also encouraged to attend, as optimizing family’s support may be an important treatment target to enhance coping.13,19 The first session was conducted in lecture-based format, dedicated to enhancing the understanding of PNES and specifically emphasized: (1) the concept that PNES, in themselves, pose no harm to the brain and other systemic organs; (2) proper safety measures can effectively minimize risk of bodily injury from PNES; and (3) the universality of PNES as a condition shared by fellow group members. These concepts aim to promote the acceptance of PNES as legitimate but manageable behavioral disruptions, rather than as exasperating, life-threatening events. This initial lecture-based session was offered once per month to newly enrolled patients with recent VEEG confirmed diagnosis of PNES. Participants were reminded of the prescribed two subsequent monthly group sessions as part of the study protocol, whereupon psychoeducation is provided through support group format. Of the patients who participated in our intervention, 73% of these patients attended this first session within 4 weeks after the VEEG-confirmed diagnosis of PNES.

During the subsequent support group session no. 1, the group facilitator directed discussions to underscore the theme regarding how physical manifestations can frequently arise from underlying emotional causes (e.g., stress ulcers, stage fright). Correspondingly, emphasis was placed on group discussions pertaining to the recognition of event trigger, creating a stress journal, and importance of allocating constructive channels for release of stress. Sharing of personal experiences, including previously utilized effective or ineffective strategies, was encouraged from the group members.

For support group session no. 2, a second theme was discussed that focused on empowering patients to take active roles toward their own recovery. This theme was highlighted by instructions on distress tolerance techniques (e.g., going to a safe place mentally when stressed), avoiding or altering event triggers, and allocation of set daily schedules for relaxation exercises and daytime naps. Sharing of personal stress management/coping strategies was again encouraged from group members. If seizures occurred during any of these sessions, the group was instructed to assume a neutral attitude by accepting these events as “expected” reactions, and redirect attention back to the discussion of the topics at hand. The goals of this approach were to minimize attentional gain from PNES, mitigate the natural trepidation when confronted with PNES, and emphasize capability for continued normal activity despite PNES. Like the initial lecture-based session, a support group session was offered on a monthly basis, whereupon the first or second theme was alternately emphasized during each month’s session. Patients exited the intervention portion of the study on a continuously rolling basis after having participated in a support group that discussed theme 1 and another support group that discussed theme 2 in either order (i.e., completing three therapy sessions in total). Among the patients who attended all three therapy sessions of the study protocol, 65% of them completed the intervention within 3 months, whereas 35% of them completed the intervention within 5 months. Typical attendance to each session ranged between 3 and 10 participants (including family members).

The lecture-based and support group sessions were led by either a neurologist (DKC) or a neurology nurse practitioner (RF), both of whom have had prior exposures to provision of group psychoeducation, as well as substantial experiences working with patients with PNES.

**Nonintervention assignment (control)**

Upon discharge from the EMU, patients returned to our VA seizure clinics (staffed by DKC, RF, or RAH) for follow-up visits after around 3 months, and then again after around 6 months. Requests for more frequent follow-up visits related to worsening of PNES were discouraged so as to avoid rewarding the illness behavior. Emphasis during these visits was placed on conceptual iteration of the psychological origin for PNES. This concept was reinforced by supervised and gradual withdrawal of antiepileptic drug, if applicable. Referrals to mental health services were offered to patients who had not yet engaged in these services. Supportive roles serving to consolidate therapeutic alliances were also emphasized. Whenever appropriate, referrals to social workers, case managers, or physical/occupational/vocational rehabilitation services were pursued.

**Outcome measures**

For the intervention group, outcome measures were administered at the completion of all three therapy sessions (i.e., follow-up 1, immediately at the end of each patient’s second support group session, between 3 and 5 months after discharge from EMU), and then again at 3 months after the completion of the intervention (i.e., follow-up 2, between 6 and 8 months after discharge from EMU). For the control group, outcome measures were administered near the end of the first postdischarge seizure clinic visits at 3–5 months (follow-up 1), and then again near end of the second seizure clinic visits at 6–8 months (follow-up 2) after discharge from EMU. Primary outcome measures included the follow-
ing: (1) scores from the Work and Social Adjustment Scale (WSAS), a five item measure designed to assess impairment of psychosocial functioning (refer to Appendix 1); and (2) assessments of patients’ perceived progress regarding (a) event frequency and (b) event intensity since EMU discharge. Patients were encouraged to refer to their standardized event logs when providing their responses. Patients’ responses to (a) and (b) were scored on a Likert scale, with “1 being much worse – more than twice as bad as before,” “2 being worse – about twice as bad as before,” “3 being same as before,” “4 being better – about half as much as before,” and “5 being much better – less than half as much as before.”

Three secondary outcomes were measured. (1) We evaluated for any additional PNES-related emergency room visits or hospitalizations during the follow-up interval (based upon patients’ self-reporting, followed by chart-review confirmation). (2) We inquired regarding the development of any new and disabling symptoms for which causes have not been readily explained medically (based upon patients’ self-reporting, followed by chart-review confirmation). (3) Finally, we analyzed the results of an internal measure of knowledge and perception, which was administered to patients prior to as well as upon completion of the intervention. More specifically, patients were assessed for their perception of the following concepts paraphrased as: (a) “my understanding of my attacks has improved;” (b) “I can avoid triggers to my attacks;” (c) “my attacks do not bother me as much anymore;” (d) “I am less scared about my attacks;” (e) “I can carry on with most daily activities despite my attacks;” and, (f) “I have some control over my attacks.” Patients’ responses to concepts were scored on a Likert scale, with “1 being strongly disagree,” “2 being disagree,” “3 being neutral,” “4 being agree,” and “5 being strongly agree.” Appendix 2 provides more detailed information regarding this questionnaire utilized to measure knowledge and perception outcomes.

### Additional baseline measures

In addition to acquiring patient demographics data, all EMU patients (prior to confirmation of the diagnosis) were asked to complete four neuropsychological instruments: (1) Structured Inventory of Malingered Symptomatology (SIMS), which screens for over-reporting of uncommon cognitive and affective symptoms. (2) The Health History Checklist evaluates the somatoform tendency based on the patient’s endorsement of a list of the somatoform disorder symptoms from the Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R). (3) The Health Attitudes Survey (HAS) is an eight-question instrument designed to assess attitudes and perceptions of somaticizing patients. (4) The Beck Depression Inventory – II (BDI-II) is a 21-item measure widely used to assess depression severity. Appendix 1 provides more detailed information regarding these neuropsychological instruments.

### Statistical analyses

Investigations regarding the effect of intervention on the primary and secondary outcomes were performed by per-protocol analyses. We utilized the Mann-Whitney-Wilcoxon test to analyze differences between groups for Likert scale questions, the Pearson’s chi-square test, or two-tailed Fisher’s exact test for categorial variables, and the unpaired t-test for continuous variables. To further test for differences between the two groups concerning treatment response, a repeated measures analysis of variance (ANOVA) was used for the WSAS scores. The within-subjects factor was time point (baseline, 3, 6 months), with condition of group membership (intervention vs. control) as the between-subjects factor. For the additional baseline psychological instruments, ANOVA was used to assess for significant group differences, where the self-report measures were used as dependent variables, whereas group designation was used as the independent factor. Statistical analyses of psychological instrument data were performed with SPSS version 17.0.1 (SPSS Inc., Chicago, IL, U.S.A.). All other data analyses were conducted using Stata/MP version 11.2 for Windows (StataCorp LP, College Station, TX, U.S.A.).

The above-mentioned study protocol was approved by the institutional review board of Baylor College of Medicine as well as the Research and Development Committee of the Michael E. DeBakey VA Medical Center.

### Results

We identified 107 consecutive patients who received VEEG-confirmed diagnosis of PNES at our center during the study period (Fig. 1). After excluding 36 patients who met the exclusion criteria and seven patients who declined participation in our study, 64 patients enrolled in the study. Upon randomization, 34 patients were allocated to the intervention group and 30 patients were allocated to the control group. After exclusion of patients who were unable to complete at least one survey of outcome measures (14 intervention and 7 control patients), analyses of outcome measures were performed on 20 intervention and 23 control group patients. No significant difference in the baseline characteristics was found between those allocated to the intervention and control groups (Table 1), including illness burden and concurrent participation in counseling/therapy outside of our study intervention. Moreover, upon comparing the baseline characteristics of patients who did not complete the entire protocol (14 intervention and 9 control patients) versus patients who completed the entire protocol (20 intervention and 21 control group patients), none of the measures significantly differed at p < 0.5.

At the time of enrollment, the baseline WSAS scores between intervention (mean 23.05, standard error of the
mean [SEM] 1.54) and control (mean 24.17, SEM 1.69) groups were not significantly different (p = 0.629, Fig. 2). After completing the three-therapy sessions, the intervention group scored significantly lower on the WSAS (i.e., less functional impairment) than the control group when measured at follow-up 1 (intervention: mean 18.4, SEM 1.91; control: mean 25.52, SEM 1.95, p = 0.013, Fig. 2). At follow-up 2, the benefit of group psychoeducation was sustained as reflected by persistence of the significant difference in WSAS scores (intervention: mean 18.75, SEM 1.85; control: mean 24.86, SEM 2.15, p = 0.038, Fig. 2). We also applied repeated measures ANOVA to investigate effects of group and time, as well as a group × time interaction. We did not observe a main effect for the within-subjects factor of time $F_{2,39} = 1.389, p = 0.255$. A main effect was observed for the between-subjects factor of group $F_{1,39} = 4.136, p = .049$. An interaction was observed for group × time, $F_{1,39} = 11.41, p = .002$, such that an effect was seen from baseline to follow-up 1, but was not maintained through follow-up 2.

The patients’ endorsement of PNES frequency was not significantly different between intervention and control groups at both follow-up 1 (p = 0.359) and follow-up 2 (p = 0.394). Similarly, in terms of the reported intensity of the attacks in themselves, the comparison between the intervention and control groups was not significantly different at both follow-up 1 (p = 0.504) and follow-up 2 (p = 0.437).
From an internal measure of intervention outcomes, we initially observed no significant baseline difference (at time of enrollment) between responses from patients in the intervention and control groups to all six statements regarding their perceptions of PNES (Table 2). Subsequently, patients who completed the intervention, when compared to the control group, showed significantly more affirmative and sustained endorsements regarding the following statements: “my attacks do not bother me as much anymore” (p < 0.001 at follow-up 1, and p < 0.001 at follow-up 2); and “I am able to carry on with most daily activities despite my attacks” (p = 0.037 at follow-up 1, and p = 0.021 at follow-up 2). In addition, the intervention group showed significantly more affirmative, but nonsustained endorsements regarding the following statements: “I am able to avoid triggers to my attacks” (p = 0.037 at follow-up 1, and p = 0.021 at follow-up 2); and “I have some control over my attacks” (p = 0.006 at follow-up 1, but not significant at follow-up 2).

Over the course of 6–8 months of follow-up after discharge from the EMU, one patient from the intervention group and five patients from the control group required emergency room visits or hospitalizations for PNES-related symptoms. In other words, patients from the intervention group showed less utilization of acute health care

<table>
<thead>
<tr>
<th>Table 1. Demographic, psychosocial, seizure burden, and neuropsychological instrument data comparisons between the intervention and control groups</th>
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<tr>
<td>Intervention group (n = 34)</td>
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<td>Age, mean (SD)</td>
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<td>Gender (% male)</td>
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<td>Marital status (% married)</td>
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<td>Years of education, mean (SD)</td>
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<td>Employment (% employed)</td>
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<td>Total no. of axis I + II disorders, mean (SD)</td>
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<td>GAF, mean (SD)</td>
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<td>PTSD (%)</td>
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<td>Concurrent counseling/therapy (%)b</td>
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<td>Baseline seizure frequency, n (%)c</td>
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<td>Rare</td>
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<td>Duration of seizure history, mean months (SD)</td>
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<td>SIMS, mean (SD)</td>
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<td>HAS, mean (SD)</td>
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<td>HHC, mean (SD)</td>
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<td>BDI-II, mean (SD)</td>
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</table>

SD, standard deviation; GAF, global assessment of functioning; PTSD, posttraumatic stress disorder; SIMS, structured inventory of malingering symptomatology; HAS, Health Attitude Survey; HHC, Health History Checklist; BDI-II, Beck Depression Inventory-II.

None of the measures significantly differed at p < 0.05.

aPercentage of patients who, during the study period, were receiving disability-related benefits.

bPercentage of patients who, during the study period, were receiving any form of mental health-related counseling or therapy from sources outside of our epilepsy center.

cDaily, one to several seizures per day; weekly, one to several seizures per week; monthly, one seizure every month or every few months; rare, fewer than three seizures per year.

From an internal measure of intervention outcomes, we initially observed no significant baseline difference (at time of enrollment) between responses from patients in the intervention and control groups to all six statements regarding their perceptions of PNES (Table 2). Subsequently, patients who completed the intervention, when compared to the control group, showed significantly more affirmative and sustained endorsements regarding the following statements: “my attacks do not bother me as much anymore” (p < 0.001 at follow-up 1, and p < 0.001 at follow-up 2); and “I am able to carry on with most daily activities despite my attacks” (p = 0.037 at follow-up 1, and p = 0.021 at follow-up 2). In addition, the intervention group showed significantly more affirmative, but nonsustained endorsements regarding the following statements: “I am able to avoid triggers to my attacks” (p = 0.016 at follow-up 1, but not significant at follow-up 2); and “I have some control over my attacks” (p = 0.006 at follow-up 1, but not significant at follow-up 2).

Over the course of 6–8 months of follow-up after discharge from the EMU, one patient from the intervention group and five patients from the control group required emergency room visits or hospitalizations for PNES-related symptoms. In other words, patients from the intervention group showed less utilization of acute health care.

Figure 2.
Patients in the intervention group (maroon squares) demonstrated significant improvement on the Work and Social Adjustment Scale (WSAS) across both follow-ups 1 and 2 (*p < 0.05), with the means dropping below the score of 20—a threshold above which reflects moderate to severe functional impairment. Error bars: Standard error of the mean (SEM).

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resources when compared to controls, although the magnitude of the difference failed to reach statistical significance ($p = 0.184$). Also during this follow-up interval, there were no significant differences between the two groups for the development of new and disabling symptoms for which causes have not been readily explained medically ($p = 0.606$), the initiation of new counseling/psychotherapy programs outside of the present study ($p = 0.655$), and the initiation of new psychotropic medications ($p = 0.523$).

**DISCUSSION**

In this study, we attempted to augment our initial communication to patients regarding the diagnosis of PNES with a subsequent, three-session group psychoeducational program administered by our own epilepsy center. The majority (73%) of participating patients commenced on this intervention within 4 weeks after learning of the diagnosis. Although we did not observe significant differences in PNES frequency or intensity, the patients who underwent the intervention demonstrated significant improvement in their WSAS scores, reflecting less impairment in important areas of functioning. Concordant with our results, a pilot randomized controlled trial of CBT for patients with PNES showed a significant improvement in WSAS scores over a 6-month follow-up period.9 Similar to our nonintervention group, a multicenter prospective study evaluating the outcome of PNES after communication of the diagnosis with no additional treatment showed no significant improvement in WSAS scores at 6 months.25 When we examined for more specific perceptions that may influence functional status, we observed that patients from the intervention group were significantly more likely to demonstrate sustained endorsements of the following: (1) PNES as being less bothersome to them; and (2) capability of working around PNES such that essential daily activities can be pursued. These perceived enhancements of functionality despite persistence of PNES were further evinced by the observed trend toward lesser PNES-related emergency room visits or hospitalizations, during the 6–8 months following discharge from EMU.

The WSAS has been used in several clinical populations to measure treatment outcomes, including depression and obsessive-compulsive disorder in its validation study and with phobic disorders.26 Of more relevance to our study, it has been used in somatoform disorders, such as chronic fatigue syndrome27 and in previous PNES samples. These studies demonstrated that the WSAS measure of functional impairment can distinguish meaningful differences in illness severity and treatment response. A WSAS score ≥20 has been suggested to reflect moderate to severe functional impairment.20 The mean of the WSAS scores from our intervention group was initially above this threshold at baseline, and then dropped below this threshold at both follow-up 1 and follow-up 2 (Fig. 2). This scoring pattern supports a degree of treatment response that may be clinically meaningful.

There has been some controversy whether therapeutic attention should be focused more on symptoms (seizure counts) versus functional status among patients with PNES. Some investigators have shown that full remission from PNES needs to be achieved in order to establish significant improvement in the patient’s overall quality of life.28 Other investigators have considered the negligible risk of harm to the brain/other systemic organs as well as the lower risk of accidental bodily injury from PNES,29 and opined that effectuating remission of PNES should not necessarily be the primary treatment goal.30 Supporting this latter sentiment is the observation that some patients, despite remission from PNES, remain poorly functional as demonstrated by continued dependence on health-related benefits or emergence of substituting somatic symptoms.31–33 One previous study showed that group psychoeducation for patients with PNES, while failing to appreciably reduce seizure counts, can still be effective in terms of improving coping strategies and reducing PNES-associated psychopathology.15 Similarly, our group psychoeducational intervention was associated with participants’ improvement in important areas of functioning as well as possible reduction in acute

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**Table 2. Comparison of the patients’ perceptions regarding PNES over follow-up intervals between intervention and control groups**

<table>
<thead>
<tr>
<th>Patients’ perceptions regarding PNES</th>
<th>Comparison of means, intervention vs. control groups</th>
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<tbody>
<tr>
<td></td>
<td>Enrollment (p-value)</td>
</tr>
<tr>
<td>My understanding of my attacks has improved</td>
<td>0.927</td>
</tr>
<tr>
<td>I am able to avoid triggers to my attacks</td>
<td>0.896</td>
</tr>
<tr>
<td>My attacks do not bother me as much anymore</td>
<td>0.631</td>
</tr>
<tr>
<td>I am less scared about my attacks</td>
<td>0.811</td>
</tr>
<tr>
<td>I am able to carry on with most daily activities despite my attacks</td>
<td>0.609</td>
</tr>
<tr>
<td>I have some control over my attacks</td>
<td>0.095</td>
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PNES, psychogenic nonepileptic seizures.

Bold highlighted p-value represents significantly more affirmative endorsement from the intervention group.
care utilization (and related iatrogenic injury risk), despite absence of significant changes in attack frequency/intensity.

The emphasis on cost/resource effectiveness in our brief group interventional approach compelled us to primarily focus our therapeutic effort on improving functional status, while dedicating comparatively less attention toward abolishing symptoms (seizure counts). Although etiologically heterogeneous, PNES are most commonly conceptualized as a psychological defense mechanism working to mitigate inner stressors from conscious awareness, or as psychosomatic manifestations of inherent personality disorders. In either case, the underlying psychopathology is deeply ingrained; therefore, interventions to obviate the need of such psychosomatic defenses may entail a more extensive therapeutic alliance—resources that were not available within our epilepsy center. Rather, our brief group psychoeducational approach aimed to legitimize these psychosomatic defenses and accept PNES occurrences, instead of conveying expectation to take them away. Our efforts focused on modifying individual adaptations to PNES, rather than on dissolving fundamental defense tendencies in personality. To this end, we endeavored to alter the patients’ perception of how PNES affects them by consolidating the concept of PNES as internally derived, safe, and manageable behavioral disruptions (i.e., PNES are what the patient does). We likewise focused on dispelling the victimization mindset of PNES as externally afflicted, life-threatening conditions (i.e., PNES are not what the patient has). Consequently, among patients who completed our intervention, the results from the WSAS scores, our internal measure of intervention outcomes (Table 2), and trend toward lesser PNES-related acute medical needs reflected some beneficial perceptual changes regarding PNES. In sum, our neurologist-initiated group psychoeducation for patients with PNES was derived from a cost/resource-effective approach and emphasized on fostering harmonious coexistence with PNES, rather than cure. We also aspired to cultivate within each patient a framework of psychological mindedness from which future therapeutic alliance can build on or be more readily achieved.

When comparing individual to group therapy of identical therapy formats, meta-analyses have generally shown no differential effectiveness between these modalities. Efficacy aside, group therapy when compared to individual therapy can offer some additional advantages, which may be particularly beneficial to patients with PNES. First, psychoeducation conveyed through another fellow patient within the therapy group, sharing his or her own experiences, may yield at times more legitimacy and impact than a therapist’s counseling. This benefit may be particularly relevant to patients whose transference is influenced by previous negative experiences with the health care establishment or authority figures, leading to projected distrust. Second, a breakthrough in terms of seizure control in one patient can have a “ripple effect,” actuating others in the group to model the coping strategies that led to the breakthrough. Even for the more ambivalent members of the group, witnessing improvement in another member may at least persuade more open-mindedness to the possibility of change. Finally, whereas individual therapy may be accessible to only a small number of patients due to resource limitations, group therapy approach expands to the treating capacity of the therapist such that larger number of patients may benefit from the intervention. This economy-of-scale treatment principle is particularly meaningful in settings where nonsocialized medicine is delivered. Moreover, whereas some group therapy programs have a preset enrollment window, our study protocol was designed to recruit new group participants on a continuously rolling basis, such that unnecessary delay (from the initial impact of the neurologist’s communication of the diagnosis) is avoided and enrollment opportunity is maximized.

There are several potential biases with our study that may limit generalization of our results. Among 34 patients who were randomized to the intervention, 20 patients (59%) completed the study’s prescribed three group therapy sessions. Comparisons of outcome measures between the intervention and control groups were performed by per-protocol analyses. Consequently, the demonstrated willingness of the patients who completed the study protocol, when compared to the ambivalence of those who missed the assigned sessions and became lost to follow-up, may bias the study sample toward inclusion of patients who are more motivated to pursue self-help and achieve clinical improvement. Another study bias can result from the lack of investigator and subject blinding, which is logistically difficult to actualize in interventional studies involving psychotherapies. Moreover, the predominantly male participants as well as unique intragroup culture and camaraderie within our veteran population may further contribute to a sample bias that limits the applicability of our results to the broader population with PNES, which is predominantly female and civilian.

Additional study design modifications can enhance the merit of our study. Because of our small sample size, our study may not be sufficiently powered to detect significant differences in the demographic and psychosocial variables between the intervention and control groups. Therefore, potential confounds have not been definitively excluded. Longer postintervention follow-up beyond 6–8 months would allow for more precise determination regarding the extent of time over which the efficacy from our brief group therapy can persist. Beyond our results from PNES frequency/intensity, WSAS, and PNES-related acute medical resource utilization, further validated instruments such as measures on health-related quality of life and illness perceptions may allow for a more complete assessment of the patient’s overall health status following our intervention. Our abbreviated (three-session) group therapy protocol...
allows for more readily achievable standardization of intervention across collaborating centers, and future multicenter studies would strengthen the statistical power and generalizability of the intervention outcome.

Although the neurologist’s communication of the diagnosis to patients with PNES can be known to affect the outcome for some, such advantage is often lost from subsequent inaction, as lack of additional intervention has been shown to result in no meaningful improvement of functionality. Patients with PNES and neurologists alike are frequently stymied by the limited availability of therapeutic options due to cost/resource constraints. Under this backdrop, we proposed a cost/resource effective, brief group psychoeducational intervention that can be executed as a neurologist-initiated program in an epilepsy center. Our group sessions were facilitated by clinicians in the neurology discipline who were psychologically minded, having had extensive experiences working with patients afflicted by PNES. Although our patients did not enjoy significant reduction in seizure burden, we believe that they did nonetheless achieve meaningful functional improvement to allow for better engagement in life from which future gains may ensue.

**ACKNOWLEDGMENTS**

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**DISCLOSURE**

None of the authors has any conflict of interest to disclose. We confirm that we have read the Journal’s position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

**REFERENCES**

Brief Group Psychoeducation for PNES

Appendix 1

The Work and Social Adjustment Scale20 (WSAS) is a five-item measure that assesses an individual’s self-perception of functioning in everyday activities across several domains (e.g., work, home management, interpersonal, and leisure). Each item is rated on a 9-point scale ranging from 0 (not at all a problem) to 8 (very severely impaired), with total scores ranging from 0 to 40, high scores relating to higher levels of impairment in functioning. In its validation study, the measure showed adequate internal reliability (Cronbach’s α > 0.78).

Structured Inventory of Malingered Symptomatology21 (SIMS) screens for over-reporting of uncommon cognitive and affective symptoms. The SIMS is composed of 75 self-report, true-false items that are to be answered by individuals 18 and older with at least a fifth-grade reading level. Inter-rater agreement among nine licensed clinical psychologists, working from an initial pool of 200 questions, was used to categorize 15 individual items into each of five subscales including the following: neurologic impairment (NI), affective disorders (AF), psychosis (P), low intelligence (LI), and amnestic disorders (AM). In addition, a total score is calculated by summing all of the raw scores (range: 0–75).

The Health History Checklist is a list of the somatoform disorder symptoms from DSM-III-R.22 Patients were asked to place a check next to a symptom if it had been a significant problem for them. Endorsement of 13 items or more is considered to be indicative of somatoform disorder tendencies.

The Health Attitudes Survey23 (HAS) is an eight-question instrument designed to assess attitudes and perceptions of somatizing patients and discriminate them from other patient populations. Questions are answered based on a 5-point Likert scale ranging from 0 (Strongly Disagree) to 4 (Strongly Agree) for a maximum score of 32.

The Beck Depression Inventory – II24 (BDI-II) is a 21-item measure that has been widely used to assess depression severity. Each question ranges from 0 to 3 and asks questions consistent with current diagnostic criteria for depression (e.g., feelings of worthlessness, loss of sleep and appetite, suicidality). Total scores range from 0 to 63, with higher total scores indicating more severe degree of depressive symptoms. The test has been shown to have high internal consistency (α = 0.91).

Appendix 2

QUESTIONNAIRE FOLLOW-UP #: 

Study Patient ID# 

Date: 

For each of the questions below, please circle the appropriate response:

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1. My understanding for the cause of my attacks has improved after Dr. Chen’s VEEG evaluation</td>
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<tr>
<td>2. I am able to avoid “triggers” to my attack and therefore my attacks are now less frequent and less strong</td>
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<tr>
<td>3. My attacks do not really bother me or affect my life that much anymore</td>
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<tr>
<td>4. I am less scared about what is happening to me when I have my attack</td>
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<tr>
<td>5. Despite my attacks, I am still able to carry on with most of my essential daily activities</td>
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<td>6. I have some control over my attacks</td>
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<td>7. The amounts of my attacks are about:</td>
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</tbody>
</table>

1. (Much worse – more than twice as worse as before) 
2. (Worse – about twice as worse as before) 
3. (Same as before) 
4. (Better – about half as much as before) 
5. (Much better – less than half as much as before)
8. The intensity or severity of my attacks is about:
   1 (Much worse – more than twice as intense as before)
   2 (Worse – about twice as intense as before)
   3 (Same as before)
   4 (Better – about half as intense as before)
   5 (Much better – less than half as intense as before)

9. Since your VEEG evaluation, have you required any recent ER visit or hospitalization?
   Yes/No If Yes, please explain:

10. Since your VEEG evaluation, have you developed any NEW medical symptoms involving your body that you or your doctors have not been able to explain?
    Yes/No If Yes, please explain:

11. Any NEW mental health intervention since your VEEG evaluation? (circle all that apply)
    a New Counselor
    b New Psychiatrist
    c New Psychiatric Medication (if yes, which one? ________________________)
    d New Social Worker
    e New Psychologist
    f Other intervention that is new (if yes, please explain ________________________)
    g No new intervention

If any new mental health intervention, please explain: