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Stress coping strategies in patients with psychogenic non-epileptic seizures and how they relate to trauma symptoms, alexithymia, anger and mood

Lorna Myers [a,*], Melissa Fleming [a], Martin Lancman [a], Kenneth Perrine [a,b], Marcelo Lancman [a]

[a] Northeast Regional Epilepsy Group, United States
[b] Weill-Cornell Medical College, United States

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ABSTRACT

Purpose: The purpose of the present study was to assess stress coping strategies employed by patients with psychogenic non-epileptic seizures (PNES) and determine whether these approaches were associated with other psychopathological features. Ineffective stress coping strategies can have a variety of unhealthy consequences fueling psychopathology just as psychopathology can also have an impact on stress coping. Because of this, the study of stress coping has the potential to inform our understanding of the PNES condition and underscore a potential target for psychological treatment.
Methods: Eighty-two consecutive patients with PNES were studied using the Coping Inventory for Stressful Situations (CISS). The CISS is a self-rating coping strategies scale that has three main subscales (Task-Oriented, Emotion-Focused, and Avoidance-Oriented). Other psychological variables that were thought to potentially influence the chosen coping mechanisms including alexithymia, symptoms of post-traumatic stress disorder, anger expression and select scales from the Minnesota Multiphasic Personality Inventory 2-RF (MMPI 2-RF) were also evaluated.
Results: Fifty patients (60.9%) endorsed using at least one coping strategy that was 1.5 standard deviations or more away from the normal adult mean. Over 30% of the participants endorsed using elevated Emotion-Focused coping strategies (T score $\geq$ 65), and just over 25% endorsed underusing Task-Oriented coping strategies (T score $\leq$ 35). Elevations in avoidance strategies were endorsed by only 15.9% of the respondents. ANOVA comparing *T* scores between the coping strategies was significant ($F = 13.4$, $p = .0001$) with a significantly lower Task-Oriented strategy than Emotion-Focused ($p = .001$) and Avoidance ($p = .005$) strategies.

Patients with high scores of Emotion-Focused coping strategies also had significantly high scores on diverse psychopathology factors including elevations on depressive mood, intrusive experiences, anger state, and general anger scores. In contrast, those who used Task-Oriented strategies and who used Avoidance-Focused strategies had less psychopathology including low positive emotion scores (RC2).
Conclusion: Nearly one-third of patients with PNES tended to use the less effective Emotion-Oriented coping strategies and one fourth reported underusing the more effective Task-focused strategies. Substantial differences were noted between coping strategies with a significantly lower Task-Oriented strategy than Emotion-Focused and Avoidance strategies. In addition, high Emotion-Focused coping was seen in patients with underlying psychological symptoms that were not observed in other coping strategies. This information supports the relevance of assessing stress coping in patients with PNES because it allows the identification of useful behavioral targets for the psychotherapist.

1. Introduction

Psychological stress is a relational concept that stems from a perceived discrepancy between an external demand and the available resources for dealing with it. Stress can be conceived of along two themes: the physical and mental changes a person experiences as a result of the external stressor and the aptitude the person possesses to handle the stressful situation (i.e. coping).[1] Lazarus and Folkman's[2] appraisal model of psychological stress views stress as originating from a circular sequence that begins with initial appraisals of novel events' threat levels, followed by physiological and emotional changes and subsequent appraisals of available coping options and their effectiveness. Coping is a cognitive-behavioral process that unfolds in the context of a

* Corresponding author at: Northeast Regional Epilepsy Group, 820 Second Avenue, Suite 6C, New York, NY 10017, United States. Tel.: +1 212 661 7460; fax: +1 212 661 7496.
E-mail addresses: lmyers@epilepsygroup.com, dramyers@yahoo.com (L. Myers).

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situation or condition perceived as personally relevant and challenging and serves the purpose of handling the particular demand.[3] Lazarus and Folkman classified coping responses as either problem-focused or Emotion-Focused. Problem-focused strategies tend to increase the individual's awareness, level of knowledge and range of behavioral and cognitive coping strategies and act upon the stressor. Emotion-Focused strategies aim to limit the degree of emotional disruption caused by the event and do not directly effect change on the event itself. The study of stress typically utilizes self-report measures to assess stress appraisal and stress coping strategies. The Coping Inventory for Stressful Situations (CISS)[4] is a measure that assesses the two coping strategies discussed as well as a third coping strategy of avoidance producing three scales: Task-Oriented, Emotion-Focused, and Avoidant-Oriented; the first is considered the more efficient strategy for most stressors and is associated to resilience and lower psychopathology rates.[5,6] The Emotion-Focused and Avoidant-Oriented strategies are considered less effective because they do not produce change in the triggering circumstances and can be draining over time. Psychogenic non-epileptic seizures (PNES) are events that resemble epileptic seizures but occur without epileptiform activity and instead stem from a psychological source.[7] The seizure-like behaviors have been conceived of as resulting from a maladaptive coping approach to stressful situations that are perceived as unbearable.[8] PNES patients have been found to experience stressful life events as more severe and distressing while engaging less in active coping and planning than controls.[9–12]

The purpose of the present study was to assess coping strategies employed by patients with PNES and determine whether these approaches were associated with other maladaptive psychological features. Identifying psychological factors that play a role in triggering and maintaining PNES has the potential to determine more effective and targeted directions for treatment. Our hypothesis was that patients with PNES would engage less in Task Oriented strategies and more in Emotion and Avoidance Strategies.

2. Materials and methods

This study included all consecutive patients with the diagnosis of PNES (n = 100) confirmed with inpatient video-EEG monitoring who underwent a comprehensive neuropsychological battery (between 2008 and 2012) and had an IQ $>$ 70.

All of the participants were interviewed by a neuropsychologist who elicited whether there was a history of trauma. Trauma was classified as physical abuse (i.e. bruising, broken bones, whip marks, stab wounds, concussions) or rape/sexual abuse (i.e. touching/fondling and/or forced oral sex or vaginal/anal intercourse). Since some patients had experienced multiple traumatic events age of the first traumatic episode was classified as "age of abuse." Age of PNES onset and duration were noted.

2.1. Exclusion criteria

The final number of patients was reduced to 82 patients because of the following exclusions: 4 earned a Full Scale IQ of less than 70, 6 patients were found to have a dual diagnosis of epilepsy and PNES, and the data collected were determined to be invalid for 8 individuals due to suspected malingering. Patients were determined to be exerting insufficient effort based on the recommendation stated in the Test of Memory Malingering (TOMM) professional manual combining numerical scores (i.e. Trial 1 and 2 of the TOMM), behavioral observations suggestive of deficient effort, and verification of an active pursuit of a personal injury suit or a disability petition. The specific criteria stated in the TOMM professional manual was used to interpret the TOMM scores.

2.2. Measures

The standard battery of tests administered to our patients with PNES at the Northeast Regional Epilepsy Group includes 10 cognitive tests that assess intelligence, pre-morbid intelligence, verbal and visual memory, attention, executive functions, speech and language, and fine motor skills and five psychological measures. Because of the substantial load of cognitive testing administered to our patients, the Test of Memory Malingering (TOMM) has been added to the battery with the purpose of examining the validity of our results.

Seven measures from the Northeast Regional Epilepsy Group PNES neuropsychological battery were used for analysis in this study. Five of these are psychological measures: Coping Inventory for Stressful Situations (CISS), State Trait Anger Expression Scale-2 (STAXI-2), Toronto Alexithymia Scale-20 (TAS-20), Trauma Symptom Inventory 2 (TSI 2), and the Minnesota Multiphasic Personality Inventory-2-RF (MMPI-2-RF). The Test of Memory Malingering (TOMM) and Wechsler Abbreviated Scales of Intelligence (WASI) were utilized as part of exclusion criteria demands. The WASI was also examined to determine whether there was a correlation between IQ and coping strategies.

We also examined the relationship of the psychological measures to demographic variables, including age at onset of PNES, years of duration of PNES, history of any abuse, and type of abuse (physical, sexual, or both).

The CISS is a paper-and-pencil self-report scale that was developed to assess three coping strategies that the respondent typically uses when confronted with stressful situations: Task-Oriented, Emotion-Oriented and Avoidance. It can be used with normal and clinical populations. The adult version of the CISS is based on three normative samples including adults (249 males, 289 females), college students (471 males, 771 females), and psychiatric inpatients (164 males, 138 females). The CISS provides norms for adults and psychiatric inpatients. There are a total of 48 items (e.g. focus on the problem and see how well I can solve it, get angry, go out for a snack or meal) on which respondents are asked to indicate "how much you engage in these types of activities when you encounter a difficult, stressful, or upsetting situation". Raw scores are converted to T scores which is a type of standard score with a mean of 50 and a standard deviation of 10. Interpretive guidelines for "elevated" T scores are that 61–65 (87–94th%ile) are "above average, 66–69 (95–97th%ile) are "much above average", and 70 ($\geq$99th%ile) or higher are very much above average. Linear T scores do not transform the actual distribution of the variables in any way. The present study compared participant scores to adult "normal" norms in accordance with typical clinical practice.

Validity of the multidimensionality of the CISS scales and construct validity of the scales have been examined with college, adult and inpatient samples. Factor analysis produced congruence coefficients comparing each of the three factors above 0.95 for all three samples. This supports that the CISS independently assesses for the three Task-Oriented, Emotion-Oriented and Avoidance focused scales. Construct validity of the CISS has been conducted as for coping (Ways of Coping Questionnaire – WCQ), psychopathology (Basic Personality Inventory – BPI and MMPI-2), depression (Beck Depression Inventory – BDI), anxiety (Endler Multidimensional Anxiety Scales – EMAS), somatic complaints (Psychosomatic Symptom Checklist – PSC), neuroticism and extraversion (Eysenck Personality Inventory – EPI). For a comprehensive description of these studies the reader is directed to the CISS Professional Manual.[4] In sum, results from these studies have shown that CISS Emotion-Oriented coping is strongly positively related to depression, anxiety,

neuroticism, and somatization. Task-Oriented coping is negatively related to depression and unrelated to anxiety, somatization, neuroticism and extraversion. Avoidance-Focused coping was unrelated to depression, low or unrelated to anxiety, and correlated positively to somatization.

One of the three stress coping strategies is Task-Oriented coping which refers to purposeful Task-Oriented efforts aimed at solving the problem, cognitively restructuring the problem or attempts to alter the situation. The emphasis is on the task or planning and direct attempts to solve the problem. Emotion-Focused coping refers to emotional reactions that are self-oriented. The aim is to reduce stress and reactions include emotional responses, self-preoccupation and fantasizing. Avoidance coping refers to activities and cognitive changes aimed at avoiding the stressful situation via distancing or distracting oneself with other situations or tasks or via social diversion.

The STAXI-2[13] is a 57-item self-report measure which consists of three main scales: State Anger Scale, which measures the intensity of anger feelings and the extent to which a person feels like expressing anger at a particular time; the Trait Anger Scale, which measures how often angry feelings are experienced over time and thus provides a sense of the degree to which anger may or may not be a chronic part of the person's temperament, and an Anger Expression Index, which is a general index of anger expression based on responses to the anger control and expression subscales. Satisfactory factor loadings for the 57 items and adequate concurrent validity have been determined between the STAXI-2 subscales and other measures of hostility and personality (Budd-Durkee Hostility Inventory, MMPI Hostility scale, Eysenck Personality Questionnaire, State Trait Personality Inventory). Higher scores reflect stronger endorsements of anger symptoms within that domain.

The TAS-20[14] is self-report scale used to measure alexithymia composed of 20 items that are rated on a 5 point scale, ranging from 1 (strongly agree) to 5 (strongly disagree). A score equal to or less than 51 represents "non-alexithymia", whereas a score equal to or greater than 61 represents "alexithymia". This measure has demonstrated good internal consistency (Cronbach's alpha = .81) and test–retest reliability (.77, $p < .01$) and has also demonstrated adequate levels of convergent and concurrent validity. Higher scores reflect greater alexithymia.

The TSI-2[15] is a 136 item self-report measure that is used to evaluate acute and chronic posttraumatic symptomology in adults. The instrument provides 10 clinical scales, but only five were included for analyses due to overlap with other psychological inventories (TSI 3 assesses anger, TSI 5 assesses avoidance approaches, and the TSI 9 assesses impaired self-reference which are otherwise being assessed by our other measures) or divergence from study focus (TSI 7 and 8 assess dysfunctional sexual behaviors). The scales that were examined included TSI1- Anxious Arousal (anxiety and autonomic hyperarousal), TSI2- Depression; TSI4- Intrusive Experiences (i.e. nightmares, flashbacks, upsetting memories; TSI 5- Dissociation (cognitive disengagement, depersonalization, derealization, emotional numbing and out-of-body experiences); and TSI10- Tension Reduction Behavior (involvement in distracting external activities as a way to reduce painful internal states including for example, substance use and sexual acting out). A *T* score of 65 and above is considered clinically elevated and a *T* score of 35 and less is considered significantly reduced.

The MMPI-2-RF[16] is a self-report measure of psychopathology and personality. The test is comprised of 338 true–false items that measure of psychopathology and personality and is intended for adults (18 and older). There are 9 validity scales as well as 3 Higher-Order (H-O) scales and 9 Restructured Clinical (RC) scales. As per the MMPI 2RF manual, an entire profile is rendered invalid if F-r $\geq$ 120 and/or Fp-r $\geq$ 100 as with Scales VRIN and TRIN $>$ 80; none of the individuals in this sample presented with scores in these ranges. The Higher-Order scale of Emotional/Internalizing Dysfunction (EID) is of particular interest given its broad assessment of overall emotional dysfunction. The Restructured Clinical scales (RC1: Somatic Complaints; RC2: Low Positive Emotions; RC3: Cynicism) are also of special interest given their potential relationship to PNES. Consequently, these four scales were used for analyses. Higher scores reflect greater psychopathology.

The TOMM[17] is a 50-item visual recognition test sensitive to motivation and effort that is specifically designed to differentiate between authentic memory impairments and malingering. It is a test of "effort" and as such has been classified as a symptom validity test (SVT) or Performance Validity Test (PVT). The TOMM numerical scores combined with situational variables assist the neuropsychologist in making a clinical decision about the effort that is being put forth on testing. The two decision rules stated in the TOMM manual were used to classify test takers. Scores that fulfill either or both rules raise serious questions about the individual's motivation to perform well on other tests and raise concerns about the validity of other scores. A cut off score of 45 on Trial 2 had a high specificity correctly classifying 95% of all non-demented patients.

The WASI[18] consists of four subtests: Vocabulary, Similarities, Block Design, and Matrix Reasoning. The four-subtest form results in Verbal (VIQ), Performance (PIQ), and Full Scale (FSIQ) scores.

2.3. Analysis

Analyses were conducted over three steps. The first step was to determine the number of patients that endorsed using the CISS subscales (Task-Oriented, Emotion-Focused and Avoidance) to an extent that deviated significantly from normal adult means ($\geq$1.5 standard deviation) as that is the cut off used in clinical practice (Task Oriented scale: a *T* score of less than 35; Emotion oriented and Avoidance scales: a *T* score greater than 65). One-way analysis of variance (ANOVA) with dummy coding was used to compare the *T* scores of the three coping strategies, and chi-square was used to compare the frequency of elevations between the three coping strategies.

The second step we took was to determine the psychological factors associated to predominant stress coping strategies, the primary outcome measures used were the CISS Task-Oriented, Emotion-Focused and Avoidance-Oriented Scores. Pearson product-moment correlation was used to measure the association of the psychological measures (TAS-20, TSI 2, STAXI-2 and MMPI-2-RF), quantitative demographic and clinical variables with the CISS scores. A Bonferroni's adjustment was made for each of the CISS tasks correlations to account for experiment-wise error.

An independent *T* test was used to assess whether the presence or absence of a history of abuse and type of abuse associated with CISS scores.

Our third step was to use stepwise linear regression to determine predictors of the CISS scores separately for each of the three CISS factors; a p value of less than 0.05 was considered significant. The scales from the psychological measures mentioned above were used as predictors (TAS-20; TSI Anxious Arousal, Depression; Intrusive Experiences; Dissociation, and Tension Reduction; STAXI-2 State Anger, Trait Anger, and Anger Expression Index; and MMPI-2-RF EID, RC1, RC2, and RC3 scales).

Sixty of the subjects who participated in a prior publication in which quality of life and anger expression in PNES were examined participated in this present series.[19] The current sample differs in that it includes 4 additional males and a total of 22 new subjects as compared to the last publication. Mean age and education are similar in both samples.

Institutional Review Board approval for an anonymous archival record review was obtained with removal of non-relevant PHI (Copernicus IRB NRE1-11-155).

3. Results

Our sample was composed of 10 males and 72 females. Mean age was 39.7 years (16–67), mean years of education were 13.9 (10–20). Out of the patients that provided responses about abuse, there was a positive history of abuse in 57 out of 75 (76%), 29 out of 62 had sexual abuse (46.8%) and 37 out of 64 had physical abuse (57.8%). Twenty-one out of 75 (28%) reported experiencing both sexual and physical abuse. The mean age of abuse was 12.5 years (1–58).

Fifty patients (60.9%) endorsed using at least one coping strategy that was 1.5 standard deviations or more away from the normal adult mean. Elevated Emotion-Focused coping strategies (mean = 56.0 ± 14.0) were seen in 25 patients (30.5%), elevated Avoidance (mean = 51.7 ± 2.3) was seen in 13 (15.9%) and low Task-Oriented coping strategies (mean = 45.1 ± 4.3) were found in 21 (25.6%). Eight patients reported a combination of significantly low Task Orientation and significantly elevated Emotion-Focused coping and seven reported a combination of elevated Emotion-Oriented and Avoidance-Focused strategies. The ANOVA comparing T scores between the coping strategies was significant ($F = 13.4$, $p = .0001$) with a significantly lower Task-Oriented strategy than Emotion-Focused ($p = .001$) and Avoidance ($p = .005$).

3.1. Relation between Emotion-Focused coping strategies and other variables

Examination of other psychological variables demonstrated a significant correlation between high Emotion-Focused coping strategies and alexithymia from the TAS-20; Anxious Arousal, Depression, Intrusive Experiences, Defensive Avoidance, Dissociation, and Tension Reduction Behaviors from the TSI-2; Anger State, Trait, and Anger Index from the STAXI-2; and MMPI 2-RF Low Mood, Somatic Complaints, Cynicism, and Emotion/Internalization Dysfunction (Table 1).

Stepwise multivariate regression on the Emotion-Focused scale from the CISS was significant ($F = 23.71$, $R^2 = 0.71$, $p = .001$). Five predictors were retained as significant, including TSI2-Depression ($t = 3.62$, $p = .001$), TSI4-Intrusive Experiences ($t = 4.40$, $p = .001$), TSI10-Tension Reduction Behaviors ($t = -2.52$, $p = .016$), STAXI-2 Anger Index ($t = 3.48$ $p = .001$), and STAXI-2 State scale ($t = -2.44$, $p = .019$).

3.2. Relation between Task-Oriented coping strategies and other variables

Task-Oriented strategies were significantly associated to low alexithymia scores, low RC2-low positive emotions, low and EID-Emotional/Internalization Dysfunction. Stepwise multivariate regression on the Task-Oriented Scale was significant ($F = 27.16$, $p = .001$, $R^2 = 0.44$) and retained one predictor: RC2-low positive emotions ($t = -11.29$, $p = .001$).

3.3. Relation between Avoidance-focused coping strategies and other variables

With regards to Avoidance-Focused strategies from the CISS, a correlation to low RC2-low positive mood was the only significant variable. Stepwise multivariate regression on the Avoidance-Focused Scale was significant ($F = 6.27$, $p = .015$, $R^2 = 0.09$) and retained one predictor: RC2 ($t = 10.06$, $p = .001$).

We did not find a significant relationship between coping strategies and any other variables: demographic, clinical (i.e. age at which the diagnosis of PNES was made or years of PNES duration, intelligence quotient, education) or historical (i.e. history of abuse, type of abuse).

Table 1
Correlations between CISS scales and psychological variables. Pearson product-moment correlation/$p = 0.038$.

	CISS_task	CISS_emotion	CISS_avoid
CISS_task	1.001	−.113	.450*
		.312	.001
CISS_emotion	−.113	1.001	.074
	.312		.511
CISS_avoidance	.450*	.074	1.001
	.001	.511	
TAS-20	−.258*	.542*	−.082
	.023	.001	.474
TSI_1 (anxious arousal)	−.103	.702*	−.112
	.382	.001	.343
TSI_2 (depression)	−.187	.682*	−.078
	.108	.001	.504
TSI_4 (intrusive experiences)	−.137	.622*	−.142
	.242	.001	.225
TSI_6 (dissociation)	.006	.537*	.073
	.961	.001	.532
TSI_10 (tension reduction)	−.132	.389*	.131
	.257	.001	.264
RC1 (somatic complaints)	−.026	.393*	−.086
	.848	.003	.531
RC2 (low positive emotions)	−.595*	.417*	−.325*
	.001	.002	.015
RC3 (cynicism)	−.009	.429*	.176
	.947	.001	.199
EID (emotional internaliz. dysfunction)	−.359*	.680*	−.090
	.007	.001	.515
STAXI-2 state anger	.006	.314*	.047
	.958	.004	.674
STAXI-2 anger index	−.158	.461*	.042
	.156	.001	.709
STAXI-2 trait anger	−.166	.476*	.006
	.135	.001	.957

CISS = Coping Inventory for Stressful Situations, TAS-20 = toronto alexithymia scale, TSI = trauma symptom inventory, RC1, RC2, RC3, EID are from the MMPI-2-2RF, STAXI-2 = state-trait anger expression inventory-2.
* $r = 0.50$.

4. Discussion

Our study revealed that nearly one third of the patients in this sample reported an elevated use of Emotion-Focused coping strategies (i.e. self-oriented stress reduction approaches that include fantasizing, self-blame and angry outbursts) which is considered to be ineffective in resolving most stressful situations. In contrast, diminished Task Oriented coping strategies (i.e. purposeful Task-Oriented efforts aimed at solving or cognitively restructuring the problem or attempts to alter the situation) were found in 25.6%. Moreover, the potentially troublesome and ineffective combination of significantly low Task Orientation and significantly elevated Emotion-Focused coping was found in 10%. In this sense, our results are consistent with other studies that have found decreased use of effective Problem-Solving strategies in PNES patients[9,20,21] and support our hypothesis that Emotion-Focused coping is more prevalent in a substantial number of patients with PNES. A reasonable expectation is that there would be greater emotional distress and psychopathology in these particular patients. Avoidance strategies (i.e. activities and cognitive changes aimed at avoiding stress via distraction or social diversion) were reported by only 15.9% of respondents. Seven patients reported the potentially ineffective combination of strategies that included elevated Emotion-Oriented and Avoidance-Focused strategies. The heightened use of these two

strategies would likely be associated to greater distress and continued exposure to unresolved problems.

Additional testing revealed elevations of depressive mood, Intrusive Experiences, Tension Reduction Behaviors, Anger State and Anger Index in those who reported using Emotion-Focused coping strategies at high levels. High prevalence rates of depressive and anxiety disorders in patients with PNES have been described.[22] It has been theorized that sensing that one has inadequate resources in the context of a stressful event can lead to feelings of helplessness, depression, and increased anxiety. Depressive cognitive distortions can contribute to impairments in stress appraisal and effective problem-solving. Just as might be seen in a feedback loop, ineffective problem-solving can contribute to depressive feelings, anxiety and prolonged affective distress.[23] In contrast, having adequate problem solving strategies is associated to resilience and psychological health.[24,25]

Seventy six percent of our sample endorsed having been the victim of abuse. Psychological trauma is considered one of the main etiological factors in PNES and reported in some series in up to 90% of the cases.[12,26] Research on victimization and trauma has shown that these can lead to more ineffective coping strategies of choice.[27] Although a positive correlation between trauma historical variables (type and age of abuse) and coping strategies was not determined in our study elevations in symptoms associated to post traumatic pathology were identified. In fact, one of the major components of the PTSD triad, Intrusive Experiences, was found to correlate with the elevated use of emotion as a coping mechanism. Tension reduction behaviors which represent maladaptive ways often used by traumatized individuals to relieve distress and emotional suffering were also elevated. The latter clearly represents an unhealthy problem solving approach.

With respect to anger, patients reporting elevations in anger were also more prone to use emotion rather than task oriented strategies. Obviously, the inappropriate and excessive experience of anger is inefficient as a problem solving approach. In addition, persons who employ excessive anger and are high on cynical hostility have been found to experience negative consequences on emotional well-being (i.e. depression), and social relationships.[28,29] With regards to PNES, this finding is consistent with previous reports of hostility, low openness, and anger as a common coping strategy.[30,31] Anger has also been associated to decreased quality of life (emotional well-being, cognitive and social effects, among others) in patients with PNES.[19]

We found that the elevated use of an Avoidant coping strategy correlated significantly with low positive emotion but with no other variables. Therefore, it would appear that avoidance is not as strongly associated to depressive characteristics. One explanation for this result may rest in the composition of the CISS; one of the two main components of the CISS Avoidance coping scale includes social diversion. This is in fact comparable to social support which represents a healthy coping maneuver. Case in point, Uehara et al. reported that the CISS Avoidance scale showed a positive correlation with extraversion on the Munich Personality Test[6] which is a positive behavioral manifestation in many situations.

Task-Oriented Coping Strategies represent the healthiest mechanisms to deal with most stress. A Task-Oriented Coping Strategy which includes planned out problem solving, cognitive restructuring and seeking social support was found to correlate negatively with low positive emotion (RC2). Our findings are consistent with other reports that Task oriented approaches negatively correlate to depression[24] and depressive symptoms. It is understandable that the positive feedback and sense of efficacy that results from using this strategy and effectively resolving problems could help counteract depressive symptoms. Similarly, cognitive appraisals of stressful events and the implementation of problem solving strategies from a non-depressed state of cognition would also promote more effective problem resolution.

A limitation of our study was that ethnicity and acculturation were not assessed. There are variations in coping modes in different cultures[29] as well as which strategies would be considered more effective; this could have proven an important consideration. Gender was also not equally represented although this is the result of the higher ratios of women over men who present with this disorder. Regardless, future attempts to analyze male versus female coping strategies might contribute useful information on differences in these two groups. It could be argued that there is a referral bias in that this sample includes only those who have reached a tertiary center for video telemetry and that there may be important differences in patients with PNES who do not. However, this is the quandary that those who conduct research of PNES face since without video telemetry one could argue that it is uncertain whether the diagnosis of PNES is accurate and psychological research and conclusions obtained in these samples could therefore be questionable. Lastly, stress appraisal was not collected in this study; this would complement our findings regarding stress coping approaches. In the future, it would be useful to include this as another study variable.

In sum, in PNES, one fourth of our sample revealed using diminished Task Oriented coping strategies while nearly one third revealed using elevated Emotion-Oriented strategies. Greater psychopathology was seen more in patients who used Emotion-Oriented approaches and less in those who used Task oriented approaches. These findings add to our understanding of functional differences in patients with PNES and provide us with thought-provoking inter-group differences. These findings have compelling potential for psychological treatment because identifying which coping strategies the patient utilizes gives the psychologist more precise targets with which to work. In particular, incorporating this information into treatment would guide therapist and patients to working on recognizing individual stressors and the ways in which the patient reacts to each of them. This would then be followed by the assessment and selection of alternative problem solving approaches. This procedure would be repeated with each new stressor habituating the patient to utilizing these more effective problem solving approaches over time.

Future studies are needed to replicate these results and to study these variables in a treatment setting. A more in depth examination of patients who reported using a combination of ineffective strategies represents another intriguing research direction. Lastly, until now much of the research on stress coping strategies has depended on the individual's self-report therefore relying primarily on conscious and purposeful approaches to stress. Future research directions might seek to examine spontaneous coping strategies that the patient may not even be aware of employing; this information would be obtained through direct observation or reports provided by significant others.

5. Conclusion

Consistent with our prediction, a substantial number of patients with PNES tended to use Emotion-Focused strategies and a sizable number tended to underuse Task-Oriented coping strategies. Greater reliance on the Task-Oriented coping strategy was associated with less psychopathology than those who used Emotion-Focused coping strategies. Those persons who primarily tended to use Emotion-Focused strategies presented with more psychopathology, including high scores of depressive mood, intrusive experiences, tension reduction behaviors, and elevations in anger expression. In contrast, patients using Task-Oriented strategies were significantly lower on low positive emotion (depressive symptom). This study underscores the utility of

formally assessing stress coping strategies and has the potential to contribute to psychotherapeutic treatment design in PNES. The introduction of Task oriented strategies and concrete problem solving skills as well as reduction of Emotion-Focused strategies represent important therapy components for working with these patients.

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