

The Effect of Moral Injury on Psychogenic Non-epileptic Seizures (PNES) in U.S. Combat Veterans

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Abstract

Moral Injury (MI) is defined as perpetrating, failing to prevent, or bearing witness to acts that violate a person's deeply held moral beliefs or values (Currier, 2017). It often results in feelings of guilt and shame. MI develops from a potentially morally injurious event (PMIEs), which is the experience that violates the person's beliefs. Psychogenic Non-Epileptic Seizures (PNES) look like epileptic seizures, but the electrical firing in the brain is different. The aim of this study was to see the effect MI has on veterans with PNES, and compare it to veterans who only have PNES. To measure this 2 questionnaires were developed, one asking about PNES and MI and one asking only about PNES. Patients with PNES and MI answered the first questionnaire, and patients with only PNES answered the second. The study was able to find 2 participants, both who filled out the PNES and MI questionnaire. The study was unable to look at how MI in PNES in U.S. Combat veterans compare to veterans who only have PNES.

Introduction

Moral Injury (MI) is defined as perpetrating, failing to prevent, or bearing witness to acts that ultimately transgress an individual's deeply held moral beliefs (Currier 2017). Dr. Jonathan Shay was the first to coin the term Moral Injury in his research with Vietnam veterans. Although MI can occur in first responders, health care workers, and civilians, it has mostly been studied in veterans and military personnel from the United States, Australia, The United Kingdom and Israel.

Moral Injury and Post Traumatic Stress Disorder (PTSD) are considered to be separate disorders, but are similar in certain aspects. PTSD is a fear-based disorder resulting from physical danger. MI on the other hand results from moral transgressions in a high stakes situation (Zefferman et al., 2020). MI is thought to result in feelings of guilt, shame, difficulty in forgiveness, distrust, changes in religious beliefs, demoralization, grief and disgust (Kelley, 2019).

MI develops from exposure to potentially morally injurious events (PMIEs). A morally injurious event is an experience which violates the moral beliefs or values of the individual in a high-stakes situation. These violations may be something the individual did which they now regret, something they failed to do, something that someone else has done or failed to do, something that they had witnessed, or something they learned about after it already happened (Wyatt et al, 2020).

Psychogenic non-epileptic seizures (PNES) look like epileptic seizures, except the brain wave recordings from an electroencephalogram (EEG) do not show epileptiform activity. Unlike epilepsy, PNES is caused by emotions or overwhelming physiological distress. An estimated 90% of those with PNES have a history of psychological trauma (Myers, 2014). PNES may

develop in individuals who have a history of trauma, depression, PTSD, troubled family history (alcoholism, sexual abuse, etc.), anxiety or addiction. Both research on PNES and MI is fairly new, although the concepts of both are hundreds of years old. Instances can be found from previous wars or literature. For example Dr. Jonathan Shay found aspects of MI in Homer's the Iliad and the Odyssey (Shay, 2014).

Very little research has been conducted on the effect of MI on PNES in combat veterans. One of the if not the first study to examine PNES and MI together was the journal article Moral Injury in Veterans with Nonepileptic Seizures (LaFrance et al., 2019). The study examined the difference between veterans with PNES and MI, and veterans with only PNES. The purpose for this study is to examine the effect MI has on psychogenic nonepileptic seizures (PNES) in U.S combat veterans.

Hypothesis

The hypothesis for this study is that the presence of moral injury in U.S. Combat Veterans with PNES will lead to more severe PNES symptoms when compared to those who only have PNES.

Methodology

This study was conducted through SUNY Albany's Science Research in the High School Program. To conduct this research, 2 questionnaire's were developed. One asked questions solely on PNES. The other asked the same questions about PNES and demographics, but it included questions about moral injury as well. A website was developed along with a poster to help spread awareness about this research and to find participants. The questionnaires have no required questions. The surveys are designed so that if there are any questions that the patient is uncomfortable answering, they may leave it blank. A place was also provided after each of the

questions where the patients could anonymously share more about their experiences or response if they would like. All patients remained completely anonymous.

The image below shows an example of the general format used for the questions in both questionnaires. This question starts by asking if the patient experienced any cognitive effects after their seizures in the last four weeks. If not, they move onto the next question. If yes they would move to the follow up question which assesses the frequency of the effects on a scale of 1 to 10 (1 being never and 10 being always). There was then another follow up question asking about the severity of these effects, following the same format. Finally there was a written response question where the patients can write more about their seizures if they would like to.

5. Did you experience any Cognitive Effects (confusion, loss of memory, loss of speech, etc.) AFTER the events in the past 4 weeks?

Yes

No (if no, skip to question 7)

5a. How often did you experience cognitive effects AFTER the events?

	1	2	3	4	5	6	7	8	9	10	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

5b. How severe were the cognitive effects you experienced AFTER the events?

	1	2	3	4	5	6	7	8	9	10	
Not Severe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Severe

5c. If you feel comfortable doing so, please share more information about the Cognitive Effects you experience AFTER the events.

Long answer text

Participants for this study needed a Video-EEG diagnosis of PNES, needed to be over 18 years old, and must have served in the U.S. armed forces. The location and duration of deployment did not matter, as long as it qualified as a combat zone. If the patient was filling out the PNES/MI Questionnaire, they should have had a MI diagnosis or reason to believe they had MI. Patients were found by contacting several social media groups focusing on epilepsy, PNES, veterans or moral injury. Patients were also collected by reaching out to medical professionals via email and through school administrators who shared information about the research.

In order to see if moral injury led to an increase in the severity of PNES symptoms, patients for this study were divided into 2 subgroups. The first being those who only have PNES and no diagnosis of Moral Injury. The second being those who have a diagnosis of both PNES and Moral Injury.

Results

The study was able to find two participants, both of which filled out the PNES/MI questionnaire. Both participants were between 31-40 years old and were both white. One of the participants was male and the other female. The male participant's (patient 1) service was one year long, his age of onset for PNES was between 21-25, has a Bachelor's in progress, and is a disabled veteran on disability. The female participant's (patient 2) service was 9 years long, her PNES age of onset was under 18 years old, she has an Associate's degree, and is currently employed. Demographic information for this study is shown in Table 1.

Table 1: Demographic Information

	Age	Gender	Age of PNES Onset	Race	Length of Service	Employment Status	Education
Patient 1	Between 31-40	Male	Between 21-25	White	One year 2005/06	Disabled vet on disability	Bachelor's in progress
Patient 2	Between 31-40	Female	Younger than 18	White	9 years	Employed	Associate's Degree

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Both patients reported having movements or actions during their PNES events, however the severity and the actual movements were different for each. Patient 1 reported the severity of his movements as an 8 out of 10 (10 being the most severe and 1 being not at all). He described the movements as constant grinding of his teeth and rapid physical reactions. Patient 2 described her movements as a 4 out of 10, and reported head jerks to mainly the left. The patients also reported experiencing altered consciousness or sensations during their events. Patient 1 reported having flashbacks and intrusive thoughts lasting from minutes to hours, while patient 2 reported feeling as if she was looking at things through a haze, easily getting overwhelmed with emotions, and reported a difficulty with comprehending words, as well as responding to questions.

Patients 1 and 2 reported cognitive effects after their events (ex. confusion, loss of memory), however Patient 1 reported a much higher severity than Patient 2. Patient 2 reported not experiencing cognitive effects often (2 out of 10) and the severity of these effects were not severe (4 out of 10). Her specific symptoms included trouble remembering dates, times and tasks. Patient 1 on the other hand, reported having cognitive effects almost always following his

PNES events (9 out of 10), and reported the severity of these effects as very severe (9 out of 10). His specific symptoms included brief lapses in hand eye coordination and fine motor skills. He also explained that these specific symptoms followed his MST attack (MST stands for Military Sexual Trauma).

Both patients reported very different emotional effects (ex. anxiety, anger, depression) following the PNES event. Patient 2 reported both the severity and occurrence of these emotional effects as a 5 out of 10, stating she becomes easily startled, overwhelmed, and irritable and experiences high levels of anxiety. Patient 1 reported the severity and occurrence of these emotional effects as a 10 out of 10. He reported feelings of depression, anxiety, fear, emotional numbness, and a feeling of “being some version of yourself you can’t even understand”.

When asked about the overall severity of their PNES symptoms over the last 4 weeks, Patient 1 rated his symptoms as a 9 out of 10, saying that he could not sleep more than 2 or 3 hours without having to wake up and reposition himself. Patient 2 reported her overall symptoms as a 5 out of 10, and said she experiences 2 episodes over the last 4 weeks with effects that lasted days or weeks after the event.

The patients also filled out questions about their moral injury symptoms, these responses are shown in Table 2. Patient 1 reported doing things that betrayed his own personal beliefs and values, feeling guilt over surviving an event that others didn’t, and that seeing so much death has changed him. Both Patient 1 and Patient 2 reported witnessing or being involved with violence that was out of proportion to the event, as well as being a victim of sexual assault. When asked how difficult these symptoms have made it for them in their everyday life (ex. doing their work or their social life) on a scale of 1 to 10 (10 being extremely and 1 being not at all), both patients put 10.

Table 2: Moral Injury

	The things I saw left me feeling betrayed by military/ political leaders	I did things that betrayed my personal beliefs/ values	I saw/was involved in the death(s) of an innocent	I saw or was involved in violence that was out of proportion to the event	I was sexually assaulted	Seeing so much death has changed me	How difficult have these problems made it for you in your everyday life?
Patient 1	Strongly Agree	Strongly Agree Disagree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Extremely
Patient 2	No response	No response	No response	Strongly Agree	Agree	No response	Extremely

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Discussion

The study was unable to find participants to complete the PNES only form, so the original hypothesis could not be tested. The study was able to find 2 participants to fill out the PNES/MI form.

Both patients reported general symptoms including movements/actions during their events, emotional effects following the event, and cognitive effects afterwards, but their specific symptoms were different. For example, Patient 1 always had severe emotional effects following his events, which included anxiety, depression, and emotional numbness. Patient 2’s emotional effects occurred less often and were less severe than Patient 1’s. Patient 2’s emotional effects include anxiety, irritation, and it is easier for her to become overwhelmed.

There were 12 questions at the end of the questionnaire asking about the patient's experiences with moral injury. Patient 1 responded to all 13 of the moral injury questions, and Patient 2 responded to 3 of them. As stated before, both patients reported being victims of sexual assault and witnessing or taking part in violence that was disproportionate to the event. Both patients also said that their moral injury symptoms made their daily life extremely hard.

Limitations for this study are that it is a self-reported study and that there was no way to check the participants' medical histories to see if their responses are accurate. Another possible limitation was that there were no required questions in either questionnaire. This was done in order to not force the participants to answer questions that were too personal or that asked about traumatic events that they preferred to not talk about. Many of the questions were left unanswered because of this.

Future research should focus on PNES and moral injury as separate conditions (in order to improve treatment and diagnosis protocols) as well as on their impact on each other. This study chose to focus on MI specific to U.S. Combat Veterans, but future research should look into MI in specific military branches, police, firefighters, doctors, first responders, and in civilians.

Conclusion

The study was unable to prove the hypothesis that the presence of moral injury in U.S. combat veterans with PNES results in more severe symptoms of PNES.

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