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## Review Article

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## Burns and Posttraumatic Stress Disorder: What's Being Done

Derek L. Holt, DNP, FNP-BC, ENP-BC<sup>1#</sup>, Brigitta Strutchen, MSN, RN, APRN, FNP-C, RNFA<sup>2</sup>

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<sup>1#</sup>School of Nursing, University of Mississippi, Mississippi, USA

<sup>2</sup>Ascension St. Vincent- Indianapolis Burn center, Indiana, USA

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**#Corresponding author:** Derek L. Holt, DNP, FNP-BC, ENP-BC, Assistant Professor and Director of FNP Track, School of Nursing, University of Mississippi Medical Center, 2500 N State Street, Jackson, Mississippi 39216, USA

## Abstract

Burn injuries can be a life-shattering event causing significant physical impairment. Burn survivors suffer from changes in appearance and body function. The perception of burn injuries has transformed from permanent disability to now rehabilitative. Through ever-evolving technology coupled with enhanced clinical assessments, burn injuries are seen through the lens of being more than physical. This article discussed the impact of quality screening instrumentation for the burn patient. Early detection of posttraumatic stress disorder symptomology and aggressive treatment are essential in improving the quality of life of those who have suffered a burn trauma. Early detection and aggressive treatment are essential in improving the quality of life of people suffering from burn trauma.

**Keywords:** Burns; Posttraumatic stress disorder; Trauma

## Introduction

Whether minor or severe, burns can be a catastrophic event causing significant physical impairment. Burn survivors suffer from changes in their bodily appearance and body function. Over the years, significant advancements have been in treating and caring for physical burns. However, burns injuries are often accompanied by a substantial psychological impact that is devastating to survivors. Although some patients may have neutral or positive psychological influences when rehabilitating from burn trauma, many will develop negative psychological symptoms during recovery. Like other trauma victims, burn patients can develop anxiety, depression, body image disturbances, and Posttraumatic Stress Disorder (PTSD). Depression and generalized anxiety among burn patients and their families have garnered considerable attention in prior studies and in clinical practice [1]. However, PTSD is also a widespread disorder experienced by burn survivors that have not received much attention from clinicians and scientists.

Posttraumatic Stress Disorder (PTSD) is a constellation of symptoms that persists for more than 30 days after exposure to a traumatic event [2]. The U.S. national lifetime prevalence for PTSD is 6.8%. However, burn literature reports PTSD in burn survivors as high as 30% [3]. Traumatic events that can induce PTSD can range from military combat and severe injury to violence and illness. However, PTSD can also be induced by witnessing a close friend or family member's traumatic event or repeated exposure to extreme events. Severe burns can be a life-long physical and psychological injury. Kornhaber R, et al. [4], highlight that long-term outcomes for burn survivors have not been studied sufficiently. Burn patients often receive care that makes identifying psychological symptoms challenging to recognize as the patient moves from unit to unit and even facility to facility, encountering many different healthcare professionals only experiencing parts of the patient's progression.

## Etiology

Posttraumatic stress disorder has been described as the complex somatic, cognitive, affective, and behavioral effects of psychological trauma. PTSD can be characterized by intrusive thoughts, nightmares, and flashbacks of traumatic events [5]. People with PTSD may experience hypervigilance, sleep disturbances, and avoidance of trauma reminders, leading to considerable social, occupational and interpersonal dysfunction. The clinical expression of PTSD symptoms or clusters of symptoms can vary culturally [6]. Pre and peritraumatic risk factors that can predispose people and increase the likelihood of survivors developing PTSD include but are not limited to prior traumatic events, less education, low socioeconomic status, childhood abuse, and poor social support [5].

In posttraumatic stress disorder there is a dysregulation of the hypothalamic pituitary axis resulting in an overactive stress response [2]. This dysregulation causes the Corticotropin-Releasing Factor (CRF), a hormone involved in the stress response, to become overactive. This hyperactive CRF results in increased norepinephrine in the brain causing patients to experience hyperarousal, re-experiencing, and anxiety. Cortisol levels are initially increased in PTSD. However, over time these levels decline due to the desensitization of hormone receptors [2]. Additionally, during PTSD the normalizing effects of serotonin are not as effective in attenuating the stress response in the brain.

## Diagnostic Criteria & Assessment Findings

Burns are devastating injuries that not only cause high morbidity and mortality but also contribute to economic burdens and cause psychological and emotional complications. Burn survivors experience several detrimental sequelae depending on the location and severity of the burns. Burns to the face and upper body can alter a patient's self-concept, public image, and expressive communication leading to PTSD. Burns covering a large surface area can cause excruciating pain. Patients often undergo multiple surgeries and countless dressing changes that exacerbate pain, leading to psychological complications.

According to the American Psychiatric Association [6], Diagnostic and Statistical Manual of Mental Disorders, there are eight Criteria. Criterion A is about the stressor. Individuals must be exposed to actual or threatened death, serious injury, or sexual violence in one of several ways. These exposures can be directed or witnessed in person or in learning that the traumatic event has occurred with a loved one. Burn survivors can be exposed in several ways during a burn event, including being burned, watching others being burned, or hearing that others may have died during the burn event, causing extreme stress. Criterion B involves intrusion symptoms where the traumatic event is persistently re-experienced in variable ways such as nightmares, flashbacks, emotional distress, or physical reactivity [6].

Persistent avoidance of trauma-related stimuli after the trauma is the hallmark of Criterion C. Burn survivors may avoid trauma-related thoughts, feelings, or external reminders. In Criterion D, patients experience a negative alteration in cognitions and mood. Examples of these negative cognitions can include the inability to recall key features of the burn event. Some may have exaggerated blame of self or others for causing the burn. Survivors may feel isolated and have difficulty experiencing a positive affect. Criterion E, is concerned with alterations in arousal and reactivity. Survivors may become irritable or aggressive. Some may become involved in risky or destructive behavior. Hypervigilance and heightened startle reaction is also seen in PTSD patients. This criterion also explains how patients may have difficulty sleeping or concentrating. In Criterion F, symptoms must be present for greater than one month (American Psychiatric Association, [6]. In children, PTSD may be exhibited by bedwetting, irritability, and emotional detachment. Children with burns may even begin to act younger than their age or worry about dying [2].

Criteria G involves function significance and how the patient's symptoms create distress or functional impairment at home, work, relationships, etc. The last criterion, H, is an exclusionary criterion. Clinicians must rule out that the symptoms are not due to other causes such as medication, substance use, or other physical or mental illness.

## Differential Diagnosis

Clinicians must rule out other causes of the patient's symptoms. Patients may also have other underlying mental illnesses that were caused or present before the burn event that needs addressing. Acute stress, adjustment, and anxiety disorders can all have similar symptoms, such as panic symptoms and hypervigilance. Depressive disorders can have symptoms of sleep disturbances, social isolation, and low energy. Individuals suffering from disruptive impulse control and conduct disorders often participate in risky behaviors. Children may also have underlying conditions such as Attention Deficit Hyperactivity Disorder (ADHD), anxiety, bipolar, depressive, and nightmare disorders. Careful attention to symptoms and overlapping symptoms is vital when dealing with burn victims. Patients need to be asked specific questions about their traumatic burn experience and other prior traumatic experiences to differentiate PTSD from other psychiatric disorders. Questions should be asked with compassion and sensitivity. Patients can be reluctant to discuss past traumatic events because of guilt, embarrassment, or discomfort inherent in revisiting painful memories.

Several structured interviews or questionnaires are available to providers to screen patients for PTSD. The Primary Care PTSD Screen, DSM-5 (PC-PTSD-5) is a 5-item screen to identify individuals with probable PTSD. The measure begins with an item that assesses lifetime exposure to traumatic events. This tool has shown good reliability and validity [5]. The PTSD checklist, DSM-5 (PCL-5), is a 20-item self-report measure that assesses the DSM-5 symptoms of PTSD. The PCL-5 has a variety of purposes, including screening individuals for PTSD, making a provisional PTSD diagnosis, and monitoring symptom change during and after treatment. Many burn programs have utilized posttraumatic stress disorder screening tools to address the stressor associated with a burn injury. The (PC-PTSD-5) is an initial screening tool that gauges responses related to stress, anxiety, and depression within the previous 30 days. A positive screen does not yield a diagnosis of PTSD, only the probability. A formal, more in-depth review is typically recommended.

However, the gold standard for diagnosing PTSD is a structured interview like the Clinician-Administered Posttraumatic Stress Scale for DSM-5 (CAPS-5) [7]. This screening scale has also been extensively validated and widely used for diagnostic purposes in PTSD [7]. There is a Clinician-Administered PTSD Scale for Children and Adolescents (CAPS-CA) in children with burns. The Child PTSD Symptom Scale (CPSS) and Children's PTSD Inventory (CPTSD-I) can also be utilized in the pediatric burn population.

Burn research has attempted to address this disparity with screening tools that address more specific Quality of Life (QOL) indicators in the form of patient-reported outcome measures (PROMs). PROMs have been used in clinical research and are valuable in understanding the health needs of a population, as metrics for quality improvement efforts, and to optimize treatment regimens [8]. Burn-specific PROMs include The Burn Specific Health Scale Brief (BSHS-B), The Adult Burn Outcome Questionnaire (ABOQ), and the Burn Outcome Questionnaire (BOQ) for infants, toddlers, children/teenagers, teenagers, and young adults. Marino S, et al. [9], noted that there were no existing instruments comprehensively measure the social impacts of burns. This led to the development of a framework that would become the Life Impact Burn Recovery Evaluation (LIBRE).

The LIBRE Profile is a 192-item questionnaire that evaluates relationships with family and friends, social interactions, social activities, work and employment, and romantic and sexual relationships. The LIBRE Profile was the first tool that exclusively measured social impact after a burn injury with confirmed reliability and validity [10]. A significant advantage of Item Response Theory-based measures is the ability to administer the assessment using a Computer Adaptive Testing (CAT) approach. A small set of selected items from a large item bank are determined and unique for each respondent with the same standard metrics [11].

## Management

Burn patients exist within the realm of day-to-day operations. "Common challenges for burn survivors include resumption of an active role at work, participating in leisure activities, interacting with friends and family, and maintaining a rich social life with personal relationships" [9]. These daily life activities may become re-triggering events if they cannot be completed to the burn patient's perceived satisfaction. Ryan CM, et al. [12] note a significant challenge is that there is no accepted standard battery of tests that address structural issues for burn survivors, let alone the other layers of functionality.

Early detection and treatment of PTSD is essential to prevent long-term complications. Even though PTSD is a highly treatable condition, people of color or a lower socioeconomic status are less likely to receive outpatient PTSD and other mental health services [13]. Burn trauma patients must begin their treatment while still in an acute care setting. Untreated PTSD is associated with an increased risk of trauma recidivism [13]. Psychologists, psychiatrists, and social work disciplines should work in tandem with burn specialists treating both physical and mental health care simultaneously. Trauma-focused psychotherapies are a first-line treatment modality and should be offered to all burn survivors [2]. Non-pharmacological management of PTSD includes community resources, psychoeducation, and cognitive-behavioral therapy.

There are different approaches to the pharmacologic management of PTSD. Sleep disturbances are a core symptom of PTSD; therefore, managing sleep may aid in attenuating other symptoms. Although cognitive-behavioral therapy is the first-line treatment, pharmacological intervention is necessary when the insomnia is refractory to treatment. The approach to pharmacological treatment of insomnia in PTSD requires that selection of an agent should be based on several factors, including but not limited to the type of insomnia, the patient's age, the presence of comorbidities or psychological conditions, and the safety profile of the drug [14]. Benzodiazepines should be avoided due to the increased risk for substance use disorders. A Veteran Affairs (VA) pharmacy records review showed trazodone was the most prescribed off-label sedative agent for insomnia in chronic PTSD [14].

There is limited data on using antidepressants for PTSD, but they account for many off-label prescriptions to treat insomnia [14]. There are two Selective Serotonin Reuptake Inhibitors (SSRI) medications, sertraline (Zoloft) and paroxetine (Paxil), that are approved by the Food and Drug Administration (FDA) for PTSD-related mood treatment in adults [2]. When treating PTSD, clinicians should monitor clinical worsening and suicidal ideation for the first few months when initiating SSRI therapy. Melatonin agonist has been used to treat patients with PTSD, but its efficacy has yet to be established. Antipsychotics are not recommended for managing insomnia unless the patient exhibits psychosis, agitation, or unremitting PTSD symptoms [14]. Newer pharmaceutical agents, such as orexin antagonists or endocannabinoid receptor agonists, may offer adequate alternatives for treating PTSD-related insomnia. Still, their efficacy is yet to be established in random control trials. Current literature examining marijuana use in PTSD has encouraging results, but this, too, lacks randomized control trials.

## Conclusion

Burns injuries are often accompanied by a significant psychological impact that requires constant monitoring. PTSD is a widespread disorder experienced by burn survivors that has received attention from clinicians and scientists. Early detection and treatment of PTSD is essential to prevent long-term complications and may prevent trauma recidivism. Posttraumatic stress disorder screenings result in referrals to psychologists, psychiatry, support groups, and local stress centers. Addressing the social impact of burns is essential. Clinical assessments and patient-specific concerns result in additional occupational, physical, recreational, and speech therapy referrals. Integration of a PTSD screening tool along with the LIBRE Profile could provide the gap coverage that is ultimately beneficial to the patient. Trauma-focused cognitive-behavioral therapies are a first-line treatment modality and should be offered to all burn victims. Additional research may help clinicians understand how PTSD manifests in burn trauma and improve patient-focused plans of care.

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