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The Relationships between Burn Pain, Anxiety and Depression

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ABSTRACT

This study examined the interrelationships between anxiety, depression and pain in burn injured patients. Seventy patients with severe burns were interviewed within two weeks of their burn trauma. The short form of McGill Pain Questionnaire and a visual analog scale were employed to measure the pain experienced at rest. Anxiety and depression levels were assessed with the Beck Depression Inventory and Beck Anxiety Inventory. The results showed that significant number of patients had suffered from depressive and anxious symptomatology. Higher levels of anxiety and depression were associated with higher pain scores. Percent of total body surface burned was associated with increased pain scores, anxiety and depression. The authors emphasises the need for accurate multidisciplinary assessment and treatment of pain and psychological disorders in burn injured patients which needs to be highly individualized and frequently adjusted according to the patients specific needs.

***Key words**: burns, pain, anxiety, depression, multidisciplinary approach*

Introduction

Burn injuries are devastating, sudden and unpredictable forms of trauma which affect the victims both physically and psychologically. Advances in medical management have dramatically decreased mortality rates from burn injuries. With the successful battle against infections and the improvement of medical techniques, it became possible to save the life of extensively burned persons[1]. The growing number of individuals surviving such devastating injuries has prompted an increased focus on problems of rehabilitation, independence and psychosocial adjustment[2]. The psychological consequences of sustaining burn injuries from minor to severe are well documented[3–5]. It is also recognised that psychological difficulties, such as symptoms of post-traumatic stress disorder (PTSD), anxiety and depression can persist for some time after the injury and may develop into chronic problems[5–8]. Recent studies suggest that the psychological needs of burn patients in general are not being met[5]. Burns may be considered as a »continuous traumatic stress disorder«[9]. A major component of the suffering from burn injury is the severe pain[10]. Burn pain is one the most intense and prolonged types of pain in clinical practice. From the first moments of a burn injury, as well as throughout the entire period of treatment, pain affects the patient not only as a symptom but also as a difficult medical problem. It is essential to deal aggressively with the problem of burn pain[11,12]. Pain arises both from the burns and their treatment, the latter including dressing changes, surgical operations, and physical and occupational therapy[13]. In terms of treatment, pain during hospitalization can be classified as background (that which is present while the patient is at rest; pain of lower intensity and longer duration), procedural (more intense, short-lived pain generated by wound care or therapies), breakthrough (spiking of pain levels that occur when current analgesic efforts are exceeded), and post-operative[14]. Burn pain is influenced by the following factors:depth of burn, stage of healing, nature of care procedures and patient characteristics[15.] Another aspect to consider in burn injured patients is that psychological factors such as depression or anxiety become a part of the experience of pain, particulary if pain medication is not initiated prior to the unpleasant procedures[16]. It is also recognized that anxiety can worsen acute pain. Undertreated pain in burn patients can result in non-compliance with hospital treatment, disrupted care, development of chronic pain

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syndrom, and increased risk of anxiety disorders[17–19]. Anxiety is an affective response commonly reported by persons after the emotional and physical trauma of burn injury. Anxiety may be related to a burn injury in different ways such as basic threat to narcissistic integrity, fear of strangers, fear of separation, fear of loss of love nad approval, fear of loss of body parts or of injury to them, fear of loss of developmentally achieved function or fear of retaliation[20]. Depression and anxiety related to pain are often reported[21]. During the acute phase of burn treatment, anxiety commonly occurs in the presence of other components of distress, including pain, itch, and mood disturbances such as depression or grief. One component of distress will often enhance another area of distress. For example, some evidence exists to support a bidirectional relationship between pain and anxiety. Poorly managed pain can increase anxiety and *vice versa*. Depression in burn injured patients may be evoked by several causes. Depressed moods are expected responses to any loss or threatened loss. All of the fears that bring anxiety also involve some degree of loss and, therefore, can also bring about depressed feelings. Grief and mourning, pain, social isolation during hospitalization and premorbid depression may also have a relationship with post burn depression[22]. Depression manifestes itself in many ways, such as sadness, decreased appetite, weight loss, sleep disturbances, early morning awakening, diminished psychomotor activity, low self-esteem, feeling od helplessness and hopelessness. Because of many metabolic changes in burn injured patients it is often difficult to diagnose a depressed state solely from vegetative signs and symptoms. According to the recent studies, the best predictor for depression was pre-morbid psychopathology**.** Therefore, it is always wise to look for a history of previous mental illness, especially depression[23]. Also, the final alteration in body appearance may be significant factor in the development of depression in burn injured patients, as well as social deprivation during hospitalization. The purpose of this clinical study was to analyse the interrelationships between the characteristics of burns, pain, anxiety and depression.

Methods

Subjects

A total of 70 patients with severe burns, who were hospitalized during 2004 at the University Hospital Clinic of Traumatology in Zagreb, Croatia, were selected as the sample for this study. From the patients included in the study 48 (68.57%) were males, and 22 (31.43%) were females. Age of the patients were between 15 and 84 (mean age was 44.17) The hospital stay ranged from 2 to 135 days (mean 28.67 days, SD=27.31). All burns were accidental.The most frequent cause of the burns was thermal injuries (e.g., flames,hot liquide, etc.), and other causes included electrical and chemical burns or a combination of them. Total body surface area (TBSA) that was burned was calculated by summing the percent of second and third degree burns. The extent of burn injures ranged from small (1–9% TBSA-30 patients), large (10–19% TBSA-29 patients) and extensive (>20% TBSA-11 patients).The mean TBSA was 12.16%.(ranged from 2–45%, SD=10.04). The mortality rate was 2.85% Patients with very severe burn injuries didn't participate in the study, because they couldn't fill the questionnaires at that time.Localisation of burns in face, hands and neck had 53 patients (77.14%).The depth of burns varied from second-degree (IIA-3 patients, IIB-27 patients), third-degree (38 patients) and fourth-degree (2 patients)

Survey design and assessment instruments

Self-completion survey packs were administered to the patients who were hospitalized because of severe burns.During the first few days after stabilization of vital functions, patients were informed about the study and gave their consent to participate. They were interviewed within two weeks of their burn trauma. A questionnaire devised specifically for use in this study was used to gather: demographic information, information about the burn injury/condition as well as about premorbid psychiatric and medical disorders.

Burn related information

The extent of the burn, localization of burn, the manner in which the burn injury was sustained and where the burn was sustained were obtained from the medical notes and questionnaire devides specifically for use in this study.

General demographic information

Information about age, sex, marital status, occupation were obtained from medical notes and questionnaire.

Previous psychiatric history

The data about presence of previous psychiatric disorders as well as their treatment were obtained from the medical notes and psychiatric interview, in order to ensure that current anxiety and depression was not the result of an ongoing disorder.

Anxiety

Beck Anxiety Inventory was used to assess anxiety within 2 weeks of the burn injury. The score of axiety range from 0 to 63 and the higher the score, the more anxiety experienced. Beck Anxiety Inventory is validated self-report instrument designed to measure state anxiety[24].

Depression

Beck Depression Inventory was used to assess depression within 2 weeks of the burn injury. Beck Depression Inventory is a widely used clinical and research instrument which assesses current depressive symptomatology The score of depression range from 0 to 63 and the higher the score, the more depression experienced. The score less than 4 were considered as denial and the score

over 40 suggest possible characteristics of histrionic or borderline personality disorder [24].

Pain

Subjective experience of pain was measured by visual analog scale (VAS) and short form of Mc Gill Pain Questionnaire (SF-MPQ). The SF-MPQ consists of 15 representative words from the sensory (n=11) and affective (n=4) categories of the standard, long form of MPQ. The SF-MPQ appears to be a useful instrument which is sensitive to traditional clinical therapies, analgesics drugs and epidural blocks. Qualitative profiles and quantitative scores for different dimensions of pain as well as total pain score can be derived from the adjectives the patient selects to describe his pain[25]. It takes about 2–5 minute to administer, the words are simple and the intensity ranking of mild, moderate, and severe was understood by every patient who was tested. The data obtained from SF-MPQ provide information on the sensory, affective and overall intensity of pain. Also, SF-MPQ is capable of discriminating among different pain syndrommes.

Results

From the patients included in the study, 25 patients (35.71%) have previous psychiatric disorders. Alcohol dependence was present in 18 patients (25.71%), and heroin dependence in 4 patients (5.71%). Five (7.14%) patients had suffer from dementia, and 3 patiens (4.29%) had previous psychotic disorder. Ten patients (14.9%) had a past depressive epizode, and 4 patients had a combat-related posttraumatic stress disorder.

Patients' mean total score on the Beck Anxiety Inventory was 13.79 (SD=9,44) with a minimum of 0 and a maximum of 40. Forty-seven patients (67.14%) reported very low anxiety, 17 patients (24.29%) reported moderate anxiety, and 6 patients (8.57%) reported severe anxiety. There were no statistically significant gender differences in the level of anxiety. From the 22 females included in the study, 10 females reported very low anxiety, 10 females were moderately anxious, and 2 females reported severe anxiety. From the 37 males included in the study, 37 of them reported very low anxiety, 7 reported moderate anxiety and 4 were severe anxious. We found statistically significant relationship between level of anxiety and TBSA (t=0.947, df=69, P<0.005). Fifty three patients with the localization of burns in hands and face had lower level of anxiety (X=12.89, SD=1.15) than 17 patients without localization on that „visible« parts of the body (X=16.59, SD=2.92).

Patient's mean total score on the Beck Depression Inventory was 10.69 (SD=10.57), with a minimum of 0 and a maximum of 44. Thirty six patients (51.43%) were not depressed, 14 patients (20%) reported mild depression, 15 patients (21.43%) reported moderate depression and 5 patients (7.13%) had severe depressive symptomatology. It is interesting that 26 patients (37.1%) denial their depressive symptomatology, and 2 patients (2.9%) had score for histrionic or borderline personality disorders. From the patients who denial the depressive symptomatology, 23 patients (88%) were males, and 3 patients (12%) females. We found not significant correlation between level of depression and gender. Significant correlation was found between TBSA and level of depression (t=–0.84, df=69, p<0.005) but we found no statistically significant correlation between level of depression and localization of burns.

The mean total pain score at SF MPQ was 11.86 with a minimum of 0 and a maximum of 36 (SD=9.09). The mean affective pain score was 2.46, with a minimum of 0 and a maximum of 9 (SD=2.57), and the mean sensory pain score was 9.4 (minimum 0, maximum 28, SD=7,15). Mean VAS score during interview was 2,2 (ranged from 0 to 5, SD=1.00). No statistically significant gender differences were found in all pain dimensions with t-test (t= 10.216, df=69, p<0.005) and with very small correlation coefficient (0.074, p<0.005).We found statistically significant correlations between TBSA and sensory (t=–1.923) affective (t=–7.881) and total pain scores (t=–1.9, p< 0.005, Figure 1) The extent of the burns was a significant predictor of pain.

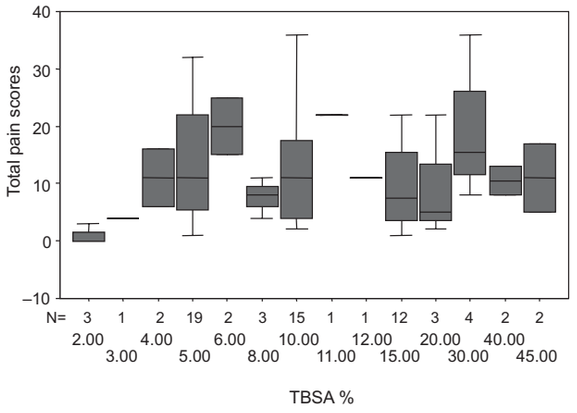

Fig. 1. The relationship between total body surface area (TBSA) that was burned and total pain scores.

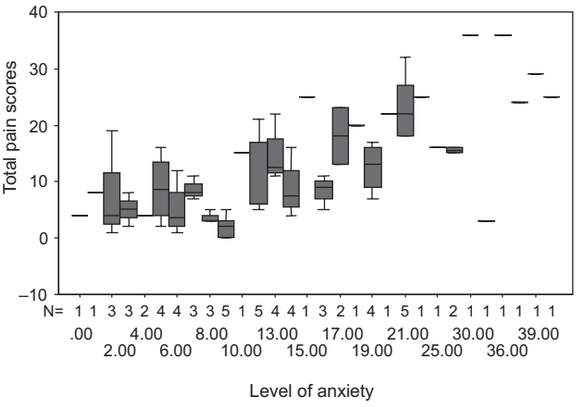

Fig. 2. The relationship between anxiety and total pain scores.

We found statistically significant relationship between total pain scores and anxiety (correlation coefficient = 0.667, t=2.13, df=69, p<0.005, Figure 2). Higher levels of anxiety were associated with higher pain scores. Statistically significant corellation was also between affective and sensory dimensions of pain and anxiety (Figure 3 and 4).

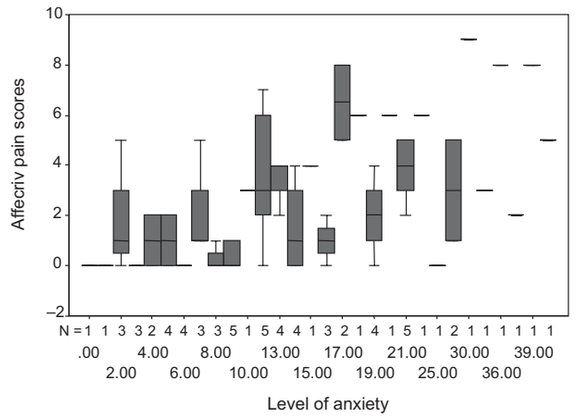

Fig. 3. The relationship between anxiety and affective pain scores.

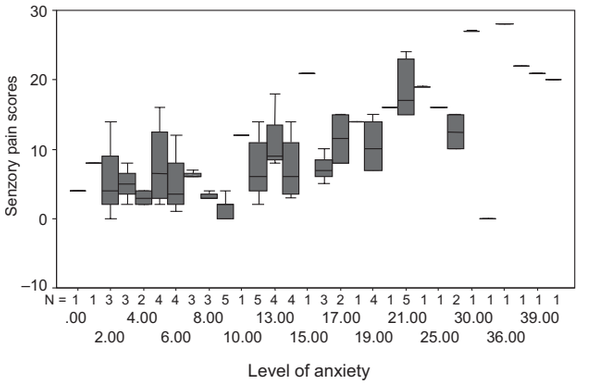

Fig. 4. The relationship between anxiety and sensory pain scores.

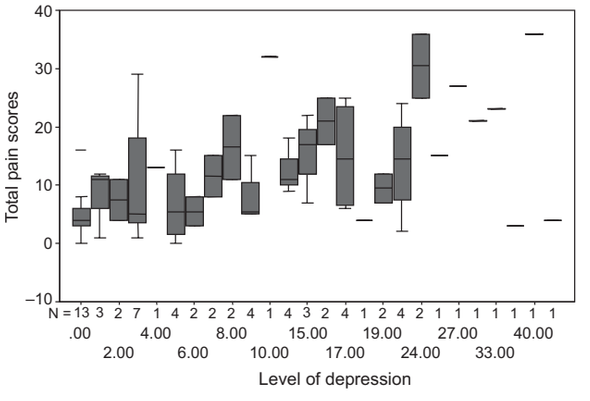

Fig. 5. The relationship between depression and total pain scores.

We found statistically significant correlation between total pain score and depression (t=–0.927, df=69, p< 0.005, Figure 5). Also, statistically significant relationship were between affective and sensory dimensions of pain and level of depression (Figure 6 and 7).

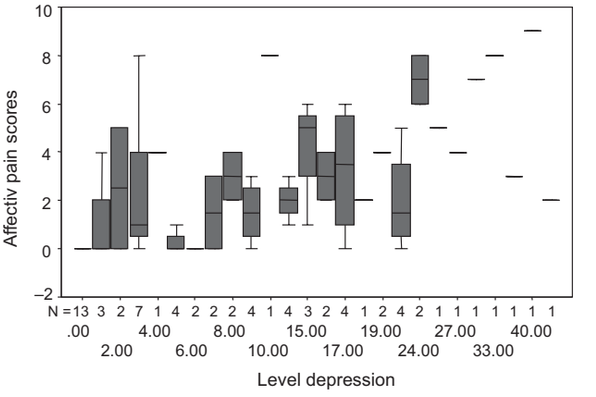

Fig. 6. The relationship between depression and affective pain scores.

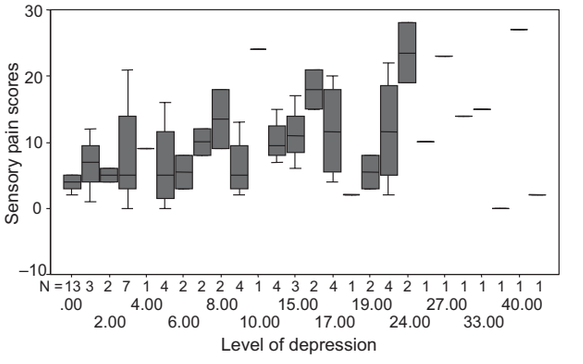

Fig. 7. The relationship between depression and sensory pain scores.

Discussion

In this study, significant number of patients showed depressive and anxious symptomatology. It is necessary to be aware of the nature of the patient's psychological response to injury. Certain responses are an expected part of the patient's normal process of coping with the trauma. According to the recent studies, sleep disturbances, behavioural problems, delirium, depression and anxiety are fairly common in the acute stage of recovery[26]. Significant number of patients had previous psychiatric history. Premorbid individual characteristics are important factors in adaptation after a burn injury. Premorbid psychopathology may indirectly or directly add to the risk of being burned, to the severity of burn, and to the leght of hospitalization[27]. Patients with psychiatric disorders may be more at risk for burn injuries due to reduced competence, a disturbed state of mind, careless-

ness or active self-harm, recklessness or risk taking. Tarrier found that in vulnerable individuals, a burn injury acts as a severe stressor that precipitates a recurrence of an established psychiatric disorder[28]. Ehde et al. found that on a symptom based level, about 90% of all patients have some stress symptoms initially[6]. Our results are similar to those of Patterson et al., who found that beetween 31 and 50 percent of patients suffer clinically significant levels of anxiety, and 26.9 percent meet the criteria for PTSD[6]. This study showed that significant number of patients suffer from depressive symptomatology even in acute phase. In an early study, depression was clinically assessed in 15% of the patients during hospitalization[17]. Several studies showed that the prevalence of depression varies during hospitalization, with between 20.6 and 33 percent experiencing depression during hospitalization and 11 percent experiencing suicidal ideation[29]. Ptacek et all found with self report instruments the higher rates of depression, with 37% classifying as mildly and 15% as moderately to severely depressed during hospitalization[30]. The very high number of patients who deny depressive symptomatology is probably because of early phase of treatment. During the acute phase of severe burn injury there is often an initial period of withdrawal, with little interest in external events, family or friends. During the early stages of an injury, this withdrawal response is often mistaken for depression. Also, in the early phase of injury, it may become apparent that the patient is utilizing the defense mechanism of denial. Denial is a part of the psychological response repertoire of most burn patients. Denial is a protective, unconscious defense mechanism, because it relieves anxiety that arises when an individual is threatened with the possibiliy of death, mutilation and pain. The abrupt removal of denial in the early phase of an injury may disrupt a vulnerable ego, leading to marked anxiety, a narcissistic rage, severe depression and even overt psychosis[20]. When the patients were at rest, the amount of pain they reported was significantly related to their anxiety and depression levels: the more anxious or depressed they were, the higher they rated their pain. Pain is a subjective experience. No matter how the various levels of pain are defined, exact, objective criteria for the description of pain are difficult to establish.There is extreme individual variability in burn pain with changing patterns over time, which often led to undermedication and chronicity. Medical and nursing staff frequently underestimates pain and are unnecessarily worried about undesirable secondary effects, such as addiction that may follow opioid administration. With individualized drug treatment, all burn patients can benefit from pain relief. Our results confirmed that pain and anxiety are two indissociable aspects of the same phenomenon, triggered by severe tissue injury[31]. In burn patients, anxiety relates to the immediate past (for example, the circumstances leading to the injury and even feelings of guilt for injuries caused to others), to the present (worry about the progress of treatment), and to the future (survival, appearance, ability to work, etc.). Increased catecholamine release or increased sympathetic neuronal activity also leads to more muscular tension, which will affect pain. Moreover, from the initial treatments, the experience of pain leads to worry about the next and so on, leading to a vicious circle of anxiety-pain-anxiety[20]. If more anxious or depressed patients tend to experience more pain, it means that these patients could perhaps be helped with psychological methods of intervention. Significant correlation was found between the pain scores and burn size, a result which is consistent with previous observations. It might be expected that the larger the TBSA, the more psychologically distresses the patient will be postburn. Some research suggests that patient with burns exceeding 40% of TBSA have higher mean scores of dysfunction on the Burn Specific Health Scale in the affective and body image domains, but Pruizinsky et al. found no direct correlation between the extent of the injury and the psychological adjustment of the patient[32]. Some papers suggests that small burns can result in large psychological problems[33]. For many decades the treatment of pain, not only in burns patient but also more generally, was based on the hypotheses that the degree of pain is proportional to the degree of tissue damage. Modern research has now shown that the initial painful stimulation of nerve endings by the burn can result in peripheral and central senzitization causing the development of chronic pain syndrome that is very difficult to treat. The risk for the development of chronic pain syndrome depends from the optimal burn pain management. This is the basis for the variability in pain intensity observed in various cases. Patients with small injuries may report as much pain as patients with larger burns[34]. The change in the patient's appearance may be a major cause of distress. Disfiguring burns can cause psychosocial problems in the area of social functioning and may affect quality of life in general[1]. We believe that our results is different because of acute phase of the treatment, and that follow up interviews will be necessary to investigate the relationship between localization of burns and psychological consequences. In this study, we found no gender differences in levels of anxiety and depression. Most reports indicate that gender has no impact on development of depression. Two exceptions noted that females were more at risk, but both studies combined gender with facial disfigurement and concluded that females with facial disfigurement were more at risk of becoming depressed[35–36]. Also, one study found that female gender is a risk factor for anxiety[37] and other authors reported no impact of the gender on development of anxiety[38]. Our results indicate that psychological interventions aimed at controlling anxiety and depression in burned patients would benefit from being introduced relatively early in the course of treatment so as to prevent these problems[39]. Perhaps the most powerful types of nonpharmacologic interventions are those that prevent or avoid unnecessary elements of care that may cause pain. Psychological techniques for acute pain control can include hypnosis, cognitive behavioral techniques, distraction and operant (learning) approaches. These supportive techniques must always be used in conjunction with pharmacological treatments, and should

never replace them. Patients with chronic pain often respond well to techniques in which their pain behavior is ignored and when they are distracted from pain.

Conclusion

Burn patients present a unique challenge in pain, anxiety and depression management. Emotional factors can have an effect on both pain sensation and pain behavior. Anxiety, depression and sleep disturbances exacerbate the perception of pain, and each situation that exacerbates one of these symptoms will subsequently cause increased pain. The close relationship between pain, anxiety and depression necessitates that both be managed simultaneously in the treatement of burn injured patients. These findings support the multifactorial nature of burn pain, anxiety and depression and provide guidance for practice.Although this study had a number of limitations, for example, the sample size was small and nonhomogenous, and the study as without follow up, it provided empirical evidence that demonstrated the extent of psychological difficulties experienced by burn-injured patients in acute phase of their treatment. The findings strongly support the urgent need for the development of a comprehensive follow-up service post-burn injury that would make both specialist physical and psychological support more accessible to patients. Specialized burn care centers, using a multidisciplinary approach, should not only successfully treat large burns and their complications, but should provide the necessary rehabilitation and psychological support required for readjustment back into society. Also, psychiatrist may have to work on the staff's sense of helplessness in the face of the patients's response.All hospital setting where burn patients are treated should have a close working relationship with psychiatrist who sees the patient early in the course of hospitalization. But, for all patients the very first need is physical comfort, and pain issues must be cosidered before any psychotherapeutical approach.

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POVEZANOST IZMEĐU OPEKLINSKE BOLI, ANKSIOZNOSTI I DEPRESIJE

S A Ž E T A K

U ovom je radu istraživana međupovezanost između anksioznosti, depresije i boli kod opeklinskih bolesnika. Sedamdeset bolesnika sa ozbiljnim opeklinama intervjuirani su unutar dva tjedna od opeklinske traume. U mjerenju boli korišten je McGill-ov upitnik o boli (kraći oblik) te vizualna analogna skala. Razina anksioznosti i depresije procjenjivana je sa Beckovim upitnikom za anksioznost i Beckovim upitnikom za depresiju. Rezultati ukazuju da je značajan broj bolesnika imao anksioznu i depresivnu simptomatologiju. Viša razina anksioznosti i depresije bila je povezana sa višom razinom boli. Veći postotak opečene površine tijela bio je povezan sa povišenom razinom boli, anksioznosti i depresije. Autori naglašavaju potrebu multidisciplinarne procjene i liječenja boli i psiholoških poremećaja kod opeklinskih bolesnika uz individualiziran pristup i česta prilagođavanja prema specifičnim potrebama bolesnika.