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HYPNOTIZABILITY AND TRAUMA SYMPTOMS AFTER BURN INJURY

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Abstract: This study investigated the association of trauma symptoms and hypnotizability in 43 hospitalized survivors of burn injury. Three to 17 days after the injury, participants rated the frequency of intrusive and avoidance symptoms and were interviewed with the posttraumatic stress disorder module of the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders-III-R. The Hypnotic Induction Profile was also administered at the postburn, hospital stage of recovery. Results indicated that when participants were divided into low, mid-range, and high hypnotizability categories, high hypnotizability was associated with more intrusive, avoidance, and arousal symptoms. Although causal relations cannot be assessed in this cross-sectional study, these results suggest that, as compared to the low and mid-range categories, high hypnotizables may experience a greater frequency of trauma symptoms after burn injury.

Burns that require hospitalization are multisystem injuries that can be life threatening and may result in many losses, including body integrity, home, employment, and security. In addition, there are psychological ramifications of a burn injury as the patient struggles with various degrees of visual disfigurement and painful burn treatment (e.g.,

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repeated painful wound debridement). Indeed, between 22% and 56% of burn survivors report psychiatric symptoms and adjustment problems (Kleve & Robinson, 1999; Tedstone, Tarrier, & Faragher, 1998).

Research (Perry, Difede, Musngi, Frances, & Jacobsberg, 1992; Powers, Cruse, Daniels, & Stevens, 1994; Roca, Spence, & Munster, 1992) suggests that 20% to 45% of burn survivors have a constellation of psychological trauma symptoms severe enough to warrant a diagnosis of Posttraumatic Stress Disorder (PTSD). The Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV; American Psychiatric Association, 1994) is the current version of the DSM, however, the Diagnostic and Statistical Manual of Mental Disorders-III-R (DSM-III-R; American Psychiatric Association, 1987) was the version current at the time this study was conducted. According to DSM-III-R, PTSD may develop after an event that is outside of the range of usual human experiences and is characterized by three symptom clusters: (a) reexperiencing of the trauma, such as intrusive thoughts, flashbacks and nightmares (Cluster B); (b) avoidance or numbing of general responsiveness, such as engaging in avoidance behaviors and/or a restricted range of affect (Cluster C); and (c) arousal, such as difficulty staying asleep and exaggerated startle response (Cluster D). These symptoms must be experienced for at least one month for a PTSD diagnosis to be made.

Research with survivors of other traumas such as violent crimes (Brewin, Andrews, Rose, & Kirk, 1999) suggests that acute trauma symptoms (e.g., Acute Stress Disorder, or ASD, DSM-IV) are associated with the eventual development of PTSD, poor psychological adjustment, and problems in returning to work (for review, see Cardena, Koopman, Classen, Waelde, & Spiegel, 2000). Further, trauma symptoms experienced during the acute, postburn stage of recovery predict persistence of such symptoms up to 1 year later (Difede & Barocas, 1999; Roca et al., 1992; Tedstone et al., 1998). Difede and Barocas (1999) found that, as compared to burn injury survivors without PTSD, those who were diagnosed with PTSD at 1 year after the initial postburn hospital assessment had higher levels of avoidance at the initial assessment. In addition, a model that included initial avoidance scores correctly predicted 64% of the PTSD cases and 65% of the cases without PTSD, for an overall accuracy rate of 65%. Tedstone et al. (1998) found that avoidance and intrusion at 2 weeks postburn accounted for about a third of the variation in 3 months postburn avoidance (35.2%) and intrusion (30.9%). Hence, the relationship between the extent of trauma symptoms within the first few weeks after injury appears to be important prognostically in regard to the patient’s eventual emotional recovery. Given that there is considerable variability in the extent of acute trauma symptoms (i.e., intrusion and avoidance) across patients (Perry et al., 1992; Roca et al., 1992) and the prognostic importance of acute reactions for further emotional complications, it is prudent to consider what patient character-
istics might be associated with the development of frequent and intense trauma symptoms during the first days postinjury.

Indeed, although not consistent, research suggests that the extent of acute and chronic trauma and distress symptoms are associated with a number of sociodemographic and individual factors including age, gender, dissociativity, and low levels of social support (Cardeña et al., 2000; Difede, Jaffe, Musngi, Perry, & Yurt, 1997; Koopman, Classen, Cardeña, & Spiegel, 1995; Perry, Cella, Falkenberg, Heidrich, & Goodwin, 1987; Perry et al., 1992; Taal & Faber, 1998). For example, Taal and Faber (1997) found that dissociative symptoms measured 5 to 8 days after admission to a burn unit were associated with distress symptomatology (as measured on the SCL-90) at hospital discharge. Perry and colleagues (1992) found that social support assessed within the first week of hospitalization for burn injury was associated with PTSD 2 months later. There is reason to believe that a person’s level of hypnotizability may be an additional risk factor for subsequent difficulties. Specifically, high hypnotizability has been associated with compromised response to stress, trauma, and medical procedures among these types of patients (Butler, Duran, Jasiukaitis, Koopman, & Spiegel, 1996; Greenleaf, Fisher, Miaskowski, & DuHamel, 1992; Hilgard & Hilgard, 1975; D. Spiegel & Cardeña, 1990). For example, Wickramasekera, Pope, and Kolm (1996) found that those chronic pain sufferers who had a high degree of hypnotizability had a larger increase in skin conductance level during experimentally induced cognitive stress as compared to those with a moderate or low degree. In addition, Greenleaf and colleagues (1992) found that after cardiac surgery, individuals with high hypnotizability took longer to achieve blood pressure stabilization in the ICU.

Although hypnosis has been used to decrease the pain and suffering experienced by burn injury survivors (Ewin, 1992; Patterson, Goldberg, & Ehde, 1996), the degree to which hypnotizability is associated with early trauma symptoms in the postburn hospital stage of recovery has, to the best of our knowledge, not been investigated. It is clear that high hypnotizable patients are more likely to benefit from hypnotic interventions for pain than lows (Hilgard & Hilgard, 1975; Montgomery, DuHamel, & Redd, 2000). In light of the suggestive findings noted above, they may also be at general risk for early trauma symptoms and hence for more protracted difficulties. The purpose of this study is to test whether the frequency of early trauma symptoms among burn patients is positively associated with hypnotizability as assessed within the first 17 days of hospitalization. The present study considers to what extent early trauma symptoms arise among burn patients in discreet categories of hypnotizability: low, mid-range, and high. We posit that patients who are highly responsive to hypnosis will manifest more frequent, early trauma symptoms than will patients in the low and mid-range categories.
It is important to note that this study is strictly correlational in nature and merely probes for an association between hypnotizability (as measured soon after the burn injury) with degree of early trauma symptoms. As such, attribution of causality remains speculative. Furthermore, even though hypnotizability is a remarkably stable trait (Piccione, Hilgard, & Zimbardo, 1989), this study cannot rule out the possibility that patient responsiveness to hypnosis might somehow have been affected by the injury or treatment experience. Nevertheless, a demonstrated association between in-hospital hypnotizability and early trauma symptoms may inform prognosis and treatment planning. Such an association may also indicate areas for future clinical research examining how and why patients come to react to severe physical injuries as they do.

**METHOD**

The current study was conducted as part of a larger ongoing effort to assess psychological adjustment in adult burn survivors in the acute, hospital stage of recovery (see Difede et al., 1997, for a detailed description of the larger study). As previously noted (Difede et al., 1997; Perry et al., 1992), adults in the New York metropolitan area who experience major burn injuries are routinely brought to the New York Hospital Regional Burn Center. All consecutive admissions to the Burn Center were approached during a 2-year period. All adult patients who were English speaking, without incapacitating delirium, and capable of granting informed consent were interviewed within the first 2 weeks of hospitalization. Additional criteria for the current study included that the participants not have burns on their left arm and hand. These individuals were excluded as burns may have affected the mobility needed in the left arm and hand for administration of the arm levitation item during assessment of hypnotizability.

**Measures**

The standard sociodemographic questionnaire used in the ongoing study of PTSD at the New York Hospital Regional Burn unit was employed. Three additional measures were used in the present study: the Impact of Event Scale (IES; Horowitz, Wilner, & Alvorez, 1979); the Structured Clinical Interview for DSM-III-R, PTSD module (SCID-PTSD; Spitzer, Williams, Gibbon, & First, 1989); and the Hypnotic Induction Profile (HIP; H. Spiegel, 1977; H. Spiegel, Greenleaf, & Spiegel, 2000).

The IES, a 15-item self-report measure with satisfactory psychometric properties, was used to measure intrusive (IES-I) and avoidance (IES-A) symptoms associated with the burn injury. Participants rated the frequency of symptoms for the previous week. In this study, participants were reminded, “On [date], you experienced a burn injury.” Respondents then indicated on a scale of 0 to 5 how frequently (0 = Not at all,
1 = Rarely, 3 = Sometimes, or 5 = Often) these intrusive symptoms (e.g., “I thought about it when I didn’t mean to”) and avoidance (“I tried to remove it from my memory”) were true for them during the past 7 days.

All items of the PTSD module of the SCID were administered to each study participant. Difede trained the two administrators in the use of the SCID. She is a licensed psychologist with an extensive background in administration of the SCID-PTSD with burn patients (e.g., Difede & Barocas, 1999; Perry et al., 1992) and was trained by the SCID-PTSD authors. The two administrators of the SCID-PTSD for the present study were a clinical psychology doctoral candidate and a nurse practitioner, both trained by Difede using the same procedures that she had undergone with the SCID authors. This training was similar to that described by Ventura, Liberman, Green, Shaner, and Mintz (1998) and entailed trainees corating videotaped SCID-PTSD interviews and conducting SCID-PTSD interviews that were corated by Difede.

A total PTSD score and PTSD reexperiencing, avoidance, and arousal cluster scores (i.e., Clusters B, C, and D) were generated by summing the items on which an individual met subthreshold or threshold criteria (i.e., a 2 or 3). Because all participants were assessed in the acute, postburn stage of recovery, the PTSD diagnosis time criteria of 1-month duration could not be met. ASD (DSM-IV; American Psychiatric Association, 1994) was not assessed because it was not part of the existing nomenclature at the time of the study.

The HIP is an eight-item ordinal scale derived from a behavioral measure of hypnotizability that takes 5 to 10 minutes to administer. It was administered by the first author, who received extensive training in its administration by H. Spiegel and Greenleaf. From the eight items, two factors—the eye roll and the induction score—were calculated. In this study, the eye-roll score was excluded from the HIP scoring and only the induction score (IND) was used, because the patients’ eye muscle mobility may have been affected by facial burns. Based on recommended scoring procedures, both a continuous total score summed across items (0 through 16) and categorical groupings based on the IND scores were generated.

Procedure

As previously noted (Difede et al., 1997), consecutive admissions to the Burn Center were approached in their hospital rooms by one of the investigators of the larger study. Of those approached for the larger study, 10% refused participation. Those individuals who refused were not significantly different from those who participated with regard to sociodemographic or burn injury variables. None of the participants from the larger study declined participation in the current study.

Three to 17 days after presentation at the hospital for burn injury, patients were interviewed and were administered the standard
instruments indexing trauma symptoms and hypnotizability. On average, the HIP was administered 8 days after the burn event, and the majority (i.e., 73%) of the participants were administered the HIP on the same day or within 24 hours after the other measures. Many burn patients are unable to write during the first few weeks following burn injuries, therefore, for consistency in data collection, research team members read the questionnaires to all subjects and marked responses on the standardized instruments. The measure of hypnotizability, the HIP, was administered by the first author. The first author was blind to the participants’ scores on the IES and the SCID-PTSD. Seventy-three percent\(^1\) of the participants were administered the HIP on the same day or within 24 hours after the other three study measures were administered. For the remaining participants, HIP administration varied from 10 days before (1 person) to 6 days (1 person) after the administration of the other measures. Hospital charts provided data on etiology of burn and percent of body burned.

**Analytic Strategy**

Analyses were conducted in three stages. In the first stage, univariate analyses were conducted to investigate the relation of trauma symptoms (i.e., IES Avoidance and Intrusive symptoms; SCID-PTSD Clusters B, C, and D; and Total SCID-PTSD symptoms) with treatment/physical (i.e., percent of body burned, time since burn injury to study measures’ administration, and burn etiology) and sociodemographic variables (i.e., gender, race, age, income, and education). Such treatment/physical and sociodemographic variables are important to include because research has suggested that they may be associated with trauma symptoms (e.g., Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Perry et al., 1992). Those treatment/physical and sociodemographic variables identified as associated with trauma symptoms in this sample were included in later analyses as control variables (i.e., covariates). In the second stage, the relation of low, mid-range, and high hypnotizability (as a categorical variable) with trauma symptoms were investigated. In the third stage, the relation of low, mid-range, and high hypnotizability with trauma symptoms were analyzed controlling for the possible influences of the covariates.

**Results**

Forty-four participants (17 females, 27 males) were recruited to this substudy. Participants ranged in age from 19 to 58 (\(M = 37.54, SD = 11.43\)), and the extent of their burn injuries ranged from 1% to 19% total body surface burned (\(M = 5.48\%, SD = 3.6\)). The patients were predominately African American (54.5%) males (61%), with a high-school degree or a higher level of education (82%), and an annual income of $50,000 or less (64%) (see Table 1). Of the 44 participants, one did not complete the
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HIP due to repeated interruptions. The number of participants completing each remaining measure varied slightly (reason not recorded) and is noted in Table 2. We employed mean substitution for the outcome variables in the MANOVA, ANOVA, and regression analyses.

The alphas for the HIP IND, the IES-I, and IES-A were acceptable (.81, .77, and .73, respectively). Means, standard deviations, and ranges for study measures are shown in Table 2. As indicated in Table 2, the mean HIP IND scale for this sample was 9.16. Based on categorical scoring procedures for the HIP, 7 participants were categorized as low (0 to 5), 23 as mid-range (6 to 11), and 13 as high (12 to 16) (Greenleaf et al., 1992; H. Spiegel et al., 2000; H. Spiegel & Spiegel, 1978).

Sociodemographic Characteristics and Trauma Symptoms

The relations of treatment/physical and sociodemographic variables to trauma symptoms (i.e., IES Avoidance and Intrusion symptoms; SCID-PTSD Clusters B, C, and D; and Total SCID-PTSD symptoms) were examined. Depending on whether the variable was categorical (e.g., gender) or continuous (e.g., age), comparisons of means or correlations of variables were calculated. None of the treatment/physical variables (e.g., percent of body burned) were found to be associated with trauma symptoms. Two sociodemographic factors were associated with trauma symptoms. Younger age was associated with higher SCID-PTSD arousal (Cluster D) symptoms ($r = -.344, n = 41, p < .05$), and having an income of $15,000 or less was associated with both greater SCID-PTSD arousal (Cluster D) and total SCID-PTSD symptoms ($t = 2.297, df = 35, p < .05; t = 2.257, df = 33, p < .05$). Other sociodemographic variables (e.g., gender, race) were not associated with trauma symptoms in this sample. As noted above, only those treatment/physical and sociodemographic variables identified as associated with specific trauma symptoms in this sample were included in later analyses. Therefore, only the relation of hypnotizability with SCID-PTSD arousal (Cluster D) and SCID-PTSD

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For comparison purposes, participants' HIP scores were calculated using the 0 to 10-point scoring system (see H. Spiegel & Spiegel, 1978). The mean for the sample of hospitalized burn patients was 5.9, which is lower than the mean of 7.23 for normal controls. The mean of the current study sample on the 0- to 10-point HIP scale is consistent with that of prior research with clinical populations (e.g., the mean of 5.96 for psychiatric patients with miscellaneous disorders, D. Spiegel, Detrick, & Frischholz 1982). Some researchers (D. Spiegel, Hunt, & Dondershine, 1988) have noted that individuals with PTSD may have relatively higher hypnotizability scores. Although our numbers are small and we do not have a group of patients with and a group without a diagnosis of PTSD, we tested the notion that the HIP 10-point score differed for those individuals who did, and who did not, meet criteria for SCID-PTSD Cluster B, Cluster C, or Cluster D. Using the outcome data with list-wise deletion for missing variables, the mean score for those who did meet criteria for one of the three clusters ($n = 19, M = 6.45$) was not significantly different ($t = -1.14, df = 41, p = .26$) from those who did not meet one of the three clusters ($n = 21, M = 5.56$).
Table 1
Sociodemographic and Medical Variables (N = 44)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>17</td>
<td>38.6</td>
</tr>
<tr>
<td>Male</td>
<td>27</td>
<td>61.4</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live w/significant other</td>
<td>2</td>
<td>4.5</td>
</tr>
<tr>
<td>Married</td>
<td>15</td>
<td>34.1</td>
</tr>
<tr>
<td>Divorced</td>
<td>10</td>
<td>22.7</td>
</tr>
<tr>
<td>Widowed</td>
<td>1</td>
<td>2.3</td>
</tr>
<tr>
<td>Single</td>
<td>16</td>
<td>36.4</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>12</td>
<td>27.3</td>
</tr>
<tr>
<td>Hispanic</td>
<td>7</td>
<td>15.9</td>
</tr>
<tr>
<td>African American</td>
<td>24</td>
<td>54.5</td>
</tr>
<tr>
<td>Not identified</td>
<td>1</td>
<td>2.3</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 12 years</td>
<td>8</td>
<td>18.2</td>
</tr>
<tr>
<td>High school graduate</td>
<td>14</td>
<td>31.8</td>
</tr>
<tr>
<td>Some college and/or training</td>
<td>13</td>
<td>29.5</td>
</tr>
<tr>
<td>College graduate</td>
<td>7</td>
<td>15.9</td>
</tr>
<tr>
<td>More than college</td>
<td>2</td>
<td>4.5</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>7</td>
<td>15.9</td>
</tr>
<tr>
<td>5,000 to 15,000</td>
<td>10</td>
<td>22.7</td>
</tr>
<tr>
<td>15,000 to 30,000</td>
<td>9</td>
<td>20.5</td>
</tr>
<tr>
<td>30,000 to 50,000</td>
<td>9</td>
<td>20.5</td>
</tr>
<tr>
<td>50,000 to 100,000</td>
<td>4</td>
<td>9.1</td>
</tr>
<tr>
<td>Not reported</td>
<td>5</td>
<td>11.4</td>
</tr>
<tr>
<td>Burn etiology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flame</td>
<td>19</td>
<td>43.0</td>
</tr>
<tr>
<td>Scald</td>
<td>22</td>
<td>50.0</td>
</tr>
<tr>
<td>Chemical</td>
<td>1</td>
<td>2.3</td>
</tr>
<tr>
<td>Electrical</td>
<td>1</td>
<td>2.3</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>2.3</td>
</tr>
</tbody>
</table>

total symptoms after controlling for age and income were investigated below.

Trauma Symptoms and Hypnotizability

To investigate the association of hypnotizability category and trauma symptoms, a multivariate analysis of variance (MANOVA) was conducted. A model that included the degree of hypnotizability (i.e., low, mid-range, and high) as the independent variable and multiple trauma
Table 2
Characteristics of Hypnotizability and Trauma Symptoms

<table>
<thead>
<tr>
<th>Scale</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Actual Range</th>
<th>Possible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIP-Induction</td>
<td>43</td>
<td>9.16</td>
<td>3.49</td>
<td>1.0 - 14.5</td>
<td>0 - 16</td>
</tr>
<tr>
<td>SCID-PTSD, Total Scorea</td>
<td>40</td>
<td>4.32</td>
<td>3.47</td>
<td>0 - 13</td>
<td>0 - 19</td>
</tr>
<tr>
<td>SCID-B, Reexperiencing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster</td>
<td>42</td>
<td>1.38</td>
<td>1.08</td>
<td>0 - 04</td>
<td>0 - 04</td>
</tr>
<tr>
<td>SCID-C, Avoidance Cluster</td>
<td>42</td>
<td>1.31</td>
<td>1.37</td>
<td>0 - 04</td>
<td>0 - 07</td>
</tr>
<tr>
<td>SCID-D, Arousal Cluster</td>
<td>42</td>
<td>1.59</td>
<td>1.61</td>
<td>0 - 06</td>
<td>0 - 06</td>
</tr>
<tr>
<td>Impact of Event-Avoidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(IES-A)</td>
<td>40</td>
<td>15.22</td>
<td>8.79</td>
<td>0 - 32</td>
<td>0 - 40</td>
</tr>
<tr>
<td>Impact of Event-Intrusion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(IES-I)</td>
<td>40</td>
<td>17.62</td>
<td>9.03</td>
<td>0 - 35</td>
<td>0 - 35</td>
</tr>
</tbody>
</table>

Note. HIP = Hypnotic Induction Profile; SCID = Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders-III-R; PTSD = Posttraumatic Stress Disorder. aPTSD symptoms (SCID Total and Cluster Scores) were based on summing items indicated as meeting threshold or subthreshold criteria.

symptoms indicators as the dependent variable (i.e., IES Avoidance and Intrusive symptoms, SCID-PTSD Clusters B, C and D symptoms) was assessed with a MANOVA. Because the homogeneity of variance assumption was not met for the SCID-PTSD Cluster D variable (untransformed Bartlett-Box $F(2, 1969) = 6.13, p = .002$), a square root transformation of scores on this variable was undertaken resulting in an acceptable distribution (transformed Bartlett-Box $F(2, 1969) = 1.64, p = .19$). The MANOVA was significant ($F = 2.80, df = 10.70, p < .01$) and indicates that there is a relation between hypnotizability and trauma symptoms as measured across these five variables, such that patients who were more hypnotizable evidenced more symptoms. Indeed, in all cases but one (on the IES-I variable), mean scores on the five symptom scales progressively increased from low through medium to high hypnotizables. As indicated in Table 3, univariate analysis revealed a significant and positive association between hypnotizability and trauma symptoms as indexed by the IES-A ($F = 6.49, df = 2, 40, p < .01$), IES-I ($F = 4.15, df = 2, 40, p < .05$), and SCID-PTSD arousal, Cluster D ($F = 3.38, df = 2, 40, p < .05$) measures. This model was associated with .95 power to detect an effect indicating that grouping participants into low, mid-range, and high hypnotizability categories had good explanatory value.

Univariate analyses (ANOVA) were also conducted to investigate the association of categories of hypnotizability with individual trauma symptom indicators using post hoc tests for unequal sample sizes (i.e., Gabriel, a post hoc test). As indicated in Table 3, post hoc comparisons indicated that individuals with a high degree of hypnotizability
Table 3
Means, Standard Deviations, MANOVA, and ANOVA Results of Mean Level of Trauma Symptoms by Level of Hypnotizability

<table>
<thead>
<tr>
<th>Scale</th>
<th>Low Hypnotizability</th>
<th>Midrange Hypnotizability</th>
<th>High Hypnotizability</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=7</td>
<td>n=23</td>
<td>n=13</td>
<td>F(2,40)</td>
</tr>
<tr>
<td>SCID-B, Reexperiencing Cluster</td>
<td>.71 (1.11)</td>
<td>1.36 (.93)</td>
<td>1.80 (1.15)</td>
<td>2.54, p = .09</td>
</tr>
<tr>
<td>SCID-C, Avoidance Cluster</td>
<td>.71 (1.50)</td>
<td>1.24 (1.24)</td>
<td>1.69 (1.44)</td>
<td>1.24, p = .30</td>
</tr>
<tr>
<td>SCID-D, Square Root of Arousal Cluster</td>
<td>.78 (1.06)</td>
<td>.86 (0.61)</td>
<td>1.46 (0.72)</td>
<td>3.38, p = .04</td>
</tr>
<tr>
<td>Impact of Event-Avoidance (IES-A)</td>
<td>9.60b (5.60)</td>
<td>13.44b (7.36)</td>
<td>21.03* (8.56)</td>
<td>6.49, p = .004</td>
</tr>
<tr>
<td>Impact of Event-Intrusion (IES-I)</td>
<td>17.52a,b (9.54)</td>
<td>14.85b (7.48)</td>
<td>22.94a (8.38)</td>
<td>4.15, p = .023</td>
</tr>
</tbody>
</table>

Note. The first number in each cell is the mean, and the second number is the standard deviation. N = 43. The MANOVA was significant (F = 2.80, df = 10,70, p < .01). Cell means with different superscripts within each row differ by p < .05, based on ANOVA with Gabriel’s post hoc test. SCID = Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders-III-R.
reported more IES-A symptoms, $M = 21.03$, than those with a low or a mid-range degree, $M = 9.60$ and $M = 13.44$, respectively, $p < .01$. In addition, those in the high hypnotizability category also reported greater IES-I symptoms as compared to those in the mid-range, $M = 22.94$ versus $14.85$, $p < .05$.

As age and income were associated with SCID-PTSD total symptoms and SCID-PTSD arousal, Cluster D, two regression analyses were conducted that included age and income in the first step and then hypnotizability in the second step, with either SCID-PTSD total symptoms or the square root of the SCID-PTSD arousal, Cluster D, as the outcome variable. Hypnotizability was dummy coded into two variables: (a) one indicating mid-range versus others and (b) one indicating highs versus others. In the first regression analysis, total SCID-PTSD symptoms was the outcome variable. Age and income were entered as the first step in the regression analysis and then the two dummy hypnotizability variables were entered in the second step. In this analysis, only income, $\beta = -.38$, $t = -2.47$, $p < .05$, was significantly associated with the total number of SCID-PTSD symptoms. After accounting for the significant relation of income, $\beta = -.35$, $t = -2.46$, $p < .05$, and age, $\beta = -.325$, $t = 2.30$, $p < .05$, with PTSD-SCID arousal, and Cluster D, hypnotizability category was not significant (e.g., for the variables of highs versus others, $\beta = .25$, $t = 1.23$, $p = .23$).

**DISCUSSION**

To the best of our knowledge, this study represents the first investigation of hypnotizability as a factor associated with trauma symptoms after burn injury in the acute hospital stage of recovery. The study results suggest that, overall, high hypnotizables are more likely to experience trauma symptomatology than low and mid-range hypnotizables. As compared to those in the mid-range, high hypnotizables were more likely to experience intrusive symptoms such as recurrent and distressing recollections of the burn. High hypnotizables were also more likely to experience greater avoidance than mid-range and low hypnotizables. The mid-range and low hypnotizables did not differ from each other in postburn trauma symptoms. These results, as well as clinical implications, study limitations, and areas for future research, are discussed below.

The results of this study suggest that as compared to individuals categorized as low and mid-range, high hypnotizables are more likely to experience a greater frequency of burn-injury-related intrusions and avoidance in the acute, hospital stage of recovery. Although multiple indicators suggested that high hypnotizability was associated with these trauma symptoms, there were some interscale variations (e.g., a relation with the IES-A measure but not with the SCID-PTSD avoidance Cluster C). These differences may possibly have been due to things like...
slight variations in the time span indexed, item wording, or measure reliability. For example, the IES was keyed to symptoms experienced by the respondent within the "past seven days," and the SCID-PTSD module was keyed to symptoms experienced "since the burn injury." Furthermore, on the SCID-PTSD module, one item states, "Since the burn injury, have you made a special effort to avoid thinking or talking about what happened?" The corresponding idea is indexed by items on the IES such as "I tried not to think about it," and "I tried not to talk about it." Moreover, although the SCID and IES are both used to assess PTSD, researchers have noted that the measures are not interchangeable (Allen, 1994; Joseph, 2000).

Sociodemographic variables were not associated with SCID-PTSD Cluster B, Cluster C, or the IES scale. However, income and age were associated with SCID-PTSD Cluster D and total SCID-PTSD symptoms. After participants' ages and incomes were taken into account, the relation between hypnotizability and SCID-PTSD total and arousal Cluster D were not found, suggesting the possible importance of these variables. Given that these sociodemographic variables were not uniformly associated with trauma symptoms, the modest sample size, and the possible spurious results, further research is needed to investigate these relations. In addition, future research addressing the relation of hypnotizability and PTSD symptoms might include such sociodemographic variables.

The primary study finding regarding the psychological vulnerability of the highs to trauma symptoms in the acute postburn hospital stage of recovery is consistent with the prediction from the Spiegel's and Wickramasekera's models of hypnotizability. For example, the Spiegel model proposes that the highs are extremely sensitive and reactive to stressful environments. According to this model, hypnotizability is an indicator of hypnotic capacity and responsivity to internal/external stimuli and is a means to index individual differences. A person who is low in hypnotizability usually has a greater internal locus of control and focus; is more prone to be guided by logic, reason, and cognition; has minimal dissociative capacity; and is not highly suggestible. The high hypnotizable person, in contrast, is more easily externally influenced, is more suggestible, and is high in dissociative capacity. The person in the mid-range has a propensity to oscillate between these extremes and

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4Although the contributions of H. Spiegel's collaborators are recognized (e.g., see H. Spiegel & Greenleaf, 1992; H. Spiegel & Spiegel, 1978; Stern, Spiegel, & Nee; 1978-1979), for the purposes of this paper, the model of hypnotizability as an individual difference characteristic is called the Spiegel model.

5Although the contributions of Wickramasekera's collaborators are recognized (e.g., see Wickramasekera, Pope, & Kolm, 1996; Perlstrom & Wickramasekera, 1998), for the purposes of this paper the High Risk Model of Threat Perceptions is called the Wickramasekera model.
integrate the characteristics of lows and highs. In the postburn hospital stage of recovery, the patient and others around him or her are adjusting to multiple losses, including body integrity, home, employment, physical well-being, predictability, and security (Bernstein, 1987; Bernstein, O'Connell, & Chedekel, 1992). Based on the Spiegel model, highs are at risk for postburn trauma symptoms because they are hyperreactive to their own injury as well as the observable burn unit events, such as the distress of a roommate who looks in the mirror for the first time and expresses anguish.

The results of this study are also consistent with the Wickramasekera high-risk model of threat perception (Perlstrom & Wickramasekera, 1998; Wickramasekera et al., 1996). The Wickramasekera model proposes that hypnotizability is one of three factors (i.e., hypnotic ability, catastrophizing, and negative affectivity) that amplify the probability that life stress will generate psychological and somatic symptoms. According to this model, highs are at risk for stress disorders because they are prone to “surplus empathy,” are hypersensitive to perception of a threat, and are sympathetically hyperreactive to a threat. The implication of the present study, that highs are more likely to experience trauma symptoms after burn injury, is consistent with the predictions from this model. Similarly, from the cognitive processing perspective (Creamer, Burgess, & Pattison, 1990), highs may be at risk for trauma symptoms because dissociation and avoidance may prevent adaptive cognitive processing or the integration of the burn event into an individual’s worldview. Lack of processing and integration of the event are proposed by cognitive processing theorists to result in subsequent distress (Creamer et al.).

The corollary, that low and mid-range hypnotizability may be a protective factor in the postburn hospital stage of recovery, is understandable from the Spiegel model. This model suggests that lows have an internal orientation and low responsivity to external stimuli that may protect them from being negatively influenced by the chaotic burn unit environment and the surrounding distress of others. According to this model, mid-range individuals, who oscillate and function in between the rigidity and fixedness of lows and the malleability and suggestibility of highs, may similarly be protected from external distressing stimuli. The Wickramasekera model would also predict that mid-range hypnotizability may be protective.

The association of hypnotizability and trauma symptoms found in this study also converges with prior research by Greenleaf and colleagues (Greenleaf et al., 1992), which found that highs were at increased risk for physical distress (i.e., required more time to stabilize after surgery) in a chaotic ICU hospital environment. The association of hypnotizability and trauma symptoms is also consistent with prior research indicating the overlap among hypnotic phenomena and trauma.
symptoms (Cardeña, 2000; Classen, Koopman, & Spiegel, 1993; D. Spiegel et al., 1988).

**Clinical Implications**

Research suggests that burn patients are at high risk for trauma symptoms after the event of being burned and being in a hospital burn unit. Prevention of trauma symptoms at the acute postburn stage of recovery is particularly critical as trauma symptoms at this time are associated with later full-blown PTSD (Difede & Barocas, 1999). Assessment of hypnotizability would help to identify individuals who may experience acute and chronic trauma symptoms and who would benefit from early intervention. Assessment of hypnotizability would also facilitate tailoring the treatment intervention to each individual’s degree of hypnotizability, because hypnotizability has been associated with the impact of hypnotic interventions (Hilgard & Hilgard, 1975; Montgomery et al., 2000). Hypnosis may be a particularly useful component of interventions to reduce postburn trauma symptoms because it has been found to decrease intrusion and avoidance symptoms in those experiencing PTSD symptoms (Brom, Kleber, & Defares, 1989; Cardeña, 2000).

**Study Limitations and Areas for Future Research**

The primary study limitation is that the design was cross sectional and that hypnotizability was assessed after burn injury, which restricted our ability to examine causal relations; we cannot conclude that high hypnotizability causes greater frequency of trauma symptoms nor the reverse. This study was the first attempt to address this association, and longitudinal research (with hypnotizability measures before the traumatic event) is needed to address causal relations and to do so within the context of other known factors associated with trauma symptoms, such as low levels of social support (Perry et al., 1992; Taal & Faber, 1998). The results of such research would facilitate identification of the additional factors needed in an assessment of individuals at risk for acute and chronic trauma symptoms. In addition, although the composition of the sample allows for some generalization across ethnic groups, the sample was small and this study was limited to one hospital. The number of individuals classified as meeting SCID cluster criteria in each category were too few to make investigation of meeting cluster criteria and category of hypnotizability meaningful (e.g., 9 individuals met criteria for Cluster D). In addition, DSM-III-R did not include ASD, which is included in DSM-IV, thereby limiting the comparison of the present study with current studies designed to investigate ASD and its relation to the development of PTSD.

Future research needs to explore the relation of hypnotizability and acute and chronic trauma symptoms across various geographical and burn treatment settings. It may also be helpful in future research to
include the Clinician Administered PTSD Scale (CAPS) (Blake et al., 1990a, 1990b), because this measure allows for assessment of intensity as well as frequency of PTSD symptoms. In addition, the level of pain medication should be included in future studies assessing the relation of hypnotizability and postburn trauma symptoms. Future research with hospitalized burn patients that employs the HIP should also exclude those with burn injuries on either arm and hand, and not just the left arm and hand as was done in the present study. In the HIP, the right arm and hand are employed for comparison to the left, and right arm and hand burns may impact this comparison. Finally, it would be important in future research to investigate the relation of hypnotizability and additional indicators of trauma symptoms, such as ASD, and of general distress, such as major depression as well as positive adjustment.

REFERENCES


Hypnotizability and Trauma Symptoms


Hypnotisierbarkeit und Traumasymptome bei Brandverletzung

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Hypnotisabilité et symptômes traumatiques après brûlure.

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Résumé: Ce travail étudie l’association de symptômes traumatiques et l’hypnotisabilité chez 43 patients survivant après brûlure. 3 à 17 jours après l’épisode de brûlure il a été noté la fréquence de symptômes intrusifs et d’évitement (interrogatoire au moyen du module d’évaluation du PTSD (DSM-III-R) (SCID). Le test du profil d’induction hypnotique (HIP) a été utilisé dans la période après brûlure et au moment de la rééducation. Les résultats montrent que lorsque les participants étaient séparés en groupe faiblement, moyennement ou hautement hypnotisables, les sujets hautement hypnotisables avaient plus de symptômes intrusifs, d’évitement, et d’excitation. Toutefois les relations causales n’ont pas pu être évaluées dans cette étude croisée. Ces résultats suggèrent que comparativement aux catégories basses ou moyennes, les sujets hautement hypnotisables peuvent avoir une plus grande fréquence de symptômes traumatiques après une lésion par brûlure.

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Hipnotizabilidad y síntomas de trauma después del daño por quemadura

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Resumen: Este estudio investigó la asociación entre los síntomas de trauma y la hipnotizabilidad en 43 supervivientes de daños de quemadura hospitalizados. Tres a 17 días después del daño de quemadura, los participantes clasificaron la frecuencia de los síntomas intrusivos y de evitación, y los entrevistamos con el módulo del trastorno de estrés postraumático de la entrevista clínica estructurada para el DSM-III-R (SCID). Administramos también el Perfil de Inducción Hipnótica (HIP) en la etapa hospitalaria de recuperación después de la quemadura. Los resultados indicaron que cuando dividimos a los participantes en categorías de hipnotizabilidad baja, media y alta, la hipnotizabilidad alta estuvo asociada con más síntomas intrusivos, de evitación, y de excitación. Aunque no podemos evaluar relaciones causales en este estudio no longitudinal, los resultados sugieren que, comparadas con las categorías de hipnotizabilidad baja y media, los muy hipnotizables posiblemente experimentan una frecuencia mayor de síntomas de trauma después del daño de quemadura.

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