Psychosocial Concomitants of Persistent Pain Among Persons with Spinal Cord Injuries

Although many persons with spinal cord injuries report problems with persistent, recurrent pain, very little empirical research has examined this issue. The impact of painful conditions on rehabilitation and subsequent adjustment has yet to be empirically clarified. Two studies are reported which (1) investigate differences between persons with and without persistent pain on measures of depression and psychosocial impairment, and (2) examine possible differences in the degree of pain-related suffering between persons with paraplegia and quadriplegia. Results from the first study demonstrate that pain is associated with more depressive behaviors and greater psychosocial impairment regardless of the time since the onset of injury. In the second study, ratings of sensory and affective pain intensities were obtained from persons with paraplegia and quadriplegia. Results indicated that persons with paraplegia displayed more pain-related suffering than persons with quadriplegia for equal intensities of pain sensation. Recommendations for theoretical and clinical considerations in spinal cord injury rehabilitation are provided.

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The study of psychosocial adjustment following spinal cord injury (SCI) has focused primarily on emotional reactions to the disability, with special attention to problems like depression, denial, and psychosocial dysfunction. Interestingly, many persons with SCI report that persistent pain is the most frequent and disconcerting medical problem they experience. Yet this particular issue has received relatively little empirical attention from researchers in SCI rehabilitation.

The few studies that have examined persistent and chronic pain among persons with SCI have been primarily descriptive. In one of the earliest surveys of this type, Nepomuceno and colleagues found that 48% of the 200 patients canvassed reported distressing, intractable pain, and 44% of these persons said it interfered with their daily activities. A second study by the same research team examined responses on psychological instruments completed by 75 of these 200 respondents during previous inpatient rehabilitation. It was found that higher levels of self-reported pain were related to older patient age, higher verbal ability, higher levels of anxiety, and negative psychosocial environments. Patients who had more problems with daily activities secondary to pain were older and more depressed. Other correlational data have also indicated that higher levels of education are related to increased pain reports, presumably because these persons may be more articulate and thoughtful about these sensations.

NeuroRehabil 1991; 1(4):7-16
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Other studies of pain after SCI have been generally descriptive and consistent with initial survey findings. Kumar and co-workers\(^6\) surveyed 992 members of the Paralyzed Veterans Association and found that 63% reported pain at or below the level of lesion. Forty-two percent of these persons tried to manage their pain with multiple pain medications. Rose and colleagues\(^7\) surveyed a British sample of 885 persons with SCI and reported that 43% experienced constant pain and 83% of those employed said the pain interfered with their work. These authors also noted no relationship between the time since the onset of injury and onset or relief of pain. A more recent study indicates that pain following SCI is linked to psychosocial adjustment.\(^8\) In this work, persistent pain among patients with SCI was significantly associated with anger, negative cognitions, and emotional distress beyond that related specifically to the physical disability.

Comparative studies of SCI and pain have been few. Umlauf and co-workers\(^9\) reported that pain intensity ratings of 38 SCI patients were comparable to those acquired from 27 patients with chronic low back pain. However, a more recent study found that chronic pain patients had higher depression and distress scores than a sample of persons with SCI, and these researchers speculated that chronic pain probably had a minimal impact on well-being following SCI.\(^10\)

The psychosocial effects of pain following SCI may be better understood in comparative studies of persons with SCI who are experiencing pain and those who are not. No study to date has systematically examined differences between persons with SCI who report the presence of pain and those who do not. Pain may have differential effects depending on the expectations of the person experiencing the painful sensation. Many people who become paralyzed may find pain distressing because it may be an aversive sensation that interferes with expected activities of daily living. The degree of distress accompanying pain has been shown to correspond with the degree to which the pain interferes and disrupts goal-directed and expected activities.\(^8\)\(^,\)\(^11\)

The present research was conducted to systematically investigate the psychosocial concomitants of persistent pain among persons with SCI. In the first study, the relationships of pain to depression and psychosocial impairment were examined on the basis of reports from persons with and without pain. The effects of time since injury and level of injury on these outcome variables were also studied as moderating factors. In the second study, the ratings of pain sensation and unpleasantness obtained in the first study were investigated to determine the differential meanings of pain among persons with paraplegia and those with quadriplegia.

**STUDY 1**

The first study examined the relationships between the presence of persistent pain, depression, and psychosocial impairment among persons with SCI.

**Method**

**Participants.** All of the 198 participants were receiving treatment for SCI. One hundred and eight patients were serviced by a Veteran's Administration medical center, 62 were being treated at a general rehabilitation unit in an urban medical school, 20 were receiving treatment in a rehabilitation facility in a rural area, and 8 were residing in an independent living apartment complex. The total sample comprised 180 men and 18 women. The mean age was 38.81 years (SD = 18.51, range 18 to 83 years). One hundred and seventeen patients were Caucasian, 77 were African-American, two were Asian-American, and one was of Hispanic heritage. The average time since the onset of the injury was 83.07 months (SD = 121.48, range 1 to 490 months). One hundred and eighteen participants were paraplegic and 80 were quadriplegic. The average length of formal education was 12.02 years (SD = 2.69, range 4 to 19 years).
Patients were approached by a member of the research team and informed that the study examined the relationship between interpersonal behavior and adjustment to SCI. Informed consent was obtained from interested participants. The independent and dependent measures were administered in a random order. Trained interviewers verbally administered the measures to patients, since many patients with high level injuries required assistance. During the course of the interview, participants were asked if they were experiencing pain of at least two weeks' duration. Participants were not asked if pain was perceived as a problem or if they had sought treatment for pain.

**Dependent measures.** The Inventory to Diagnose Depression (IDD)\textsuperscript{12} was used to measure depression. The IDD is a 22-item self-report instrument developed to measure depressive behavior.\textsuperscript{13} Test-retest reliabilities and internal consistency markers have been impressive in comparisons with interview systems and other self-report measures of depression.\textsuperscript{12,13,14} The IDD requires the respondent to indicate the severity of each symptom of depression on a five-point Likert scale. The sum of these responses provides a total severity score that serves as a single index of depressive behavior. The severity score was used in this study.

The Sickness Impact Profile (SIP)\textsuperscript{15} was used to measure psychosocial impairment. The SIP is a 136-item questionnaire measuring health-related impairment in physical and psychological dimensions. The psychosocial subscale was utilized in this study. Items on this subscale tap functioning across categories of social interaction (e.g., "I am doing fewer social activities with groups of people"), alertness ("I do not keep my attention on any activity for long"), emotional behavior ("I laugh or cry suddenly"), and communication ("I do not speak clearly when I am under stress"). Respondents are asked to endorse only those items that describe their personal experience within the preceding 24 hours. Test-retest correlations of the SIP across several studies and time intervals have been consistently high (0.75 to 0.92) for the total score, and moderate (0.45 to 0.60) for items endorsed.\textsuperscript{15,16} Validity coefficients resulting from comparisons with other measures of health-related dysfunction have ranged from 0.30 to 0.85.\textsuperscript{16} Higher scores denote greater psychosocial dysfunction.

**Statistical analysis.** Pearson correlation coefficients were first computed between the measures of depression, psychosocial impairment, level of injury (coded as paraplegia = 1; quadriplegia = 2), presence of pain (1 = no pain, 2 = reported pain), and time since the onset of injury (recorded in months). Separate 2 (level of injury) × 2 (presence of pain) analyses of variance using time as a covariate (ANCOVA) were computed for the depression and psychosocial impairment variables, respectively. Multiple regression equations were used as post-hoc procedures to more precisely define the relative contributions of time, level of injury, and pain status on each outcome variable.

**Results**

Means and standard deviations for each of the dependent variables are shown in Table 1. Of the 198 participants, 54 paraplegics and 46 quadriplegics reported not experiencing persistent pain, while 64 paraplegics and 34 quadriplegics reported persistent pain ($X^2 = 2.62, p = 0.11$).

The 2 (pain status) × 2 (level of injury) ANCOVA on depression revealed a significant effect for pain, $F(1,192) = 6.07, p = 0.02$. Patients reporting persistent pain had significantly higher scores on the depression measure. No other effects were significant. However, time since injury significantly covaried with depression, $F(1,192) = 4.39, p = 0.04$. Similarly, the ANCOVA on psychosocial impairment revealed a significant effect for pain, $F(1,173) = 6.67, p = 0.01$. No other effects were significant. Patients who reported persistent pain had significantly higher psychosocial impairment scores. Time since injury approached significance as a covariate of impairment, $F(1,173) = 3.16, p = 0.08$.

Given the covariance of time since injury on each dependent variable, separate multiple hierarchical regression equations were computed
Table 1. Depression and Psychosocial Impairment by Level of Injury and Pain Status

<table>
<thead>
<tr>
<th>Presence of Pain (Means ± SD)</th>
<th>None</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patients with paraplegia</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>11.02 (8.58)</td>
<td>16.47 (14.45)</td>
</tr>
<tr>
<td>Psychosocial impairment</td>
<td>10.68 (9.68)</td>
<td>18.20 (16.63)</td>
</tr>
<tr>
<td><strong>Patients with quadriplegia</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>12.76 (10.03)</td>
<td>15.09 (10.25)</td>
</tr>
<tr>
<td>Psychosocial impairment</td>
<td>16.31 (13.18)</td>
<td>19.11 (14.22)</td>
</tr>
</tbody>
</table>

Standard deviations are expressed in parentheses. Depression was measured by the Inventory to Diagnose Depression scale; psychosocial impairment was measured by the relevant section of the Sickness Impact Profile.

Table 2. Correlations between Patient Variables, Depression, and Psychosocial Impairment

<table>
<thead>
<tr>
<th>Pain</th>
<th>Level of Injury</th>
<th>Depression</th>
<th>Psychosocial Impairment</th>
<th>Time Since Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>...</td>
<td>-0.10</td>
<td>0.17&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.05</td>
</tr>
<tr>
<td>Level of injury</td>
<td>...</td>
<td>0.03</td>
<td>0.16&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.08</td>
</tr>
<tr>
<td>Depression</td>
<td>...</td>
<td>0.72&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td>-0.15&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Psychosocial impairment</td>
<td>...</td>
<td></td>
<td></td>
<td>-0.14</td>
</tr>
<tr>
<td>Time since injury</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>p < 0.05; <sup>b</sup>p < 0.01.

Pain status coded as 1 = no pain present, 2 = pain present; level of injury coded as 1 = paraplegia, 2 = quadriplegia; time since injury recorded in number of months.

to predict depression and psychosocial impairment, respectively. Time since injury was entered at the first step of each equation as a predictor variable, followed at the second step by level of injury (coded as 1 = paraplegia, 2 = quadriplegia), and then by pain status (coded as 1 = no pain, 2 = persistent pain present). Finally, a set of interaction terms was entered as a block to examine any possible interactive effects (time × level, time × pain, pain × level, time × level × pain). Table 2 presents correlations between all of the variables used in the regression analyses.

The first equation was computed to predict depression. Time since injury, entered at the first step, was significantly predictive of depression, $F(1,196) = 4.76, p = 0.03, R^2 = 0.02$. Recent injury was significantly associated with higher depression scores. Level of injury, entered at the second step, was not significantly predictive of depression, $F_{inc}(1,197) = 0.06, ns$.

Pain status was entered at the third step and was significantly predictive of depression, $F_{inc}(1,196) = 5.49, p = 0.02, R^2_{inc} = 0.03$. The presence of persistent pain was significantly associated with higher depression scores. The block of interaction terms, entered at the final step, was not predictive of depression, $F < 1, ns$.

In the equation predicting psychosocial impairment, time since injury approached significance as a predictor, $F(1,177) = 3.34, p = 0.07, R^2 = 0.02$. Recent injury was associated with higher impairment scores. Level of injury, entered at the second step, also approached significance in the prediction of impairment, $F_{inc}(1,176) = 3.61, p = 0.06, R^2_{inc} = 0.02$. Quadriplegia was associated with higher impairment scores. Pain status, entered at the third step, was significantly predictive of impairment, $F_{inc}(1,175) = 5.14, p = 0.02, R^2_{inc} = 0.03$. The presence of pain was significantly associated with higher impairment above and beyond the
variance accounted for by level of injury and time since onset of injury. The block of interaction terms, entered at the final step, was not significantly predictive of impairment, $F < 1, ns$.

In summary, patients who reported the presence of persistent pain had higher impairment and depression scores. Although time since injury significantly covaried with the psychosocial variables, it did not moderate the relation of pain to depression and impairment. Pain was significantly associated with higher depression and impairment regardless of level of injury or time since the onset of injury.

**STUDY 2**

Approximately 49% of the participants in the first study reported recurrent or chronic pain related to their injury. Those with pain evidenced significantly greater depression and psychosocial impairment compared to those who were pain free. In the second study, we evaluated the possible impact of pain-related disability on affective responses to persistent pain. Given the greater potential for activities of daily living among persons with paraplegia than among persons with quadriplegia, it is likely that the presence of pain may disrupt the behavioral activities and intentions of persons with paraplegia. Disruption of goal-directed activities that one expects to perform contributes to greater frustration and emotional distress. The greater expectation and desire for activities among persons with paraplegia would, therefore, put them at greater risk for pain-related suffering. The logic of this assertion is based on the considerable research on the importance of individual differences in the meaning of pain and individual expectations that pain will interfere with activities of daily living.

In a classic study described in his book, Beecher highlighted the impact of personal meaning and significance of acute pain on suffering and emotional distress. He pointed out that there is no simple, direct relationship between the extent of tissue damage and reaction to a wound. Beecher asked wounded soldiers if they wanted medication for pain relief. About one-third of those interviewed wanted analgesics. Of the postsurgical civilians suffering from far less tissue trauma, four-fifths wanted medication to relieve their pain. The important difference between the two groups seemed to lie in the response to and interpretation of the wounds received. To the soldiers, the wounds were apparently interpreted with relief and gratitude for being alive after encountering a life-threatening experience on the battlefield. However, the civilians appeared to interpret major surgery as a depressing, calamitous event, even if the surgery was essential. Thus, Beecher interpreted the difference in requests for medication as reflecting differences in significance of the wound to the two different groups.

In other research, the cognitive, attentional focus of an expectant mother has been shown to selectively influence ratings of unpleasantness, but not the ratings of sensory intensity of childbirth pain. Price and co-workers employed visual analogue scales to determine expectant mothers’ ratings of pain intensity and pain unpleasantness at various stages of labor. They also asked if attention was focused on the pain or on attempting to avoid the pain (all were students of a childbirth education program), or if attention was focused on the impending birth of the child. When the women in labor focused on the impending birth, the unpleasantness of the pain associated with a contraction was strikingly reduced compared to pain ratings from women attending to the pain or trying to avoid the pain. This disparity in pain-related suffering was not associated with significant differences in pain intensity ratings associated with contractions. Similarly, Harkins and colleagues reported that chronic pain unpleasantness but not sensory intensity was higher among patients with higher neuroticism scores. Individuals high in neuroticism also have a significant proclivity for a somatic focus, symptom amplification, and presentation of “suffering.” Thus, evidence supports that the manner in which a person interprets the significance of his or her pain influences suffering and perceived unpleasantness much more than the sensory intensity of a painful event.
Whether suffering associated with pain in SCI patients is influenced by level of spinal cord trauma was evaluated in this study. We assumed that the level of dysfunction in activities of daily living is generally greater for persons with quadriplegia than for those with paraplegia. Therefore, the presence of pain would be perceived as more aversive among persons with paraplegia than among those with quadriplegia. It was hypothesized that, if for equal levels of pain intensity, persons with paraplegia reported greater pain-related unpleasantness, this would be indirect evidence for differences between these two groups in the personal meaning and significance of pain. Specifically, we predicted that, for equal intensity levels of persistent pain, persons with paraplegia would report greater pain unpleasantness compared to persons with quadriplegia, and that this would be independent of patient depression and psychosocial impairment. Such a finding would suggest a need for reliable and validated indices of pain-related disability for patients with SCI that would allow systematic development of pain control and intervention strategies.

Method

Participants. Eighty-three patients from the first study who reported the persistent presence of pain of at least two weeks' duration participated in the second study. In this sample, the average age was 37.52 years (SD = 13.37 years), and the average time since injury onset was 73.52 months (SD = 95.11 months). The sample consisted of 74 men and 9 women. Fifty-three persons had paraplegia and 30 had quadriplegia.

The method of collecting self-report data from these participants was identical to that in the first study with one exception. Patients who had reported persistent or chronic pain were asked to complete visual analogue scales (VASs) of average pain sensation and pain unpleasantness. Fifteen of the original 98 patients in the first study were not administered the VASs due to time constraints or functional inabilities to reliably respond to the VASs. Subsequently, data from 83 participants were analyzed.

Measures of pain intensity and unpleasantness. Two separate visual analogue scales (VASs) were used to measure pain sensory intensity and pain unpleasantness. The VASs consisted of two 150-mm lines labeled to distinguish between the sensory aspect of pain and the affective evaluation of the pain. End points for the sensory scale were "no sensation" and "the most intense sensation imaginable." End points for the unpleasantness scale were "not at all unpleasant" and "the most unpleasant imaginable." Respondents were asked to rate the average sensory and unpleasantness intensity for the previous week.

Instructions were consistent with previous recommendations. The two dimensions of pain (sensory and affective) were explained to participants, and then the two scales were administered. The scales have evidenced considerable validity and reliability over several studies.

Statistical analysis. A difference score was computed by subtracting the unpleasantness score from the sensory score for each participant. Then, separate one-way analyses of variance were computed for the sensory, unpleasantness, and difference scores by level of injury (paraplegia, quadriplegia). Finally, correlations were computed between the three pain indices and the total depression score from the IDP and the psychosocial impairment scale of the SIP (both described in the first study).

Results

Table 3 presents the means and standard deviations for the sensory, unpleasantness, and difference pain scores by level of injury. Persons with paraplegia did not differ from persons with quadriplegia in the absolute ratings of pain sensation [F(1,80) = 1.41, ns] and unpleasantness [F(1,80) = 0.92, ns]. As predicted, however, the difference between scores of sensory VAS ratings minus affective VAS ratings was significant [F(1,80) = 6.12, p = 0.015]. As shown in the Figure, persons with paraplegia reported greater suffering for given levels of pain intensity in comparison to persons with quadriplegia.
Table 3. Depression and Psychosocial Impairment by Level of Injury and Pain Status

<table>
<thead>
<tr>
<th>Patient Group</th>
<th>Sensory Ratings</th>
<th>Unpleasantness Ratings</th>
<th>Difference Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with paraplegia</td>
<td>80.65 (39.02)</td>
<td>99.51 (37.01)</td>
<td>-18.65 (32.71)</td>
</tr>
<tr>
<td>Patients with quadriplegia</td>
<td>90.60 (51.54)</td>
<td>91.27 (35.87)</td>
<td>0.67 (29.85)</td>
</tr>
</tbody>
</table>

Standard deviations are expressed in parentheses.

Table 4. Correlations between Depression, Psychosocial Impairment, and the Three Pain Indices

<table>
<thead>
<tr>
<th></th>
<th>Sensory Ratings</th>
<th>Unpleasantness Ratings</th>
<th>Difference Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>0.13</td>
<td>0.19</td>
<td>-0.07</td>
</tr>
<tr>
<td>Psychosocial impairment</td>
<td>0.18</td>
<td>0.20</td>
<td>0.07</td>
</tr>
</tbody>
</table>

All p values are nonsignificant.

Sensory and affective pain ratings and difference scores provided by persons with paraplegia and quadriplegia.

A post-hoc analysis of covariance for group difference in ratings of affective response to pain, controlling for pain intensity ratings, produced similar results. The pain unpleasantness ratings adjusted for pain intensity ratings were significantly different (p = 0.035); the paraplegic group had an affective pain rating of 101.6 (SD = 4.0) and the quadriplegic group had a score of 87.3 (SD = 5.3). These results are consistent with the prediction that, for similar sensory pain intensity ratings, persons with paraplegia would report greater emotional suffering than would persons with quadriplegia.

To determine if the assessment of pain-related suffering as measured by the difference score was confounded with patient depression and psychosocial impairment, Pearson correlations were computed between the IDP total scores, the SIP scores, and the three pain indices. Correlations are displayed in Table 4. Depression and psychosocial impairment were not significantly correlated with any of the pain measures, indicating that the three measures of pain were not unduly contaminated by levels of patient depression and psychosocial impairment.

In general, the results of the second study provide indirect evidence for the hypothesis that persons with paraplegia perceive similar levels of chronic pain as more unpleasant or affectively disturbing than persons with quadriplegia, due to differences in meaning of pain between the two groups.

**DISCUSSION**

The results of the present two studies indicate that the presence of pain following SCI has adverse psychosocial concomitants, and the degree of pain-related suffering may be mediated by patient expectations for behavior. Specifically, persons with SCI who reported the presence of pain of at least two weeks' duration evidenced higher depression and psychosocial impairment scores than those who were pain free. The relation of pain to depression and impairment was not significantly moderated by the amount of time since the onset of injury; although recent injury was associated with
higher depression scores and greater impairment, pain status accounted for more variance in the depression and psychosocial impairment scores after controlling for the effects of time.

In addition, results of the second study indicate that the degree of pain-related suffering may be moderated by cognitive sets. Persons with paraplegia, who reasonably expect to be more behaviorally active and versatile than persons with quadriplegia, evidenced greater pain unpleasantness in relation to their levels of pain sensation than those who were quadriplegic. This disparity was independent of patient depression and psychosocial impairment. It is possible that this degree of pain-related suffering could be related to other negative emotional reactions such as anger and frustration—emotions that are salient but generally overlooked reactions to pain conditions.8,11,23

The results indicate that a greater recognition of the deleterious effects of pain following SCI is warranted. Clinical impressions suggest that patients may initially interpret the presence of pain as a possible signal that other capacities will be resumed. However, survey research has clearly documented that persons with SCI find pain to be a distressing impediment in later adjustment, particularly with goal-related activities such as employment.7 The findings of the present studies concur with these surveys, revealing that pain is directly associated with negative psychosocial reactions and indirectly with cognitive sets for expected behaviors.

The significant findings of the two studies can be contrasted with the results of a study by Cohen and colleagues,10 which concluded that pain after SCI did not appear to have any real negative effects on psychosocial functioning. These workers found that patients with chronic back pain were more distressed and impaired than persons with SCI who had chronic pain. In the first study, we found that persons with SCI who were not experiencing persistent pain were less depressed and impaired than those SCI patients who were in pain. In comparison to a more relevant reference group, then, pain following SCI does seem to have a negative impact on psychosocial adjustment. However, the variances accounted for in the post hoc regressions imply that the relationship between pain and psychosocial dysfunction was relatively small. While these findings at first glance may appear to lack clinical significance, it is possible that these effects were moderated by a variety of individual difference variables that have been related to pain-related disability in other studies, such as those that considered personality styles (e.g., neuroticism), type of injury (e.g., missile wound versus athletic injury), pain chronicity, medications (especially analgesics and benzodiazepines), age, and environmental considerations. It should also be noted that patients were not asked if pain was a problem per se; they were only asked if they were experiencing persistent pain of at least two weeks' duration. Other data suggest that SCI patients who present pain as a problem exhibit more distress.8 Future research that systematically examines each of these variables may likely find a stronger association between pain and psychosocial dysfunction among persons with SCI.

The present research implies that interventions for alleviating pain-related distress and expectations about painful sensations are needed regardless of the extent of the injury and the amount of time since injury onset. These interventions may instruct patients in the utility of specific coping skills in attempts to lessen pain intensities. Other strategies may inform patients about the nature of pain. Cognitive-behavioral techniques that are embedded in a framework sensitive to the biomedical aspects of SCI pain are especially recommended.24 Other, more acute, situations in SCI rehabilitation may also be appropriate for interventions designed to enhance coping with pain. For example, many patients report that the surgical removal of halo devices (to stabilize the spine) is a painful procedure, and clinicians may assist these patients by teaching a variety of techniques including relaxation, focused attention, or self-hypnosis.

Finally, the duration of injury was found to be significantly related to patient self-reports of
depression and psychosocial impairment. Patients with more recent injuries evidenced more impairment and depression than those who had been injured for longer periods of time. Although many anecdotal reports have maintained that time passage is related to patient adjustment, very little empirical support for this position has been found. The present findings may be due in part to the substantial number of subjects interviewed and the wide range in duration of pain among persons in the sample. Other studies have employed considerably smaller samples. It is not known if specific depressive symptoms, such as somatic and vegetative symptoms, are more common among those receiving initial hospitalizations following trauma. These symptoms may be reconciled over the course of rehabilitation.

In summary, these studies document the psychosocial impact of pain following SCI. Further work could investigate other possible moderators of the pain-distress relationship. It would appear that clinical interventions addressing the negative concomitants of pain are justified in SCI rehabilitation. Other research could describe the different types of pain and possibly identify situations and procedures during rehabilitation that patients experience as painful. Interventions with documented effects for these types of pain problems should then be implemented and evaluated.

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