
Personality Disorder Characteristics and Adjustment Following Spinal Cord Injury

Richard O. Temple and Timothy R. Elliott

Persons with personality disorders exhibit many health-compromising behaviors including impulsivity, poor social judgment, interpersonal turmoil, and maladaptive coping strategies. These behaviors are often observed among some persons who incur spinal cord injuries (SCIs); such behaviors are also suspected in the development of psychological problems and pressure sores. We conducted two studies to examine these issues. In the first study, we studied the rate at which personality disorder characteristics were observed among persons recuperating from surgical repair of a severe pressure sore and the rate of these characteristics among persons with recent-onset SCI. In the second study, we examined the relation of personality disorder characteristics to emotional adjustment and pressure sore occurrence among persons with recent-onset SCI. Our findings suggest that these personality characteristics may be observed among many persons with SCI, but they may not be uniquely predictive of pressure sore development. Key words: *adjustment, personality, pressure sores*

IN A REVIEW OF PERSONALITY and health, Friedman, Hawley, and Tucker¹ observed that the failure to engage in protective health measures—which constitutes an important behavioral risk factor—may be associated with sensation seeking, low conscientiousness, hostility, low self-esteem, or other personality traits. Hostile and cynical people are likely to have interpersonal disputes because of their suspicious, competitive, irrational style. These behaviors can compromise health by interfering with social support and by placing the individual in stressful situations. The authors add that failure to take the individual into account is a factor in the limited success of many public and individual health interventions.

These behaviors are often associated with personality disorder characteristics, and they can compromise personal health after physical disability.^{2,3} Individuals with entrenched and aberrant personality styles often exhibit problems with impulsivity, social judgment,

restlessness, interpersonal turmoil, and personal discipline that can result in therapeutic nonadherence and subsequent health complications over time. Persons with spinal cord injury (SCI) who exhibit these tendencies would likely demonstrate many physical and psychological problems.

Unfortunately, no studies to date have examined personality disorder characteristics after the onset of SCI. There is some research indicating that behaviors associated with personality disorders may be present among persons with SCI. Early work with the

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Minnesota Multiphasic Personality Inventory found persons with SCI report more impulsive characteristics than those with other chronic health conditions⁴; similar differences were found between persons incurring SCI in high-impact incidents and those who incurred SCI via other means.⁵ For many years there has been some concern that persons who adventitiously acquire SCI may have more sensation-seeking tendencies than people in general,^{6,7} and these behaviors may be related to pressure sore development.⁸ Although elevations in excitement seeking and impulsivity may reflect characteristics of young men generally (who are at greatest risk for SCI⁹), recent research using a matched control design has found a greater degree of sensation seeking and criminality among persons with SCI than among others with similar demographics and from the same locale.¹⁰

Most contemporary classifications view personality traits as dimensional entities that are present in all people and are viewed as abnormal only when they deviate from a norm established by the individual's culture. The *Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition (DSM-IV)*^{11(p629)} defines a personality disorder as “an enduring pattern of inner experience and behavior that deviates markedly from the expectations of the individual's culture, is pervasive and inflexible, has an onset in adolescence or early adulthood, is stable over time, and leads to distress or impairment.” This definition is consistent with that of the previous edition of this document, the *DSM-III-R*,¹² which groups personality disorders into three clusters. Cluster A disorders are characterized as “odd or eccentric” and include the individual diag-

noses of Paranoid, Schizoid, and Schizotypal personality disorders. Cluster B disorders include Antisocial, Borderline, Histrionic, and Narcissistic and connote a “dramatic, emotional, or erratic” personality style. Individuals with Cluster C diagnoses are characterized as “anxious or fearful,” and this cluster includes Avoidant, Dependent, Obsessive-Compulsive, and Passive-Aggressive personality disorders.

Previous research has demonstrated the importance of studying personality disorder characteristics in the rehabilitation setting. For example, Elliott et al.¹³ found that the presence of personality disorders among outpatients in a chronic pain clinic was related to higher levels of self-reported distress and pain at both the beginning and end of treatment. Few relations were found, however, between personality disorders and physical therapist ratings of impairment and improvement. Personality disorder characteristics can adversely affect rehabilitation efforts by contributing to maladaptive coping patterns such as avoidance and inactivity.¹⁴ Other evidence indicates that persons with personality disorder tendencies have less optimal gains and outcomes in chronic pain treatment programs.^{14,15}

We conducted two studies to examine the possible influence of personality disorder characteristics in SCI rehabilitation. In Study 1, we examined the rate of potential personality disorder characteristics using the Millon Clinical Multiaxial Inventory¹⁶ (MCMI) measures. We examined the rate of persons exhibiting personality disorder characteristics among persons admitted to an inpatient rehabilitation program for recent-onset SCI, and then we examined the rate at which these characteristics occurred in a

sample of persons admitted after surgical intervention for a severe pressure sore. We compared the rate at which personality disorder characteristics were observed between the two samples. It was hypothesized that individuals who developed pressure sores would manifest more personality disorder characteristics than inpatients with acute SCI, assuming that persons with personality disorder characteristics would have difficulty adhering to self-care regimens, which in turn would compromise their health.

In Study 2, we then examined the relation of personality disorder characteristics to psychological reactions and pressure sore occurrence among the individuals with recent-onset SCI in Study 1. We expected personality disorder characteristics would be associated with greater distress at admission and discharge, and we presumed persons with positive pressure sore diagnosis would evidence more personality disorder characteristics than persons who did not have a pressure sore 1 year after discharge from the inpatient rehabilitation program.

Study 1

Participants

The inpatient sample consisted of 44 persons consecutively admitted for recent-onset SCI who were referred for a psychological evaluation. A total of 47 were referred for assessment, but 3 of these persons produced invalid profiles on the key measure used in this study and were thus excluded from further study. All of these individuals had incurred their injury within 1 year of referral. The second sample consisted of 20 persons consecutively admitted after skin-flap repair surgery for severe pressure sores. Relevant

demographic characteristics for the samples are presented in Table 1. Participants were assessed between 1993 and 1998. The MCMI was used until the MCMI-II was available to the clinic research team. In the inpatient group, all participants received the MCMI-II. Seven participants completed the MCMI and 13 completed the MCMI-II in the pressure sore group.

Measures

The MCMI¹⁶ were used to assess personality disorder characteristics. Both MCMI questionnaires have 175 items that are answered in a true-false format. The MCMI questionnaires were developed to assess personality disorders according to the *DSM* diagnostic framework.¹⁶ The diagnostic scales on these inventories are interpreted according to base rates that parallel clinical prevalence rates for each disorder. Base rate scores greater than 75 indicate a presence of characteristics on a given scale generally consistent with the corresponding personality disorder diagnosis. A more conservative cutoff of 85 is sometimes recommended for use with persons who may not have any history of psychological disturbance. The personality scales are also grounded in Millon's personality model in which characterological styles are described in terms of biological predispositions and learning experiences.¹⁷

The original MCMI consists of 11 scales that coincide with *DSM* personality disorder categories including the Cluster A disorders (Paranoid, Schizoid, and Schizotypal), Cluster B disorders (Antisocial, Borderline, Aggressive-Sadistic, Narcissistic, and Histrionic), and Cluster C disorders (Compulsive, Dependent, and Passive-Aggressive). The MCMI-II retained these 11 categories and

Table 1. Demographic characteristics of participants

Characteristics	Persons with recent SCI	Persons with pressure sore repair
Men	34	18
Women	10	2
Age		
Mean	33.95	34.65
SD	12.14	9.24
Race		
White	23	13
African American	21	7
Education		
Mean	11.95	11.26
SD	2.05	2.16
Level of injury		
Stenosis	5	0
Paraplegia	25	12
Tetraplegia	14	8
Lesion		
Incomplete	21	5
Complete	23	15

added 2 more, aggressive-sadistic and self-defeating.

Scales on the Millon inventories assess long-standing features and current presentation of each dimension of the respondent’s personality style. The Cluster A category, as described in the *DSM-III-R*, encompasses a constellation of characteristics that often share an “odd or eccentric” quality in presentation. The Cluster B characteristics often share “dramatic, emotional, or erratic” features. Finally, the Cluster C category describes disorders that often appear “anxious or fearful.”

Profiles that had a validity index of 0 (indicating a “valid profile”) or 1 (“questionable validity”)¹⁶ were retained for analysis. The *Manual for the MCMI-II* recommends

that profiles with index scores of 2 or more (“invalid”) be discarded. This procedure was used to delete profiles that might have been contaminated by “careless, confused, or random responding.”^{16(p196)} Furthermore, the *Manual* also recommends the examination of the raw score of Scale X on the MCMI-II as an additional safeguard. The raw score of Scale X assesses the applicability and degree of a disclosure correction, taking into consideration a tendency to be guarded or hesitant or, conversely, an exaggerated or unusually open response style. A Scale X raw score less than 145 or greater than 590 indicates that the profile is probably invalid and should be discarded.¹⁶ Thus, only profiles with X raw scores between 145 and 590 were retained for analysis.

Procedure

All participants with recent-onset SCI received the MCMI–II as part of a routine psychological evaluation. Participants recuperating from skin-flap surgery were also referred for psychological assessment; the first seven of these participants took the MCMI and the rest took the MCMI–II when it was procured by the psychological staff. The Millon questionnaires were read to participants because many were mobility impaired and were unable to complete the instruments independently. Data were collected in one session whenever possible, but occasionally the situation necessitated a second session to complete the assessment.

Results

Summary data for the Millon scales are presented in Table 2. Using the standard cutoff, 84% (37 of 44) of the inpatient sample exhibited personality disorder characteristics; 72% of the sample (31 of 44) met conservative criteria for presence of a personality

disorder. Neither race nor gender were related to personality disorder classification using either criteria (χ^2 s < 2.70, *ns*). Age and education were not significantly related to personality disorder classification using either criteria (all *F*s < 1.5, *ns*). As can be seen in Table 2, more participants in the inpatient sample were categorized as having a Cluster B diagnosis than any other cluster (19 and 18 persons, using standard and conservative criteria, respectively). Cluster C membership was the second highest, with 16 and 11 persons being so classified using standard and conservative criteria, respectively. Only 1 person of the 43 was classified with a Cluster A disorder, regardless of the criteria used.

As for individuals in the pressure sore sample, 90% (18 of 20) of the participants met criteria for a personality disorder using the standard criteria, compared to 55% (11 of 20) using the conservative cutoff. Chi-square analyses found no relationship between the presence or absence of a personality disorder (using both criteria) with race (χ^2 s < 1.2, *ns*), and comparisons with gender were not calculated due to small cell size for women (*n* = 2).

Table 2. MCMI classifications by patient group in Study 1

Patient group	Inpatients		Pressure sore patients	
	Standard criteria	Conservative criteria	Standard criteria	Conservative criteria
Normal profiles	7	13	2	9
Cluster A	1	1	3	2
Cluster B	19	18	11	7
Cluster C	16	11	4	2

Note: Normal profiles are defined as those with no score greater than 74 for the standard criteria and no greater than 84 for the conservative criteria. Cluster designations were determined by the category with the highest score. If there were two equally high scores, the next highest score determined membership. One participant in the inpatient group was unable to be classified in this manner, due to many extreme scores. MCMI = Millon Clinical Multiaxial Inventory.

No significant differences were found between the personality disorder grouping in age and education (all F s < 1.0, *ns*). As with the inpatient participants, more individuals in the pressure sore sample were classified as having Cluster B characteristics than either of the other classifications (11 and 7 using standard and conservative criteria, respectively).

Finally, we examined possible differences in the rate at which personality disorder characteristics were observed between the two samples. Using both the standard and conservative criteria, no significant differences were found between the inpatient and pressure sore participants, regardless of the cut-off criteria (both χ^2 s < 1.5, *ns*).

Study 2

Participants

The study sample consisted of the 44 persons admitted to the inpatient acute rehabilitation program in Study 1. The mean time since injury onset for this sample was 9.27 weeks ($SD = 10.32$). Fifteen persons incurred SCI in motor vehicle accidents, 10 from acts of violence, 6 from disease processes, 8 from falls or occupational accidents, 3 in recreational or athletic accidents, and 2 from other causes of injury.

Measures

Personality disorder characteristics

It was important to examine the general base rate means on each of the personality disorder scales on the MCMI–II. However, given the relatively low number of participants and the number of variables for analy-

sis, we explored options for reducing the number of MCMI–II variables for meaningful analysis. There has been some concern regarding the external validity of the 10 scales despite supportive evidence comparing MCMI–II profiles with clinician ratings and with scores on other established self-report measures (e.g., the MMPI¹⁶). The concerns appear to be due, in part, to the fairly high interscale correlations among the 10 scales, and the unclear and somewhat atheoretical nature of the present taxonomy of personality disorder classifications.

To address this problem and to restrict our number of variables for meaningful correlational analyses and interpretation, we limited our use of the separate MCMI–II scales to three variables that would specifically reflect Cluster A, B, and C characteristics for each respondent. This procedure has been used in prior research with the MCMI–II with meaningful results.¹⁸ Therefore, we collapsed the 10 scale scores into the three broad clusters delineated in the *DSM–III–R*. Thus, the base rate scores on the three scales comprising the Cluster A category (Schizoid, Schizotypal, and Paranoid) were summed and divided by 3 to obtain a general index of Cluster A characteristics. Similarly, the base rate scores from the four scales measuring Cluster B tendencies (Narcissistic, Antisocial, Histrionic, and Borderline) were summed and divided by 4 to obtain a single index of these characteristics. The three scales assessing behaviors associated with the Cluster C dimensions (Avoidant, Dependent, and Passive-Aggressive) were summed and divided by 3 to obtain an index of these characteristics. These three composite cluster scores were used in correlational analyses.

Patient distress

The Inventory to Diagnose Depression¹⁹ (IDD) is a 22-item measure of depressive behavior.²⁰ Acceptable test-retest reliability ($r_s = .98$ over 2 days) and internal consistency coefficients ($\alpha = .92$) have been reported; correlations with interview systems and other self-report measures of depression have also been adequate (r_s ranging from .80 to .87).¹⁹⁻²¹ Each item requires a respondent to indicate the severity of a depressive behavior on a 5-point Likert scale. The sum of responses provides a total severity score. Higher scores reflect the endorsement of more depressive behaviors. The IDD is recommended as a useful tool in the assessment of depressive behavior among persons with SCI.²²

Acceptance of disability

The Acceptance of Disability (AD) scale²³ is a 50-item self-report measure of adjustment among persons with disability. It assesses the three components of acceptance of disability as defined by Wright²⁴: the degree to which a person is able to (1) find meaning in their circumstances, (2) value their selfhood, and (3) maintain positive beliefs about themselves. Each item is rated on a Likert-type scale. Sample items include the following: "Disability or not, I'm going to make good in life," "There are times I completely forget that I am physically disabled," "My disability, in itself, affects me more than any other characteristic about me," and "I believe that physical wholeness and appearance make a person what he/she is." The AD scale has evidenced adequate internal consistency ($\alpha = .93$ ²³). Higher scores denote greater acceptance of disability.

The manual lists several studies that indi-

cate that the scale is a sensitive index of adjustment among persons with a variety of debilitating and chronic conditions.²⁵ The total score from the AD scale has also been associated with measures of positive attitudes toward persons with disability, self-esteem, spiritual well-being, and satisfaction with social relationships.²³

Pressure sores at the annual evaluation

Skin deterioration at the annual medical evaluation 1 year after discharge from the unit was determined by observational procedures used by psychiatrists or nurses conducting these evaluations, according to criteria utilized throughout the cooperating Model Systems centers.²⁶ Although pressure sores are routinely assessed for severity, for our purposes it was sufficient to categorize individuals who were diagnosed with one or more pressure sores at the evaluation (coded as 1) and those who were determined to have no pressure sores at this time (coded as 0).

Statistical analyses

We first computed means and standard deviations on all self-report variables. We then examined any differences between persons who had a profile indicative of a personality disorder and those with a normal profile on the depression and acceptance of disability measures. We calculated correlations between the three cluster scores, the two adjustment measures, and several demographic variables (education, age, weeks since onset of injury, completeness of lesion coded as 0 = incomplete and 1 = complete). We computed a regression equation to determine if the three composite cluster scores would predict acceptance of disability, after taking into account other variables that might corre-

late with this criterion variable. Finally, we examined any possible differences on the MCMI–II scores between persons with and without a pressure sore 1 year later.

Results

Mean base rate scores and their standard deviations for the MCMI–II personality scales are displayed in Table 3. Mean scores and standard deviations on the IDD and AD measures are also presented in Table 3. One person was not administered the IDD, which reduced the number of participants available for analysis to 43 for this variable. Similarly, 15 persons did not participate in the discharge evaluation, which limited the number of participants with usable AD scales to 29. Persons who were administered the AD scale

in the discharge evaluation did not differ from those who did not participate in this assessment in terms of three composite MCMI cluster scores or depression (all F s < 1.75, ns) Correlations between the three average MCMI–II cluster scores, the IDD, the AD, completeness of lesion, age, education, and time since the onset of SCI are contained in Table 4.

Using the conservative base rate cutoff to establish the presence of a personality disorder ($PD > 84$), we classified 13 persons as having normal profiles and 31 as having profiles indicative of a personality disorder. No differences were found in the rate of personality disorder profiles as a function of gender, race, or lesion (all χ^2 s < 2.6, ns). The personality disorder group did not have a significantly higher level of depression (mean = 15.77, $SD = 7.28$) than persons with no personality disorder (mean = 10.77, $SD = 11.47$), $F(1, 41) = 2.09, ns$. The personality disorder group had significantly lower AD scores (mean = 198.73, $SD = 46.57, n = 22$) at discharge than participants without a personality disorder (mean = 241, $SD = 23.72, n = 7$), $F(1, 29) = 6.97, P < .02$.

Inspection of correlations presented in Table 4 revealed that all three cluster composite scores were significantly associated with depression. Higher levels of depression were associated with higher scores on the MCMI–II. No demographic variables were significantly associated with depression. In the regression equation to predict acceptance of disability at discharge, we first entered depression to control for any variance due to initial distress, and this was a significant predictor, $F(1, 27) = 17.76, R^2 = .40, P < .001$. As would be expected, higher depression was associated with lower acceptance of dis-

Table 3. Means and standard deviations for MCMI–II personality scales and adjustment variables for persons with recent-onset SCI

Variable	Mean	SD
MCMI–II		
Paranoid	69.68	24.95
Schizoid	59.07	23.41
Schizotypal	57.23	25.91
Borderline	53.59	30.29
Dependent	67.30	23.30
Avoidant	52.59	30.60
Passive-Aggressive	54.98	38.98
Average of Cluster A	61.99	21.45
Average of Cluster B	67.29	23.17
Average of Cluster C	60.62	20.40
Inventory to Diagnose		
Depression	14.26	10.55
Acceptance of Disability	208.93	45.67

Note: MCMI–II = Millon Clinical Multiaxial Inventory–II; SCI = spinal cord injury.

Table 4. Correlations between the MCMI-II cluster scores and adjustment and demographic variables in Study 2

Variables	1	2	3	4	5	6	7	8	9
1. Cluster A	—	.73	.88	-.59	.50	.20	-.14	-.24	.14
2. Cluster B		—	.69	-.53	.49	-.06	-.01	.10	.04
3. Cluster C			—	-.67	.49	.12	-.12	-.13	.23
4. AD				—	-.63	-.06	.03	.19	-.16
5. IDD					—	.03	-.05	-.18	-.11
6. Age						—	.31	-.11	-.29
7. Education							—	-.05	.02
8. Lesion								—	-.26
9. TSO									—

Note: Correlations $\geq .31$ and $< -.30$ are significant at $P < .05$ level. AD = Acceptance of Disability scale; IDD = Inventory to Diagnose Depression scale; Lesion = completeness of lesion; TSO = time since the onset of injury (in weeks).

ability at discharge. The three average MCMI-II cluster scores were added at the second step, and this block significantly augmented the equation, as indicated in the incremental change (Δ) statistics for this block, $F\Delta(3, 24) = 4.19$, $R^2\Delta = .21$, $P < .05$. This block thus accounted for an additional 21% of the variance in acceptance of disability. Of the three cluster scores, the Cluster C composite score significantly contributed to the prediction of acceptance of disability ($\beta = -.57$, $t = -2.34$, $P < .05$). Higher Cluster C scores were associated with lower acceptance of disability at discharge, above and beyond the variance attributable to initial levels of depression.

Inspection of medical records and the Model Systems database revealed that 38 persons did not have a pressure sore 1 year after their discharge from the inpatient program; 6 persons had at least one pressure sore. There was no difference between these two groups on any of the three composite cluster scores, depression, or the adjustment variable (all F s < 1.00 , ns). Therefore, no

further analyses were conducted with these data.

Discussion

In our first study, between 72% and 84% of recently admitted persons with SCI and between 55% and 90% of persons recuperating from skin-flap surgery displayed traits consistent with a personality disorder. A relatively high percentage in both groups had elevated profiles suggestive of personality-related problems, and Cluster B characteristics were most frequently observed in both groups. No differences were observed between persons with and without pressure sores on the three composite cluster scores in the second study. The relatively low number of participants in the second study certainly constrained our ability to detect any differences between these groups. Nevertheless, there is no evidence in this research that personality disorder characteristics are uniquely associated with the occurrence of a pressure sore.

There is no evidence in this research that personality disorder characteristics are uniquely associated with the occurrence of a pressure sore.

These data provide no evidence that personality disorder features characterize persons with severe pressure sores at a rate greater than that observed among persons with recent-onset SCI. Similarly, we cannot conclude that personality disorder characteristics predispose persons to develop severe pressure sores that warrant surgical intervention. In our sample, however, we are concerned that over 50% of persons with a severe pressure sore in the first study reported characteristics associated with a personality disturbance, and a high rate was observed among those in the inpatient sample. These are issues that should be investigated thoroughly in subsequent research, as these may have considerable implications for clinical practice. Furthermore, the overall high rate of personality disorder characteristics in this sample suggests certain strategic interventions that may be beneficial in a rehabilitation setting. For example, interventions that foster independence in a dependent individual or those that take into account a person's sense of self-entitlement can make the rehabilitation process much more productive than interventions that ignore these characteristics.

Results of the second study suggest that persons with more behaviors often associated with personality disorders may have more distress soon after injury onset, but this relationship is not specific to persons who

may have extreme profile elevations on the MCMI–II. Persons who endorse more behaviors associated with personality disorders may have problems coming to terms with disability as they face discharge into the community, and this may be particularly pronounced among persons with more elevated MCMI–II profiles. Their ongoing characterological problems likely interfere with their ability to find meaning, to experience positive value shifts, and to come to terms with their situation.²⁷

Yet, it is not surprising that the personality disorder characteristics would be associated with distress and account for a relatively high degree of variance in acceptance of disability scores. Many characteristics associated with Cluster C tendencies, for example, include a disposition for negative affects, dysfunctional cognitions, and an intractable pessimism and irrational beliefs that perpetuate anxiety, depression, and distress.¹⁷ The MCMI questionnaires have occasionally been criticized for being too sensitive to respondent distress and emotional maladjustment.²⁸ It is possible that distressed persons produce a more elevated MCMI profile, and our findings may reflect this circularity. In this process, then, the MCMI may also “overpathologize” persons without any prior psychiatric history.

The conclusions that can be drawn from the present results are limited by several factors. First, the small sample size of the pressure sore group may have limited our ability to detect differences in the rate of personality disorder characteristics when compared to the inpatient group. The present investigation did not control for a history of pressure sores in the pressure sore sample. Similarly, the small number of persons with

pressure sores after the first year of SCI restricted our ability to determine any significant effects. Finally, we did not measure or examine tobacco, alcohol, and other substance use in either sample. We do not know the degree to which these behaviors may have affected our results. It is hoped that other research will explore the role of personality characteristics in the development of complications secondary to serious illness

and injury, taking the present results into account and addressing these limitations.

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