
Posttraumatic Stress Disorder Symptomatology in Men and Women with Spinal Cord Injury

Linda R. Mona, Rebecca P. Cameron, Linda M. Lesondak, and Fran H. Norris

This descriptive study explored posttraumatic stress disorder (PTSD) symptoms in a nonveteran sample ($N = 109$ men and 86 women) of participants with spinal cord injury (SCI). Participants completed a demographic survey and Foa's (1995) Posttraumatic Stress Diagnostic Scale. Results suggested that there were no significant differences between men and women or by level of injury (i.e., paraplegic and tetraplegic) in terms of number of PTSD items endorsed and PTSD severity score. Both men and women reported PTSD symptom severity total scores classified in the mild range of symptom severity. Research and clinical implications are discussed. Key words: *disability, paraplegia, posttraumatic stress disorder, rehabilitation, spinal cord injury, tetraplegia, trauma*

UPON ACQUIRING a traumatic spinal cord injury (SCI), individuals have the unusual experience of having several parameters of their life suddenly change. The influence that this profound change may have on subsequent psychological adjustment and well being has been explored extensively in the rehabilitation literature.¹⁻⁴ However, little research has explored the impact of the injury event itself. Given that the presence of posttraumatic stress disorder (PTSD) has been explored in other traumatized groups (e.g., combat war veterans, survivors of industrial and natural disasters, survivors of motor vehicle accidents, violent crime victims, rape victims),⁵⁻⁷ the degree to which persons with SCIs experience PTSD has come into question. Furthermore, given that past research has suggested that the occurrence of a physical injury acquired during a traumatic event has emerged as a reliable determinant of PTSD in other traumatized populations,⁸⁻¹¹ researchers have begun to take a closer look at the pres-

ence of PTSD in persons with SCI. The term *trauma* has been used ambiguously in rehabilitation literature. Typically, the word *trauma* has been used to describe the actual physical trauma associated with injury. However, the field of psychology uses this same word to refer to events in which one's life or physical well being is threatened. For the purposes of this study, we will attempt to

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clarify the distinction between these meanings throughout the text of this article.

PTSD and SCI

In recent years, the incidence and prevalence of PTSD in men with SCIs have begun to be studied in veteran populations.^{12–16} Specifically, one study examined 126 veterans and found rates of current and lifetime PTSD in men with SCIs comparable to those in other traumatized groups.¹² PTSD diagnoses in this study were determined using two structured interviews. In a later study of these veterans, Radnitz and colleagues¹³ explored trauma-related risk factors for PTSD in a sample of 125 male veterans with SCI. Within this study, category of injury was found to be the most consistent predictor of a PTSD diagnosis and PTSD symptom severity. Specifically, results indicated that persons with paraplegia endorsed more PTSD symptoms and met criteria for a PTSD diagnosis more often compared to persons with tetraplegia. In addition, this study noted that the presence of a head injury at the time of trauma was found to predict PTSD symptom severity but not PTSD diagnostic status. In another study examining this sample, Radnitz and colleagues¹⁴ assessed the effects of category of injury (i.e., paraplegic and tetraplegic) on the severity and prevalence of PTSD and subsequently compared these results to a sample of participants who experienced traumatic injuries other than SCI. The authors found that male veterans with tetraplegia reported significantly less severe current PTSD symptoms than the injured control group who were not significantly different from veterans with paraplegia.

Another study investigated PTSD in 16

male veterans with acquired traumatic SCIs and reported no findings of PTSD diagnoses.¹⁵ (Here the term *acquired traumatic SCI* refers to SCI resulting from acute injury.) Participants in this study were administered a battery of psychological measures to assess PTSD, prevalence of psychiatric disorders other than PTSD, and current levels of stress. Although some participants did endorse PTSD-related symptoms, none came close to meeting the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders (DSM)* criteria for PTSD. It is important to keep in mind that the sample size in this study was smaller compared to other research investigating PTSD in SCI populations and thus the generalizability may be limited.

Differentiating between paraplegic and tetraplegic status is important for several reasons. In general, the PTSD literature demonstrates that greater severity of traumatic exposure and of physical injury sustained in a traumatic exposure results in higher risk of PTSD.^{17,18} In addition, considering the fact that there are marked differences in functional impairment (e.g., ability to perform activities of daily living and instrumental activities of daily living, increased use of assistive devices) between paraplegics and

Given that women and men vary in the frequency with which they are exposed to certain types of traumatic experience (e.g., rape, sexual abuse, military combat, accidents), exploration of PTSD by gender seems pertinent.

tetraplegics, investigating the consequences of endured traumatic events becomes of interest. Whereas Radnitz et al.^{13,14} found that tetraplegic status was associated with decreased risk of PTSD and paraplegic status was associated with increased risk of PTSD, it appears that the general PTSD literature would predict the opposite effect. Given this contradictory information, we sought to further explore the relationship between severity of injury and PTSD and to explore gender differences in the experience of PTSD after traumatic events.

PTSD and Gender

Gender differences in rates of PTSD after exposure to traumatic events have been found, with women being more vulnerable to PTSD than men.¹⁹ This is consistent with gender differences found in major depression and some other anxiety disorders. It is difficult to tease apart these gender differences; however, given that women and men vary in the frequency with which they are exposed to certain types of traumatic experience (e.g., rape, sexual abuse, military combat, accidents), exploration of PTSD by gender seems pertinent. The PTSD literature to date has not adequately examined potential gender differences in rates of PTSD when aspects of the traumatic exposure have been controlled.²⁰ Studies suggest that rape and sexual assault, more common among women, are associated with higher risk for PTSD than other types of trauma,²⁰ although there are indications that women may be at higher risk of PTSD even within categories of traumatic events.¹⁹ Given the suggestion that women may be at higher risk of PTSD

than men, within the context of very limited literature on gender differences, it seemed important to include gender as a predictor variable in our study.

PTSD in Civilian Populations

There are several reasons why it is important to examine PTSD symptoms in nonveteran persons with SCI. Traumatic exposure and PTSD related to combat duties may be quite different from PTSD resulting from exposure to civilian violence. Specifically, soldiers in war typically encounter multiple dimensions of trauma exposure, including enduring physical hardship (e.g., exhaustion), witnessing violence and abuse, participating in violence, and experiencing chronic threat to well being, prolonged loss of control, and eventual loss of meaning.²¹ Victims of violence, on the other hand, may experience a one-time, highly unusual experience, or their victimization may occur against a backdrop of chronic stress (e.g., living in a harsh inner-city environment, experiencing repeated victimization or family violence).²² In fact, McFarlane and de Girolamo¹⁸ report rates of PTSD among victims of violence to be as high as 25%.

It is difficult to definitively assess rates of PTSD following specific types of traumatic experiences because methodological differences among studies profoundly affect findings. However, the National Vietnam Veterans Readjustment Study (NVVRS) found current rates of PTSD after combat exposure of 15%, as well as an 11% rate of partial PTSD among the same group many years after Vietnam.⁵ This information indicates that the effects of PTSD can linger years after exposure to the event.

Study Goals and Hypotheses

The research discussed thus far of PTSD in male veterans with SCI has begun to shed light on this historically unexplored topic. However, to begin to fully understand the relation between SCI and PTSD, it is necessary to explore these issues in nonveteran samples and in women. Most of the literature focusing on psychological variables in persons with SCI has explored either men or women exclusively.^{23,24} No research to date has investigated the prevalence of PTSD symptoms and severity of symptoms in women with SCI; our study gathered descriptive information on this population in addition to simultaneously exploring PTSD symptoms in nonveteran men with SCIs. By taking this approach, we aimed to discover the similarities and differences in the prevalence of PTSD symptoms between men and women with SCIs in addition to laying the foundation for examining women's experiences.

In accordance with past research on PTSD and SCI, we predicted that severity of injury would be inversely related to PTSD in both men and women with SCIs. Similarly, based upon the literature of PTSD in women, it was hypothesized that women with SCIs would report higher levels of PTSD, in general, compared to men with SCIs.

Method

Participants

Participants with acquired traumatic SCI were sought for this study. Individuals who had acquired a SCI through spinal tumors or other health-related consequences were excluded. Only individuals who had lived with a SCI for a minimum of 2 years were re-

cruited, because past research has pointed toward a heightened degree of psychological distress during the first year of injury.^{25,26}

The majority of participants were identified using the outpatient files of the Shepherd Center, a large southeastern rehabilitation facility. Participants' files were selected randomly from the outpatient database, with attempts to obtain 50% men and 50% women. Of the 220 surveys that were mailed to potential participants, 185 (107 men and 78 women) were returned, yielding a 80% response rate. An additional 10 surveys were mailed to individuals with acquired traumatic SCI who had contacted researchers after learning about the project from other Shepherd Center participants. All 10 (2 men and 8 women) surveys were returned from this latter data collection phase, yielding a total sample response rate of 85%. The final sample included 195 individuals, 109 men and 86 women (see Table 1 for details of sample characteristics).

Demographic information

Efforts were made to access an ethnically diverse sample given that the majority of previous research has focused on Caucasian men with SCI. The final sample was comprised of 66% Caucasians, 27% African Americans, 5% Native Americans, 1% Asian Americans, and 1% Hispanic Americans (see Table 1).

Chi-square tests and *t* tests were used to determine whether or not there were significant differences between men and women on demographic variables. The only significant difference found was for age. Specifically, men reported a higher average age in years ($M = 39.2$, $SD = 5.9$) compared to women ($M = 34.6$, $SD = 7.8$), $t(192) = 4.73$, $P < .05$.

Table 1. Sample demographic characteristics

Characteristic	No.	% of total sample
Gender		
Men	109	56
Women	86	44
Ethnicity		
Caucasian	127	66
African American	53	27
Native American	10	5
Asian American	2	1
Hispanic	2	1
	<i>M</i>	<i>SD</i>
Age in years		
Men	39.2	5.9
Women	34.6	7.8
Education in years		
Men	13.2	2.6
Women	13.8	2.2
Age of onset of injury		
Men	26.5	7.1
Women	22.7	7.4
Duration of injury in years		
Men	12.6	7.4
Women	11.7	5.2

Disability characteristics

Participants gave detailed information regarding their disability. Men indicated a slightly higher age of onset of injury compared to women (see Table 1). There was a significant difference between men and women in terms of the duration of the injury in years, $t(191) = 1.02$, $P < .01$. Men ($M = 12.6$, $SD = 7.41$) indicated living with the injury longer than women ($M = 11.7$, $SD = 5.24$).

Injury characteristics

A cross-tabulation was used to assess differences between men and women in terms of how they acquired their injury (see Table

2). A chi-square analysis revealed no significant differences between men and women on the injury-related characteristics.

Detailed information about the level of injury and whether the injury was complete or incomplete was also obtained and is reported in Table 2. The only significant difference between men and women with regard to injury characteristics was that there was a higher percentage of men with tetraplegia compared to women with tetraplegia, $\chi^2(1, N = 194) = 3.82$, $P < .05$.

Procedure

Participants were sent research materials that included a self-addressed stamped envelope in which to return the questionnaire packet. The title page of the questionnaire packet stated that, depending upon the extent of disability, respondents had the option of completing materials on their own, answering any and all questions over the telephone, or being provided with an assistant, other than their primary personal assistant, to complete materials. Of the 195 respondents, one male participant requested to complete the survey by telephone due to limited hand mobility that restricted his ability to use a writing instrument. Data collection occurred over a 9-month period.

Instruments

Demographic information

Participants were given a questionnaire that assessed demographic information (i.e., age, gender, ethnicity/race, years of education) and disability-specific factors (i.e., how the injury was acquired, age of onset of disability, duration of disability, level of injury, and whether the injury was complete or incomplete).

Table 2. Number and percentage of total sample's injury characteristics

Characteristic	No.	% of total sample
Acquired injury		
Motor vehicle accident	119	61
Men	62	57
Women	57	66
Fall	31	16
Men	19	18
Women	12	14
Sports-related activity	19	10
Men	15	14
Women	4	5
Other	25	13
Men	13	11
Women	25	15
Level of injury		
Paraplegics	101	61
Men	50	57
Women	51	66
Tetraplegics	93	48
Men	59	54
Women	34	40
Injury severity		
Incomplete	74	40
Men	41	39
Women	33	39
Complete	116	60
Men	64	61
Women	52	61

Trauma

To assess the current level of PTSD symptomatology resulting from participants' SCI, we used the Posttraumatic Stress Diagnostic Scale (PDS).²⁷ This is a 49-item self-report instrument designed to aid in assessment of PTSD symptoms. For the purposes of our study, only the symptom severity portion of the scale was used. These items correspond to the 17 symptoms outlined in the *DSM-IV*

PTSD Criteria B, C, and D. Participants were asked to rate how often a particular PTSD symptom has bothered the respondent in the past month, with responses ranging from "not at all" to "five or more times a week." Sample items include, "having bad dreams or nightmares about the SCI" and "trying not to think about, talk about, or have feelings about the SCI." Foa and colleagues reported that an alpha of .92 was calculated for the 17 items on which the symptom severity score is based, indicating that the symptom severity is internally consistent.²² Similarly, an alpha of .91 was yielded in the present study.

Results

Given that a major goal of this study was to provide descriptive information about the prevalence of PTSD symptomatology within a nonveteran sample of men and women with SCI, all data were examined separately by gender.

Study variable correlations

Table 3 shows the correlations among demographic variables, disability-related factors, and PTSD symptom severity. No significant correlations were found between disability and injury variables (i.e., age of onset of injury, duration of injury, severity of injury, etiology of injury) and PTSD symptom severity.

PTSD symptom frequency and severity by gender

SCI-related PTSD symptom frequency was examined by gender (see Table 4). Men's and women's PTSD symptom severity total scores were compared (see Table 5). No significant differences were found be-

Table 3. Correlations of study variables

Variables	1	2	3	4	5	6	7	8	9	10
1. Gender	—	-.16	-.05	.09	-.15	.06	-.25	-.07	-.18	.11
2. Minority status		—	-.11	.08	.20*	.07	.03	.09	.01	.09
3. Acquired by fall			—	-.55**	-.14*	-.17*	.14*	.03	-.28**	.07
4. Acquired by motor vehicle accident				—	-.42**	-.48***	-.10	-.06	.11	.03
5. Acquired by sports					—	-.13	-.03	-.02	-.06	-.03
6. Acquired by other						—	.01	.09	.22**	.06
7. Age at injury							—	-.48**	-.12	-.07
8. Duration of injury								—	.09	-.01
9. Severity of injury									—	.05
10. Posttraumatic stress disorder										—

Note: Measures of association between dichotomous variables are reported as Phi scores.

* $P < .05$. ** $P < .01$. *** $P < .001$.

tween the groups. However, overall, women ($M = 10.5$, $SD = 10.41$) reported a higher PTSD symptoms severity score as compared to men ($M = 8.78$, $SD = 8.85$). Both men and women reported PTSD symptom severity total scores classified in the mild range of severity.²⁷

PTSD symptom severity and number of symptoms by level of injury

Because previous research has suggested that the category of injury (i.e., paraplegic or tetraplegic) is a predictor of PTSD symptomatology in persons with SCI, data were examined by this injury characteristic (see Table 6). Whereas there were no significant differences between people with paraplegia or tetraplegia in terms of number of symptoms endorsed or symptom severity, persons with tetraplegia did report slightly higher mean number of symptoms and higher symptom severity score. To explore this data further, we looked at the specific PTSD

subscales that correspond with *DSM-IV* PTSD diagnostic criteria (see Table 6). No significant differences between men and women or by level of injury were found by diagnostic criteria.

Discussion

This study explored the prevalence of PTSD symptoms in a nonveteran sample of men ($n = 109$) and women ($n = 86$) with SCI and tested for gender differences on PTSD symptom variables. Our results suggested that there were no significant gender differences in terms of the number of PTSD items endorsed and PTSD severity scores. Both men and women reported PTSD symptom severity scores classified in the mild range of severity. In an effort to replicate previous findings, the relation between level of injury (i.e., paraplegic and tetraplegic) and PTSD symptoms was explored. Even though women and persons with tetraplegia en-

Table 4. Chi-square analysis of gender differences in PTSD symptom severity scores in the last month

Subscale and symptoms	Not at all				Once a week				Two or more times a week			
	Men		Women		Men		Women		Men		Women	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Reexperiencing												
Upsetting thoughts	74	68	53	62	20	18	23	27	15	14	10	12
Bad dreams	98	90	71	83	9	8	12	14	2	2	3	4
Reliving events	98	90	69	80	6	6	14	16	5	6	3	4
Emotionally upset	65	60	38	45	29	27	27	32	15	14	20	24
Physical reactions	98	90	62	72	10	9	16	19	1	1	8	9
Avoidance												
Avoid thoughts	86	79	56	67	9	8	19	23	14	13	9	11
Avoid activities/people	86	79	65	76	13	12	9	11	10	9	12	14
Not remembering events	89	82	62	72	5	5	9	11	15	14	15	17
Less interest in activities	65	60	49	58	26	24	20	24	18	17	15	18
Distant from people	64	59	40	47	23	27	25	29	22	20	21	24
Emotionally numb	84	77	64	74	18	17	16	19	7	6	6	7
No hope for future	49	45	43	50	41	38	21	24	19	17	22	26
Arousal												
Trouble sleeping	45	41	35	41	19	17	17	20	45	41	34	40
Feeling irritable	64	59	38	44	34	32	32	37	11	10	16	19
Trouble concentrating	70	64	50	58	21	19	15	17	18	17	21	24
Overly alert	71	65	54	63	15	14	15	17	23	21	17	20
Easily startled	71	65	42	49	21	19	27	31	17	16	17	20

Note: No significant findings by gender. PTSD = posttraumatic stress disorder.

dorsed more PTSD symptoms and received higher PTSD severity scores, these differences were not significant.

Our results are consistent with previous research that reported generally low levels of incidence of PTSD in SCI populations.^{15,16} It is important to keep in mind that no diagnostic interview or brief psychiatric inventory was conducted with this sample and thus information about whether or not participants met criteria for *DSM-IV* PTSD diagnosis is unknown. However, given that mild PTSD symptomatology was reported, fur-

ther research on this topic is warranted.

Other authors have mentioned difficulties in exploring PTSD among persons with SCI.¹²⁻¹⁵ These difficulties include uncertainty about knowing how to distinguish between PTSD symptoms directly attributed to the SCI event versus PTSD symptoms that may be the result of living with a chronic disability. Furthermore, given that head injuries often occur along with SCI, problems can arise with the actual memory or recollection of the SCI event per se. These questions also surfaced in our study. Researchers have

Table 5. Means and standard deviations of total PTSD severity scores and number of symptoms reported by gender and level of injury

Variable	<i>M</i>	<i>SD</i>
Severity scores		
Total	9.74	9.60
Male	8.78	8.85
Female	10.50	10.41
Paraplegics	8.74	9.57
Tetraplegics	10.83	9.63
Number of symptoms reported		
Total	5.86	4.46
Male	5.28	4.10
Female	6.58	4.59
Paraplegics	5.26	4.13
Tetraplegics	6.46	4.54

Note: PTSD = posttraumatic stress disorder.

suggested that one reason that persons with tetraplegia report fewer PTSD symptoms is due to nature of their injury, which compromises the sympathetic nervous system¹³ and results in the loss of ability to experience physiological arousal. The reasons for this discrepancy are unclear and warrant further investigation.

When studying SCI populations, it is important to remember that there are limitations resulting from the use of self-report measures. Specifically, research has pointed toward difficulties with using self-report measures because of scale elevations with items associated with physical symptoms.^{28,29} Given that individuals with SCI possess the experience of surviving a life-changing event, living with a full-time disability, and dealing with non-disability-related life maintenance, interpretation of responses to

Table 6. Mean and standard deviations of number of symptoms measured by PTSD subscales

Symptoms	<i>M</i>	<i>SD</i>
Reexperiencing (5 symptoms)		
Total	1.27	1.39
Male	1.03	1.32
Female	1.58	1.44
Paraplegics	1.00	1.24
Tetraplegics	1.55	1.51
Avoidance (7 symptoms)		
Total	2.35	2.04
Male	2.20	1.93
Female	2.55	2.16
Paraplegics	2.19	2.03
Tetraplegics	2.59	2.03
Arousal (5 symptoms)		
Total	2.23	1.59
Male	2.06	1.50
Female	2.45	1.68
Paraplegics	2.13	1.49
Tetraplegics	2.32	1.68

Note: PTSD = posttraumatic stress disorder.

general psychologically oriented questions may be unclear.

Even though persons with sudden onset of illnesses or disabilities experience some form of psychological distress, most do not seek formal treatment for these distressful thoughts and feelings.³⁰ With this in mind, clinicians should include psychologically oriented trauma-based questions in their assessment of clients with SCI. It will help in diagnosis and treatment planning if clinicians can differentiate among psychological distress factors associated with the injury event, with living with a disability, and

with psychological factors unrelated to the SCI.

Future research that is aimed at exploring the experience of PTSD symptoms among persons with SCI should continue to focus on men and women and veteran and nonveteran populations. Given that prior exposure to traumatic events may increase risk of PTSD following the event under study, future researchers should assess exposure to traumatic events in addition to the event that resulted in SCI. The greater representation of

diverse samples and comprehensive information may help to resolve discrepant findings and enrich our understanding of these phenomena.

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