

# Trauma and Posttraumatic Stress Disorder in Women With Chronic Pelvic Pain

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**OBJECTIVE:** To examine the effect of abuse history, other major trauma, and posttraumatic stress disorder (PTSD) on medical symptoms and health-related daily functioning in women with chronic pelvic pain.

**METHODS:** We administered a questionnaire to 713 consecutive women seen in a referral-based pelvic pain clinic.

**RESULTS:** We found that 46.8% reported having either a sexual or physical abuse history. A total of 31.3% had a positive screen for PTSD. Using regression and path analysis, controlling for demographic variables, we found that a trauma history was associated with worse daily physical functioning due to poor health ( $P < .001$ ), more medical symptoms ( $P < .001$ ), more lifetime surgeries ( $P < .001$ ), more days spent in bed ( $P < .001$ ), and more dysfunction due to pain ( $P < .001$ ). Furthermore, a positive screen for PTSD was highly related to most measures of poor health status ( $P < .001$ ) and somewhat explained the trauma-related poor health status.

**CONCLUSION:** The association of trauma with poor health may be due in part to the development of PTSD resulting from trauma. These findings demonstrate the importance of screening for trauma and PTSD in women with chronic pelvic pain.

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**LEVEL OF EVIDENCE: II**

Posttraumatic stress disorder (PTSD) is a serious type of anxiety disorder initiated by personal experience of a serious trauma. One in four people with a history of trauma will develop PTSD; women

are twice as likely to acquire PTSD after trauma compared with men.<sup>1,2</sup> A history of sexual and physical abuse has been consistently shown to cause the highest rates of PTSD, leading to significant disability.<sup>2–5</sup> Previously, high rates of sexual and physical abuse and other trauma have been shown among women with chronic pelvic pain, including symptoms of dyspareunia and dysmenorrhea.<sup>6–15</sup> Although studies have examined how abuse history affects the health of those with chronic pelvic pain,<sup>16–21</sup> none have examined how PTSD affects the course of this illness. Thus, the primary goal of the current study is to examine the role of trauma and PTSD on the health status of women with chronic pelvic pain.

Comorbid PTSD is associated with poor health and related quality-of-life outcomes in other medically ill patient populations.<sup>22,23</sup> Early diagnosis of PTSD is critical, because prompt initiation of treatment improves long-term outcome and prevents needless and ongoing suffering.<sup>24</sup> In addition, PTSD may affect how patients with chronic pelvic pain respond to standard gynecologic treatment interventions. Unfortunately PTSD is often underdiagnosed or misdiagnosed in nonpsychiatry settings.<sup>25,26</sup> However, there is a brief screening tool to assess PTSD that has been validated for use in an outpatient obstetrics and gynecology setting.<sup>27,28</sup> Thus, another goal of this paper is to examine the prevalence of PTSD with a large chronic pelvic pain clinical sample.

Chronic pelvic pain, is generally defined as non-cyclic pain of at least 6 months duration, severe enough to require medical care or cause disability and occurring in locations such as the pelvis, anterior abdominal wall at or below the umbilicus, lower back, or buttocks.<sup>29</sup> Chronic pelvic pain has been estimated to have a prevalence of 15% among women of reproductive age<sup>30</sup> and accounts for 10% of gynecologic consultations and 40% of diagnostic laparoscopies performed in general hospitals.<sup>31,32</sup> Many women with chronic pelvic pain fail to respond to treatment,

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relapse rates are high, and chronic pelvic pain patients use a disproportionate amount of health care resources.<sup>33</sup> Given that women with chronic pelvic pain have high rates of trauma and are often treatment refractory, this is an ideal population to examine the effects of trauma and PTSD on health status.

Thus, the primary aim of our current study was to examine how abuse history, other major trauma, and screening positive for PTSD may affect health-related physical functioning, pain, medical symptoms, and health care usage among women seeking care for chronic pelvic pain. We hypothesized that those with trauma or abuse would be more likely to have a positive screen for PTSD and that those with trauma or abuse and PTSD symptoms would have worse health status on all variables.

## SUBJECTS AND METHODS

We collected data on 713 women patients from a referral-based pelvic pain clinic at the University of North Carolina from April 2003 to September 2005. Consecutive English-speaking women patients between ages 18 years and 66 years at the clinic were asked to fill out a brief questionnaire. Before completing the survey, all women were screened to document a history of chronic pelvic pain using the working definition of “noncyclic pelvic pain for at least 6 months duration, severe enough to require medical care or cause disability.” The questionnaire was self-administered and completed in a private area in the clinic. The data on 713 patients represented an 89% response rate of those eligible. Among the 79 women who did not complete the questionnaire, approximately one half ( $n=39$ ) refused, and the other half consented but did not return the questionnaire. The study was approved by the UNC Committee for the Protection of Human Subjects. Patients who agreed to participate gave informed consent and signed the Health Insurance Portability and Accountability Act of 1996 release.

Our comprehensive patient survey included questions about patient demographics, medical history, abuse and trauma history, PTSD screening, somatic symptoms, the effect of health on physical health functioning, days spent in bed due to illness, and number of lifetime surgeries.

To obtain standardized questions assessing trauma, including sexual and physical abuse history, we adapted a structured interview from previous research.<sup>21,34–36</sup> Sexual abuse included genital touching or vaginal or anal intercourse where force or threat of harm was present. In children (younger than 13 years) the threat of force or harm was implied by

a 5-year age differential between the victim and perpetrator. Physical abuse consisted of incidents separate from sexual abuse that included life-threatening physical attack with the intent to kill or seriously injure or other physical abuse such as being beaten, kicked, or burned. We constructed a summary measure of number of lifetime traumas by assigning one-point for each of the following: 1) child sexual abuse, 2) adult sexual abuse, 3) life-threatening attack, 4) other physical abuse, 5) parental alcohol or drug abuse or mental illness, 6) foster care, reform school or prison before age 18, 7) life-threatening illness or accident, 8) child having life-threatening illness or death, 9) close friend or family member killed by drunk driver or murdered, and 10) parents or sibling deaths before the participant was 18.

The SPAN, (acronym for symptoms of **s**tartle, **p**hysiologic arousal, **a**nger and emotional **n**umbness: Multi-Health Systems Inc., North Tonawanda, NY) is a brief four-item instrument for assessment of PTSD symptoms that has been validated against the Davidson Trauma Scale<sup>24</sup> in both outpatient psychiatric and general gynecology settings.<sup>27,28</sup> Four items ranging from 0–4 are summed and a score of 5 or greater is considered a positive screen for PTSD.

We chose the Rand 12-Item Health Survey [Short Form (SF-12)] to measure the degree to which health status interferes with daily functioning. The current study focused on the subscales of healthy physical functioning, and functioning without bodily pain using norm-based scoring. Cronbach’s  $\alpha$  reliability from several studies generally shows adequate reliability (.73–.78).<sup>37</sup> A high score on all subscales indicates better health.

Women were asked to respond to the following questions: 1) “How many days during the past 3 months did you stay in bed (more than half the day) because of illness?” and 2) “How many surgeries have you had in your lifetime? How many of these surgeries were for treatment of pelvic pain?” These items were adapted from previous research showing more days in bed and surgeries among patients with abuse history and functional compared with organic illness.<sup>15,21,38</sup>

Number and frequency of nonpelvic pain symptoms was adapted from our previous studies.<sup>21</sup> Thirteen symptoms reported as “sometimes” or “often” occurring in the past 6 months were blurred or double vision, numbness, shortness of breath, irritations or pain in eyes or ears, frequent headaches, palpitations, chest pain, frequent backaches, muscle aches in shoulders or neck, diarrhea or constipation or nausea,



indigestion, difficulty swallowing, and pain with urination.

SAS (SAS Institute Inc., Cary, NC) statistical software was used for all analyses. Before analyzing data, we examined the distribution of all health status variables to insure that they were approximately normal (number of pelvic surgeries and number of days in bed due to illness were truncated at eight and 16, respectively, due to outliers). We performed non-parametric analyses to make sure that the relationships seen were not a result of lack of normalcy. We also examined the distribution of outcome variable to make certain that excessive skew was not present. All data analyses used two-tailed tests and controlled for background variables of age, race (white or non-white), and education.

We ran linear regression with path analyses for each of the dependent variables, stepping in variables in the following order: 1) demographics (age, education, and race), 2) number of traumas, and 3) positive screen for PTSD. We allowed variables to stay in the models if  $P < .05$  at the step it went in. We calculated the  $\chi^2$  to test the relationship between the number of traumas and a positive screen for PTSD. We also examined the relationship of trauma and PTSD with health status and calculated standardized  $\beta$  coefficients. The standardized  $\beta$  coefficient is a common approach used to standardize the independent variables. We can standardize coefficients by dividing by its standard deviation (SD) and express it in terms of deviations from the mean. Thus, we are measuring changes in the dependent variable in terms of SD units for each of the other variables. This measures

how much a 1-unit change in the independent variable causes in the dependent variable, now in SD units. The great value of the  $\beta$  coefficient is that it shows the “effect” of one variable on another no matter how differently the variables are scaled.

## RESULTS

Table 1 shows descriptive data about our sample. The vast majority of the sample (85%) was between 18 and 45 years of age. Fully 78% were white, 16% were African American, and 6% were other racial or ethnic groups. Almost one half the sample had a college degree or higher (45.2%), with a mean education of 14.9 years.

We found that 34.5% reported having a history of sexual abuse, 28.9% reported physical abuse, and 46.8% reported having sexual or physical abuse or both. One half the women had two or more lifetime traumas; the average number of traumas was 1.9. Almost one third (31.3%) had a positive screen for PTSD. More patients with two or more traumas had a positive screen for PTSD (40.4%) compared with those with less than two traumas (21.8%) ( $\chi^2=28.3$ ,  $P < .001$ ).

Chronic pelvic pain patients in this referral practice tended to score well below the 25th percentile on the SF-12 bodily pain scale (37.1 median) compared with U.S. female population norms and at the 25th percentile for patients with depression or rheumatoid arthritis. Almost one half (49%) reported five or more nongynecologic medical symptoms, 35% spent 5 or more days in bed due to illness in the past 3 months,

**Table 1. Descriptive Data on Demographic Variables, Trauma, Posttraumatic Stress Disorder, and Health Status**

	All Patients			Patients With PTSD			Patients Without PTSD			P
	Mean	SD	%	Mean	SD	%	Mean	SD	%	
Age (y)	35.3	9.8		35.2	9.7		35.4	10.0		.80
Education (y)	14.9	2.5		14.3	2.5		15.1	2.5		<.001
Race (% white)			78.1			73.8			80.7	.04
No. lifetime traumas	1.9	1.8		2.6	2.0		1.6	1.6		<.001
Sexual and/or physical abuse			46.8			62			41	<.001
PTSD screen score and % positive	3.7	3.8	31.3							
Healthy physical functioning	44.0	12.5		39.0	12.7		46.4	11.8		<.001
Functioning without pain	37.9	13.8		32.8	12.9		40.2	13.7		<.001
No. nonpelvic medical symptoms	4.8	3.1		6.4	3.1		4.0	2.8		<.001
No. lifetime surgeries for CPP	3.9	3.2		4.7	3.5		3.6	3.0		<.001
No. days in bed due to illness	4.4	5.6		6.3	6.1		3.5	5.2		<.001

PTSD, posttraumatic stress disorder; SD, standard deviation; CPP, chronic pelvic pain.

The n for all variables is 713, except n=707 for PTSD, 711 for healthy physical functioning, 701 for functioning without pain, due to missing data.

P for categorical variables calculated with  $\chi^2$ . P for continuous variable calculated with *t* test.



and 39% had two or more pelvic surgeries in their lifetime.

Using regression and path analysis controlling for demographic variables (age, education & race), we found that more trauma was associated with worse health status on all variables (Tables 2–4). Specifically, trauma was related to worse daily physical functioning due to poor health ( $P<.001$ ), more dysfunction due to pain ( $P<.001$ ), more medical symptoms ( $P<.001$ ), more lifetime surgeries ( $P<.001$ ), and more days spent in bed ( $P<.001$ ). Trauma explained from 4% to 10% of the variance in health status over and above that explained by the demographic variables. We found that patients scoring low on trauma (0 or 1) had similar physical health-related functioning (mean 46.1) as women in the general population and similar pain as depressed patients (mean 41.1) (based on norm-based scoring for the SF-12). Those scoring high on trauma (more than 1) have physical functioning (mean 42.0) similar to patients with serious chronic medical conditions (eg, rheumatoid arthritis, liver disease, diabetes), and pain levels (mean 34.8) far worse (below 25 percentile) than patients with depression and serious medical conditions. Figure 1 shows that those with high trauma have 1.2 to almost two more medical symptoms, lifetime surgeries and days spent in bed compared with those with less trauma.

A positive screen for PTSD was highly related to all measures of poor health status (all but one with  $P<.001$ ), explaining from 2% to 12% of the variance over and above demographic variables and trauma. Similar to trauma, patients screening negative for PTSD had similar physical health related functioning (mean 45.7) as women in the general population and similar pain as other serious illness and chronic pain patients (mean 39.3). Those screening positive for PTSD had physical functioning (mean 40.5) similar or

worse than patients with serious chronic medical conditions (eg, rheumatoid arthritis, liver disease, diabetes), and pain levels (mean 34.9) far worse (below 25 percentile) than patients with serious medical conditions. Figure 1 also shows that those screening positive for PTSD was associated with from .6 to 2.0 more medical symptoms, lifetime surgeries, and days spent in bed compared with those not screening positive for PTSD. The effects of trauma were somewhat explained by PTSD, indicating that the associations of past trauma with poor health may in part be due to the development of PTSD.

## DISCUSSION

We found that almost 50% of women with chronic pelvic pain reported a history of sexual or physical abuse. This rate of reported trauma is significantly higher than national samples of women in the general population. Approximately one in three women with pelvic pain also had a positive screen for PTSD, indicating that there is high degree of psychiatric comorbidity in this patient population that may potentially contribute to the patient's perception of and ability to cope with chronic pain. Thus, obtaining an abuse and trauma history, as well as an assessment for PTSD, are critical components of the comprehensive evaluation of patients with chronic pelvic pain.

Chronic pelvic pain patients in our referral-based clinic are a greatly medically and psychologically impaired group, with U.S. female population norm scores similar to those with rheumatoid arthritis and major depression. In addition, we found that more trauma was associated with significantly worse health status on all variables, including worse daily physical functioning due to poor health, more dysfunction due to pain, more medical symptoms, more lifetime surgeries, and more days spent in bed. In fact, those chronic pelvic pain patients with two or more lifetime

**Table 2. Healthy Physical Functioning and Functioning Without Pain by Demographics, Trauma, and Posttraumatic Stress Disorder\***

	Healthy Physical Functioning						Functioning Without Pain					
	B	P	B	P	B	P	B	P	B	P	B	P
Age	-0.11	.002	-0.10	.005	-0.11	.002	-0.03	.34	-0.02	.62	-0.02	.51
Education	0.27	<.001	0.24	<.001	0.20	<.001	0.33	<.001	0.29	<.001	0.28	<.001
Race	0.05	.18	0.04	.23	0.02	.52	0.08	.03	0.07	.04	0.06	.06
No. total traumas			-0.22	<.001	-0.15	<.001			-0.24	<.001	-0.18	<.001
PTSD-positive					-0.24	<.001					-0.18	<.001
R <sup>2</sup>	0.09		0.14		0.18		0.12		0.18		0.21	

B, standardized regression coefficient (how many of its own standard deviations the dependent variable changes when the independent variable is increased by one of its own standard deviations); PTSD, posttraumatic stress disorder.

\* Regression results with demographics entered into equations first, number of total trauma added second, and PTSD-positive screen added last.



**Table 3. Number of Nonpelvic Medical Symptoms and Lifetime Surgeries By Demographics, Trauma, and Posttraumatic Stress Disorder\***

	Number of Nonpelvic Medical Symptoms						Lifetime Surgeries					
	B	P	B	P	B	P	B	P	B	P	B	P
Age	0.12	<.001	0.10	<.004	0.11	<.001	0.20	<.001	0.18	<.001	0.19	<.001
Education	-0.23	<.001	-0.19	<.001	-0.15	<.001	-0.18	<.001	-0.15	<.001	-0.14	<.001
Race	-0.06	.10	-0.05	.13	-0.03	0.40	0.04	.34	0.04	.25	0.06	.12
No. total traumas			0.32	<.001	0.20	<.001			0.21	<.001	0.18	<.001
PTSD-positive					0.37	<.001					0.13	<.001
R <sup>2</sup>	0.08		0.18		0.30		0.07		0.11		0.13	

B, standardized regression coefficient; PTSD, posttraumatic stress disorder.

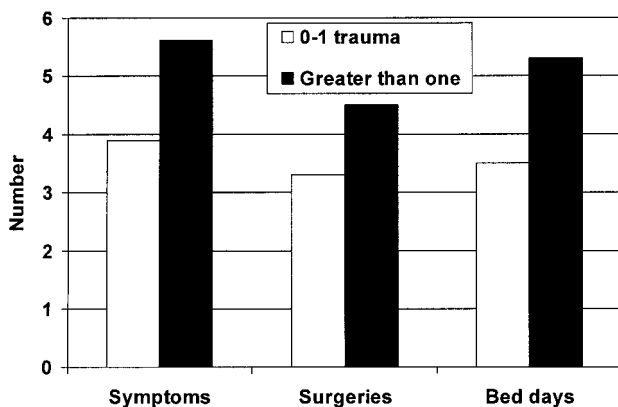
\*Regression results with demographics entered into equations first, number of total trauma added second, and PTSD-positive screen added last.

**Table 4. Days Spent in Bed by Demographics, Trauma, and Posttraumatic Stress Disorder\***

	Number of Days Spent in Bed					
	B	P	B	P	B	P
Age	-0.04	.28	-0.06	.12	-0.05	.20
Education	-0.17	<.001	-0.13	<.001	-0.10	<.005
Race	-0.05	.19	-0.04	.23	-0.03	.40
No. total traumas			0.22	<.001	0.15	<.001
PTSD-positive					0.21	<.001
R <sup>2</sup>	0.03		0.08		0.12	

B, standardized regression coefficient; PTSD, posttraumatic stress disorder.

\*Regression results with demographics entered into equations first, number of total trauma added second, and PTSD-positive screen added last.



**Fig. 1.** Number of medical symptoms, lifetime surgeries, and days spent in bed by low- and high-trauma groups.

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traumas have U.S. female population norm scores far worse than patients with other serious medical illnesses and major depression. Moreover, patients screening positive for PTSD also had significantly worse scores on physical functioning and pain, more medical symptoms, more lifetime surgeries, and more days spent in bed. The effects of trauma were somewhat explained by PTSD, indicating that the associa-

tions of past trauma with poor health may in part be due to the development of PTSD.

Several aspects of our study design limit our conclusions. Findings from our referral-based pelvic pain clinic may not be generalizable to patients with chronic pelvic pain who seek care in primary care or general gynecology settings. Second, our study population has on average almost 15 years of education, which again is not generalizable to the general population. Study participation involved recalling events that may have occurred many years in the past, and therefore recall bias must be considered.

Interestingly, although the literature examining the effect of PTSD on chronic pain is very small, more recently, studies have attempted to address the “chicken or egg” issue of which comes first: psychopathology or chronic pain. One recent study suggests that central nervous system dysregulation seen in PTSD may also strongly contribute to the development of a chronic pain syndrome, particularly in those who have childhood abuse histories.<sup>39</sup> Specifically, neuroanatomic work in PTSD suggests dysregulation in limbic, paralimbic, and prefrontal regions that are involved in the stress response and emotional processing, including alterations of hypothalamic-



pituitary axis function, autonomic and adrenergic hyperactivity, and the generation of PTSD symptoms.<sup>40-42</sup> Abnormalities in prefrontal function have also been noted in those pain patients prone to catastrophizing.<sup>43</sup>

Our work suggests that patients with PTSD (similar to major depression) are more likely to report their pain as severe, compared with those without PTSD, even when there is no apparent objective medical basis for the difference in pain intensity.<sup>44-46</sup> We propose that women with chronic pelvic pain who have experienced trauma are likely to have symptoms of PTSD that may significantly affect the presentation of their symptoms, as indicated by their poor health status and their poor response to treatments (eg, psychological, medical, and surgical).

A recent study by Leserman et al<sup>47</sup> examined diagnostic subtypes of chronic pelvic pain and how the subtypes differed in health status and trauma history. This study used a subgroup of patients from the much larger data set presented in this manuscript and examined a newly developed diagnostic classification system for chronic pelvic pain (seven diagnostic categories). Leserman et al reported that specific subtypes of chronic pelvic pain may be related to a history of trauma. Thus, further research in the definition of subtypes of chronic pelvic pain may be needed to improve treatments and health outcomes for these patients.

Our current work demonstrates that PTSD has a critical role in the presentation and course of illness in women with chronic pelvic pain. Importantly, there are highly efficacious treatment interventions (psychologic and pharmacologic) that exist for the treatment of PTSD.<sup>48</sup> For example, the selective serotonin reuptake inhibitors have demonstrated efficacy in the pharmacologic therapy of PTSD,<sup>49,50</sup> and there are multiple studies demonstrating the effectiveness of cognitive-based psychotherapies.<sup>51,52</sup> Therefore, comprehensive treatment strategies will need to target PTSD symptoms and histories of trauma or abuse in women with chronic pelvic pain. Furthermore, a self-rated screening instrument for PTSD can serve as a useful tool for triaging patients with a history of trauma in a gynecology setting so that specific treatment interventions may be developed that will address the effect of trauma in chronic pelvic pain.

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