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Posttraumatic Stress Disorder in Incarcerated Women: A Call for Evidence-Based Treatment

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The majority of women who enter the criminal justice system, most of whom are poor and women of color, have suffered from significant lifetime trauma exposure that can lead to posttraumatic stress disorder (PTSD). It is essential to identify the prevalence of PTSD among this population in order to identify treatment needs. Most studies on PTSD among incarcerated women have focused on PTSD in jailed populations, including women awaiting trial. Using a cross-sectional study design, we estimated the prevalence of PTSD and comorbid physical and mental health conditions in 387 incarcerated women sentenced to a maximum-security prison in the United States. Almost half (44%) of our sample met the diagnostic criteria for PTSD. Women with moderate to severe PTSD symptoms were more likely to report several comorbid physical and mental health conditions than were women without PTSD. Women with the most severe symptoms were most likely to report receiving mental health treatment in prison; women with moderate to severe symptoms were less likely to report receiving similar mental health care. Our findings add support to the link between PTSD and comorbid physical and mental health conditions and suggest that many women with PTSD are not receiving mental health treatment that is likely to benefit them. Because prison has become the mental health safety net for some of the nation's most vulnerable women, it is imperative that prisons provide evidence-based PTSD treatment during incarceration.

Keywords: posttraumatic stress disorder, trauma, prisons, women's health

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The criminal justice system has become a mental health safety net for some of our nation's poorest and most vulnerable women. Women enter prison not only with significant mental and physical health conditions, but often have histories of victimization and trauma exposure (Browne, Miller, & Maguin, 1999; Gilfus, 2002; Harlow, 1999). Trauma, including physical and sexual abuse, can result in long-term mental health disorders, including posttraumatic stress disorder (PTSD; American Psychiatric Association, 2000). Because prisons are often the mental health provider of last resort for trauma survivors, it is vital that correctional health providers, as well as other mental health professionals and policymakers, better understand both the nature and scope of women's trauma exposure prior to incarceration, as well as their physical and mental health symptoms during imprisonment. The purpose of this investigation was to estimate the prevalence of PTSD in women incarcerated in a maximum-security prison, as well as comorbid physical and mental health conditions associated with PTSD among these women.

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Background

Trauma exposure has been identified as a pathway to prison for many female trauma survivors, because their coping mechanisms are often criminalized (DeHart, 2008). As young girls, survivors might run away from abusive families, only to suffer additional violence living on the streets. Survivors might use illegal substances, such as cocaine and heroin, to escape and numb the physical and psychological pain of victimization or might become involved in other criminal activity, such as theft and prostitution (Gilfus, 2002). Without provisions to ensure the safety of victimized women and girls or adequate community mental health interventions to treat female survivors, many ultimately become involved in the criminal justice system.

Posttraumatic Stress Disorder in Incarcerated Women

Incarcerated women have a high prevalence of experiences that might lead to PTSD, including physical and sexual victimization (Browne, Miller, & Maguin, 1999), witnessing abuse of family members (Greene, Haney, & Hurtado, 2000), and violence experienced as part of the "drug culture" (Greene et al., 2000, p. 11). Given these numerous risk factors, it is not surprising that women in prison report higher lifetime and current prevalence rates of PTSD than nonincarcerated women. Table 1 presents a summary of studies that examined the rates of PTSD among incarcerated women. As a reference point, Kessler, Sonnega, Bromet, Hughes, and Nelson (1995), using data from the National Comorbidity Survey (NCS), identified that 10.4% of nonincarcerated women had been diagnosed with PTSD in their lifetimes (lifetime prevalence rate). As is clear from the data presented in Table 1, there are alarmingly high rates of current PTSD among incarcerated women, with estimates from approximately 17% (Brinded, Simpson, Laidlaw, Fairley, & Malcolm, 2001) to 48% (Zlotnick, 1997).

PTSD and Physical Health Conditions

Posttraumatic stress disorder has been linked to a variety of comorbid physical health conditions. Using data from the NCS, Sareen, Cox, Clara, and Asmundson (2005) identified that PTSD was associated with neurological, vascular, gastrointestinal, metabolic/autoimmune, and bone and joint conditions. In a sample of women receiving Medicaid, Seng, Clark, McCarthy, and Ronis (2006) identified that women with PTSD (without comorbid depression, dissociative, or borderline personality disorder) were more likely that their counterparts without a psychiatric diagnosis to have been diagnosed with most of the identified ICD-9 Taxonomy Categories of Diseases, chronic conditions associated with trauma, and most reproductive health conditions. Seng and colleagues also described the presence of a dose-response relationship between PTSD severity and chronicity and physical comorbidity (p. 53). Although the precise causal link between PTSD and physical health conditions is not fully understood, the presence of PTSD is a consistent risk factor for physical disease.

Summary and Gaps in Knowledge

Many women enter the criminal justice system having suffered from significant lifetime trauma exposure, the result of which might lead to undiagnosed and untreated PTSD. To date, however, most studies on PTSD in incarcerated women have focused on PTSD in jailed populations, including women awaiting trial. We identified one study (Zlotnick, 1997) conducted with convicted women serving their sentence in a prison setting (as opposed to nonconvicted women in a jail setting). Women in jail, especially those who have not been sentenced or those who might be released on bail, might have different mental health needs than convicted women serving their sentences in a maximum security prison setting.

This investigation complements Zlotnick's (1997) work and comprises a larger sample of women sentenced to a maximum security women's prison located in the United States. Furthermore, this investigation addresses comorbid physical and mental health disorders and conditions associated with PTSD. Our specific aims were to: 1) estimate the prevalence of PTSD in women incarcerated in a maximum security prison; 2) identify and describe the nature of incarcerated women's traumatic exposures; and 3) evaluate the association between physical and mental health conditions, including depression and PTSD. This investigation will help to identify the mental health treatment needs among this vulnerable population.

Method

This investigation used a cross-sectional descriptive design using self-report questionnaires with female volunteers to assess the prevalence of physical and mental health conditions, including PTSD, in a sample of women incarcerated in a maximum security prison.

Setting

This investigation was conducted in a maximum security state prison for women located in the United States. Approval from

Table 1
Studies Examining PTSD and Incarcerated Women

Study	Sample (*N*)	Assessment instrument	Current PTSD diagnosis (%)	Lifetime PTSD diagnosis (%)
Brindad et al. (2001)	Remand and sentenced prisoners in New Zealand (162)	CIDI-A	16.6 (past month)	
Green et al. (2005)	County jail (100)	CIDI	22	
Teplin et al. (1996)	Jail detainees awaiting trial (1,272)	DIS	22.3 (past 6 months)	33.5
Zlotnick (1997)	Convicted state prisoners (85)	SCID	48.2	20

Note. CIDI-A = Composite International Diagnostic Interview-Automated; CIDI = Composite International Diagnostic Interview; DIS = Diagnostic Interview Schedule; SCID = Structured Clinical Interview for the *DSM-IV*

relevant Institutional Review Boards (IRBs) was obtained prior to study initiation.

Sampling

This investigation used nonprobability sampling. Eligible women included convicted adult women in the prison. Participants housed in the prison's general population community were invited to participate. Nonconvicted women, minors, and women who could not read or write in English were ineligible to participate. For security reasons, women housed in the Restricted Housing Unit (RHU; where inmates are held in solitary confinement for disciplinary infractions or protective custody), the Mental Health Unit (MHU), and the Intake and Classification Unit (where new inmates are housed and classified over a period of approximately 90 days), were ineligible to participate.

In 2010, the first author visited each eligible housing unit over a period of 2 weeks to describe the purpose of the study to potential participants. These discussions often took place during the inmate housing unit meetings. Women were provided the opportunity to ask questions about the investigation and to make comments. Women were told that completion of the survey was voluntary and that they would not be penalized if they declined to participate. Women were also told that they would not be compensated for their participation. Furthermore, women were instructed not to include any identifying information on any part of the survey. At the end of each unit meeting, the surveys were left with the Unit Officer and were available for women to complete if desired. Women submitted completed surveys in sealed opaque envelopes via the secure inmate mail system (locked canvas bag). The first author obtained and examined each sealed envelope at the end of each day. No envelopes appeared to have been tampered with. In order to maintain participant anonymity and confidentiality, permission was granted from the IRBs to use Information Statements in lieu of signed consents.

Instruments

Participants completed a self-report survey on a variety of health related issues. Variables pertinent to the current investigation included past physical and mental health problems, including PTSD. A brief review of each variable and instrument is provided below.

Past physical and mental health problems. The Prison Health Survey (PHS) is a self-report demographic and health form created by the first author. The PHS, which was patterned after the medical "check off" forms commonly used in clinical practice, included 88 items. In addition to demographic information, the PHS inquired about physical health conditions and symptoms, such as cardiovascular, liver, and neurologic conditions, muscle and joint problems, issues specific to women's health, cancer, and disabilities. Self-report mental health problems or diagnoses, including Axis I disorders (mood, anxiety, eating, psychotic, and dissociative disorders), Axis II disorders (borderline personality disorder), past suicidaility and self-injurious behaviors, and substance use were also assessed via the PHS.

Posttraumatic Stress Disorder. Posttraumatic stress disorder was measured via the 49-item Posttraumatic Stress Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997). The PDS measures PTSD diagnosis, symptom severity, and level of impairment of functioning. The instrument is written at the eighth-grade level and can be completed via pencil and paper format in approximately 15 min. Previous research has demonstrated the strong psychometric properties of this instrument. Foa et al. (1997) reported that among a large sample ($N = 248$) of trauma survivors, PDS scores had good internal consistency (coefficients $\alpha = .92$ for total symptom severity, .78 for reexperiencing, .84 for avoidance, and .84 for arousal), test–retest reliability of diagnosis ($\kappa = .74$) and symptom severity ($r = .83$ for total, .77 for reexperiencing, .81 for avoidance, and .85 for arousal), convergent validity ($\kappa = .65$ between the PDS and the Structured Clinical Interview for DSM Disorders [SCID; First, Spitzer, Gibbon, & Williams, 2002], 82% agreement between the two measures, sensitivity of the PDS = .89, specificity = .75.). Similarly strong psychometric properties associated with the use of the PDS were reported among a sample of men and women with a history of PTSD and alcohol dependence (Powers, Gillihan, Rosenfield, Worly, & Foa, 2012). The internal reliability for our sample on the total symptom severity scale was $\alpha = .92$. To our knowledge, this is the first time this instrument has been used in a sample of incarcerated women. The PDS is scored using the manualized PDS Scoring Worksheet, which provides PTSD diagnostic information and symptom severity based on a respondent's exposure to a Criterion A traumatic event (American Psychiatric Association, 2000), reexperiencing, avoidance, and arousal symptoms, symptom duration, and distress and impairment in daily functioning.

Data Management and Statistics

All completed surveys were backed up as electronic documents and stored on a secure research server. Data were double entered and each data set was carefully compared against the other for discrepancies. Descriptive statistics were used to examine the entire sample, as well as the subgroups of women with and without PTSD. Inferential statistics, including chi-squares and least likelihood ratios, were used to compare differences between groups on key variables that were assessed as binary outcomes.

To address Aim 1, which was to estimate the prevalence of PTSD in women incarcerated in a maximum security prison, we categorized participants based on whether they met criteria for PTSD (1 = yes, 0 = no) as described in the PDS worksheet (Foa et al., 1997). Prevalence was calculated by dividing the number of women who met criteria for PTSD by the total number of women in the study. Among women who met criteria, we created four groups based on symptom severity: scores of 1–10 were classified as mild symptoms; 11–20 represent moderate symptoms; 21 – 35 were moderate to severe symptoms; and scores of 36 and above were classified as severe symptoms (Foa et al., 1997). Only one woman who met criteria for PTSD had mild symptoms (PDS score = 7) and was dropped from all subsequent analyses.

To address Aim 2, which was to identify and describe the types of traumatic exposures incarcerated women have experienced in their lifetimes, we conducted a series of chi-squared tests to compare women with no PTSD and with moderate, moderate to severe, and severe symptoms on a number of traumatic events which were all assessed using a series of yes/no questions. Some of the items, such as "Have you ever experienced torture?" had a small number of affirmative responses ($n < 5$). Therefore, we

calculated least likelihood ratios (*LR*) to assess differences between women with no PTSD, moderate symptoms, moderate to severe symptoms, and severe symptoms on outcomes with very few "yes" responses. Significant LR and chi-square values were followed up by pair-wise comparisons using a Bonferroni adjustment to determine the exact location of the difference. Descriptive responses written by participants also address Aim 2.

To address Aim 3, which was to evaluate the association between physical and mental health conditions, we compared women who did not meet criteria for PTSD to those with either moderate, moderate to severe, or severe symptoms using a series of chi-squared analyses and likelihood ratios for those outcomes with 5 or fewer affirmative responses.

Results

Participants

Blank surveys were distributed to 900 incarcerated women. Almost half (49%; $n = 445$) returned their survey. Of the returned surveys, most (89%; $n = 387$) were completed sufficiently to answer the research questions. Sample ($N = 387$) demographic data are presented in Table 2. Most (83%) of the women who completed the survey were under the age of 50 ($M = 38$. $SD = 10.94$) and most (77%) had served 3 or fewer years in prison. Just over one third (36%) of women reported having either attended some college (25%) or graduating from college (11%). Almost half (47%) reported a history of previous incarceration. The most frequently reported criminal acts that resulted in participants' current incarceration included drug-related crimes (26%) and murder (21%). There were no significant demographic differences with regard to PTSD diagnosis (all *p*s $> .05$).

Prevalence of PTSD in Incarcerated Women (Aim I)

Almost half (45%; $n = 176$) of women who completed the PDS met diagnostic criteria for current PTSD at the time of the interview. Of the women who met criteria, 23% had severe symptoms ($n = 40$), 58% had moderate to severe symptoms ($n = 102$), and 19% had moderate symptoms ($n = 33$). From a clinical perspective, women with moderate to severe and severe symptoms, which comprised most of the women in our sample with PTSD, are those most in need of treatment.

Nature of Traumatic Exposure (Aim 2)

Over half of our entire sample reported exposure to at least one of the following traumatic events: nonsexual assault (both known and unknown assailants), sexual assault (known assailant), sexual contact under the age of 18 by someone 5 or more years older, and incarceration (see Supplemental Table 1). Women with PTSD (at all levels of symptom severity) were significantly more likely to report exposure to nonsexual assault (both known and unknown assailants), sexual assault (known assailant), and sexual contact with someone at least 5 years older than they before the age of 18 (see Table 3). Additionally, women with moderate to severe or greater symptoms were more likely to report a sexual assault by a stranger than were those with no PTSD; similarly, these same women reported a higher frequency of life-threatening illness than those with no PTSD. Finally, women with severe symptoms reported significantly higher levels of torture.

When women reported "other" traumatic events, they were asked to briefly describe the event. Numerous women described witnessing violent acts, including domestic violence, homicide,

Table 2
Sample Demographics

Characteristic	*n* (%)
Age (years)	
$M = 38$ years	
$SD = 10.94$	
Range = 20–85	
$n = 384$	
20–29	109 (28)
30–39	105 (27)
40–49	108 (28)
50–59	50 (13)
60–69	10 (3)
70+	2 (1)
Time served (years)	
$M = 4$ years	
$SD = 7.11$	
Range = 0.5–38 years	
$n = 385$	
< 1	84 (22)
1–3	212 (55)
4–6	28 (7)
7–10	17 (4)
11 or more	44 (11)
Previous incarceration	
$n = 387$	
Yes	183 (47)
Race	
$n = 386$	
Black	96 (25)
White	254 (66)
Hispanic	12 (3)
Asian	1 (0.3)
Native American	4 (1)
Bi-Racial	19 (5)
Education	
$n = 383$	
Less than 8th grade	14 (4)
Some high school	65 (17)
High school graduate/GED	169 (52)
Some college	95 (25)
College graduate	40 (11)
Primary offense	
$n = 385$	
Drug-related crime	99 (26)
Murder	79 (21)
Theft/larceny	37 (10)
Assault	32 (8)
Robbery	31 (8)
Forgery/fraud	19 (5)
Violation of probation/parole	19 (5)
Drunk driving	13 (3)
Burglary	11 (3)
Characteristic	
Homicide by vehicle	8 (2)
Manslaughter	6 (2)
Receiving stolen property	6 (2)
Sex offense	4 (2)
Weapons	3 (1)
Arson	1 (0.3)
Other	17 (4)

Table 3
Trauma Exposure by Severity of PTSD Symptoms

Exposure	PTSD symptom severity								
	No PTSD (n = 211)		Moderate symptoms (n = 33)		Moderate to severe PTSD symptoms (n = 102)		Severe PTSD symptoms (n = 40)		Significance
	n	%	n	%	n	%	n	%	
Accident	98	(47)	12	(39)	58	(59)	23	(58)	*NS*
Disaster	41	(20)	7	(23)	28	(28)	9	(23)	*NS*
Nonsexual assault/known	97	(46)[a]	22	(69)[b]	80	(79)[b]	28	(72)[b]	$X^2 = 36.17^{**}$
Nonsexual assault/stranger	95	(45)[a]	19	(58)[b]	63	(63)[b]	26	(67)[b]	$X^2 = 13.18^{**}$
Sexual assault/known	98	(47)[a]	22	(67)[b]	69	(68)[b]	29	(73)[b]	$X^2 = 20.46^{**}$
Sexual assault/stranger	73	(35)[a]	13	(41)[a]	62	(63)[b]	26	(67)[b]	$X^2 = 28.46^{**}$
Combat	2	(1)	0	(0)	0	(0)	1	(3)	*NS*
Sexual contact under age of 18 with someone 5 or more years older	119	(57)[a]	26	(81)[b]	76	(75)[b]	29	(74)[b]	$X^2 = 17.36^{**}$
Prison	117	(56)	22	(69)	61	(60)	24	(62)	*NS*
Torture	22	(11)[a]	5	(16)[a]	22	(22)[a]	12	(31)[b]	$LR = 13.12^{**}$
Life-threatening illness	53	(26)[a]	9	(29)[a]	42	(43)[b]	14	(39)[b]	$X^2 = 10.13^{*}$
Other trauma	89	(43)	17	(52)	57	(57)	24	(62)	*NS*

Note. Values in a row with different superscripts differ significantly from each other.
$^{*}p < .05$. $^{**}p < .01$.

suicide, and animal torture. Women also described long-term sexual victimization, often by multiple perpetrators, including molestation, gang rapes, kidnappings, and forced prostitution. Many women characterized their "other" trauma as a lifetime of exposure to traumatic events, including sexual violence, physical abuse, and witnessing violent events in their homes and communities. Examples of unedited quotes related to "other" traumatic events are provided in Table 4.

PTSD and Comorbid Health Conditions (Aim 3)

Participants reported high rates of physical and mental health conditions (see Supplemental Table 2). There were no differences in use of the prison chronic disease clinic or medication line based on PTSD status; however, women with severe symptoms were significantly more likely to report using prison mental health services than were those with milder symptoms or no PTSD (see Table 5). Women with severe symptoms were also more likely to report taking medication for depression, anxiety, and sleeping problems than women with milder symptoms or women with no PTSD.

There was also a significant relationship between PTSD status and lifetime medical diagnoses (see Table 5). In specific, women with severe symptoms were more likely to report at least one incident of head injury with loss of consciousness (lifetime) than were those with milder symptoms or no PTSD. Women with moderate to severe or greater symptoms reported a higher lifetime incidence of pelvic inflammatory disease than women with milder symptoms or no PTSD. Several comorbid health conditions, including anemia, chronic obstructive pulmonary disease, and physical disability, approached but did not reach statistical significance when calculated using the likelihood ratio statistic (see Table 5).

Results also revealed significant relationships between PTSD symptoms and current physical symptoms (see Table 5). Women with moderate to severe and greater symptoms reported a higher incidence of chest pain, heart palpitations, shortness of breath, muscle/joint pain, bowel problems, frequent headaches, memory loss, fainting, and sleep problems in the past year than women with milder symptoms or no PTSD. Women with severe symptoms were more likely to report a head injury in the last year with loss of consciousness than women with milder symptoms or no PTSD.

With regard to mental health issues, women with moderate to severe and greater symptoms reported significantly higher levels of lifetime major depression, anxiety, panic attacks, eating disorders, borderline personality disorder, and suicide attempts. Although these same women were also more likely to report a receiving a diagnosis of PTSD in their lifetime, it is unclear if this reflects a past diagnosis or the current episode. Women with moderate to severe and greater symptoms were significantly more likely to report tobacco usage in prison as well as self-injurious behavior while in prison. Women with severe symptoms were also more likely to report being diagnosed with dissociative identity disorder.

Discussion

Our research confirms that PTSD is a significant mental health problem facing women in prison, with nearly half of our sample

Table 4
Examples of "Other" Traumatic Events

Witnessing violence
"Watching my mother get physically and mentally abused by my father as a kid. He broke into our home when I was 11 with a gun to kill my mom and himself."
"I watched my mother be beaten by different men from the age of 5 to 12."
"Found my father after he cut both of wrists in a suicide attempt. There was blood everywhere and he was very close to death."
"Made to watch a pet tortured and killed when I was three."
"Witnessed my stepfather being brutally beaten. He almost died and was left with 2/3 of his skull."
"I witnessed the brutal murder of a 16 year old girl when I was 17."
"Found brother dead with his head blown off."
"My next-door neighbor stuck a shotgun in his mouth and pulled the trigger. His brains were in my drive way and there was a note pinned to his chest."
Long-term sexual victimization
"Being molested by neighbor and cousins from the age of 6–12."
"My mother pimping me out and my aunt setting me up for rape which resulted in pregnancy at 15 years old."
"I had 2 of my toes cut off by my father. He started raping me after that."
"It is something to be raped, but it was worse stress and pushed me over the edge when my daughter was molested. I stabbed him."
"I was kidnapped at the age of 5 old by a stranger and raped for 3 months. Had to go to trial when I was 9."
"Kidnapped at 15 sold to a pimp in Boston and walked away 9 months later."
Lifetime of traumatic events
"Being beaten physically by my brother. Being put in a trunk of a car and overdosed- left for dead. Raped brutally at age 15. Watching my siblings shoot up dope."
"Being verbally, sexually and physically assaulted by my children's father. Being physically attacked by a family member since the age of 8. Physically attacked by a stranger."
"I was raped at gun-point at 16. Never told anyone. I was raped and molested by my biological sperm donor. I told and he went to jail. I had a lot of events in my life."
"I've been beat all my life. Gang raped at 16, sexually molested. I've watched my mom be beat all my life then my brothers. Violence is all I'm used to being entrapped in."
"My father tried to kill me, he tried suicide 2 times that I'm aware of, my brother was stabbed and robbed, my sister tried to kill herself and 2 of her kids, another brother and sister became drug addicts to cope with my father's abuses."
"Molested from 7–14 years old by step father, and mother allowed him. Watching and listening to mom get beaten and raped by boyfriend. Abused by family and punched."
"Boyfriend at 19 years old beat me regularly and made me miss-carry my baby. Locked in closet a lot not feed regularly as a child."
"Mother killed my sister when I was 3. I have been beaten my entire childhood. Molested twice. Raped 1992. Beaten in the streets. Jumped, robbed, domestic violence."
"House fire at the age of 16, Friend got shot, Foster father raped me have a child from that. Raped by a drug dealer's friend."

meeting diagnostic criteria for the disorder. Several key variables, including use of prison mental health services and use of medication for depression, anxiety, and sleep disorders, distinguished women with severe PTSD symptoms from those with moderate or moderate to severe symptoms. Although nearly three quarters of women with the most severe PTSD symptoms are receiving prison-based mental health treatment, it is unknown how effective these services are.

While the majority of women with severe symptoms reported receiving mental health services in prison, only about half (54%) of women with moderate to severe symptoms reported receiving similar care. This finding is important because these two groups of women suffered from similar rates of comorbid physical and mental health problems. Furthermore, women with moderate to severe symptoms accounted for over half (58%) of women who met the diagnostic criteria for PTSD. There are several possible explanations for this treatment gap, including limited mental health resources within the prison as well as the women themselves declining treatment. It is also possible that, with so many women experiencing PTSD symptoms in prison, moderate to severe levels of symptomatology might have become accepted as the norm among this population.

As noted, PTSD is a critical public health problem linked to significant morbidity and mortality. In addition to high rates of psychiatric comorbidities (Zimmerman et al., 2008), PTSD is associated with medical conditions such as circulatory and respiratory disease (e.g., Ahmadi et al., 2011) as well as overutilization of general medical care (5.3 visits per year; cf. 3.4 visits per year associated with major depressive disorder; Kessler et al., 1999). In this study, women with moderate to severe and greater symptoms were significantly more likely to describe somatic complaints (chest pain, heart palpitations, shortness of breath, etc.). The same women were also more likely to report sleep problems (78% and 90%, respectively). Although these symptoms might signal an undiagnosed medical condition, they might also be directly related to the high levels of anxiety associated with PTSD. It is possible that these symptoms might prompt women to seek medical care in an already overburdened and underresourced prison health system.

Because prison has become the mental health safety net for some of the nation's most vulnerable women, most of whom have experienced traumatic events prior to imprisonment, it is imperative that prisons provide evidence-based PTSD treatment. Ideally, this treatment should be offered early in confinement, as resolution of PTSD symptoms might allow women to participate more fully in important (and often scarce) prison-based programming, such as addiction treatment, parenting classes, and GED classes. The resolution of PTSD symptoms may result in decreased medical and mental health service needs both inside and outside prison. Furthermore, existing studies suggest that incarcerated women without PTSD are less likely to have a drug relapse or to recidivate upon release (Kubiak, 2004).

Several PTSD treatment programs have been evaluated in correctional settings, including eye movement desensitization and reprocessing (EMDR; Coloseti & Thyer, 2000), seeking safety (Lynch, Heath, Mathews, & Cepeda, 2012; Zlotnick, Johnson, & Najavits, 2009; Zlotnick, Najavits, Rohsenow, & Johnson, 2003), and traumatic incident reduction (TIR) therapy (Valentine & Smith, 2001). Both seeking safety and TIR have demonstrated promising results, whereas EMDR was not found to be effective in treating PTSD in a study with a very small number of participants ($N = 5$; Colosetti & Thyer, 2000). Future investigations should test the effectiveness of these and other treatment programs in large-scale, rigorous, treatment-outcome trials to identify treatment that can be used effectively, efficiently, and safely with incarcerated women. For example,

Table 5
Comorbid Health Conditions by Severity of PTSD Symptoms

Condition	No PTSD (n = 211)		Moderate symptoms (n = 33)		Moderate to severe PTSD symptoms (n = 102)		Severe symptoms (n = 40)		Significance
	n	%	*n*	%	*n*	%	*n*	%	
Use of prison health services									
Current use of prison chronic disease clinic	69	(33)	16	(49)	45	(45)	18	(45)	NS
Current use of prison mental health services	85	(41)[a]	18	(55)[a]	55	(54)[a]	29	(73)[b]	$X^2 = 17.26^{**}$
Current use of prison medication line	114	(54)	16	(49)	59	(58)	27	(68)	NS
Current medication									
Medication for depression	79	(38)[a]	16	(49)[a]	46	(46)[a]	30	(77)[b]	$X^2 = 20.99^{**}$
Medication for anxiety	71	(35)[a]	13	(41)[a]	41	(41)[a]	26	(67)[b]	$X^2 = 14.54^{**}$
Medication for sleep problems	59	(29)[a]	7	(23)[a]	29	(29)[a]	20	(56)[b]	$X^2 = 12.32^{*}$
Medical diagnoses (lifetime)									
Myocardial infarction	15	(7)	2	(7)	6	(6)	3	(8)	NS
Hypertension	60	(29)	15	(47)	41	(41)	12	(31)	NS
Coronary artery disease	2	(1)	1	(3)	2	(2)	0	(0)	NS
Heart failure	6	(3)	0	(0)	5	(5)	1	(3)	NS
High cholesterol	53	(26)	9	(28)	29	(29)	7	(18)	NS
Anemia	33	(16)	3	(10)	22	(23)	12	(33)	NS
Asthma	61	(30)	15	(47)	39	(40)	16	(41)	NS
COPD	11	(5)	3	(10)	14	(14)	3	(8)	NS
Emphysema	6	(3)	0	(0)	8	(8)	3	(8)	NS
Diabetes	22	(11)	6	(18)	13	(13)	4	(10)	NS
Thyroid disorder	32	(16)	4	(13)	22	(22)	6	(15)	NS
Liver problems	48	(23)	10	(32)	25	(25)	15	(39)	NS
Cancer	16	(8)	6	(19)	12	(12)	1	(3)	NS
HIV	6	(3)	0	(0)	4	(4)	0	(0)	NS
Seizure disorder	17	(8)	1	(3)	11	(11)	6	(15)	NS
Head injury with loss of consciousness	28	(14)[a]	6	(20)[a]	25	(25)[a]	16	(40)[b]	$X^2 = 16.94^{**}$
Abnormal pap test	85	(41)	18	(58)	42	(42)	16	(41)	NS
Sexually transmitted infection	62	(30)	16	(52)	32	(32)	17	(44)	NS
Pelvic inflammatory disease	15	(7)[a]	5	(17)[a]	20	(20)[b]	8	(21)[b]	$LR = 12.97^{*}$
Hysterectomy	25	(12)	5	(16)	9	(9)	5	(13)	NS
Fibroids	25	(12)	4	(13)	15	(15)	5	(13)	NS
Physical disability	34	(17)	3	(10)	26	(27)	11	(28)	NS
Learning disability	16	(8)[a]	3	(10)[a]	22	(22)[b]	5	(13)[a]	$LR = 12.16^{*}$
Physical symptoms (past year)									
Chest pain	47	(23)[a]	5	(17)[a]	30	(31)[b]	18	(49)[b]	$X^2 = 15.51^{**}$
Heart palpitations	26	(13)[a]	3	(10)[a]	31	(32)[b]	12	(35)[b]	$X^2 = 23.48^{**}$
Shortness of breath with activity	78	(38)[a]	14	(45)[a]	55	(56)[b]	23	(62)[b]	$X^2 = 14.01^{**}$
Muscle or joint pain	103	(50)[a]	15	(48)[a]	71	(72)[b]	24	(63)[b]	$X^2 = 16.22^{**}$
Urinary problems	22	(11)	4	(13)	22	(23)	6	(16)	NS
Bowel problems	47	(23)[a]	5	(16)[a]	38	(37)[b]	16	(41)[b]	$LR = 13.22^{*}$
Frequent headaches	72	(35)[a]	12	(39)[a]	57	(56)[b]	26	(68)[b]	$X^2 = 22.69^{**}$
Head injury with loss of consciousness	7	(3)[a]	2	(7)[a]	7	(7)[a]	7	(18)[b]	$LR = 9.75^{*}$
Memory loss	44	(21)[a]	7	(22)[a]	37	(37)[b]	16	(42)[b]	$X^2 = 13.07^{*}$
Fainting	8	(4)[a]	3	(10)[a]	14	(14)[b]	5	(14)[b]	$LR = 11.36^{*}$
Sleep problems	107	(51)[a]	20	(63)[b]	80	(78)[b]	36	(90)[b]	$X^2 = 35.65^{**}$
Mental health diagnoses (lifetime)									
Major depression	150	(71)[a]	29	(88)[b]	93	(91)[b]	38	(95)[b]	$X^2 = 25.23^{**}$
Anxiety disorder	127	(61)[a]	24	(73)[a]	88	(88)[b]	37	(95)[b]	$X^2 = 38.68^{**}$
Panic attacks	83	(40)[a]	17	(53)[a]	68	(70)[b]	29	(75)[b]	$X^2 = 32.95^{**}$
Posttraumatic stress disorder	71	(34)[a]	13	(41)[a]	67	(67)[b]	30	(81)[b]	$X^2 = 47.87^{**}$
Eating disorder	43	(21)[a]	3	(9)[a]	29	(29)[b]	15	(43)[b]	$LR = 13.47^{**}$
Schizophrenia	14	(7)	3	(10)	10	(10)	5	(14)	NS
Dissociative identity disorder	18	(9)[a]	1	(3)[a]	10	(10)[a]	12	(32)[b]	$LR = 15.99^{**}$
Borderline personality disorder	27	(13)[a]	6	(18)[a]	29	(29)[b]	17	(44)[b]	$X^2 = 23.93^{**}$
Tobacco use in prison	129	(61)[a]	22	(67)[a]	78	(77)[b]	33	(83)[b]	$X^2 = 12.28^{**}$
Alcohol addiction	66	(32)	12	(36)	37	(37)	17	(44)	NS
Heroin addiction	50	(24)	8	(24)	24	(24)	9	(24)	NS
Prescription drug addiction	55	(26)	10	(30)	32	(32)	15	(40)	NS
Past drug/alcohol treatment	124	(59)	21	(64)	65	(64)	28	(70)	NS
Addiction treatment in prison	101	(48)	21	(64)	51	(50)	21	(53)	NS
Sold/traded sex for money	63	(30)	11	(33)	38	(37)	14	(35)	NS
Suicide attempt	73	(35)[a]	14	(42)[a]	64	(64)[b]	21	(54)[b]	$X^2 = 25.97^{**}$
Suicide attempt in prison	9	(4)	0	(0)	6	(6)	2	(5)	NS
Self-injury in prison	9	(4)[a]	0	(0)[a]	11	(11)[b]	5	(13)[b]	$LR = 11.12^{*}$

Note. Values in a row with different superscripts differ significantly from each other.
$^{*}p < .05$. $^{**}p < .01$.

to our knowledge there has not been a systematic evaluation of the efficacy of prolonged exposure therapy (PE; Foa, Hembree, & Rothbaum, 2007) among incarcerated women. Prolonged exposure is a cognitive–behavioral treatment program with the most extensive evidence for its efficacy in a large number of randomized controlled trials (Powers, Halpern, Ferenschak, Gillihan, & Foa, 2010), the gold standard in treatment evaluation research.

Limitations

Because this study used a cross-sectional design with a convenience sample, data presented in this study represent a snapshot in time. As a result, we are unable to determine directionality with regard to PTSD and physical and mental health conditions. Also, all clinical data were collected via self-report; future investigations should include clinician-administered measures. However, concordance between the PDS and clinician-administered measures of PTSD is strong (e.g., Foa et al., 1997; Powers et al., 2012), which supports the validity of the estimated rates of PTSD reported herein. Finally, our estimate is likely an underrepresentation of PTSD given our limited access to women in high-risk areas. It is possible that women housed on other prison units, including women in the mental health unit and women in RHU, might have higher rates of PTSD than women who participated in this investigation.

Conclusions

The recognition that a large proportion of women enter prison with PTSD provides an important opportunity to reform women's corrections. Most incarcerated women, including the women in our study, ultimately will leave prison and return to their families and communities. If we commit to helping women leave prison in better health than when they entered, these women may return to their communities with their baseline health intact, or even improved, and the overall health of the nation will be improved. Indeed, prisons are uniquely situated to be important public health allies by providing state-of-the-art treatment to some of the nation's most vulnerable women.

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