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Women's Sexual Desire, Trauma Exposure, and Posttraumatic Stress Disorder

Julia I. O'Loughlin[1] and Lori A. Brotto[2]

[1]Department of Counselling Psychology, University of British Columbia, Vancouver, British Columbia, Canada
[2]Department of Obstetrics and Gynaecology, University of British Columbia, Vancouver, British Columbia, Canada

Research suggests that posttraumatic stress disorder (PTSD) is associated with sexual dysfunction; however, there is a paucity of research examining the relations among trauma exposure, PTSD, and low sexual desire, specifically. Thus, the goal of the present study was to investigate whether women with hypoactive sexual desire disorder (HSDD; $n = 132$) were more likely to meet criteria for a diagnosis of current or lifetime PTSD relative to women with no sexual desire concerns ($n = 137$). We also sought to compare the type, frequency, and intensity of PTSD symptoms between the two groups. Finally, we examined whether women in the two groups were exposed to more, or different types of, potentially traumatic events. Compared to women with no sexual health concerns, women with HSDD were more likely to meet criteria for current PTSD, odds ratio (OR) = 5.50, 95% CI [1.18, 25.61]; and lifetime PTSD, OR = 2.78, 95% CI [1.56, 4.94]. Women in the HSDD group also had higher odds of meeting criteria for avoidance (5.10 times) and hyperarousal symptoms (4.48 times) and scored higher on measures of past-month PTSD symptom frequency, $d = 0.62$, and intensity, $d = 0.57$. No group differences were observed regarding reexperiencing symptoms, the associated features of PTSD, or type or frequency of exposure to potentially traumatic events. The findings indicate PTSD symptomatology may be a predisposing or perpetuating contributor to low sexual desire, and low sexual desire and PTSD may be related through an alteration in stress adaptability.

Problems with sexual desire are among the most frequently reported sexual health concerns in women (Mitchell et al., 2013; Shifren, Monz, Russo, Segreti, & Johannes, 2008). An estimated 43% of women in the United States experience sexual difficulties, and approximately 39% of those women report a lack of sexual desire (Shifren et al., 2008). Although not all women who experience low sexual desire experience distress associated with their desire concerns, 12% report their low sexual desire causes significant personal or relationship distress. Among those women, over 70% report that low sexual desire negatively impacts body image and self-esteem and causes feelings of disconnection from their romantic partner (Kingsberg, 2014).

Additionally, women who are distressed by low sexual desire are more likely than women with no sexual desire concerns to experience negative emotional states, such as frustration, hopelessness, and anger (Leiblum, Koochaki, Rodenberg, Barton, & Rosen, 2006). Considering the significant and widespread impact of low sexual desire on women's psychological well-being and quality of life, a better understanding of the multiple causes of low sexual desire in women is vital for identifying both preventative measures and effective treatment options.

Although few studies have examined the associations among trauma exposure, posttraumatic stress disorder (PTSD), and low sexual desire in women specifically, several studies have implicated trauma exposure and PTSD as predictors of sexual difficulties in women (e.g., Baggett, Gonzalez-Rivas, Olson, Cameron, & Mona, 2017; Schnurr et al., 2009). As per the fourth edition of the *Diagnostic and Statistical Manual for Mental Disorders* (*DSM-IV-TR*; American Psychiatric Association [APA], 2000), an event is considered potentially traumatic if (a) it involves exposure to actual or threatened death or to serious injury or a threat to the physical integrity of self or others either via direct experience, witnessing, or being confronted (e.g., learning about in detail) with the event or events; and (b) the individual response involves fear, helplessness, and horror. Though most individuals exposed to a traumatic event stop experiencing trauma-related symptoms by 3 months after the exposure, 8.3% develop PTSD (Kilpatrick et al., 2013), a chronic psychological condition. In addition to experiencing a traumatic event (i.e.,

Criterion A), a diagnosis of PTSD per *DSM-IV* criteria requires that a person also experience at least one reexperiencing symptom (Criterion B), at least three avoidance symptoms (Criterion C), and at least two hyperarousal symptoms (Criterion D). Symptoms must persist at least 6 months following the trauma exposure (Criterion E) and must cause significant impairment or distress (Criterion F; APA, 2000). The lifetime population rate of PTSD 12.8% for women, and women are significantly more likely than men to develop the disorder (Kessler et al., 2017; Yehuda, Lehrner, & Rosenbaum, 2015).

With respect to research examining the associations among trauma exposure, PTSD, and sexual dysfunction, sexual trauma is frequently the focus. Although it is important to recognize that not all women who experience sexual trauma report sexual problems or develop PTSD, it is noteworthy that rates of PTSD associated with sexual assault are higher than those related to other types of traumatic events (Kilpatrick, Resnick, Saunders, & Best, 1989). Difficulty achieving orgasm, reduced sexual attraction, decreased sexual satisfaction and desire, and risky sexual behavior are more common among female survivors of sexual trauma than among women who have experienced other types of trauma exposure (Schnurr et al., 2009; Turchik & Hassija, 2014; Van Berlo & Ensink, 2000). In the case of arousal and desire problems, difficulties may occur as a result of a negative association with sexual activity linked to the aversive sexual experience. With respect to risky sexual behavior following sexual trauma, findings regarding the temporal nature of the association have been mixed, but it may be that risky behaviors (e.g., engaging in unprotected sex) result from problematic substance use linked to depression and other psychological problems associated with trauma exposure (Turchick & Hassija, 2014).

Previous research has also shown an association between childhood sexual abuse (CSA) and long-term difficulties in sexual functioning (e.g., Berthelot, Godbout, Hébert, Goulet, & Bergeron, 2014). For example, women who survive CSA have been found to be significantly more likely than women who did not experience CSA to report three or more symptoms of sexual dysfunction, including difficulty achieving orgasm, diminished pleasure and interest in sex, sexual performance anxiety, or painful intercourse (Najman, Dunne, Purdie, Boyle, & Coxeter, 2005).

Although sexual dysfunction is not a specific symptom of PTSD; it is commonly reported by individuals being treated for PTSD (e.g., Breyer et al., 2014; Cosgrove et al., 2002; Yehuda et al., 2015). Although it is unclear which symptoms of PTSD are most associated with sexual dysfunction, researchers have suggested that a combination of symptoms may be precipitants, including emotional numbing, avoidance, altered self-schemas, and negative affect (Yehuda et al., 2015). For example, emotional numbing may block desire by limiting feelings of attachment and closeness, whereas self-blame and guilt may encourage avoidance of intimacy and sexual contact. Reexperiencing symptoms, including intrusive memories and flashbacks, may disrupt intimate relationships by triggering defensiveness (Van Berlo & Ensink, 2000), and avoidance

of feared stimuli and the suppression of positive emotion have been identified as being critical in the association between PTSD and sexual dysfunction (Letourneau, Resnick, Kilpatrick, Saunders, & Best, 1996). More specifically, emotional numbing and the generalization of negative emotions experienced at the time of trauma exposure appear to interfere with positive emotional experiences during sexual activity.

In female veterans who report military sexual trauma, specific PTSD symptom clusters have been shown to mediate the associations among trauma exposure, sexual dysfunction, and sexual satisfaction (Blais, Geizer, & Cruz, 2018). The association between trauma exposure, sexual satisfaction, and sexual functioning was found to be fully mediated by dysphoric arousal and anhedonia symptoms such that female veterans with a history of military sexual trauma were more likely to have sexual problems if they exhibited these symptoms. Furthermore, the effect of military sexual trauma and harassment on sexual function was found to be mediated by negative alterations in cognition and mood. To account for these findings, Blais and colleagues (2018) posited that anhedonia, dysphoric arousal, and negative alterations in cognition and mood may inhibit sexual function and satisfaction by decreasing relational intimacy. Other researchers (e.g., Martinson, Sigmon, Craner, Rothstein, & McGillicuddy, 2013) have agreed that PTSD symptoms may influence sexual function through attenuated relational intimacy. For example, hyperarousal symptoms (e.g., exaggerated startle response, hypervigilance) may inhibit sexual functioning by increasing relational anxiety. Other hyperarousal symptoms, including anger and irritability, may also affect sexual functioning by impeding relational intimacy (Mills & Turnbull, 2004).

Although there is a paucity of research linking trauma exposure and PTSD to low sexual desire specifically, theoretical and empirical research point to a likely association between these factors. A sexual response model proposed by Basson (2001) provides a theoretical framework through which the associations among trauma exposure, PTSD, and low sexual desire may be understood. In this model, positive emotions and a rewarding outcome of the sexual encounter are essential for contributing to motivation for future sex. This model also prioritizes sexual stimuli, or triggers, for eliciting sexual arousal (Toates, 2009) and recognizes the role of attention and the ability to manage distractions or intrusions in adequately attending to erotic stimuli (Prause, Janssen, & Hetrick, 2008). From this model, one could predict that reexperiencing symptoms and hyperarousal symptoms may decrease focus on erotic stimuli and/or lead to distracting or even intrusive thoughts, either of which impede arousal and, subsequently, responsive desire. Moreover, associated features of PTSD, namely those that are categorically dissociative in nature (e.g., derealization and depersonalization), would interfere with recognition and attention toward erotic stimuli, therefore impeding arousal and responsive desire.

Empirically, there is evidence of an indirect relation between childhood trauma exposure, which is characterized

by self-reported physical, sexual, or emotional abuse and/or physical or emotional neglect, and low sexual desire mediated by depression (O'Loughlin, Rellini, & Brotto, 2019). Additionally, there are indications that early life trauma may impact sexual desire through dysregulation of the hypothalamic pituitary adrenal (HPA) axis, the main system responsible for the physiological stress response (King, Mandansky, King, Fletcher, & Brewer, 2001). This finding is supported by the observation that women with low sexual desire are more likely to demonstrate HPA axis dysregulation compared to sexually healthy controls (Basson et al., 2019).

Although there is considerable research on the impact of trauma exposure and PTSD on general sexual dysfunction, this is the first study to examine their impact on chronic low sexual desire in women. Here, we used the definition of hypoactive sexual desire disorder (HSDD), defined as persistent and clinically significant reductions in sexual desire that are associated with personal or relationship distress as outlined by the *DSM-IV-TR* (APA, 2000). Based on the extant literature, we hypothesized that (a) women with HSDD would have experienced a higher number of Criterion A PTSD events; (b) relative to sexually healthy controls, women with HSDD would be more likely to meet diagnostic criteria for lifetime or current PTSD; (c) among participants who met criteria for lifetime or current PTSD, women with HSDD would be more likely to meet criteria for cluster-specific symptoms in the past month than those with no sexual desire concerns; and (d) among participants who met criteria for lifetime or current PTSD, the degree of past-month symptom intensity and frequency would be higher in women with HSDD than in those in the sexually healthy group.

Method

Participants

Participants for the current study were recruited from a sample of 324 women who took part in a larger study investigating the associations among mood, stress hormones, and sexual desire in women with and without sexual desire concerns. To ensure a comprehensive comparison of PTSD rates and symptoms by group, 55 women who either did not participate or provide sufficient information in the clinical interview portion of the study were excluded from analyses. Thus, the total sample for the current study was 269 women ($n = 132$ HSDD, $n = 137$ sexually healthy controls).

Participants were recruited from the community through advertisements on various platforms (e.g., hospital listservs, online message boards, etc.). Women were invited to participate in the study if they were between the ages of 19 and 65 years, were nonsmokers, had no major medical illness that could affect sexual functioning, were not pregnant, were not currently on medications known to affect sexual functioning (e.g., antidepressants, hormone replacement therapy), and had a body mass index between 18.5–29.9 kg/m^2. Additionally, women with a current diagnosis of depression were excluded from the study

on the basis that a lack of desire could primarily be a manifestation of a lack of motivation to engage in rewarding experiences, a characteristic of depression which may confound problems specific with sexual desire. In accordance with *DSM-IV-TR* diagnostic criteria, women were placed in the HSDD group if they reported experiencing a lack of interest in sexual activity and/or reduced or absent sexual thoughts and fantasies as well as marked distress or interpersonal difficulties associated with low sexual desire (APA, 2000). Exclusion criteria also included low desire that was entirely attributed to pain during intercourse or relationship discord or that lasted for less than 1 year. Several demographic variables were collected to describe the current sample, including age, race/ethnicity, educational attainment, relationship status and duration, sexual orientation, and employment status (Table 1). Descriptive statistics for primary study variables, by group, are presented in Table 2.

Procedure

Once inclusion criteria were established, participants were emailed a link to a battery of online questionnaires to be completed at a time of her choosing. Each participant then attended an in-person assessment with a trained clinical interviewer who conducted the Decreased Sexual Desire Screener (DSDS), the Clinician-Administered PTSD Scale (CAPS), and the Life Events Checklist (LEC) with each participant. Clinical interviewers were individuals who held a minimum of a master's degree in clinical or counseling psychology. Each interviewer had received formal training in assessment as well as training from a registered psychologist on administration of the CAPS.

Participants were provided a $50 (CND) honorarium for the current study. The study was approved by the University of British Columbia's Clinical Research Ethics Board and the Vancouver Coastal Health Hospital Research Ethics Board, and all research participants provided written informed consent.

Measures

Hypoactive sexual desire disorder. The Decreased Sexual Desire Screener (Clayton et al., 2009) is a brief, clinician-administered instrument used to diagnose generalized acquired HSDD in women. Participants were asked to first answer a series of four *yes* or *no* questions concerning their level of sexual desire and sexual satisfaction. A fifth question was asked to exclude confounding factors that may interfere with sexual desire, including illness, medications, substance use, stress or fatigue, recent childbirth, menopause, and relationship discord. Participants were diagnosed with acquired generalized HSDD if they responded *yes* to all items in Questions 1–4 and *no* to items in Question 5. If a respondent answered *yes* to Questions 1–4 and *yes* to factors in Question 5, she also received a diagnosis of HSDD if, after further assessment, those factors did not indicate another primary diagnosis. The DSDS has demonstrated strong diagnostic utility, showing high sensitivity (.88) and specificity (.84) as well as 85.2% diagnostic accuracy

Table 1

Participant Demographic Characteristics for Women With Hypoactive Sexual Desire Disorder (HSDD) and Healthy Controls

Variable	HSDD (n = 132)				Control (n = 137)			
	M	*SD*	*n*	*%*	*M*	*SD*	*n*	*%*
Age (years)	32.89	11.74			31.88	12.07		
Relationship duration (months)	82.52	88.16			76.83	98.69		
Race/ethnicity								
Euro-Caucasian			82	62.12			81	59.12
East Asian			24	18.18			34	24.82
South Asian			7	5.30			9	6.57
First Nations			2	1.52			1	0.73
Middle Eastern			5	3.78			3	2.12
African-Canadian			2	1.52			1	0.73
Other			10	7.58			8	5.84
Educational attainment								
High school			11	8.33			25	18.25
College/technical/trade school			23	17.42			19	14.39
Undergraduate degree			55	41.67			55	40.15
Master's degree			27	20.45			22	16.06
Doctoral degree			6	4.54			9	6.57
Other			10	7.58			7	5.11
Employment status								
Full-time			52	39.39			50	36.50
Part-time			21	15.90			21	15.34
Self-employed			6	4.54			8	5.84
Unemployed			2	1.51			1	0.73
Retired			5	3.79			2	1.46
Student			37	28.03			51	37.23
Homemaker			3	2.27			1	0.73
Other			6	4.54			3	2.19
Sexual orientation								
Heterosexual			110	83.33			113	82.48
Lesbian			4	3.03			4	2.92
Bisexual			12	9.09			15	10.95
Other			6	4.54			5	3.65
Relationship status								
Single			26	18.98			40	29.20
Dating			27	19.70			43	32.58
Married/cohabitating			70	51.09			45	34.09
Divorced			2	1.51			2	1.46
Widowed			2	1.51			1	0.73
Other			5	3.79			6	4.54

Note. No significant group difference on any demographic variables was observed, *p*s > .05, except for relationship status: $\chi^2(5, N = 269) = 12.40$, $p = .030$.

(Clayton et al., 2009). In the current sample, the Cronbach's alpha value was .90.

PTSD diagnosis and symptoms. The Clinician-Administered PTSD Scale (CAPS-IV) is a semi-structured diagnostic interview designed to assess PTSD symptom severity and diagnosis across each of the 17 symptoms outlined in the *DSM-IV-TR* (Weathers, Keane, & Davidson, 2001). The frequency and intensity of each symptom was rated by a clinician on a Likert-type scale ranging from 0 to 4, with higher numbers reflecting more frequent or intense symptomology (Foa & Tolin, 2000). The "1, 2" rule was applied to determine a diagnosis; that is, a frequency score of 1 and an intensity score of 2 was required for a particular symptom to meet

Table 2

Descriptive Statistics for Primary Study Variables, by Group

Variable	HSDD		Control	
	n	*%*	*n*	*%*
CAPS: Criterion A met	94	71.2	76	55.5
	M	*SD*	*M*	*SD*
Criterion B symptoms				
Current	0.92	1.22	0.49	0.84
Lifetime	2.22	1.98	1.79	1.47
Criterion C symptoms				
Current	1.17	1.36	0.70	1.24
Lifetime	3.19	2.05	2.72	3.44
Criterion D symptoms				
Current	1.32	1.30	0.71	1.12
Lifetime	2.30	1.94	1.77	1.35
Total symptom frequency				
Current	8.78	7.20	4.82	5.41
Lifetime	20.57	11.07	17.18	11.13
Total symptom intensity				
Current	9.50	7.37	5.33	5.49
Lifetime	20.08	10.25	16.81	11.03
Total traumatic events experienced	2.70	1.79	2.51	1.88

Note. CAPS = Clinician-Administered PTSD Scale.

diagnostic criterion (Weathers, Ruscio, & Keane, 1999). A PTSD diagnosis was then made according to the *DSM-IV* algorithm of endorsement of one symptom from Cluster B (reexperiencing), three symptoms from Cluster C (avoidance), and two symptoms from Cluster D (hyperarousal), along with meeting Criteria A (index event), E (symptom duration), and F (degree of distress and functional impairment). For the current study, assessment of both current and lifetime PTSD was conducted for most participants; 38 participants were only assessed for current PTSD due to scheduling conflicts that prevented administration of the full CAPS-IV. A total score for symptom frequency was yielded by summing the frequency scores for the 17 items across the three symptom clusters, and the same was done for intensity scores. Previous research has reported Cronbach's alpha values for internal consistency ranging .77 to .96 (Weathers et al., 2001). In the present sample, the Cronbach's alpha value for all CAPS items was .96.

Lifetime trauma exposure. The Life Events Checklist (LEC; Gray, Litz, Hsu, & Lombardo, 2004) was developed to evaluate whether an individual has experienced a range of potentially traumatic events, such as sexual assault, physical assault, combat, natural disasters, and/or severe human suffering. For each of the 17 items on the list, respondents are asked to rate their experience, using a 5-point nominal scale that includes the response options *happened to me*, *witnessed it*, *learned about it*, *not sure*, and *does not apply*. The CAPS was administered after the LEC, during which identification of the most salient event (i.e., index event) by the participant was made.

Data Analysis

Of the 269 participants, none had missing data on the LEC. Five participants did not complete the CAPS interview and, thus, could not be assessed for current or lifetime PTSD; these participants were not included in analyses outside of those concerning the LEC. An additional 38 women were not assessed for lifetime PTSD during the CAPS interview and were not included in the analysis of group differences in lifetime PTSD prevalence; however, they were included in analyses pertaining to current PTSD rate and symptomatology.

To compare demographic variables by group, chi-square tests were carried out for categorical variables, and independent samples *t* tests were conducted for continuous variables. To assess for potential group differences in the types of directly experienced potentially traumatic events (i.e., LEC items with an endorsement of *happened to me* or, for "sudden or violent death," an endorsement of *witnessed*), a series of chi-square tests were conducted. To control for effects of multiple testing, we used the Benjamini-Hochberg procedure for alpha correction (Benjamini & Hochberg, 1995). This procedure provides an estimate of the proportion of significant findings that are actually false positives. The corrected alpha is set to the value of the largest *p* value that is less than $(i/m)Q$, where i is equal to the *p* value rank, m is equal to the number of tests being conducted, and Q is equal to the false discovery rate (set here at 5%). To examine group differences with respect to frequency of directly experienced potentially traumatic events, an independent samples *t* test was conducted.

To assess for group differences in the rate of current and lifetime PTSD diagnosis, chi-square analyses were conducted. We then used a chi-square test to compare the subset of women in each group who met criteria for either current or lifetime PTSD on the presence of cluster-specific symptomatology in the past month. Again, the Benjamini-Hochberg alpha correction procedure was applied here to control for the effects of multiple comparisons. Next, we used an independent samples *t* test to compare the two groups on the total frequency and intensity of PTSD symptoms. Effect sizes were calculated as odds ratios (*OR*s) with 95% confidence intervals for chi-square tests and Cohen's *d* for independent samples *t* tests. All data analyses were conducted using SPSS (Version 25.0).

Results

Exposure to Traumatic Events

We began by examining the frequency of exposure to potentially traumatic events within the sample. Overall, the rate

Table 3
Summary of Life Events Checklist Results, by Group

Event	HSDD (%)	Control (%)	χ^2 (1, N = 269)	p
Natural disaster	12.1	13.1	0.06	.802
Fire/explosion	3.0	5.8	1.25	.265
Transportation accident	34.1	35.8	0.08	.733
Serious accident	15.2	13.9	0.09	.765
Exposure to toxic substance	5.3	5.1	0.01	.943
Physical assault	26.5	26.3	0.01	.965
Assault with a weapon	7.6	5.8	0.33	.569
Sexual assault	18.9	13.1	1.68	.196
Uncomfortable/unwanted sexual experience	51.5	35.8	6.78	.009
Combat exposure	0.8	2.2	0.94	.332
Captivity	1.5	2.2	0.17	.682
Life-threatening illness	6.1	3.6	0.85	.357
Severe human suffering	3.0	2.9	0.01	.957
Sudden violent death	3.8	0.7	2.88	.090
Sudden death of a loved one	27.3	29.9	0.23	.630
Serious injury	3.0	1.5	0.76	.383
Other	50.0	53.3	0.29	.590

Note. Benjamini-Hochberg alpha correction applied (α = .003).

of potentially traumatic events experienced was low within the entire sample. Specifically, endorsement was very low for combat or exposure in a war zone (1.5%); serious injury, harm or death (2.2%); severe human suffering (3.0%); captivity (1.9%); sudden violent death (2.2%); fire or explosions (4.5%); exposure to a toxic substance (5.2%); and assault with a weapon (6.7%). Endorsement was higher for natural disaster (12.6%), serious accident at work/home (14.5%), sexual assault (16%), physical assault (26.4%), sudden unexpected death of a close friend or family member (28.6%), and transportation accident (34.9%). The most frequently endorsed items were "other unwanted or uncomfortable sexual experience" (43.5%) and "any other stressful event or experience" (51.7%). Endorsement rates for all 17 items, compared by group, are presented in Table 3. Next, we compared the endorsement rates for each event included on the LEC by group. As none of the comparisons met the condition of their *p* value being less than the lowest Benjamini-Hochberg corrected *p* value of .003, we concluded that there were no significant between-group differences with respect to the type of traumatic event experienced (Table 3). We then compared the groups on the total number of potentially traumatic events encountered. No significant group difference was observed between women in the HSDD group (M = 2.70, SD = 1.79) and women in the sexually healthy control group (M = 2.51, SD = 1.88), $t(267)$ = −0.83, p = .411.

Rate of PTSD

Next, we compared the rates of current and lifetime PTSD between groups. Although overall current PTSD rate was low

in both women with HSDD (7.7%) and sexually healthy women (1.5%), women with HSDD were significantly more likely to meet criteria for a current PTSD diagnosis compared to sexually healthy controls, OR = 5.50, 95% CI [1.18, 25.61]. Similarly, significantly more women with HSDD (45.3%) compared to sexually healthy women (22.9%) met diagnostic criteria for lifetime PTSD. It was estimated that the odds of meeting criteria for lifetime PTSD were 2.78, 95% CI [1.56, 4.94], times higher for participants in the HSDD group compared to the sexually healthy group. The results of the chi-square tests are presented in Table 4.

PTSD Symptoms

We then compared the rate at which symptom cluster and associated features criteria were met in the past month among the women in the sample who met criteria for either lifetime or current PTSD. With a Benjamini-Hochberg alpha correction applied (α = .029), we found that women with HSDD were not significantly more likely than women with no sexual desire concerns to meet criteria for Cluster B (reexperiencing) symptoms; however, they were significantly more likely to meet criteria for Cluster C (avoidance), OR = 5.10, 95% CI [1.36, 19.34]; and Cluster D (hyperarousal) symptoms, OR = 4.84, 95% CI [1.73,13.53], in the past month. Regarding associated features of PTSD, women with HSDD were not significantly more likely to experience guilt over acts of commission or omission, reduction in awareness of surroundings, derealization, or depersonalization. The results of chi-square tests are summarized in Table 4.

Table 4

Group Comparisons for Current and Lifetime Posttraumatic Stress Disorder (PTSD) Diagnosis, Past-Month Cluster-Specific Symptom Criteria, and Associated Past-Month Features

Variable	N	df	χ^2 (1, N = 269)	p
Current PTSD	264	1	5.85	.016
Lifetime PTSD	226	1	12.59	< .001
Past-month Criterion B[a]	77	1	2.91	.589
Past-month Criterion C[a]	77	1	6.52	.011
Past-month Criterion D[a]	77	1	9.70	.002
Guilt over acts of omission or commission[a]	77	1	2.97	.085
Reduction in awareness of surroundings[a]	77	1	0.35	.554
Derealization[a]	77	1	2.69	.101
Depersonalization[a]	77	1	1.31	.252

[a]*Note.* Benjamini-Hochberg alpha corrections applied (α = .029).

Finally, among women in the sample who met criteria for either current or lifetime PTSD, we found that women in the HSDD group experienced PTSD symptoms more frequently in the past month (M = 11.87, SD = 8.28) than did women in the sexually healthy group (M = 7.17, SD = 6.83), t(75) = −2.60, p = .011, d = 0.62. Additionally, we found that among women who met criteria for either current or lifetime PTSD, women in the HSDD group experienced PTSD symptoms more intensely in the past month (M = 12.36, SD = 8.47) then women in the sexually healthy group (M = 8.00, SD = 6.86), t(75) = −2.37, p = .021, d = 0.57.

Discussion

The primary goal of the present study was to examine the associations among PTSD, trauma exposure, and low sexual desire (i.e., HSDD) in women. Specifically, we aimed to compare the frequency and type of trauma exposure and rate of PTSD diagnosis among women with HSDD and those who reported no sexual desire concerns. Additionally, within the subsample of women who met criteria for either current or lifetime PTSD, we examined whether differences in PTSD symptomatology, in terms of frequency and intensity of symptoms as well as diagnostic cutoffs for each symptom cluster and associated features, could be observed between groups.

The results of this study suggest that women with low sexual desire compared to sexually healthy women have not been exposed to significantly more, or differing types of, potentially traumatic events. Given that the focus of this paper is on sexual function, it is worth emphasizing that women in the two groups did not differ significantly with respect to their responses on Item 8 of the LEC, which concerns sexual assault. This finding is consistent with research showing that not all women who have experienced childhood sexual abuse have poorer sexual functioning in adulthood and that those that do demonstrate a wide range of sexual functioning (Berthelot et al., 2014).

Consistent with research documenting an association between PTSD and sexual dysfunction (e.g., Baggett et al., 2017; Cosgrove et al., 2002; Yehuda et al., 2015), we observed that women with HSDD were more likely to meet criteria for current and lifetime diagnoses of PTSD when compared to sexually healthy controls. This finding is important as this study was the first to our knowledge to examine PTSD in relation to low sexual desire, specifically in women. Although directionality cannot be determined via the methods used in this study, the current findings point to the possibility that for some women who experience low sexual desire, PTSD symptoms may contribute to the onset or perpetuation of their sexual difficulty.

Together, the above two findings—that women with HSDD appear more likely to meet diagnostic criteria for current and lifetime PTSD, despite there being no discernable differences in exposure to type or frequency of potentially traumatic events between the two groups—is significant. First, these findings point to the possibility of a shared risk factor between HSDD and PTSD. As chronic life stress and atypical stress responsiveness (i.e., HPA axis dysregulation) have been associated with both low levels of sexual desire (Basson et al., 2019; Hamilton & Julian, 2014) and PTSD (Brewin, Andrews, & Valentine, 2000; Yehuda, 1997), there is reason to believe these to be factors in the heightened risk of PTSD development in women with HSDD. That women with HSDD demonstrated more severe PTSD symptomatology compared to women with no sexual desire concerns indicates the possibility of a higher degree of HPA axis dysregulation among women in the HSDD group. This may be the result of a higher number of nontraumatic daily stressors or early life trauma (Basson et al., 2019; O'Loughlin et al., 2019) typically experienced among women with HSDD compared to those with no sexual health concerns.

Regarding the higher rate of women in the HSDD group who met the cutoff for Criterion C (persistent avoidance of stimuli), compared to women in the control group, it is possible that in addition to the impact on sexual desire of being detached or estranged from others, avoidance symptoms most predominantly impact sexual desire through restricted range of affect. In support of this speculation, individuals with sexual difficulty are found to be more likely to exhibit difficulty identifying or disclosing their emotional states, compared to those without desire concerns (Wise, Osborne, Strand, Fagan, & Schmidt, 2002). For those individuals who experienced trauma exposure of a sexual nature, it is likely that trauma exposure had a more direct effect on avoidance symptoms such that sexual situations were actively avoided on the basis that they were trauma reminders. Given that exposure to competent sexual stimuli is a necessary component for the emergence of sexual desire (Basson, 2001),

the predominance of avoidance symptoms among women with PTSD may directly contribute to their loss of sexual desire as they may not be interacting with the necessary triggers to elicit their sexual response.

Women with low levels of sexual desire have been found to be more likely than sexually healthy controls to have sex for avoidance-based reasons, such as wanting to avoid conflict (Bockaj, Rosen & Muise, 2019), and avoidance has been identified as major aspect of understanding the impact of low desire within couples (Hogue, Rosen, Bockaj, Impett, & Muise, 2019). Consistently engaging in sex as a means to aid avoidance goals lowers satisfaction for both partners. These findings suggest that for women with low desire and PTSD in particular, treatment might focus on directly targeting avoidance factors, which block motivation for sex.

Attenuated relational intimacy has been linked to both hyperarousal symptoms (Mills & Turnbull, 2004) and low sexual desire (Stephenson & Meston, 2010). As such, it is worth emphasizing that, in the present study, women in the HSDD group were more likely than healthy controls to endorse hyperarousal symptoms, such as irritability and anger outbursts, and avoidance symptoms, including feeling detached or estranged from others. Consistent with Basson's circular sexual response model (2001) and Toates' incentive motivation model (2009), it is possible that hyperarousal symptoms impact sexual desire negatively by increasing focus and attention on nonrelevant sexual cues and away from relevant sexual triggers necessary for eliciting sexual arousal.

Recent research has explored the role of interoceptive awareness, defined as an individual's ability to recognize internal bodily states in women's sexual response (Velten & Brotto, 2017). These data indicate that women who are able to remain focused and challenge distractions were better able to experience sexual response, even when it was accompanied by negative emotions. Given that women with PTSD and low desire may exhibit a combination of avoidance and hyperarousal symptoms, these findings suggest that they may also experience lower rates of interoceptive awareness. Because the latter can be cultivated by behavioral exercises, including mindfulness meditation, future studies might focus on the role of enhancing interoceptive awareness as a means of targeting these PTSD symptoms among women with low desire.

Although this study had notable strengths, it was not without limitations. The overall rate of women who met the criteria for PTSD diagnosis was low in both groups. The number of women with HSDD and sexually healthy women who met criteria for some PTSD symptoms and associated features was similarly low. These low rates may have created a floor effect that diluted observed group differences. Moreover, due to scheduling difficulties, a large number of participants ($n = 38$) were assessed for current PTSD but not lifetime PTSD, and this was the case more so for women in the HSDD group compared to the control group. Additionally, women in the present study were part of a larger study that did not aim to recruit women specifically with a history of trauma exposure or those who were experiencing current PTSD symptoms. Therefore, it is possible that this study did not adequately capture certain details or sample characteristics that may have otherwise nuanced our findings of an association between trauma and low sexual desire. Women with a current diagnosis of clinical depression were also excluded from the study. As depression is commonly comorbid with PTSD (Brady, Killeen, Brewerton & Lucerini, 2000), it is possible that excluding women with current depression reduced the generalizability of findings. Alternatively, however, it should be noted that there is substantial symptom overlap between PTSD and major depressive disorder, which may contribute to diagnostic confusion (Brady et al., 2000). Thus, the exclusion of women with a current diagnosis of depression may be considered a strength of this study.

We utilized the *DSM-IV-TR* definition of HSDD, although that diagnosis has been replaced by "female sexual interest/arousal disorder" (FSIAD) in the fifth edition of the *DSM* (*DSM-5*; APA, 2013). Because the study was designed before the *DSM-5* was in use, HSDD was used to categorize women. Given evidence that more than 70% of women with HSDD will also meet criteria for FSIAD (O'Loughlin, Basson, & Brotto, 2018), it is likely that the current observed group differences between HSDD and controls would also apply to women with FSIAD. As this study was designed before the *DSM-5* was available, it also meant that we utilized the *DSM-IV-TR* criteria for PTSD, and, as such, the symptom clusters have changed. Whereas the *DSM-IV-TR* PTSD focused on Clusters B (reexperiencing), C (persistent avoidance of stimuli), and D (increased arousal; APA, 2000), the *DSM-5* PTSD criteria expanded to include Clusters B (intrusion), C (persistent avoidance of stimuli), D (negative alterations in cognitions and mood), and E (alterations in arousal and reactivity). Future studies should seek to further evaluate the relation between PTSD symptom clusters and FSAID, using *DSM-5* criteria. Finally, the cross-sectional design of the present study did not allow us to determine causality or directionality. Thus, it is unclear if PTSD is a precipitant or perpetuate of low sexual desire. Future research in this area would benefit from a longitudinal study design.

Despite these limitations, we believe these findings have relevant clinical implications. Screening for PTSD and associated symptoms in women with low levels of sexual desire who are seeking treatment may be valuable in determining tailored treatment options, and this recommendation is consistent with the Grade A recommendation from the International Consultation on Sexual Medicine (Brotto et al., 2016). For example, evidence that PTSD symptoms, particularly hyperarousal symptoms, impact sexual desire negatively through inhibited relational intimacy indicates the use of treatments designed to simultaneously improve individual PTSD symptoms and enhance intimate relationship functioning, such as integrative couple's behavioral therapy for PTSD (Erbes, Polunsky, MacDermid, & Compton, 2008) or cognitive behavioral conjoint therapy for PTSD (Monson & Fredman, 2012). Moreover, application of Basson's model of circular sexual response (2001) to the treatment of women with comorbid PTSD and low sexual desire indicates

that an effective method of treatment may be one that focuses on present-moment attentional capacity as a means of managing distractions so women can adequately attend to erotic stimuli. This may also be important for targeting the significant avoidance symptoms shown by women with PTSD and low desire. For example, mindfulness-based treatments may be particularly effective for women with low desire who also experience PTSD-related reexperiencing symptoms or dissociative symptoms. In the context of couple's therapy, techniques that combine relaxation and interoceptive awareness training, such as sensate focus (see Weiner & Avery-Clark, 2014, for a review) may provide an effective method of cultivating sexual desire in women with a history of trauma exposure.

In conclusion, the findings from the current study make an important contribution to our understanding of PTSD symptomatology as a potentially predisposing or perpetuating contributor to low sexual desire. This awareness may inform clinical guidelines for the treatment of low sexual desire among women. Together, the findings that women with low sexual desire are more likely than sexually healthy women to meet criteria for current or lifetime PTSD and to experience PTSD symptoms more frequently and intensely, despite not having been exposed to more or different types of potentially traumatic events, points to the possibility that low sexual desire and PTSD are related through an alteration in stress adaptability.

References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorder* (4th ed., text rev.). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorder* (5th ed.). Arlington, VA: Author.

Baggett, L. R., Eisen, E., Gonzalez-Rivas, S., Olson, L. A., Cameron, R. P., & Mona, L. R. (2017). Sex-positive assessment and treatment among female trauma survivors. *Journal of Clinical Psychology*, 73, 965–974. https://doi.org/10.1002/jclp.22510

Basson, R. (2001). Human sex-response cycles. *Journal of Sex & Marital Therapy*, 27, 33–43. https://doi.org/10.1080/00926230152035831

Basson, R., O'Loughlin, J. I., Weinberg, J., Young, A. H., Bodnar, T., & Brotto, L.A. (2019). Dehydroepiandrosterone and cortisol as markers of HPA axis dysregulation in women with low sexual desire. *Psychoneuroendocrinology*, 104, 259–268. https://doi.org/10.1016/j.psyneuen.2019.03.001

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society: Series B (Methodological)*, 57, 289–300. https://doi.org/10.1111/j.2517-6161.1995.tb02031.x

Berthelot, N., Godbout, N., Hébert, M., Goulet, M., & Bergeron, S. (2014). Rate and correlates of childhood sexual abuse in adults consulting for sexual problems. *Journal of Sex & Marital Therapy*, 40, 434–443. https://doi.org/10.1080/0092623X.2013.772548

Blais, R. K., Geiser, C., & Cruz, R. A. (2018). Specific PTSD symptom clusters mediate the association of military sexual trauma severity and sexual function and satisfaction in female service members/veterans. *Journal of Affective Disorders*, 238, 680–688. https://doi.org/10.1016/j.jad.2018.05.052

Bockaj, A., Rosen, N. O., & Muise, A. (2019). Sexual motivation in couples coping with female sexual interest/arousal disorder: A comparison to control couples. *Journal of Sex & Marital Therapy*, 45, 796–808. https://doi.org/10.1080/0092623X.2019.1623356

Brady, K. T., Killeen, T. K., Brewerton, T., & Lucerini, S. (2000). Comorbidity of psychiatric disorders and posttraumatic stress disorder. *The Journal of Clinical Psychiatry*, 61, 22–32.

Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology*, 68, 748–766. https://doi.org/10.1037/0022-006X.68.5.748

Breyer, B. N., Cohen, B. E., Bertenthal, D., Rosen, R. C., Neylan, T. C., & Seal, K. H. (2014). Sexual dysfunction in male Iraq and Afghanistan war veterans: Association with posttraumatic stress disorder and other combat-related mental health disorders: A population-based cohort study. *The Journal of Sexual Medicine*, 11, 75–83. https://doi.org/10.1111/jsm.12201

Brotto, L., Atallah, S., Johnson-Agbakwu, C., Rosenbaum, T., Abdo, C., Byers, S., . . . Wylie, K. (2016). Psychological and interpersonal dimensions of sexual function and dysfunction. *Journal of Sexual Medicine*, 13, 538–571. https://doi.org/10.1016/j.jsxm.2016.01.019

Clayton, A. H., Goldfischer, E. R., Goldstein, I., DeRogatis, L., Lewis-D'Agostino, D. J., & Pyke, R. (2009). Validation of the Decreased Sexual Desire Screener (DSDS): A brief diagnostic instrument for generalized acquired female hypoactive sexual desire disorder (HSDD). *Journal of Sexual Medicine*, 6, 730–738. https://doi.org/10.1111/j1743-6109.2008.01153.x

Cosgrove, D. J., Gordon, Z., Bernie, J. E., Hami, S., Montoya, D., Stein, M. B., & Monga, M. (2002). Sexual dysfunction in combat veterans with post-traumatic stress disorder. *Urology*, 60, 881–884. https://doi.org/10.1016/S0090-4295(02)01899-X

Erbes, C. R., Polusny, M. A., MacDermid, S., & Compton, J. S. (2008). Couple therapy with combat veterans and their partners. *Journal of Clinical Psychology*, 64, 972–983. https://doi.org/10.1002/jclp.20521

Foa, E. B., & Tolin, D. F. (2000). Comparison of the PTSD Symptom Scale–Interview version and the clinician-administered PTSD scale. *Journal of Traumatic Stress*, 13, 181–191. https://doi.org/10.1023/A:1007781909213

Gray, M. J., Litz, B. T., Hsu, J. L., & Lombardo, T. W. (2004). Psychometric properties of the life events checklist. *Assessment*, 11, 330–341. https://doi.org/10.1177/1073191104269954

Hogue, J. V., Rosen, N. O., Bockaj, A., Impett, E. A., & Muise, A. (2019). Sexual communal motivation in couples coping with low sexual interest/arousal: Associations with sexual well-being and sexual goals. *PloS one*, 14, e0219768. https://doi.org/10.1371/journal.pone.0219768

Hamilton, L. D., & Julian, A. M. (2014). The relationship between daily hassles and sexual function in men and women. *Journal of Sex & Marital Therapy*, 40, 379–395. https://doi.org/10.1080/0092623X.2013.864364

Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Benjet, C., Bromet, E. J., Cardoso, G., . . . Koenen, K. C. (2017). Trauma and PTSD in the WHO World Mental Health surveys. *European Journal of Psychotraumatology*, 8, 1353383. https://doi.org/10.1080/20008198.2017.1353383

Kilpatrick, D. G., Resnick, H. S., Milanak, M. E., Miller, M. W., Keyes, K. M., & Friedman, M. J. (2013). National estimates of exposure to traumatic events and PTSD rate using *DSM-IV* and *DSM-5* criteria. *Journal of Traumatic Stress*, 26, 537–547. https://doi.org/10.1002/jts.21848

Kilpatrick, D. G., Saunders, B. E., Amick-McMullan, A., Best, C. L., Veronen, L. J., & Resnick, H. S. (1989). Victim and crime factors associated with the development of crime-related post-traumatic stress disorder. *Behavior Therapy*, 20, 199–214. https://doi.org/10.1016/S0005-7894(89)80069-3

King, J. A., Mandansky, D., King, S., Fletcher, K. E., & Brewer, J. (2001). Early sexual abuse and low cortisol. *Psychiatry and Clinical Neurosciences*, 55, 71–74. https://doi.org/10.1046/j.1440-1819.2001.00787.x

Kingsberg, S. A. (2014). Attitudinal survey of women living with low sexual desire. *Journal of Women's Health*, 23, 817–823. https://doi.org/10.1089/jwh.2014.4743

Leiblum, S. R., Koochaki, P. E., Rodenberg, C. A., Barton, I. P., & Rosen, R. C. (2006). Hypoactive sexual desire disorder in postmenopausal women: U.S. results from the Women's International Study of Health and Sexuality (WISHeS). *Menopause*, 13, 46–56. https://doi.org/10.1097/01.gme.0000172596.76272.06

Letourneau, E. J., Resnick, H. S., Kilpatrick, D. G., Saunders, B. E., & Best, C. L. (1996). Comorbidity of sexual problems and posttraumatic stress disorder in female crime victims. *Behavior Therapy*, 27, 321–336. https://doi.org/10.1016/S0005-7894(96)80020-7

Martinson, A. A., Sigmon, S. T., Craner, J., Rothstein, E., & McGillicuddy, M. (2013). Processing of intimacy-related stimuli in survivors of sexual trauma: The role of PTSD. *Journal of Interpersonal Violence*, 28, 1886–1908. https://doi.org/10.1177/088626051246910

Mills, B., & Turnbull, G. (2004). Broken hearts and mending bodies: The impact of trauma on intimacy. *Sexual and Relationship Therapy*, 19(3), 265–289. https://doi.org/10.1080/14681990410001715418

Mitchell, K. R., Mercer, C. H., Ploubidis, G. B., Jones, K. G., Datta, J., Field, N., & Wellings, K. (2013). Sexual function in Britain: Findings from the Third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *Lancet*, 382, 1817–1829. https://doi.org/10.1016/S0140-6736(13)62366-1

Monson, C. M., & Fredman, S. J. (2012). *Cognitive-behavioral conjoint therapy for PTSD: Harnessing the healing power of relationships*. New York, NY: Guilford Press.

Najman, J. M., Dunne, M. P., Purdie, D. M., Boyle, F. M., & Coxeter, P. D. (2005). Sexual abuse in childhood and sexual dysfunction in adulthood: An Australian population-based study. *Archives of Sexual Behavior*, 34, 517–526. https://doi.org/10.1007/s10508-005-6277-6

O'Loughlin, J. I., Basson, R., & Brotto, L. A. (2018). Women with hypoactive sexual desire disorder versus sexual interest/arousal disorder: An empirical test of raising the bar. *Journal of Sex Research*, 55, 734–746. https://doi.org/10.1080/00224499.2017.1386764

O'Loughlin, J. I., Rellini, A. H., & Brotto, L. A. (2019). How does childhood trauma impact women's sexual desire? Role of depression, stress, and cortisol. *Journal of Sex Research*. Advance online publication. https://doi.org/10.1080/00224499.2019.1693490

Prause, N., Janssen, E., & Hetrick, W. P. (2008). Attention and emotional responses to sexual stimuli and their relationship to sexual desire. *Archives of Sexual Behavior*, 37, 934–949. https://doi.org/10.1007/s10508-007-9236-6

Schnurr, P., Lunney, C., Forshay, E., Thurston, V., Chow, B., Resick, P., & Foa, E. (2009). Sexual function outcomes in women treated for posttraumatic stress disorder. *Journal of Women's Health*, 18, 1549–1557. https://doi.org/10.1089/jwh.2008.1165

Shifren, J. L., Monz, B. U., Russo, P. A., Segreti, A., & Johannes, C. B. (2008). Sexual problems and distress in united states women: Rate and correlates. *Obstetrics and Gynecology*, 112, 970–978. https://doi.org/10.1097/AOG.0b013e3181898cdb

Stephenson, K. R., & Meston, C. M. (2010). Differentiating components of sexual well-being in women: Are sexual satisfaction and sexual distress independent constructs? *The Journal of Sexual Medicine*, 7, 2458–2468. https://doi.org/10.1111/j.1743-6109.2010.01836.x

Toates, F. (2009). An integrative theoretical framework for understanding sexual motivation, arousal, and behavior. *Journal of Sex Research*, 46, 168–193. https://doi.org/10.1080/00224490902747768

Turchik, J. A., & Hassija, C. M. (2014). Female sexual victimization among college students: Assault severity, health risk behaviors, and sexual functioning. *Journal of Interpersonal Violence*, 29, 2439–2457. https://doi.org/10.1177/0886260513520230

Van Berlo, W., & Ensink, B. (2000). Problems with sexuality after sexual assault. *Annual Review of Sex Research*, 11, 235–257. https://doi.org/10.1080/10532528.2000.10559789

Velten, J., & Brotto, L. A. (2017). Interoception and sexual response in women with *low* sexual desire. *PloS one*, 12, 0185979. https://doi.org/10.1371/journal.pone.0185979

Weathers, F. W., Keane, T. M., & Davidson, J. R. (2001). Clinician-Administered PTSD Scale: A review of the first ten years of research. *Depression and Anxiety*, 13, 132–156 https://doi.org/10.1002/da.1029

Weathers, F. W., Ruscio, A. M., & Keane, T. M. (1999). Psychometric properties of nine scoring rules for the Clinician-Administered Posttraumatic Stress Disorder Scale. *Psychological Assessment*, 11, 124–133. https://doi.org/10.1037/1040-3590.11.2.124

Weiner, L., & Avery-Clark, C. (2014). Sensate focus: Clarifying the Masters and Johnson's model. *Sexual and Relationship Therapy*, 29, 307–319. https://doi.org/10.1080/14681994.2014.892920

Wise, T. N., Osborne, C., Strand, J., Fagan, P. J., & Schmidt, C. W. Jr. (2002). Alexithymia in patients attending a sexual disorders clinic. *Journal of Sex &Marital Therapy*, 28, 445–450. https://doi.org/10.1080/00926230290001556

Yehuda, R. (1997). Sensitization of the hypothalamic-pituitary-adrenal axis in posttraumatic stress disorder. *Annals of the New York Academy of Sciences*, 821, 57–75. https://doi.org/10.1111/j.1749-6632.1997.tb48269.x

Yehuda, R., Lehrner, A., & Rosenbaum, T. Y. (2015). PTSD and sexual dysfunction in men and women. *The Journal of Sexual Medicine*, 12, 1107–1119. https://doi.org/10.1111/jsm.12856