# Sexual Dysfunction in Male Canadian Armed Forces Members and Veterans Seeking Mental Health Treatment

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**ABSTRACT**

**Introduction**

There is mixed evidence regarding how posttraumatic stress disorder (PTSD) symptom clusters are associated with sexual dysfunction (SD), and most studies to date have failed to account for potentially confounding variables. Our study sought to explore the unique contribution of PTSD symptom clusters on (a) lack of sexual desire or pleasure, and (b) pain or problems during sexual intercourse, after adjusting for comorbidities and medication usage.

**Materials and Methods**

Participants included 543 male treatment-seeking veterans and Canadian Armed Forces (CAF) personnel (aged <65 years), referred for treatment between September 2006 and September 2014. Each participant completed self-report measures of demographic variables, depressive symptom severity, chronic pain, alcohol misuse, and psychotropic medication usage as part of a standard clinical intake protocol. Hierarchical ordinal logistic regression analyses were used to determine the incremental contribution of PTSD symptom clusters on sexual dysfunction.

**Results**

Nearly three-quarters (71.5%) of participants reported a lack of sexual desire or pleasure and 40.0% reported pain or problems during intercourse. Regression analyses suggested that avoidant/numbing symptoms were the only symptoms to be independently associated with lacking sexual desire or pleasure (AOR = 1.10; 95% CI 1.05–1.15). None of the PTSD symptom clusters were independently associated with pain or problems during intercourse.

**Conclusions**

Sexual dysfunction is prevalent among male treatment-seeking CAF personnel and veterans. Results suggest that PTSD symptoms are differentially associated with sexual desire or pleasure concerns. Assessing sexual function among CAF personnel and veterans seeking treatment for PTSD is critical in order to treat both conditions and improve overall functioning.

## INTRODUCTION

Military personnel and veterans represent a population at a relatively high risk for developing posttraumatic stress disorder (PTSD). In Canada, lifetime prevalence estimates range from 7.2% for actively serving Canadian Armed Forces (CAF) members[1] to 13–18% among veterans.[2,3] A significant proportion of those with PTSD will also experience some form of sexual dysfunction, which encompasses difficulties including sexual interest or arousal disorders, pain, and erectile or ejaculatory dysfunctions.[4] Like PTSD, sexual dysfunction is also highly prevalent among military personnel and veterans.[5–9] Existing research suggests that sexual dysfunction is a common and underreported consequence of PTSD, with previous studies demonstrating that PTSD may increase the risk of sexual dysfunction by as much as two to six times.[6,10,11] However, it is not well understood whether particular PTSD symptoms, or clusters of PTSD symptoms, contribute differentially to sexual dysfunction. Understanding how PTSD and sexual dysfunction are related may lead to improvements in the assessment and treatment of both PTSD and associated sexual concerns, particularly as some pharmacologic agents used to treat PTSD may exacerbate sexual problems,[12–14] and sexual dysfunction contributes significantly to quality of life.[9]

Previous research has demonstrated a higher prevalence of sexual dysfunction among individuals with PTSD than those without PTSD in both military and civilian cohorts.[15] In a sample of recently released Afghanistan and Iraq veterans,

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individuals with PTSD were more likely to experience sexual dysfunction (10.6%) than those without a mental health condition (2.3%), or a mental health condition other than PTSD (7.2%). Further, when controlling for sociodemographic, military, and health factors, the risk of sexual dysfunction was increased more than threefold for veterans with a PTSD diagnosis.[6] Similarly, in a sample of treatment-seeking US veterans returning from Iraq and Afghanistan, PTSD was significantly associated with increased sexual dysfunction in both younger (18–40 years), and older (>40 years) veterans.[11] Finally, 91.2% of participants in a study of treatment-seeking CAF members and veterans reported feeling that their military-related psychiatric condition(s) adversely impacted their sexual functioning; the most commonly reported impact was "loss or lessening of desire or interest in sex".[7] Despite the consistent link between a PTSD diagnosis and sexual functioning, few studies have investigated whether specific symptoms may account for this relation.

Researchers aiming to delineate the relation between sexual dysfunction and DSM-IV PTSD symptom clusters (i.e., hyperarousal, re-experiencing, and avoidance/emotional numbing) have identified emotional numbing as particularly relevant. Not only has emotional numbing been associated with both romantic relationship difficulties and distress,[16–18] but in a single study of treatment-seeking American veterans and reservists, it was the only symptom cluster to significantly predict sexual dysfunction.[19] Hyperarousal and re-experiencing symptoms may also affect sexual functioning, as PTSD is hypothesized to dysregulate the physiological mechanisms responsible for normal arousal by re-routing them away from sexual functioning and towards the intrusive memories associated with trauma.[15] In a study of female veterans with PTSD, all three symptom clusters were associated with sexual concerns, such as sexual dissatisfaction, and the numbing and hyperarousal clusters were associated with dysfunctional sexual behaviour, such as using sex to deal with distress.[20] However, none of the aforementioned studies controlled for other variables shown to be associated with sexual dysfunction in non-military populations, such as depression,[21] alcohol misuse,[22] age,[23] and psychotropic medication use.[13]

Researchers have shown that sexual dysfunction negatively impacts health-related quality of life,[8] and it is thus deserving of further research attention. Limitations of existing work include small sample size and lack of statistical control over potentially confounding variables.[7,9–11,17–19,24,25] Furthermore, most of the previous work was conducted on US military and veteran samples. Therefore, within a Canadian treatment-seeking sample of male CAF members and veterans, we sought to: 1) determine the prevalence of sexual dysfunction, defined as the extent to which individuals are bothered by: a lack of sexual desire/pleasure and/or pain/problems during intercourse; and 2) examine the associations between PTSD symptom clusters and sexual dysfunction while controlling for demographic variables, depressive symptom severity, alcohol misuse, chronic pain, and psychotropic medication usage.

## METHODS

### Participants

Participants included 543 male treatment-seeking veterans and currently serving CAF members (age <65 years old). All participants were referred for outpatient treatment of military-related mental health concerns at a specialized clinic (St. Joseph's Operational Stress Injury [OSI] Clinic, in London, Ontario, Canada). All male patients under the age of 65 who provided informed consent for their data to be used for research and program evaluation purposes were eligible for inclusion in the current study. The number of females in the present sample was not sufficiently large enough to investigate potential sex differences, and thus we excluded females from the present study.

### Procedure

As part of the standard intake assessment at the St. Joseph's OSI Clinic, participants completed a series of self-report questionnaires assessing demographic variables, mental and physical health, and well-being. Upon providing written informed consent, we stored clients' self-report data in a de-identified, password-protected electronic database used for program evaluation and clinical research. For the purposes of this study, we accessed this data to cross-sectionally assess interrelations among variables. This study was approved by the relevant hospital Research Ethics Board, Western University's Office of Human Research Ethics, and the Lawson Health Research Institute.

### Measures

#### Demographics

We examined the following participant demographic information: age at intake (years), education level (less than high school, completed high school, some postsecondary, completed postsecondary), military status (veteran/currently serving), and marital status (married/common-law, single, divorced, separated, or widowed).

#### Posttraumatic Stress Disorder

We used the PTSD Checklist – Military Version (PCL-M)[26] to assess overall PTSD symptom severity based on DSM-IV symptom clusters. The data were collected prior to the release of the PCL-5,[27] and therefore, do not reflect changes to the diagnosis of PTSD outlined in the DSM-5.[4] The PCL-M is a 17-item questionnaire assessing past-month PTSD symptom severity resulting from stressful military experiences, with possible responses ranging from 1 (*not at all*) to 5 (*extremely*). We summed responses to provide a total score ranging from 17 to 85, where higher scores indicate greater PTSD symptom severity. Consistent with past research, scores of 50 or greater

signified probable PTSD.[26] We also used the PCL-M to provide severity estimates of PTSD symptom clusters, defined as: 1) *Intrusive recollection*, or recurrent and involuntary recollections of the traumatic event, such as nightmares; 2) *Avoidant/numbing*, which includes avoidance of thoughts and activities related to the trauma and numbing of responses; and 3) *Hyper-arousal*, including irritable behaviors, hypervigilance, and problems concentrating.

### Depression

We measured depression using the Patient Health Questionnaire-9 (PHQ-9), a section of the self-administered version of the Primary Care Evaluation of Mental Disorders (PRIME-MD).[28] Respondents indicated whether they had been bothered by nine depressive symptoms during the past two weeks, such as having "little interest or pleasure in doing things". Response options ranged from 0 (*not at all*) to 3 (*nearly every day*). We summed responses to provide a total score ranging from 0 to 27, where higher scores indicated greater depressive symptom severity.

### Alcohol Misuse

We measured alcohol misuse using the Alcohol Use Disorders Identification Test (AUDIT),[29] a 10-item measure that asks respondents about their current alcohol use in terms of: alcohol consumption frequency (0 = *never* to 4 = *4 or more times a week*); quantity (0 = *none* to 5 = *10 or more*); consequences of drinking (0 = *never* to 4 = *daily or almost daily*); and others' concern about their drinking and injuries of self or others (0 = *no* to 4 = *yes, during the past year*). We summed responses to create a total score ranging from 0 to 41, where higher scores indicated more problematic alcohol use behavior. Scores of 8 or greater signified probable alcohol misuse.[29]

### Lack of Sexual Desire/Pleasure

We measured sexual desire/pleasure concerns using a single-item from the PRIME-MD.[28] The use of a single item to assess sexual desire has been employed in previous research.[5] Participants indicated whether they were bothered by having "little or no sexual desire or pleasure during sex" during the past four weeks, with the following possible responses: 0 (*not bothered*), 1 (*bothered a little*), and 2 (*bothered a lot*). Due to the constraints of this item, we were unable to separate sexual desire from pleasure during sex.

### Pain/problems During Intercourse

We measured pain/problems during intercourse using a single item from the Patient Health Questionnaire-15 (PHQ-15), a section of the self-administered version of the PRIME-MD.[28] Participants indicated whether they were bothered by "pain or problems during sexual intercourse" during the last four weeks with potential responses as follows: 0 (*not bothered*), 1 (*bothered a little*), and 2 (*bothered a lot*). Due to item constraints, we were unable to separate pain during intercourse from problems during intercourse.

### Chronic pain

We measured chronic pain using the Bodily Pain (BP) scale from the Short Form Health Survey (SF-36).[30] This scale is comprised of two questions: "How much bodily pain have you had during the past 4 weeks?" (1 = *none* to 6 = *very severe*), and "During the past 4 weeks how much did pain interfere with your normal work (including both work outside the home and housework)?" (1 = *not at all* to 5 = *extremely*). We calculated BP scores by summing responses, transforming them to a 0–100 scale (where lower scores indicated more severe chronic pain), and standardized them according to age- and sex- to create an indicator of chronic pain severity.[30]

### Psychotropic Medication Use

Participants self-reported their use of medication for anxiety, stress, or depression using the PRIME-MD,[28] with potential responses of 0 = *no* or 1 = *yes*.

### *Data Analysis*

We used Stata IC 13[31] to perform all analyses. Given the low proportion of missing data (2.5%), we used complete-case analysis. To assess the prevalence of sexual dysfunction in the sample, we calculated the number of participants that reported they were "bothered a little" or "bothered a lot" by the respective sexual dysfunction outcome. Because outcomes were ranked on 3-point ordinal scales, we used hierarchical ordinal logistic regression for each sexual dysfunction variable. We first assessed whether overall PTSD symptom severity was independently associated with sexual dysfunction and, if it was, we then determined whether each PTSD symptom cluster was independently associated with sexual dysfunction. We entered predictors in three steps to assess their incremental contribution to sexual dysfunction. In Step 1, we included age, education level, and marital status as predictors. In Step 2, we added depressive symptom severity, alcohol misuse severity, chronic pain, and psychotropic medication use. Finally, in Step 3A, we added overall PTSD symptom severity. If PTSD severity predicted sexual dysfunction, then we re-ran the model with Step 3B comprising all three PTSD symptom clusters (intrusive recollection, avoidant/numbing, and hyperarousal), in place of overall PTSD severity. We assessed for data multicollinearity using variance inflation factors (VIFs). According to a VIF cut off of 10 or higher,[32] we did not identify multicollinearity concerns for any model, as all VIFs were 3.15 or less.

## RESULTS

### *Sample Characteristics*

Sample characteristics are presented in Table I. Nearly three-quarters of participants reported being bothered in the past

**TABLE I.** Cohort Characteristics

| Variable | *n* or *M* | % or *SD* |
|---|---|---|
| Education level ($n = 513$) | | |
| Less than high school | 96 | 18.4% |
| Completed high school | 167 | 32.0% |
| Some postsecondary | 147 | 28.2% |
| Completed postsecondary | 112 | 21.5% |
| Age at intake ($n = 543$) | 41.8 | 10.7 |
| Military status ($n = 543$) | | |
| Veteran | 440 | 81.0 |
| Currently serving | 103 | 19.0 |
| Marital status ($n = 534$) | | |
| Married or common-law | 307 | 57.5% |
| Single, divorced, separated, or widowed | 227 | 42.5% |
| Intrusive ($n = 543$) | 15.7 | 6.0 |
| Avoidant/numbing ($n = 543$) | 22.5 | 8.0 |
| Hyper-arousal ($n = 543$) | 17.6 | 5.8 |
| Pain/problems during intercourse ($n = 492$) | | |
| Not bothered | 295 | 60.0% |
| Bothered a little | 91 | 18.5% |
| Bothered a lot | 106 | 21.5% |
| Sexual desire/pleasure concerns ($n = 502$) | | |
| Not bothered | 143 | 28.5% |
| Bothered a little | 149 | 29.7% |
| Bothered a lot | 210 | 41.8% |

*Note*: $M$ = mean; $SD$ = standard deviation.

four weeks by a lack of sexual desire/pleasure, and two-fifths reported being bothered in the past four weeks by pain/problems during intercourse. Over one-third ($n = 172$; 35.7%) endorsed both types of sexual dysfunction. The average PCL-M score was 55.7 ($SD = 18.1$) and, using a cut-off of 50,[26] most participants met screening criteria for probable PTSD ($n = 379$; 69.8%). The average PHQ-9 score was 15.1 ($SD = 7.3$) and most participants met criteria for probable MDD ($n = 367$; 67.6%) based on PHQ-9 scoring criteria.[28] Using a cut-off score of 8,[29] more than a third of participants met screening criteria for probable alcohol misuse ($n = 213$; 39.2%) with an average AUDIT score of 8.2 ($SD = 8.2$). Almost half of participants ($n = 213$; 47.7%) reported that they were using psychotropic medications, although due to limitations inherent in the screening survey, information on dosage, number of medications, medication class, and use of non-psychotropic medications were not able to be captured. The mean BP score of 39.3 ($SD = 22.5$) indicated considerable chronic pain issues, particularly when considering that scores below 50 indicate below average health.[33]

### *Relation Between PTSD Symptomatology and Sexual Dysfunction*

Being older, being married or in a common–law relationship, having more severe alcohol misuse, and more severe depressive symptoms were associated with increased odds of sexual desire/pleasure disturbances. With the exception of alcohol use, these relationships remained significant after adding overall PTSD severity to the model. In the final model, overall PTSD severity was associated with increased odds of sexual desire/pleasure concerns after controlling for the influence of all covariates (see Table II). Specifically, as PTSD symptom severity increased, the likelihood of being more bothered by sexual desire/pleasure disturbances also increased. Accordingly, we re-ran the hierarchical ordinal regression model, and included PTSD symptom clusters in Step 3B to replace overall PTSD severity. The avoidant/numbing PTSD symptom cluster was the only cluster found to be independently associated with increased odds of experiencing sexual pleasure/desire concerns (see Table II). Specifically, the odds of being more bothered by a lack of sexual desire/pleasure increased by 10% for every 1-point increase in avoidant/numbing symptom severity.

We followed the same hierarchical procedure to assess whether overall PTSD severity predicted pain/problems during sexual intercourse, controlling for all other covariates. Being older, being married or in a common-law relationship, having more severe chronic pain, and having more severe depressive symptoms were all associated with increased odds of pain or problems during sexual intercourse. With the exception of age, these relationships held after adding overall PTSD severity to the model in Step 3A. In the final model, PTSD severity was not associated with pain/problems during sexual intercourse (Table III). Accordingly, we did not assess the influence of PTSD symptom clusters on pain/problems during sexual intercourse.

## DISCUSSION

Nearly three-quarters of participants reported concerns with their sexual desire/pleasure and almost half reported pain/problems during sexual intercourse. Critically, these prevalence estimates do not simply reflect whether problems exist in participants, but indicate that they are both present and participants were "bothered by" the respective sexual dysfunction. As such, findings support previous research demonstrating the notable prevalence of sexual dysfunction among treatment-seeking military personnel and veterans.[5–7] Our results also supported the notion that PTSD may be associated with an increased risk of sexual dysfunction. Overall PTSD severity, and specifically the avoidant/numbing symptom cluster, was significantly associated with sexual desire/pleasure concerns even after controlling for covariates, such as depressive symptom severity, alcohol misuse, psychiatric medication use, and chronic pain severity. However, this association was not found for pain/problems with sexual intercourse. Interestingly, although psychiatric medication use is a reliable predictor of sexual dysfunction,[13] the relationship between psychiatric medication use and both sexual dysfunction variables was nonsignificant after accounting for PTSD and other comorbidities, highlighting the influential role of psychiatric symptoms in sexual dysfunction.

We found that the avoidant/numbing cluster of PTSD was significantly associated with sexual desire/pleasure concerns,

**TABLE II.** Hierarchical Ordinal Regression: Overall PTSD Symptomatology and Symptom Clusters Predicting Sexual Desire/Pleasure Concerns

| | Overall PTSD | | | PTSD Symptom Clusters | | |
|---|---|---|---|---|---|---|
| Variable | *B* | SE | AOR (95% CI) | *B* | SE | AOR (95% CI) |
| Step 1 | | | | | | |
| Age | **0.03**** | **0.01** | **1.03 (1.01–1.04)** | **0.02*** | **0.01** | **1.02 (1.01–1.04)** |
| Marital status[a] | **−0.67**** | **0.20** | **0.52 (0.35–0.76)** | **−0.69**** | **0.20** | **0.50 (0.34–0.74)** |
| Education[b] | | | | | | |
| Completed high school | 0.23 | 0.28 | 1.26 (0.73–2.17) | 0.27 | 0.28 | 1.30 (0.75–2.25) |
| Some postsecondary | 0.52 | 0.28 | 1.68 (0.97–2.93) | 0.52 | 0.28 | 1.68 (0.96–2.94) |
| Completed postsecondary | 0.24 | 0.29 | 1.27 (0.73–2.54) | 0.25 | 0.30 | 1.29 (0.72–2.30) |
| Step 2 | | | $\chi^2$ (4) = 109.13***; $R^2$ = 0.15 | | | |
| Medication usage | 0.33 | 0.19 | 1.39 (0.96–2.02) | 0.31 | 0.19 | 1.37 (0.94–1.99) |
| Chronic pain[c] | −0.01 | 0.01 | 0.99 (0.98–1.00) | −0.01 | 0.01 | 0.99 (0.98–1.00) |
| Alcohol usage | 0.02 | 0.01 | 1.02 (0.99–1.04) | 0.02 | 0.01 | 1.02 (0.99–1.04) |
| Depressive symptoms | **0.08***** | **0.02** | **1.08 (1.04–1.13)** | **0.07***** | **0.02** | **1.08 (1.03–1.12)** |
| Step 3A | $\chi^2$ (1) = 16.99***; $R^2$ = 0.16 | | | $\chi^2$ (3) = 26.56***; $R^2$ = 0.17 | | |
| Overall PTSD severity | **0.03***** | **0.01** | **1.03 (1.01–1.05)** | | | |
| Step 3B | | | | | | |
| Intrusive | | | | 0.01 | 0.02 | 1.01 (0.96–1.05) |
| Avoid/Numbing | | | | **0.10***** | **0.02** | **1.10 (1.05–1.15)** |
| Arousal | | | | −0.03 | 0.03 | 0.97 (0.92–1.03) |

*Note*: Coefficients and odds ratios are provided for the final model only, with all predictors entered. $N$ = 474. B = unstandardized coefficient; *SE* = standard error for B; AOR = adjusted odds ratio; CI = confidence interval; R2 = McFadden's R2; PTSD = posttraumatic stress disorder.
[a]Estimates are for single/divorced/separated/widowed, relative to married or common law.
[b]Estimates using "some high school" as reference category.
[c]Higher scores indicate less chronic pain.
* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

**TABLE III.** Hierarchical Ordinal Regression: Overall PTSD Symptomatology Predicting Pain/Problems During Intercourse

| Variable | B | SE | AOR (95% CI) |
|---|---|---|---|
| Step 1 | | | |
| Age | 0.02 | 0.01 | 1.02 (1.00–1.04) |
| Marital status[a] | **−0.57**** | **0.21** | **0.57 (0.37–0.85)** |
| Education[b] | | | |
| Completed high school | 0.20 | 0.29 | 1.22 (0.69–2.15) |
| Some postsecondary | 0.05 | 0.30 | 1.05 (0.58–1.89) |
| Completed postsecondary | 0.31 | 0.31 | 1.37 (0.75–2.50) |
| Step 2 | $\chi^2$ (4) = 50.57***; $R^2$ = 0.09 | | |
| Medication usage | 0.20 | 0.20 | 1.21 (0.82–1.79) |
| Chronic pain[c] | **−0.02**** | **0.01** | **0.98 (0.97–0.99)** |
| Alcohol usage | −0.01 | 0.01 | 0.99 (0.97–1.02) |
| Depressive symptoms | **0.06**** | **0.02** | **1.06 (1.02–1.11)** |
| Step 3 | $\chi^2$ (1) = 1.04; $R^2$ = 0.09 | | |
| Overall PTSD severity | 0.01 | 0.01 | 1.01 (0.99–1.03) |

*Note*: Estimates are provided for the final model only, with all predictor entered. $N$ = 465. B = unstandardized coefficient; SE = standard error for B; AOR = adjusted odds ratio; CI = confidence interval; $R^2$ = McFadden's $R^2$; PTSD = posttraumatic stress disorder.
[a]Estimates are for single/divorced/separated/widowed, relative to married or common law.
[b]Estimates using "some high school" as reference category.
[c]Higher scores indicate less chronic pain.
* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

which may be partly explained by its constituent, emotional numbing. Emotional numbing is a prominent feature of the avoidant/numbing cluster and is characterized by an inability to feel positive emotions. Insofar as sexual interest and pleasure are construed as positive emotions, one may view problems in these areas as more localized symptoms of a broad inability to experience positive affect. Further, emotional numbing may impair intimacy directly by blunting pleasurable sensations and feelings of attachment, resulting in less enjoyable sexual experiences.[15] Subsequently, one may be disinterested in or withdraw from romantic relationships, thereby limiting opportunities for intimacy.[7] Finally, sexual experiences may be lackluster and consequentially less frequent, creating a cycle of reinforcement that continues to hinder sexual interest and pleasure over time. Our results lend support to the potentially deleterious role of emotional numbing on sexual desire and pleasure, and patients with PTSD who exhibit high degrees of avoidant/numbing symptoms may be specifically at risk for sexual dysfunction. However, our study was limited by its cross-sectional design, precluding causal inferences; future longitudinal research is warranted to delineate the potential mediating pathways bridging the avoidant/numbing cluster with subsequent dysfunction.

PTSD symptoms were not associated with pain/problems during intercourse. The differential impact of PTSD on various aspects of sexual functioning has been highlighted in prior studies. For example, Badour and colleagues[5] found that PTSD negatively impacted sexual desire and arousal within a sample of Operation Iraqi Freedom/Operation Enduring Freedom veterans, but it did not predict a diagnosis of erectile dysfunction. Conversely, McIntyre-Smith and colleagues[7]

found that PTSD severity did not predict changes in sexual desire or intercourse satisfaction, but it did impact other aspects of sexual functioning such as erectile function, and overall sexual satisfaction. Our study was limited by the use of single items to represent broad sexual functioning domains. Although previous researchers have used similar strategies, by using two items to screen for sexual dysfunction[8,19] or one item to assess sexual desire,[6] this limitation prevented us from capturing the full range of sexual dysfunctions reflected in the DSM-5.[4] Despite this, our finding that PTSD was associated with concerns surrounding sexual desire/pleasure, but not pain/problems during intercourse, adds to the evidence base that PTSD symptoms may negatively affect sexual functioning and also reinforces the notion that healthy sexual functioning in one area does not necessitate healthy sexual functioning in others.

Consistent with previous reports of a robust association between depression and sexual dysfunction in non-military populations,[21] our findings demonstrated that symptoms of depression were independently associated with sexual desire/pleasure concerns. However, the majority of previous research focusing on the relation between sexual dysfunction and depression has not included individual PTSD symptoms or clusters, resulting in limited opportunities to evaluate the independent impact of both disorders simultaneously. Our findings suggest that while the avoidant/numbing symptom cluster and depression have similar symptoms (e.g., lack of interest, emotional numbing), these constructs are uniquely associated with the experience of sexual desire and pleasure.

Our findings have important clinical implications. Previous research suggests that sexual health issues among veterans are often underreported or incompletely addressed despite their debilitating impact.[10] Additionally, PTSD specialists may not inquire about sexual functioning due to lack of awareness, expertise, and/or the perspective that it is not a high priority target for intervention.[15] Therefore, it is critical to assess sexual functioning among military personnel and veterans seeking treatment for PTSD, particularly in the context of discussing symptoms of avoidance and emotional numbing. By identifying avoidance and emotional numbing as a treatment target, clinicians working with military personnel and veterans may help patients simultaneously achieve a reduction of PTSD and depressive symptoms, and an improvement in sexual functioning and relationships. Tran and colleagues have recommended a number of approaches that can be integrated with PTSD treatments, including psychoeducation aimed at normalizing sexual problems as common sequelae of trauma, the inclusion of partners in treatment, the application of cognitive-behavioral approaches targeting negative thoughts and emotions about sexual activity, and mindfulness approaches to enhance awareness of sexual sensations.[34]

Overall PTSD symptom severity was not significantly associated with pain or problems during intercourse when accounting for covariates. It is possible that PTSD may affect sexual problems indirectly by virtue of its known associations with chronic pain, as the two conditions are highly comorbid.[35] Further research that aims to delineate the independent contributions of chronic pain and PTSD symptom severity on sexual dysfunction would help clarify these complex relationships.

The present study had the following limitations worth noting. Data were cross-sectional and accordingly, we cannot assume causation. The study relied on self-report, and is subject to reporter bias. The study was limited to males and cannot be generalized to female populations. Despite these limitations, this is the only study to examine the association of PTSD symptom clusters with sexual dysfunction in a Canadian military sample. Consequently, this study adds to the dearth of research addressing the complex relationships between sexual and mental health in CAF members and veterans.

## CONCLUSION

The present study emphasized that sexual dysfunction is an important and prevalent issue among male mental health treatment-seeking CAF personnel and veterans. Overall PTSD severity, and in particular the avoidant/numbing cluster of PTSD, appear to be significantly associated with sexual desire/pleasure concerns. Future research will benefit from well-controlled studies with comprehensive and standardized measures that continue to explore the impact of sexual dysfunction among military cohorts. Research that incorporates treatment outcome data could also clarify whether improvement of PTSD symptoms, specifically avoidance and emotional numbing, diminishes sexual side effects of PTSD. Crucially, future research should aim to assess sexual dysfunction among non-heterosexual groups and in female populations, as these populations are frequently overlooked in military studies. However, it is imperative to raise awareness of the prevalence and impact of sexual dysfunctions in both males and females, and across sexual orientations, to reveal the potentially distinct associations that sexual dysfunction may have with PTSD in each sub-sample of the Canadian military population. Finally, our research stresses the importance of assessing sexual functioning among military personnel and veterans seeking treatment for PTSD, particularly in the presence of significant emotional numbing symptoms with the goal of targeting both conditions to improve overall functioning.

## CONFLICTS OF INTEREST

Dr. Elhai reports other from Royalties for books on PTSD by Elsevier and John Wiley and sons, other from Visiting scientist fellowship from Tinajin Normal University and Chinese Academy of Sciences, China, grants from grant funding from NIH and DoD, outside the submitted work. All other authors have no conflicts to disclose.

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