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Corresponding Author, Guarantor: Kimberley Watkins

Guarantor, requests for Reprints: Mark Zamorski

Email: mark.zamorski@forces.gc.ca

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Military Work-Related Sexual Assault in Canada: Prevalence, Circumstances, Correlates, and

Associations with Mental Disorders

Kimberley Watkins, MA

Rachel Bennett, MSc

Isabelle Richer, PhD

Mark A. Zamorski, MD, MHSA

Department of National Defence

101 Colonel By Drive

Ottawa, ON K1A 0K2

+1 (613) 996-8800

+1 (613) 995-5785 (FAX)

Kimberley.Watkins@forces.gc.ca

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the abstract. The final author contributed substantially to the study, both in its design and implementation, as well as to the interpretation of the study results and the writing and revising of the manuscript. All authors have read and agree with the manuscript’s final content.

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Abstract

Background: We sought to estimate the lifetime prevalence of sexual assault, assess its relationship to military service, and identify the circumstances, correlates, and associations with mental disorders of military work-related sexual assault (MWSA) in Canadian Armed Forces (CAF) personnel.

Methods: We used the 2013 Canadian Forces Mental Health Survey, a cross-sectional survey of a stratified random sample of serving CAF Regular Force personnel ($n = 6,696$). We assessed lifetime trauma exposure and past-year mental disorders using the Composite International Diagnostic Interview. We defined lifetime MWSA as either forced sexual activity or unwanted sexual touching that occurred on deployment, in another CAF workplace, or that was perpetrated by defence personnel. We defined all other sexual assault as lifetime non-MWSA.

Results: Sexual assault was more prevalent among CAF women (lifetime non-MWSA = 24.3%; MWSA = 15.5%) than men (lifetime non-MWSA = 6.0%; MWSA = 0.8%). About a quarter of individuals with MWSA had had an event on deployment. Deployment was a risk factor for MWSA in women. After controlling for covariates, including other lifetime traumas, using logistic regression, MWSA was independently associated with both any lifetime and any past-year mental disorder (adjusted odds ratio [OR] = 2.9 for each outcome) and both lifetime and past-year PTSD (ORs = 4.3 and 4.0, respectively).

Interpretation: CAF women are at increased risk of sexual assault and MWSA, relative to their male peers. Deployment is a risk factor for MWSA, and women who reported MWSA are more likely to experience mental disorders, especially PTSD.

Background

Sexual assault remains an important problem in Canada. Approximately 33% of women and 10% of men have experienced unwanted sexual touching; forced sexual activity is reported by 19% and 3% of women and men, respectively.(1) Sexual assault is a powerful contributor to the burden of mental disorders such as posttraumatic stress disorder (PTSD).(1)

In military personnel, sexual assault has particular significance. The military population is generally younger than the general population, and younger individuals are more at risk for sexual assault.(2-4) Military members also often live in isolated, close quarters with one another,(3, 5) with men greatly outnumbering and frequently outranking women.(3, 6) Military work-related sexual assault (MWSA; sexual assault that occurs in the military workplace or that is perpetrated by defence personnel) is rarely reported, due to barriers such as concerns about confidentiality,(2-4, 7) fear of career repercussions,(2, 4-6) and perceptions of lack of perpetrator accountability.(5, 8) Some aspects unique to MWSA, such as the feelings of betrayal and continuous exposure to the perpetrator when he or she is a unit member, may have a disproportionate influence on mental health.(2, 4, 9, 10) MWSA victims may also have other occupational traumatic experiences, such as combat exposure.(11-13) Thus, the military environment may increase the risk of sexual assault, interfere with intervention, and magnify its consequences.

A recent external review with approximately 700 volunteers indicated that sexual misconduct is problematic in the Canadian Armed Forces (CAF).(7) The vast majority of MWSA research, however, comes from the U.S. military.(2-4, 9, 14) Review studies have found MWSA prevalence ranging anywhere from 10% to 45% among women, (3, 9, 14) with substantial differences in populations and in definitions of MWSA.(2, 3, 9, 14) Furthermore, few studies

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3 have examined the effects of MWSA on mental health beyond those of non-sexual lifetime
4 traumas, which are common among MWSA victims.(11, 12, 15) These U.S. findings have
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6 important limitations, such as low response rates,(16) and may not generalize to the CAF.
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10 In order to gain an accurate depiction of MWSA, an ideal study(2) would comprise a
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12 standardized definition of MWSA; administration by an outside organization to reduce reporting
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14 bias; and a representative sample with a high response rate. We applied these principles in
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16 investigating the prevalence, circumstances, correlates, and associations with mental disorders of
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18 lifetime sexual assault and MWSA, controlling for other lifetime traumas among CAF personnel.
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22 **Methods**

23 *Data source and study population*

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27 Statistics Canada collected the data as part of the Canadian Forces Mental Health Survey
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29 (CFMHS) between April and August 2013.(17) The CFMHS contains a range of measures of
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31 mental health and its correlates, in order to describe the mental health and needed services of
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33 CAF members. For the present analysis, the target population was the entire CAF Regular Force
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35 in service when the survey frame was developed in September 2012.
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39 *Sampling and data collection*

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41 The CFMHS employed a stratified random sampling framework to ensure the
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43 representativeness of the sample relative to the Canadian military as a whole. Interviews were
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45 conducted face-to-face by trained Statistics Canada personnel using the computer-assisted
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47 personal interviewing method (CAPI). In total, 6,696 Regular Force members participated, for a
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49 79.8% response rate.
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53 *Measures*

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We assessed lifetime and past-year prevalence of mood and anxiety disorders (an aggregate variable of major depression, PTSD, generalized anxiety disorder, and panic disorder) with the World Health Organization World Mental Health Composite International Diagnostic Interview (WHO WMH-CIDI)(18), which uses the criteria of the Diagnostic and Statistical Manual of Mental Disorders, fourth edition.(19) We used four outcomes to parsimoniously capture a broad range of current and past mental disorders that may be associated with sexual trauma: lifetime and past-year PTSD, and any lifetime and past year mood or anxiety disorder.

We assessed lifetime non-sexual trauma exposure with a sum score of a 26-item inventory of non-sexual potentially traumatic experiences of the WHO WMH-CIDI PTSD module. Higher scores indicated greater lifetime non-sexual trauma exposure.

We measured lifetime sexual assault using the two sexual trauma-related items of the WHO WMH-CIDI PTSD module trauma inventory: forced sexual activity (“We define sexual assault as anyone forcing you or attempting to force you into any unwanted sexual activity, by threatening you, holding you down or hurting you in some way. Has this ever happened to you?”); and unwanted sexual touching (“Has anyone ever touched you against your will in any sexual way? By this I mean unwanted touching or grabbing, to kissing or fondling”). Endorsement of either or both of these experiences constituted lifetime sexual assault.

Respondents who endorsed either sexual assault item were asked three follow up questions: “Did this ever take place while deployed on a CAF operation?”; “Did this ever take place in your CAF workplace (other than on deployment)?”; and “Were any of the persons who committed this or these acts a CAF member or civilian DND [Department of National Defence] employee at the time of this or these events?” We classified all participants into three mutually exclusive groups based on the responses to these questions: participants who endorsed any of

these three military-related questions (for forced sexual activity and/or unwanted touching) were categorized as having experienced “military work-related sexual assault (MWSA)”; participants who reported lifetime sexual assault (forced sexual activity and/or unwanted touching) but did not indicate that any had been military work-related were classified as having experienced “lifetime non-military sexual assault” (non-MWSA). We considered all other participants to have experienced “no lifetime sexual assault.” Note that the structure of the questions was such that we could not distinguish between those who had had *only* MWSA from those who had had MWSA in conjunction with non-MWSA.

The survey also assessed sociodemographic and military characteristics at the time of the interview, including age group, race, marital status, CAF base geographical region, rank category, military element, and history of deployment.

Analysis

We used SAS version 9.3 for all analyses. We applied statistical weights provided by Statistics Canada, which reflected the sampling scheme and adjusted for non-response for all analyses, to generate weighted, representative prevalence estimates. We estimated prevalence by sex, type of sexual assault, and context. To compare weighted prevalence estimates, we employed the bootstrap method using Statistics Canada’s 500 replicate weights for calculation of 95% confidence intervals (CIs). We used Pearson Chi Squared (χ^2) analyses to examine the significance of differences in prevalence of sexual assault by sociodemographic and military characteristics. We also compared the mean numbers of lifetime non-sexual traumatic events and their 95% CIs by sexual assault category. Because of insufficient statistical power due to the low numbers of men per cell, we included only women in comparisons of sexual assault by

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sociodemographic and military characteristics and in the prevalence of lifetime non-sexual trauma and associations with mental disorders.

We assessed the associations between lifetime non-MWSA and MWSA and mental health outcomes among women using four binary logistic regression models, one per outcome (lifetime PTSD, past-year PTSD, any lifetime mood or anxiety disorder, and any past-year mood or anxiety disorder). We used listwise deletion for the small number of missing values, and Taylor Series Linearization for standard error estimation. We adjusted all models for the sociodemographic and military characteristics associated with the outcome variable (analyses not shown), as well as for lifetime non-sexual trauma. For each regression, we used two between-group comparisons: lifetime non-MWSA vs. no lifetime sexual assault and lifetime MWSA vs. no lifetime sexual assault, with no lifetime sexual assault as the reference group in both cases. We examined adjusted odds ratios (OR) and their respective 95% CIs to determine the magnitude and significance, respectively, of between group differences on the mental health outcomes.

Results

In total, 11.4% of participants reported any lifetime sexual trauma, which was more common among women (39.8%) than men (6.8%; Table 1). The overall prevalence of lifetime non-MWSA was 8.5%, with a higher proportion of women reporting it than men (24.3% versus 6.0%, respectively). Fewer participants reported MWSA (2.9%), which was also more prevalent among female (15.5%) than male (0.8%) members. Unwanted sexual touching was more prevalent than forced sexual activity among both men and women and for both non-MWSA and MWSA.

More than a quarter of women with MWSA reported that at least one instance had occurred on deployment, while very few men reported MWSA on deployment (Table 2). More than half of participants with MWSA stated that at least one event had occurred in a CAF workplace, other than on deployment. The vast majority of the participants who had experienced MWSA reported that it had been committed by a CAF member or DND employee.

The prevalence of no lifetime sexual assault, lifetime non-MWSA, and MWSA by sociodemographic and military characteristics for female participants is depicted in Table 3. There were slight differences in the risk factors for MWSA and non-MWSA. The women who had never been married were more likely to report MWSA than those who were married at the time of the interview. Participants working at CAF bases in Western Canada at the time of the interview were more likely to report MWSA than members from bases in Central Canada/Ontario. Women who had deployed were more likely than those who had never deployed to report MWSA. The participants who had experienced either MWSA or non-MWSA reported a higher number of lifetime non-sexual traumatic events than those with no sexual assault.

Table 4 displays the mental health associations of the sexual assault categories in the four binary logistic regression models. Nearly half of women with MWSA had had PTSD in their lifetime, and almost a quarter had past-year PTSD. The participants who reported either lifetime non-MWSA or MWSA were significantly more likely than those who reported no lifetime sexual assault to have had any lifetime or past-year mood or anxiety disorder or PTSD. After controlling for potentially confounding variables, the women who had experienced non-MWSA were about twice as likely as those with no history of sexual assault to have had any lifetime mental disorder or past-year PTSD, and nearly four times more likely to have had lifetime PTSD. The women with MWSA were nearly three times more likely than those with no sexual assault to have had a

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mental disorder in their lifetime or in the past year, and at least four times more likely to have had PTSD in their lifetime or in the past year. The ORs for non-MWSA and MWSA did not differ significantly.

Interpretation

In this first investigation of MWSA in a representative sample of CAF members, sexual assault was much more common among women, at prevalence rates of 24.3% and 15.5% for lifetime non-MWSA and MWSA, respectively, compared to 6.0% and 0.8% among men. The majority of this sexual assault was unwanted sexual touching, as opposed to forced sexual activity. Most MWSA had been perpetrated by a military or defence employee and had occurred in garrison. Deployment appeared to be a period of elevated risk for women, given that a quarter of women with MWSA reported that such events had occurred on deployment, but personnel spend relatively little of their career deployed. Women who had never been married and those who were working in Western Canada were somewhat more likely to have experienced MWSA. However, because this information was collected at the time of the interview, we could not determine whether marital status or region was a risk factor for MWSA *at the time of occurrence*. Both non-MWSA and MWSA were associated with a greater number of lifetime non-sexual traumatic events, as well as an increased risk of mental disorders and PTSD, both in the past-year and over the lifetime.

Although comparing rates of sexual assault across studies is complicated by methodological differences and reporting rates,(20) the prevalence of lifetime forced sexual activity and unwanted sexual touching, using the same definitions but different labels, did not diverge substantially from those of the Canadian general population in 2002.(1) The prevalence of lifetime sexual assault among women was also similar to the 36% self-reported prevalence

among U.S. military women.(21) No other studies have defined MWSA or reported results in a manner to allow for direct comparisons in prevalence rates, though 15% of U.S. military women and 2% of U.S. military men report sexual assault since joining the military(22). These rates are comparable to the prevalence rates of MWSA we observed. Additional detail on these prevalence comparisons is provided as Supplemental Online Content.

Previous research has also found deployment, especially with combat, to be a risk factor for MWSA,(12, 13) with qualitative research participants perceiving this to be due to lengthy periods without permitted sexual activity, increased stress, and close living quarters combining men with relatively few women.(6) Also consistent with past research, both lifetime non-MWSA and MWSA were associated with an increased likelihood of having a mental disorder, particularly PTSD. Although the odds of these mental disorders did not differ significantly between women who reported non-MWSA and MWSA, the odds were higher among women who reported MWSA. Furthermore, after controlling for other variables, only MWSA, not non-MWSA was significantly associated with any past-year disorder. This is in line with previous findings that MWSA may be more psychologically harmful than non-MWSA.(2, 4, 9, 10)

Some limitations of our study must be considered. The interviews were conducted face-to-face, which is associated with variability in reporting of sexual assault.(14) Also, because the survey only assessed lifetime sexual assault, we could not determine when the sexual assault occurred. Furthermore, the survey only assessed prevalence, not incidence, so we could not examine cumulative effects of sexual assault on mental health. We could also not determine, among those with MWSA, how much (if any) non-MWSA they had experienced. The survey also did not collect information on broader (but likely related) forms of sexual misconduct, such as harassment. In addition, aside from identification of deployment as a risk factor, we had no

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detail on the nature of the MWSA events that would inform targeting of prevention and control efforts. The low prevalence of MWSA in men, moreover, precluded any analysis of its risk factors or associations with mental disorders, which may be different from those in women.(23) Finally, the study was cross-sectional in design, so we could not determine the direction of the association between sexual assault and mental disorders.

Effective prevention and control of social and public health problems starts with a clear picture of the scope of the problem, the characteristics of those affected by it, the circumstances under which it occurs, and its impact on the affected population. This study documented that MWSA has occurred in a sizeable fraction of CAF women, that deployment is likely a period of elevated risk, and that MWSA is associated with mental disorders. While the lifetime prevalence of sexual assault in CAF personnel appears similar to that in other Canadians, the CAF may have special opportunities to address it, such as the recent establishment of an independent Sexual Misconduct Response Centre.(24) Priorities for additional research on MWSA include the obtainment of more detailed granular data on the precise circumstances of the events, which would provide additional information for prevention and control efforts.

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Table 1: Prevalence of lifetime sexual assault by sex

	Men	Women	Total
	Weighted <i>n</i> ,* % (95% CI)	Weighted <i>n</i> ,* % (95% CI)	Weighted <i>n</i> ,* % (95% CI)
No lifetime sexual assault	51640, 93.2% (92.4 – 93.9)	5360, 60.2% (56.9 – 63.6)	57000, 88.6% (87.8 – 89.4)
Lifetime non-MWSA			
Forced sexual activity	1460, 2.6% (2.2 – 3.1)	1320, 14.8% (12.3 – 17.3)	2780, 4.3% (3.8 – 4.8)
Unwanted sexual touching	3160, 5.7% (5.0 – 6.4)	2120, 23.8% (20.7 – 26.8)	5280, 8.2% (7.5 – 8.9)
Any sexual assault [†]	3320, 6.0% (5.3 – 6.7)	2160, 24.3% (21.2 – 27.3)	5480, 8.5% (7.8 – 9.3)
MWSA			
Forced sexual activity	100, 0.2% (0.1 – 0.3) §	680, 7.6% (5.8 – 9.5)	780, 1.2% (0.9 – 1.5)
Unwanted sexual touching	420, 0.8% (0.5 – 1.0)	1320, 14.8% (12.4 – 17.2)	1740, 2.7% (2.3 – 3.1)
Any sexual assault [†]	460, 0.8% (0.6 – 1.1)	1380, 15.5% (13.1 – 17.9)	1840, 2.9% (2.4 – 3.3)

Note: CI = confidence interval, MWSA = military work-related sexual assault

*In order to protect the identity of respondents, Statistics Canada permits only the release of weighted cell counts, which must be rounded to the nearest 20.

[†]Any sexual assault includes the non-mutually exclusive acts of unwanted touching and forced sexual activity.

§Caution: high levels of error (coefficient of variation >16.5%).

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Table 2: Context of military work-related sexual assault, by sex

	Men	Women	Total
	Weighted <i>n</i> ,* % (95% CI)	Weighted <i>n</i> ,* % (95% CI)	Weighted <i>n</i> ,* % (95% CI)
Forced sexual activity			
while deployed on a CAF mission	‡	160, 23.5% (13.0 – 34.0) §	-
occurred in CAF workplace (other than deployment)	‡	420, 61.8% (49.9 – 73.6)	-
committed by a CAF member or civilian DND employee	80, 80.0% (51.9 – 100) §	620, 91.2% (84.6 – 97.8)	700, 89.7% (82.8 – 96.7)
Total**	100	680	780
Unwanted touching			
while deployed on a CAF mission	‡	360, 27.3% (19.2 – 35.4)	-
occurred in CAF workplace (other than deployment)	260, 61.9% (46.3 – 77.5)	780, 59.1% (50.2 – 68.0)	1040, 59.8% (52.2 – 67.3)
committed by a CAF member or civilian DND employee	380, 90.5% (79.0 – 100)	1240, 93.9% (90.3 – 97.6)	1620, 93.1% (89.2 – 97.0)
Total**	420	1320	1740
Any sexual assault			
while deployed on a CAF mission	‡	380, 27.5% (19.7 – 35.4)	-
occurred in CAF workplace (other than deployment)	260, 56.5% (41.1 – 72.0)	820, 59.4% (50.7 – 68.1)	1080, 58.7% (51.2 – 66.2)
committed by a CAF member or civilian DND employee	380, 82.6% (70.0 – 95.3)	1300, 94.2% (90.5 – 97.9)	1680, 91.3% (87.1 – 95.5)
Total**	460	1380	1840

Note: CI = confidence interval, CAF = Canadian Armed Forces, DND = Department of National Defence.
*In order to protect the identity of respondents, Statistics Canada permits only the release of weighted cell counts, which must be rounded to the nearest 20.
‡ Insufficient data for presentation.
**The total does not reflect the sum of the contexts, as they are not mutually exclusive.
§Caution; high levels of error (coefficient of variation >16.5%).

Table 3: Sexual assault by sociodemographic and military risk factors, women only

		No lifetime sexual assault	Lifetime non-MWSA	MWSA	Total	X ²
Characteristic		Weighted <i>n</i> ,* % (95% CI)	Weighted <i>n</i> ,* % (95% CI)	Weighted <i>n</i> ,* % (95% CI)	Weighted <i>n</i> *	
Age group						
	less than 30 years	1780, 69.0% (62.7 – 75.3)	460, 17.8% (12.5 – 23.1)	340, 13.2% (8.4 – 18.0) §	2600	10.92 (<i>p</i> <.05)
	30 – 39 years	1740, 58.8% (53.0 – 64.5)	760, 25.7% (20.3 – 31.1)	460, 15.5% (11.6 – 19.5)	2960	
	40 plus	1840, 54.8% (49.6 – 60.0)	940, 28.0% (22.8 – 33.2)	580, 17.3% (13.2 – 21.3)	3340	
Race						
	White	4820, 60.9% (57.4 – 64.3)	1860, 23.5% (20.3 – 26.7)	1240, 15.7% (13.1 – 18.2)	7920	1.96 (ns)
	Non-white	540, 55.1% (44.0 – 66.2)	300, 30.6% (20.4 – 40.8) §	140, 14.3% (6.8 – 21.8) §	980	
Marital Status						
	Single (never married)	1220, 53.0% (46.0 – 60.0)	560, 24.3% (18.0 – 30.7)	520, 22.6% (16.5 – 28.7)	2280	10.53 (<i>p</i> <.05)
	Married	3420, 62.0% (57.8 – 66.1)	1340, 24.3% (20.5 – 28.0)	760, 13.8% (11.0 – 16.5)	5500	
	Widowed/divorced/separated	720, 65.5% (55.7 – 75.2)	260, 23.6% (14.5 – 32.8) §	120, 10.9% (5.0 – 16.8) §	1120	
Region						
	Atlantic	1060, 65.4% (58.0 – 72.9)	380, 23.5% (16.7 – 30.2)	180, 11.1% (6.2 – 16.1) §	1620	13.87 (<i>p</i> <.05)
	Quebec	780, 65.0% (55.2 – 74.8)	280, 23.3% (14.9 – 31.7) §	140, 11.7% (5.1 – 18.2) §	1200	
	Central/Ontario	2380, 61.3% (56.3 – 66.4)	960, 24.7% (20.0 – 29.5)	540, 13.9% (10.5 – 17.3)	3880	
	Western	1160, 52.3% (45.1 – 59.4)	540, 24.3% (18.0 – 30.7)	520, 23.4% (17.9 – 29.0)	2220	
Rank category						
	Jr. NCM	2760, 59.2% (54.0 – 64.5)	1320, 28.3% (23.5 – 33.2)	580, 12.4% (9.0 – 15.9)	4640	15.51 (<i>p</i> <.01)
	Sr. NCM	1180, 58.4% (52.5 – 64.4)	420, 20.8% (15.7 – 25.9)	420, 20.8% (15.6 – 26.0)	2020	
	Officer	1440, 63.7% (58.2 – 69.2)	440, 19.5% (15.0 – 24.0)	380, 16.8% (12.5 – 21.1)	2260	
Element						
	Land	2400, 59.7% (54.7 – 64.7)	1000, 24.9% (20.4 – 29.4)	620, 15.4% (11.6 – 19.3)	4020	3.57 (ns)
	Sea	940, 60.3% (52.8 – 67.7)	320, 20.5% (14.3 – 26.8)	300, 19.2% (13.2 – 25.3)	1560	
	Air	2040, 60.7% (55.1 – 66.4)	860, 25.6% (20.2 – 31.0)	460, 13.7% (10.0 – 17.4)	3340	
Ever deployed						
	Yes	2500, 55.8% (50.6 – 61.0)	1140, 25.4% (20.9 – 30.0)	840, 18.8% (15.5 – 22.0)	4480	7.89 (<i>p</i> <.05)
	No	2860, 64.4% (59.9 – 69.0)	1040, 23.4% (19.5 – 27.4)	540, 12.2% (8.5 – 15.8)	4440	
		Mean (95% CI)	Mean (95% CI)	Mean (95% CI)		
Lifetime non-sexual trauma						
	Number of experiences	2.1 (1.9 – 2.3)	4.0 (3.6 – 4.4)	4.9 (4.3 – 5.5)		

Note: MWSA = military work-related sexual assault, CI = confidence interval, NCM = non-commissioned member, ns = not significant.

*In order to protect the identity of respondents, Statistics Canada permits only the release of weighted cell counts, which must be rounded to the nearest 20.

Jr. NCM includes the ranks of Master Corporal/Master Seaman and below, Sr. NCM includes the ranks of Sergeant/Petty Officer 2nd Class and above.

§Caution; high levels of error (coefficient of variation >16.5%).

Table 4: Prevalence and odds ratios of mental health outcomes, females only

	Any lifetime mood or anxiety disorder	Any past-year mood or anxiety disorder	Lifetime PTSD	Past-year PTSD
	Weighted <i>n</i> ,* % (95% CI)	Weighted <i>n</i> ,* % (95% CI)	Weighted <i>n</i> ,* % (95% CI)	Weighted <i>n</i> ,* % (95% CI)
Overall	3620, 41.9% (38.5 – 45.3)	1760, 20.5% (17.6 – 23.4)	1640, 18.9% (16.0 – 21.8)	760, 8.7% (6.6 – 10.9)
No lifetime sexual assault	1580, 30.3% (26.4 – 34.1)	700, 13.5% (10.4 – 16.6)	420, 8.0% (5.5 – 10.4)	200, 3.8% (2.1 – 5.5) §
Lifetime non-MWSA	1120, 54.9% (47.1 – 62.7)	500, 24.8% (18.5 – 31.0)	660, 32.7% (25.6 – 39.7)	240, 11.7% (6.6 – 16.7) §
MWSA	900, 66.2% (58.0 – 74.3)	560, 41.2% (32.7 – 49.6)	540, 39.7% (31.1 – 48.3)	320, 23.5% (16.2 – 30.9)
	Adjusted OR** (95% CI)	Adjusted OR*** (95% CI)	Adjusted OR**** (95% CI)	Adjusted OR***** (95% CI)
Lifetime non-MWSA vs. no lifetime sexual assault	1.9 (1.3 – 2.8)	1.6 (0.97 – 2.6)	3.7 (2.3 – 6.2)	2.1 (1.0 – 4.5)
MWSA vs. no lifetime sexual assault	2.9 (1.8 – 4.5)	2.9 (1.8 – 4.8)	4.3 (2.4 – 7.6)	4.0 (1.8 – 8.9)

Note: PTSD = posttraumatic stress disorder, CI = confidence interval, MWSA = military work-related sexual assault, OR = odds ratio
*In order to better protect the identity of respondents, Statistics Canada permits only the release of unweighted cell counts; which must be rounded to the nearest 20.
**Adjusted for age, marital status, rank, region, element, deployment history, and lifetime non-sexual trauma.
***Adjusted for age, marital status, region, deployment history, and lifetime non-sexual trauma.
****Adjusted for age, marital status, rank, region, and lifetime non-sexual trauma.
*****Adjusted for age, marital status, rank, region, deployment history, and lifetime non-sexual trauma.

**Proposed Supplemental Online Content for Watkins, Bennett, Richer, and Zamorski—
Military Work-related Sexual Assault in Canada: Prevalence, Circumstances, Correlates,
and Associations with Mental Disorders**

Background

The present study¹ provided a reliable estimate of the career-long prevalence of military work-related sexual assault (MWSA) in Canadian Armed Forces (CAF) personnel. We found that the lifetime prevalence of sexual assault (forced sexual activity or unwanted sexual touching) was 33.8% in women and 6.8% in men. For MWSA, we found the lifetime prevalence to be 15.5% in women and 0.8% in men. We did not set out to rigorously compare these prevalences to those of other populations—there simply were no sufficiently comparable data available. Yet such prevalence estimates always trigger contentious questions as to how the observed prevalences compare to those in other populations and contexts. There was not sufficient room in the Interpretation section to cover this important subject in sufficient detail. This supplemental content provides additional relevant information.

Comparing rates of self-reported sexual trauma across studies is complicated by important methodological differences, particularly in assessment instruments, sample compositions, case definitions, recall periods, survey mode, and survey response rates. These issues are summarized well in a recent report.² Differences in the age and sex distribution of the populations are also problematic, given that the risk of sexual assault is strongly age- and sex-dependent.³ The age of respondents is especially important for lifetime rates, which obviously can only increase over time for a given individual and for which there are significant age-cohort effects.⁴

The four most useful points of comparison are:

- 1) Self-reported sexual assault prevalence rates in the general population;
- 2) Self-reported lifetime sexual assault prevalence in personnel of other militaries;
- 3) Self-reported prevalence of MWSA, using definitions as close to possible as our own;
and
- 4) Self-reported prevalence of sexual assault in other workplaces.

The findings discussed below emanate from large, population-based surveys in Canada and the United States, which are the most comparable sort of data to our own. eTable 1 provides additional detail on the key studies cited below.

Results

Sexual assault prevalence in the general population

Statistics Canada’s periodic *General Social Survey – Victimization* is the primary population-based data source on self-reported victimization, including sexual assault, but it unfortunately does not assess lifetime prevalence.⁵ Hence, the most comparable Canadian general population data comes from a nationally-representative telephone survey that used identical items to those used in the present study.⁶ The prevalence of lifetime unwanted sexual touching was 33% in women and 10% in men, while the corresponding prevalences for forced sexual activity were 19% and 3%, respectively.⁶ These prevalences are fairly similar to those identified in the present study (see eTable 1).

Lifetime sexual assault prevalence rates in the United States general population were assessed in the 2011 *National Intimate Partner and Sexual Violence Survey*.⁷ The lifetime prevalences of rape and other forms of sexual assault, respectively, were 19% and 44% in

women versus 2% and 23% in men.⁸ The definitions used differed somewhat from those in our survey, but again these prevalences are generally similar to those reported in our study.

Comparisons of childhood sexual abuse victimization in military personnel vs. civilians are relevant to the understanding of the present results for two reasons: first, we report here lifetime rates of sexual assault, and childhood experiences contribute heavily to lifetime rates. Second, childhood sexual abuse is a strong predictor of sexual assault in adulthood.⁹ Statistics Canada's 2012 *Canadian Community Health Survey – Mental Health* used highly comparable methods to those in the present survey, and it assessed childhood sexual abuse (though unfortunately not lifetime sexual assault).¹⁰ Using those survey data in conjunction with the data in the present analysis, Afifi and colleagues¹¹ recently reported a much higher prevalence of childhood sexual abuse in CAF women relative to their counterparts in the general population (21.0 – 24.1% vs. 12 – 16.4%) – a difference that persisted after adjustment for potential confounders (adjusted odds ratio = 1.8 – 2.2). No differences were seen in childhood sexual abuse victimization prevalence for men (5.0 – 5.7% vs. 4.3 – 5.9%). Higher rates of childhood physical abuse and of childhood exposure to intimate partner violence were also in seen in military personnel of both sexes relative to those in the general population.¹¹ Similar findings showing higher rates of child abuse victimization in individuals with military service relative to others have also been reported by investigators in the US.¹²

Sexual assault prevalence in other military personnel

Unfortunately, there have been no other recent population-based surveys of sexual assault in Canadian military personnel with which to compare our results. However, the lifetime sexual assault prevalence in CAF Regular Force and Reserve Force personnel (combined) in 2002,

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assessed in an identical fashion as in the present survey, showed virtually identical prevalence rates.¹³

There have been several major studies of sexual assault prevalence in US military personnel. The primary source of population-based data on self-reported “unwanted sexual contact” (which corresponds closely to our definition of sexual assault) in US military personnel has been the Department of Defense’s regular *Workplace and Gender Relations Survey of Active Duty Members*,¹⁴ administered by its Defense Manpower Data Center. The most recent such data for active duty personnel date to 2012, at which time 6% of women and 1% of men had experienced sexual assault *over the previous year*, most of which involved unwanted touching under our definition. That survey, however, does not report lifetime rates.¹⁴

In 2014, Congress directed the Department of Defense to outsource the survey to a third party (the RAND Corporation) to address concerns about potential bias.² Using the same definitions as in the earlier surveys, this *RAND Military Workplace Study* documented that the prevalence of past-year unwanted sexual contact had declined to 4.3% in women and 0.9% in men.¹⁵ Using a conservative case definition that mapped more precisely to the definitions of sexual assault in military law, past-year rates were similar at 5% in women and 1% in men.¹⁵ Lifetime sexual assault prevalence was 18% in women and 3% in men.¹⁵

Using a more encyclopaedic set of items from its *National Intimate Partner and Sexual Violence Survey*,^{7;8} the US Centers for Disease Control and Prevention documented a lifetime prevalence of “sexual contact violence” of 36% in active duty women, which is similar to that of the present study (men did not participate).¹⁶ That survey was unique in that the investigators were able to reliably compare the prevalence of sexual assault to that of civilian women. No statistically significant differences in either past-year or lifetime sexual assault were observed.¹⁶

In light of differences in case definitions, age distributions, survey modes, and recall periods, the most that can be concluded is that the prevalence of lifetime sexual assault in CAF personnel is fairly similar to that reported by active duty personnel in the US military. In the US military, at least, it is also clear that the prevalence of sexual assault in serving active duty personnel does not differ from that in civilians.

Prevalence of military work-related sexual assault (MWSA)

No other studies have defined MWSA or reported results in such a way that we can make direct comparisons in prevalence rates. However, 14.7% of US military women and 2.1% of military men had been sexually assaulted since joining the military,¹⁵ and the contexts of recent sexual assault events suggests that these were almost always MWSA under our definition.¹⁴ These presumed MWSA rates seem similar to those in the CAF.

Prevalence of work-related sexual assault in non-military workplaces

Data on the risk of self-reported workplace sexual assault (more narrowly defined than our definition of MWSA, which includes events that were perpetrated by co-workers outside of the workplace) are sparse but suggest that, relative to military workplaces, a much smaller fraction of sexual assaults (and violent crime in general) occur in civilian workplaces. For example, data from the US's *National Violence Against Women Survey*¹⁷ (collected in 1995 – 1996) noted a lifetime prevalence of violent victimization (sexual or otherwise) by a co-worker of only 1.1% in women and 2.3% in men. Annual rates were only 0.1% in both sexes.¹⁸ Data from the US *National Crime Victimization Survey* from 2005 - 2009 showed that only about one in seven annual incidents of sexual assault occurred in the workplace.¹⁹

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Summary

Sexual assault remains prevalent in Canada, particularly in women. The lifetime risk of sexual assault in CAF personnel appears fairly similar to that of the general population. However, a significant excess risk of child sexual abuse is seen in CAF women relative to civilian women – an important finding given the contribution of child sexual abuse to lifetime abuse prevalence and the elevated risk for sexual abuse in adulthood conferred by child sexual abuse.⁹ Lifetime sexual assault prevalence in CAF personnel is also similar to that reported in US military personnel. Finally, prevalence rates of MWSA in the US military appear fairly similar to those in the CAF.

Our own findings could not assess the proportion of sexual assault *incidents* that occurred during military service that met our definition of MWSA. However, US data clearly demonstrates that a very large fraction of all sexual assaults that occur during service would constitute MWSA,¹⁴ but the overall prevalence (both lifetime and past-year) of sexual assault in military women does not differ from that of civilian women.¹⁶ The limited data from other workplaces suggest a much less prominent role of the workplace in sexual assault in civilians.

One interpretation of these findings is that military service increases the risk of work-related sexual assault but decreases the risk of non-work-related sexual assault. We suspect that this could be at least partly due to the fact that military service is a much larger part of an employee’s social environment relative to other occupations: Military women often have military spouses, socialize with other military personnel, have frequent work-related travel with other military personnel, and live on military premises during deployment, while on training, or in garrison. Hence, opportunities for work-related sexual assault are expanded and those for non-work-related sexual assault are constrained, relative to civilians.

Conclusion

Although it appears that military personnel have similar risk for sexual assault to civilians and that the military environment may constrain opportunities for non-work-related sexual assaults, military organizations must still ensure a sexual assault-free workplace.

Indeed, military employers have greater potential opportunities to prevent sexual violence among their employees, relative to other employers. For example, military organizations have sophisticated training establishments that could be leveraged to develop and implement sexual assault prevention training. Military law contains additional sanctions for military perpetrators of sexual assault, even if it should occur off-premises. Military organizations have their own law enforcement and criminal justice apparatuses that can engage in prevention and intervention activities. Finally, military organizations usually deliver mental health care, providing an avenue to lessen the impact of past sexual assault.

If effective, prevention and control efforts in military organizations would limit the overall burden of lifetime sexual violence, which in turn would significantly lessen the overall burden of mental disorders and other negative consequences of sexual assault in military personnel and veterans.

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eTable 1: Summary of Most Relevant Points of Comparison for the Prevalence of Self-reported Sexual Assault in CAF

Personnel

Citation	Data Source	Target Population(s)	Data Collected By (Mode)	Sample Size (Response Rate)	Key Prevalence Findings: Women*	Key Prevalence Findings: Men*
Watkins, et al., 2016 ¹	2013 Canadian Forces Mental Health Survey	Serving Canadian Regular Force personnel	Statistics Canada (in-person interview)	6,696 (80%)	Lifetime SA = 33.8% Lifetime FSA = 22.4% Lifetime UST = 38.6% Lifetime MWSA = 15.5% Lifetime FSA = 7.6% Lifetime UST = 14.8%	Lifetime SA = 6.8% Lifetime FSA = 2.8% Lifetime UST = 6.5% Lifetime MWSA = 0.8% Lifetime FSA = 0.2% Lifetime UST = 0.8%
Afifi, et al., 2016 ¹¹	2013 Canadian Forces Mental Health Survey and 2012 Canadian Community Health Survey—Mental Health	Serving Canadian Regular Force personnel; Canadian general population, age 18 - 60	Statistics Canada (in-person interview)	Military: 6,696 (80%) Civilian: 15,981 (69%)	Childhood SA (FSA or UST): Military = 21.0 – 24.1% Civilian = 12.7 – 16.4%	Childhood SA (FSA or UST): Military = 5.0 – 5.7% Civilian = 4.3. – 5.9%
Van Ameringen et al., 2008 ⁶	2002 research study	Canadian general population	Commercial survey firm (landline telephone)	3,006 (27%)	Lifetime FSA† = 19.1% Lifetime UST† = 32.8%	Lifetime FSA† = 3.3% Lifetime UST† = 10.2%
Breiding et al., 2014 ⁸	National Intimate Partner and Sexual Violence Survey	US general population, 18 years or older	US Centers for Disease Control and Prevention (landline and mobile phone)	18,049 (28 – 34%)	Lifetime: Rape = 18.3% Other sexual violence = 44.6% Past-year: Rape = 1.1% Other sexual violence = 5.6%	Lifetime: Rape = 1.4% Other sexual violence = 22.2% Past-year: Rape =not reported Other sexual violence = 5.3%
Black & Merrick, 2013 ¹⁶	National Intimate Partner and Sexual Violence Survey (civilian and military components)	Active duty US military women; US general population, 18 years or older	US Centers for Disease Control and Prevention (landline and mobile phone)	Civilian: 9,086 (women only) (28%) Military: 1,408 (27%)	Lifetime “sexual contact violence”: Military = 36.3% Civilian 40.3% Past-year “sexual contact violence”: Military = 5.6%	Not surveyed

					Civilian = 5.2%	
Defense Manpower Data Centre, 2013 ¹⁴	2012 Workplace and Gender Relations Survey of Active Duty Personnel	Active duty US military personnel, excluding those of flag rank	Defense Manpower Data Centre (mode unclear)	22,792 (24%)	Past-year: Unwanted sexual contact (very similar definition to SA) = 6.1% Sexual harassment = 23%	Past-year: Unwanted sexual contact (very similar definition to SA) = 1.2% Sexual harassment = 4%
Morral, Gore, & Schell, 2015 ¹⁵	2014 RAND Military Workplace Study	Active duty US military personnel, excluding those of flag rank	Commercial survey firm under contract with RAND Corporation (internet)	145,300 (34% for women; 30% for men)	SA: Lifetime = 17.9% Pre-military = 8.2% During service = 14.7% Past-year = 4.9%	SA: Past-year = 1.0% Pre-military = 0.9% During service = 2.1% Past-year = 2.6%
Tjaden & Thoennes, 2000 ¹⁷ ; Tjaden & Thoennes, 2001 ¹⁸	1995- 1996 Violence Against Women Survey	US general population	Commercial survey firm under contract to the US Department of Justice (landline phone)	16,005 (participation rate of 72% in women, 69% in men)	Completed or attempted rape: Lifetime = 17.6 Past-year = 0.3	Completed or attempted rape: Lifetime = 3% Past-year = 0.1%

*SA = sexual assault; FSA = forced sexual activity; UST = unwanted sexual touching; MSWA = military work-related sexual assault

†In this study, while the authors used identical items as those used in the present study, they used different labels for the outcomes: they used “sexual assault” for “forced sexual activity” and “sexual molestation” for “unwanted sexual touching.”

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