



Provincial and territorial correctional service workers: A Canadian national and jurisdictional assessment of mental health

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ARTICLE INFO

Keywords:

Mental disorders
Correctional officers
Probation officers
Public safety personnel
Management
Posttraumatic stress disorder

ABSTRACT

Purpose: Canadian correctional workers (CWs) experience substantial challenges with mental health, but prevalence estimates have been limited across provincial and territorial services.

Methods: Participating CWs from all 13 provincial and territorial services ($n = 3740$) self-selected to complete an online mental health and well-being survey assessing sociodemographic characteristics and symptoms of several mental disorders. Participants worked as correctional officers, community operations (e.g., probation officers), institutional operations (e.g., program officers), community administrators (e.g., managers), institutional or regional headquarters administrators, or institutional management (e.g., superintendents).

Results: Across Canada, participants screened positive for one or more mental disorders (57.9%), with several regional differences ($ps < 0.05$). Correctional officers reported more positive screens than other CWs ($ps < 0.05$). Years of service and being married were inversely related with mental health ($ps < 0.05$).

Conclusions: The current results suggest provincial and territorial CWs report mental health challenges much more frequently than the diagnostic prevalence for the general public (10.1%) and need additional supports. Unexpectedly, there were absent elevations associated with data collected after the onset of COVID-19.

1. Introduction

A relatively recent systematic review of the mental health of correctional service providers (e.g., correctional workers broadly, which we refer to as CWs) evidenced CW mental health research remains limited, having identified only six published studies (Regehr et al., 2021). The studies included diverse sample sizes (i.e., $n = 65$ to $n = 3599$) and assessment tools, precluding robust comparisons, and producing mixed results; for example, broad prevalence ranges for Post-traumatic Stress Disorder [PTSD] (i.e., 15.0% to 29.1%), Major Depressive Disorder [MDD] (i.e., 24.0% to 59.7%), and General Anxiety Disorder [GAD] (or anxiety, less specifically) ranging from 12.2% to 37.9%. The only Canadian study, published in 2018, reported on a mix of federal CWs (i.e., employed by Correctional Services Canada; CSC

and provincial and territorial CWs, where some occupational categories and jurisdictions could not be easily discerned, evidencing 54.6% screened positive for one or more mental disorders (Carleton et al., 2018).

The 2018 Canadian study data (Carleton et al., 2018) were re-analyzed and showed no statistically significant differences in positive screening proportions between CW occupational groups, including participants working in operational institutional, operational community, administrative institutional, and administrative headquarters (Ricciardelli, 2019). A 2020 study used new data to compare Ontario provincial CW participants ($n = 1032$) across occupational categories and evidenced elevated proportions of positive screens for one or more mental disorders (Carleton et al., 2020); specifically, many CWs working in roles as governance (61.0%), correctional officers (59.0%), parole or

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<https://doi.org/10.1016/j.jcrimjus.2024.102168>

Received 10 November 2023; Received in revised form 27 February 2024; Accepted 27 February 2024

Available online 7 March 2024

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probation officers (63.2%), wellness staff (43.7%; e.g., nurses), training staff (50.0%; e.g., program officers), and administrative staff (52.0%; e.g., record keeping) screened positive for at least one mental disorder. Across occupational categories, many participants screened positive for one or more mental disorders (58.2%), with MDD (37.0%), PTSD (30.7%), and GAD (30.5%) being most common. The results were much higher than the diagnostic prevalence for the general public (10.1%; [Statistics Canada, 2013](#)). There were also several demographic differences in the sample. Women correctional officers were more likely to screen positive (59.4%) than men (56.9%; $p < .05$). In addition, participants 40 and 49 years old, working in either a position of governance or as a correctional officer, or who were divorced or separated, were all more likely to screen positive for one or more mental disorders ($p < .05$).

Researchers have identified how occupational stressors – both operational (i.e., inherent to the job context) and organizational (e.g., tied to the organization and environment) – can negatively affect CW mental health and well-being ([Johnston, Ricciardelli, & McKendy, 2021](#); [Konyk et al., 2021](#)). Specific occupational stressors include potentially psychologically traumatic event (PPTe) exposures (e.g., responding to client suicide, altercations, violence), which can be direct or vicarious (e.g., reviewing criminal records) ([Ricciardelli, Carleton, Groll, & Cramm, 2018](#); [Ricciardelli et al., 2019](#)), and can interact with perceptions of post-exposure support ([Ricciardelli & MacDonald, 2022](#)). Across CW occupational groups, occupational stressors are associated with mental health injuries ([Carleton et al., 2020](#); [Fusco et al., 2021](#); [Konyk et al., 2021](#); [Ricciardelli, Groll, Czarnuch, Carleton, & Cramm, 2019](#)). Probation and parole officers review client files, correctional officers respond to PPTes, administrative staff hear the interworking and codes called in institutions, and managers are responsible to review use of force encounters ([Fusco et al., 2021](#); [Johnston et al., 2021](#)). The PPTe exposure frequencies and impacts appear exacerbated by staffing shortages, which exacerbate the legal (e.g., being investigated for work-related decisions), social (e.g., relationship harm from gossip), psychological (e.g., mental disorders), physical (bodily harm and death), and moral (e.g., distressing value/ethics violations) vulnerabilities for CWs. Any vulnerability may negatively impact mental health and wellness, but pervasive staffing shortages in Canadian provincial and federal correctional services (e.g., [Atlantic Briefs Desk, 2023](#); [Black, 2023](#); [Rhodes, 2023](#)) appear particularly poignant risk factors.

CW experiences of occupational stressors interact with different environmental and geographic realities across the diverse Canadian provinces and territories. For example, the federal correctional service is operated by the CSC and is responsible for people sentenced to two or more years in prison; in contrast, provincial and territorial facilities are responsible for persons sentenced to a maximum of two years minus one day, or for persons in remand custody (e.g., people who have been charged with a crime or apprehended who are awaiting trial or sentencing). Each province and territory is also differently governed by an independent provincial or territorial Department (or otherwise titled) of Correctional Services, often within their Ministry or Department of Justice or Public Safety ([Ricciardelli, 2019](#)).

We designed the current study to build on previous research with federal CWs ([Carleton et al., 2018](#)) by assessing the positive screening prevalence for mental disorders among territorial and provincial CWs working in the 13 Canadian provinces and territories. The data collection began before the COVID-19 onset and continued after onset. Extant mental health research has already suggested COVID-19 negatively impacted the mental health of essential workers who, like CWs, could not stop working ([Asmundson et al., 2020](#)); for example, the mental health of nurses has been substantially negatively impacted by COVID-19 ([García-Vivar et al., 2023](#)). We planned to assess for differences in positive screens for mental disorders among provinces and territories, as well as for differences between before versus after COVID-19 onset, and differences among demographic factors (i.e., sex, age, marital status, ethnicity, education, income, years of service). We expected positive screening proportions for mental disorders to be higher than for the

general public ([Statistics Canada, 2013](#)), commensurate with previous research ([Carleton, Ricciardelli, Taillieu, et al., 2020](#)) after COVID-19 onset ([García-Vivar et al., 2023](#)), as well as for participants self-reporting as women, older, single or divorced, with lower education, and with more years of service ([Carleton et al., 2018](#); [Ricciardelli, 2019](#)). We had no a priori expectations regarding regional differences, but did expect regions where data collection began after the onset of COVID-19 to report higher positive screening proportions associated with the additional pandemic-related stressors ([García-Vivar et al., 2023](#); [Lake et al., 2022](#)).

2. Methods

2.1. Data and sample

Data were derived from the Canadian Provincial and Territorial Correctional Worker Mental Health and Well-Being Study (CWMH). The CWMH was a multi-year study using an online survey to collect data from correctional service organizations across all 13 provinces and territories in Canada. The survey link was distributed by correctional services employers and/or unions. Core questionnaire content was the same for all surveys to facilitate regional comparisons. Data collection could not be simultaneous across the 13 regions because of variations in their internal research processes and procedures (i.e., each correctional service worked with us from outreach to recruitment at varying paces per their processes and procedures). The onset of the COVID-19 pandemic in Canada in the spring of 2020 required pausing data collection until the fall of 2021, but allowed for comparing the mental health of participants before and after the COVID-19 onset. Additional CWMH Study details have been published elsewhere ([Ricciardelli et al., 2021](#)).

Only participants with at least one valid response for at least one of the mental disorder self-report measures were included, which also created sample size variability in the prevalence reporting. In total, 5212 respondents logged into the survey; however, only 3740 (final analytic sample; 71.9% of all those who logged in to the survey) respondents proceeded far enough into the survey to complete the mental disorder sections required for the current analyses. In the survey, data had to be collected all in one sitting, which led to a decrease in sample size from the beginning to the end of the survey (e.g., of the 5212 respondents who logged into the survey, approximately 3.2% were logged in for <1 min, and 8.3% were logged in for <5 min). Sociodemographic differences between those who were included and excluded from the final analytic sample are detailed in the Supplementary Online Table S1. In short, female, younger, single, higher education, and lower income respondents were more likely to be excluded from the final analytic sample. Respondents working as community operational workers and those from Nunavut were also more likely to be excluded from the final analytic sample.

Data were collected prior to the onset of the COVID-19 pandemic for Ontario (ON; i.e., December 2017 to July 2018, $n = 1084$), Manitoba (MB; i.e., February 2019 to June 2019, $n = 602$), Saskatchewan (SK; i.e., May 2019 to January 2020, $n = 605$), Nova Scotia (NS; i.e., July 2019 to May 2020, $n = 156$; note that only 9 respondents [5.8% of sample from Nova Scotia] from Nova Scotia completed the survey after the declaration of COVID-19 as a global pandemic by the World Health Organization), New Brunswick (NB; i.e., September 2018 to April 2019, $n = 27$), Newfoundland and Labrador (NL; i.e., February 2018 to April 2019, $n = 69$), and Yukon (YK; i.e., December 2018 to February 2020, $n = 47$). Data were collected after COVID-19 onset for Alberta (AB; i.e., September 2020 to March 2022, $n = 395$), Quebec (QC; i.e., October 2021 to December 2022, $n = 241$), British Columbia (BC; i.e., May 2022 to December 2022, $n = 422$), Prince Edward Island (PEI; i.e., June 2022 to November 2022, $n = 63$), Northwest Territories (NT; i.e., March 2023 to June 2023, $n = 18$), and Nunavut (NU; i.e., March 2023 to June 2023, $n = 11$). Participation was voluntary and informed consent was obtained

from each participant. The CWMH Study received ethics approval from Research Ethics Boards at Memorial University of Newfoundland (ICEHR #20201330-EX), University of Regina (REB #2017-098), and Queen's University (#6024787).

2.2. Measures

2.2.1. Mental disorders

We used several validated self-report screening measures to assess mental disorder symptoms. PTSD was assessed with the 20-item PTSD Checklist for the DSM-5 (PCL-5; Weathers et al., 2013) evaluating past-month PTSD symptoms. PCL-5 total scores can range from 0 to 80, with positive screens for participants who reported exposure to at least one PPTe on the Life Events Checklist for the DSM-5 (Weathers et al., 2013), met minimum criteria for each PTSD symptom cluster, and had a total score of >32 (Bovin et al., 2016; Weathers, Blake, et al., 2013). MDD was assessed with the 9-item Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001) evaluating symptoms during the past 14 days. PHQ-9 total scores can range from 0 to 27, with positive screens for participants who had a total score > 9 (Kroenke et al., 2001; Kroenke, Spitzer, Williams, & Löwe, 2010). GAD was assessed with the 7-item GAD Scale (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006) evaluating symptoms during the past 14 days. GAD-7 total scores can range from 0 to 21, with positive screens for participants who had a total score > 9 (Kroenke et al., 2010; Swinson, 2006). PD was assessed with the 7-item PD Severity Scale–Self-Report (PDSS-SR; Houck, Spiegel, Shear, & Rucci, 2002; Shear et al., 1997) evaluating symptoms during the past 7 days. PDSS-SR total scores can range from 0 to 28, with positive screens for participants who had a total score > 9 (Shear et al., 2001). AUD was assessed with the 10-item Alcohol Use Disorder Identification Test (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993), evaluating symptoms during the past 12 months. AUDIT total scores can range from 0 to 40, with positive screens for participants who had a total score > 15 (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). A variable for any mental disorder screen was computed based on whether a participant screened positive on any of the mental disorder screening measures.

2.2.2. Sociodemographic variables

Sociodemographic variables included sex (i.e., male, female), age group (i.e., 18–29 years, 20–39 years, 40–49 years, 50–59 years, 60 years and older), marital status (i.e., married/common-law/remarried, separated/divorced/widowed, single), highest level of education (i.e., high school or less, some post-secondary [less than a 4-year college or university degree], 4-year college or university degree), total household income (i.e., less than \$80,000, \$80,000 or more), work location (i.e., urban, rural), total years of service as a correctional worker (i.e., <4 years, 4–9 years, 10–15 years, >15 years), and occupational group (i.e., administrative headquarters, community administration/management, correctional officer, institutional administration/management, program officer, youth correctional worker).

2.3. Statistical analyses

First, descriptive statistics were used to examine distributions of sociodemographic variables, individual mental disorders, and the any mental disorder variable stratified by region. Second, logistic regression models were computed to examine associations among sociodemographic variables, individual mental disorders, and the any mental disorder variable. Third, logistic regression models were computed to assess for differences in the prevalence of individual mental disorders or the any mental disorder variable across regions. Models were first run unadjusted, and then adjusted for sociodemographic covariates (i.e., sex, age, marital status, education, household income, total years of service, and occupational groups). In adjusted models, data that were missing on a specific sociodemographic covariate because it was not

collected by the province/territory was coded back into the variable as “missing/not collected” in order to retain those provinces/territories in multivariable analyses. Differences across regions were tested by changing the logistic regression model reference categories. Fourth, logistic regression models were computed to assess for differences in prevalence of individual mental disorders and the any mental disorder variable between regions where data collection occurred prior to (i.e., ON, MB, NB, NL, YK, SK, NS) or after the COVID-19 onset (i.e., PEI, AB, BC, QC, NT, NU). Models were first run unadjusted, and then adjusted for sociodemographic covariates. Complete case analyses were conducted using SPSS software (V.28). Results at $p < .05$ were considered statistically significant.

3. Results

Table 1 presents the distribution of sociodemographic variables for each region and the entire sample. Table 2 presents associations between sociodemographic variables with each specific mental disorder and any mental disorder. Female CWs were less likely ($ps < 0.05$) than male CWs to screen positive for PTSD, MDD, and AUD. CWs 40 to 49 years old had higher odds of screening positive for PTSD, MDD, and any mental disorder than CWs <30 years old ($ps < 0.05$). CWs 40 years old and older had lower odds of screening positive for GAD than CWs <30 years old ($ps < 0.05$). CWs 60 years old and older also had lower odds of screening positive for MDD, PD, and any mental disorder than CWs <30 years old ($ps < 0.05$).

CWs who were single, separated, divorced, or widowed had higher odds of screening positive for PTSD, MDD, GAD, PD, and any mental disorder ($ps < 0.05$). CWs who reported high school or less as their highest level of education had higher odds of screening positive for PTSD than CWs who reported having a four-year college or university degree ($p < .05$). CWs who reported having a total household income of less than \$80,000 had higher odds of screening positive for PTSD, MDD, GAD, PD, and any mental disorder, than CWs who reported having a total household income of more than \$80,000 ($ps < 0.05$). CWs who reported working in a rural work location had higher odds of screening positive for MDD, GAD, and any mental disorder, than CWs who reported working in an urban work location ($ps < 0.05$). Most CWs who reported four or more total years of service had higher odds of screening positive for all assessed mental disorders, and any mental disorder, than CWs who reported less than four years of total service ($ps < 0.05$).

Table 3 presents the positive screening prevalence for any mental disorder among the total sample (i.e., 57.9%), as well as by region and by COVID-19 onset (i.e., ranging from 42.9% in YK to 83.3% in NB). Positive screens for MDD were the most prevalent (37.3%; ranging from 24.6% in NL to 64.0% in NB), followed by PTSD (29.0%; ranging from 19.7% in NL to 58.3% in NB), GAD (27.8%; ranging from 16.9% in NL to 45.8% in NB), PD (19.0%; ranging from 11.7% in QC to 41.7% in NB), and AUD (5.5%; ranging from 0.0% in PEI and NU to 9.5% in NB).

Table 4 presents results of comparing positive screening prevalence proportions across regions. Overall, CWs from NB reported a higher odds of a positive screening for each mental disorder and any mental disorder than most other regions ($ps < 0.05$; see limitations). CWs from MB also tended to report a higher positive screening prevalence for most mental disorders and any mental disorder, except NB. CWs living in QC tended to report a lower prevalence of positive screens for most mental disorders and any mental disorder than other regions ($ps < 0.05$). CWs from NB and MB had higher odds of screening positive for any mental disorder than most other regions ($ps < 0.05$), except NT and NU. CWs from QC had lower odds of screening positive for any mental disorder than CWs from NB, MB, BC, ON, and AB ($ps < 0.05$). CWs from YK had lower odds of screening positive for any mental disorder than CWs from NB, MB, and BC ($ps < 0.05$). Table 5 presents results of comparing positive screening prevalence proportions across regions after adjustment for sociodemographic covariates. Similar to unadjusted models, CWs from NB tended to have higher odds of screening positive for most mental

Table 1
Distribution of sociodemographic variables across provinces and territories, % (n).

Sociodemographic covariate	Canada	Pre-COVID provinces and territories							During COVID provinces and territories					
		ON	MB	NB	NL	YK	SK	NS	PEI	AB	BC	QC	NT	NU
Sex														
Male	49.9 (1546)	47.7 (515)	59.5 (353)	48.1 (13)	56.5 (39)	70.2 (33)	–	59.7 (92)	50.0 (30)	45.2 (176)	43.8 (181)	39.7 (95)	61.1 (11)	72.7 (8)
Female	50.1 (1553)	52.3 (564)	40.5 (240)	51.9 (14)	43.5 (30)	29.8 (14)	–	40.3 (62)	50.0 (30)	54.8 (213)	56.2 (232)	60.3 (144)	38.9 (7)	27.3 (3)
Age														
19–29 years	12.4 (456)	15.8 (169)	5.8 (34)	14.8 (4)	8.7 (6)	12.8 (6)	14.8 (88)	10.9 (17)	18.0 (11)	9.8 (38)	10.8 (45)	15.1 (36)	11.8 (2)	0.0 (0)
30–39 years	28.3 (1042)	28.2 (302)	31.1 (182)	14.8 (4)	33.3 (23)	40.4 (19)	28.9 (172)	23.7 (37)	31.1 (19)	32.1 (124)	22.7 (94)	23.9 (57)	17.6 (3)	60.0 (6)
40–49 years	30.9 (1135)	26.7 (286)	39.8 (233)	48.1 (13)	37.7 (26)	21.3 (10)	25.9 (154)	25.6 (40)	24.6 (15)	31.6 (122)	32.3 (134)	39.5 (94)	35.3 (6)	20.0 (2)
50–59 years	22.9 (841)	25.7 (275)	18.5 (108)	22.2 (6)	15.9 (11)	19.1 (9)	21.8 (130)	34.0 (53)	18.0 (11)	19.4 (75)	26.5 (110)	19.7 (47)	29.4 (5)	10.0 (1)
60 years +	5.5 (203)	3.6 (39)	4.8 (28)	0.0 (0)	4.3 (3)	6.4 (3)	8.6 (51)	5.8 (9)	8.2 (5)	7.0 (27)	7.7 (32)	1.7 (4)	5.9 (1)	10.0 (1)
Marital status														
Married/ Common-law/ Remarried	69.1 (2547)	67.1 (717)	75.9 (451)	69.2 (18)	69.1 (47)	73.9 (34)	66.8 (396)	65.6 (101)	70.0 (42)	66.8 (261)	72.6 (304)	67.2 (160)	50.0 (9)	77.8 (7)
Separated/ Divorced/ Widowed	12.1 (447)	14.0 (149)	11.1 (66)	3.8 (1)	8.8 (6)	2.2 (1)	11.0 (65)	14.9 (23)	8.3 (5)	13.8 (54)	14.3 (60)	5.9 (14)	16.7 (3)	0.0 (0)
Single	18.7 (690)	18.9 (202)	13.0 (77)	26.9 (7)	22.1 (15)	23.9 (11)	22.3 (132)	19.5 (30)	21.7 (13)	19.4 (76)	13.1 (55)	26.9 (64)	33.3 (6)	22.2 (2)
Education														
High school or less	9.4 (337)	5.0 (52)	20.2 (121)	3.7 (1)	8.1 (5)	27.3 (12)	7.9 (46)	5.5 (8)	3.3 (2)	8.8 (32)	9.9 (40)	4.5 (10)	23.5 (4)	36.4 (4)
Some post- secondary	44.6 (1602)	46.7 (490)	44.0 (263)	70.4 (19)	71.0 (44)	43.2 (19)	37.8 (221)	45.9 (67)	51.7 (31)	43.3 (158)	40.6 (165)	49.6 (111)	47.1 (8)	54.5 (6)
4-year College/ University	46.0 (1655)	48.4 (508)	35.8 (214)	25.9 (7)	21.0 (13)	29.5 (13)	54.3 (317)	48.6 (71)	45.0 (27)	47.9 (175)	49.5 (201)	46.0 (103)	29.4 (5)	9.1 (1)
Household Income														
Less than \$80,000	25.3 (756)	26.5 (268)	20.1 (111)	53.8 (14)	17.9 (12)	16.3 (7)	32.1 (176)	32.9 (49)	–	18.1 (64)	–	24.4 (55)	–	0.0 (0)
\$80,000 or more	74.7 (2232)	73.5 (745)	79.9 (442)	46.2 (12)	82.1 (55)	83.7 (36)	67.9 (373)	67.1 (100)	–	81.9 (290)	–	75.6 (170)	–	100.0 (9)
Work Location														
Urban	95.2 (3495)	97.5 (1053)	84.2 (473)	92.6 (25)	98.6 (68)	95.7 (45)	97.7 (586)	94.2 (147)	96.8 (61)	96.9 (381)	97.6 (410)	96.6 (229)	94.4 (17)	–
Rural	4.8 (177)	2.5 (27)	15.8 (89)	7.4 (2)	1.4 (1)	4.3 (2)	2.3 (14)	5.8 (9)	3.2 (2)	3.1 (12)	2.4 (10)	3.4 (8)	5.6 (1)	–
Total Years of Service														
<4 years	17.1 (629)	26.6 (284)	6.3 (37)	14.8 (4)	17.4 (12)	19.1 (9)	18.7 (111)	10.9 (17)	31.1 (19)	9.1 (35)	15.4 (64)	13.4 (32)	17.6 (3)	20.0 (2)
4–9 years	23.6 (868)	14.3 (153)	35.7 (209)	11.1 (3)	26.1 (18)	48.9 (23)	24.1 (143)	25.6 (40)	18.0 (11)	26.4 (102)	27.2 (113)	17.6 (42)	35.3 (6)	50.0 (5)
10–15 years	21.8 (802)	17.5 (187)	27.7 (162)	22.2 (6)	24.6 (17)	19.1 (9)	19.4 (115)	17.3 (27)	16.4 (10)	28.5 (110)	23.4 (97)	23.9 (57)	17.6 (3)	20.0 (2)
>15 years	37.4 (1373)	41.5 (443)	30.3 (177)	51.9 (14)	31.9 (22)	12.8 (6)	37.9 (225)	46.2 (72)	34.4 (21)	36.0 (139)	34.0 (141)	45.0 (107)	29.4 (5)	10.0 (1)
Occupational Group														
Administrative Headquarters	2.7 (100)	1.4 (15)	0.5 (3)	0.0 (0)	1.5 (1)	4.3 (2)	1.2 (7)	14.7 (23)	17.7 (11)	4.8 (19)	2.4 (10)	3.8 (9)	0.0 (0)	0.0 (0)
Community Administration/ Management	5.6 (207)	3.4 (36)	1.7 (10)	0.0 (0)	0.0 (0)	0.0 (0)	8.4 (51)	1.9 (3)	19.4 (12)	10.7 (42)	8.1 (34)	5.4 (13)	33.3 (6)	0.0 (0)
Community Operational	17.9 (664)	15.3 (163)	7.0 (42)	3.7 (1)	6.2 (4)	8.5 (4)	19.7 (119)	25.0 (39)	17.7 (11)	26.2 (103)	28.4 (119)	18.8 (45)	61.1 (11)	27.3 (3)
Correctional Officer	48.6 (1805)	52.4 (559)	70.1 (422)	70.4 (19)	73.8 (48)	48.9 (23)	34.5 (209)	55.8 (87)	29.0 (18)	29.0 (114)	43.9 (184)	49.6 (119)	0.0 (0)	27.3 (3)
Institutional administration/ management	15.5 (576)	17.6 (188)	13.8 (83)	22.2 (6)	18.5 (12)	31.9 (15)	18.8 (114)	0.0 (0)	3.2 (2)	19.8 (78)	11.7 (49)	10.0 (24)	5.6 (1)	36.4 (4)
Program officer	7.9 (294)	9.8 (105)	7.0 (42)	3.7 (1)	0.0 (0)	6.4 (3)	7.4 (45)	0.0 (0)	12.9 (8)	9.4 (37)	5.5 (23)	12.5 (30)	0.0 (0)	0.0 (0)
Youth correctional worker	1.8 (65)	NA	NA	NA	NA	NA	9.9 (60)	2.6 (4)	NA	NA	NA	NA	NA	9.1 (1)

Notes. Dashes indicate situations where the specific province/territory did not collect data on the sociodemographic item. NA = not applicable as a job category in the province/territory. ON = Ontario; MB = Manitoba; NB = New Brunswick; NL = Newfoundland and Labrador; YK = Yukon; SK = Saskatchewan; NS = Nova Scotia; PEI = Prince Edward Island; AB = Alberta; BC = British Columbia; QC = Quebec; NT = Northwest Territories; NU = Nunavut.

Table 2
Associations between sociodemographic variables and mental disorders in Canada.

Sociodemographic variable	Post-traumatic stress disorder	Major depressive disorder	Generalized anxiety disorder	Panic disorder	Alcohol use disorder	Any mental disorder
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Sex^a						
Male	1.00	1.00	1.00	1.00	1.00	1.00
Female	0.71*** (0.61, 0.84)	0.85* (0.73, 0.99)	1.09 (0.92, 1.28)	0.95 (0.78, 1.15)	0.55*** (0.38, 0.79)	0.92 (0.79, 1.07)
Age						
18–29 years	1.00	1.00	1.00	1.00	1.00	1.00
30–39 years	1.19 (0.92, 1.54)	1.23 (0.97, 1.56)	0.81 (0.63, 1.03)	1.04 (0.78, 1.39)	1.42 (0.83, 2.43)	1.28* (1.01, 1.63)
40–49 years	1.49** (1.16, 1.92)	1.37** (1.09, 1.74)	0.76* (0.60, 0.97)	0.94 (0.71, 1.26)	1.30 (0.76, 2.23)	1.40** (1.11, 1.78)
50–59 years	1.06 (0.81, 1.39)	0.98 (0.77, 1.26)	0.52*** (0.40, 0.67)	0.74 (0.55, 1.01)	0.76 (0.41, 1.39)	0.90 (0.70, 1.15)
60 years +	0.70 (0.46, 1.06)	0.66* (0.45, 0.96)	0.25*** (0.15, 0.40)	0.53* (0.32, 0.88)	0.24 (0.06, 1.03)	0.68* (0.47, 0.98)
Marital Status						
Married/Common-law/Remarried	1.00	1.00	1.00	1.00	1.00	1.00
Separated/Divorced/Widowed	1.71*** (1.38, 2.13)	1.84*** (1.49, 2.27)	1.48*** (1.18, 1.85)	1.74*** (1.36, 2.23)	1.43 (0.90, 2.27)	1.80*** (1.43, 2.26)
Single	1.22* (1.01, 1.47)	1.48*** (1.24, 1.77)	1.42*** (1.17, 1.72)	1.31* (1.05, 1.63)	1.37 (0.92, 2.27)	1.35** (1.12, 1.62)
Education						
High school or less	1.00	1.00	1.00	1.00	1.00	1.00
Some post- secondary	1.09 (0.84, 1.41)	0.95 (0.74, 1.22)	0.99 (0.76, 1.30)	1.14 (0.83, 1.56)	1.31 (0.70, 2.45)	1.10 (0.85, 1.43)
4-year college/university	0.72* (0.55, 0.94)	0.78 (0.62, 1.01)	0.87 (0.64, 1.09)	0.87 (0.63, 1.91)	0.88 (0.47, 1.67)	0.85 (0.65, 1.10)
Household Income^b						
Less than \$80,000	1.00	1.00	1.00	1.00	1.00	1.00
\$80,000 or more	0.76** (0.63, 0.90)	0.71*** (0.59, 0.84)	0.73*** (0.61, 0.89)	0.71** (0.58, 0.88)	1.12 (0.75, 1.67)	0.75** (0.62, 0.90)
Work Location^c						
Urban	1.00	1.00	1.00	1.00	1.00	1.00
Rural	1.15 (0.83, 1.61)	1.52** (1.11, 2.08)	1.41* (1.01, 1.98)	1.28 (0.87, 1.88)	0.67 (0.24, 1.84)	2.18*** (1.48, 3.21)
Total Years of Service						
<4 years	1.00	1.00	1.00	1.00	1.00	1.00
4–9 years	1.75*** (1.36, 2.25)	1.49*** (1.19, 1.88)	1.40** (1.09, 1.78)	1.47** (1.10, 1.97)	2.47** (1.35, 4.49)	1.86*** (1.48, 2.33)
10–15 years	1.93*** (1.50, 2.49)	1.69*** (1.34, 2.13)	1.33** (1.04, 1.70)	1.45** (1.08, 1.95)	2.39** (1.30, 4.38)	1.89*** (1.50, 2.39)
>15 years	1.89*** (1.49, 2.38)	1.53*** (1.24, 1.89)	0.99 (0.79, 1.24)	1.27 (0.97, 1.67)	1.84* (1.04, 3.29)	1.50*** (1.22, 1.85)
Occupational Group						
Correctional officer	1.00	1.00	1.00	1.00	1.00	1.00
Administrative headquarters	0.28*** (0.15, 0.52)	0.40*** (0.24, 0.66)	0.53* (0.31, 0.92)	0.39* (0.19, 0.82)	0.51 (0.16, 1.63)	0.45*** (0.28, 0.71)
Community Administration/Management	0.46*** (0.31, 0.67)	0.39*** (0.27, 0.55)	0.50*** (0.34, 0.74)	0.67 (0.44, 1.02)	0.24* (0.07, 0.75)	0.44*** (0.32, 0.61)
Community Operational	0.54*** (0.44, 0.67)	0.71*** (0.59, 0.87)	0.78* (0.63, 0.96)	0.79 (0.61, 1.003)	0.46** (0.28, 0.75)	0.70*** (0.58, 0.86)
Institutional administration/management	0.70*** (0.57, 0.87)	0.71*** (0.58, 0.87)	0.66*** (0.53, 0.83)	0.87 (0.67, 1.12)	0.65 (0.40, 1.06)	0.68*** (0.55, 0.83)
Program officer	0.52*** (0.38, 0.70)	0.56*** (0.42, 0.74)	0.61** (0.45, 0.83)	0.69* (0.48, 0.98)	0.68 (0.37, 1.26)	0.52*** (0.39, 0.68)
Youth correctional worker	0.61 (0.34, 1.08)	0.64 (0.37, 1.09)	0.68 (0.37, 1.25)	0.78 (0.39, 1.55)	0.71 (0.22, 2.30)	0.56* (0.34, 0.95)

Notes. OR = odds ratio; CI = confidence interval.

* $p < .05$; ** $p < .01$; *** $p < .001$.

^a Data from Saskatchewan were not included in sex models (as information on sex was not collected in that province).

^b Data from British Columbia, Prince Edward Island, and Northwest Territories were not included in income models (as information on income was not collected in those provinces).

^c Data from Nunavut were not included in work location models (as information on urban vs. rural work location was not collected in those provinces).

disorders, and CWs living in QC tended to have lower odds, than CWs working in other provinces/territories after adjustment for sociodemographic covariates. In addition, CWs living in NL tended to have lower odds of screening positive for several mental disorders relative to CWs from other provinces after adjustment for sociodemographic covariates.

Table 6 presents prevalence and odds for each mental disorder and

any mental disorder between regions where data were collected before (i.e., ON, MB, NB, NL, YK, SK, NS) and after the COVID-19 onset (i.e., PEI, AB, BC, QC, NT, NU). The positive screening prevalence proportions for MDD (37.0% versus 37.8%), GAD (28.8% versus 25.5%), PD (19.2% versus 18.4%), and AUD (6.3% versus 4.5%) were comparable ($ps > 0.05$) between regions where data were collected before and after the

Table 3
Distribution of mental disorders across provinces and territories, % (n).

Mental disorder	Canada	Pre-COVID provinces and territories							During COVID provinces and territories					
		ON	MB	NB	NL	YK	SK	NS	PEI	AB	BC	QC	NT	NU
Post-traumatic stress disorder	29.0 (1031)	30.3 (311)	33.8 (196)	58.3 (14)	19.7 (13)	21.7 (10)	26.8 (154)	28.9 (44)	22.8 (13)	27.1 (102)	30.2 (122)	20.2 (45)	26.7 (4)	27.3 (3)
Major depressive disorder	37.3 (1299)	37.0 (380)	44.0 (245)	64.0 (16)	24.6 (15)	31.8 (14)	31.6 (180)	32.9 (48)	27.6 (16)	40.4 (148)	40.7 (157)	31.4 (69)	35.3 (6)	40.0 (4)
Generalized anxiety disorder	27.8 (932)	30.3 (305)	30.4 (161)	45.8 (11)	16.9 (10)	25.6 (11)	24.6 (135)	31.6 (43)	26.3 (15)	25.5 (90)	31.1 (111)	15.5 (33)	28.6 (4)	30.0 (3)
Panic disorder	19.0 (628)	18.0 (177)	21.7 (113)	41.7 (10)	11.9 (7)	14.3 (6)	18.4 (100)	22.5 (31)	15.5 (9)	21.4 (75)	19.4 (69)	11.7 (25)	35.7 (5)	10.0 (1)
Alcohol use disorder	5.5 (157)	7.1 (62)	3.9 (9)	9.5 (2)	6.3 (2)	7.3 (3)	5.9 (30)	5.4 (7)	0.0 (0)	8.0 (26)	3.2 (11)	2.0 (4)	7.1 (1)	0.0 (0)
Any mental disorder	57.9 (1822)	55.8 (541)	78.3 (329)	83.3 (20)	48.7 (19)	42.9 (18)	53.1 (280)	55.0 (77)	43.4 (23)	56.0 (192)	59.7 (216)	46.6 (95)	61.5 (8)	50.0 (4)

Notes. ON = Ontario; MB = Manitoba; NB = New Brunswick; NL = Newfoundland and Labrador; YK = Yukon; SK = Saskatchewan; NS = Nova Scotia; PEI = Prince Edward Island; AB = Alberta; BC = British Columbia; QC = Quebec; NT = Northwest Territories; NU = Nunavut.

Table 4
Associations between Province/Territory and Mental Disorders in Canada (Unadjusted Models)

Province/Territory	Post-traumatic stress disorder	Major depressive disorder	Generalized anxiety disorder	Panic disorder	Alcohol use disorder ^a	Any mental disorder
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Pre-COVID Provinces/Territories						
ON	1.00	1.00	1.00	1.00	1.00	1.00
MB	1.17 (0.94, 1.46)	1.34** (1.08, 1.65)	1.00 (0.80, 1.26)	1.26 (0.97, 1.64)	0.58 (0.29, 1.19)	2.87*** (2.20, 3.74)
NB	3.21** (1.41, 7.31)	3.03** (1.33, 6.92)	1.95 (0.86, 4.40)	3.25** (1.42, 7.42)	1.53 (0.35, 6.70)	3.97* (1.35, 11.69)
NL	0.56 (0.30, 1.05)	0.56 (0.32, 1.01)	0.47* (0.24, 0.94)	0.61 (0.27, 1.37)	0.97 (0.23, 4.13)	0.75 (0.40, 1.43)
YK	0.64 (0.31, 1.30)	0.80 (0.42, 1.52)	0.79 (0.39, 1.59)	0.76 (0.31, 1.82)	1.14 (0.34, 3.81)	0.60 (0.32, 1.11)
SK	0.84 (0.67, 1.05)	0.79* (0.63, 0.98)	0.75* (0.59, 0.95)	1.03 (0.78, 1.35)	0.90 (0.57, 1.41)	0.90 (0.73, 1.11)
NS	0.94 (0.64, 1.36)	0.83 (0.58, 1.21)	1.06 (0.72, 1.57)	1.32 (0.86, 2.03)	0.83 (0.37, 1.86)	0.97 (0.68, 1.38)
During COVID Provinces/Territories						
PEI	0.68 (0.36, 1.28)	0.65 (0.36, 1.17)	0.53 (0.45, 1.51)	0.83 (0.40, 1.73)	–	0.61 (0.35, 1.06)
AB	0.85 (0.65, 1.11)	1.16 (0.91, 1.48)	0.79 (0.60, 1.04)	1.24 (0.92, 1.68)	1.26 (0.78, 2.02)	1.01 (0.79, 1.29)
BC	0.99 (0.77, 1.28)	1.17 (0.92, 1.48)	1.04 (0.80, 1.35)	1.10 (0.80, 1.49)	0.48* (0.25, 0.93)	1.17 (0.92, 1.50)
QC	0.58** (0.41, 0.83)	0.78 (0.57, 1.06)	0.42*** (0.28, 0.63)	0.60* (0.39, 0.95)	0.29* (0.11, 0.82)	0.69* (0.51, 0.94)
NT	0.84 (0.26, 2.64)	0.93 (0.34, 2.53)	0.92 (0.29, 2.96)	2.52 (0.84, 7.62)	–	1.27 (0.41, 3.91)
NU	0.86 (0.23, 3.27)	1.14 (0.32, 4.05)	0.99 (0.25, 3.84)	0.51 (0.06, 4.01)	–	0.79 (0.20, 3.19)
Significant differences between provinces ^b	NB > ON, MB, NL, YK, SK, NS, PEI, AB, BC, QC MB > NL, SK, AB, QC ON > QC BC > QC	NB > ON, NL, YK, SK, NS, PEI, AB, BC, QC MB > ON, NL, SK, NS, PEI, QC BC > NL, SK, QC ON > SK	NB > NL, SK, AB, QC ON > NL, SK, QC BC > NL, SK, QC NS > NL, QC SK > QC AB > QC	NB > ON, MB, NL, YK, SK, PEI, AB, BC, QC NT > NL, QC ON > QC MB > QC SK > QC NS > QC AB > QC BC > QC	ON > BC, QC AB > BC, QC SK > QC	NB > ON, NL, YK, SK, NS, PEI, AB, BC, QC MB > ON, NL, YK, SK, NS, PEI, AB, BC, QC BC > PEI, YK, QC ON > QC AB > QC

Notes. OR = odds ratio; CI = confidence interval; ON = Ontario; MB = Manitoba; NB = New Brunswick; NL = Newfoundland and Labrador; YK = Yukon; SK = Saskatchewan; NS = Nova Scotia; PEI = Prince Edward Island; AB = Alberta; BC = British Columbia; QC = Quebec; NT = Northwest Territories; NU = Nunavut. * $p < .05$; ** $p < .01$; *** $p < .001$.

^a Data from Prince Edward Island, Nunavut, and Northwest Territories were not included in the alcohol use disorder models as no one from Prince Edward Island or Nunavut met criteria for a positive screen for alcohol use disorder, and only 1 person from Northwest Territories screened positive.

^b Differences across the provinces and territories were tested by changing the reference categories in logistic regression models (at least $p < .05$). Bold type indicates the province with significantly larger odds.

Table 5
Associations between Province/Territory and Mental Disorders in Canada (Adjusted Models)

Province/Territory	Post-traumatic stress disorder	Major depressive disorder	Generalized anxiety disorder	Panic disorder	Alcohol use disorder ^a	Any mental disorder
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Pre-COVID Provinces/Territories						
ON	1.00	1.00	1.00	1.00	1.00	1.00
MB	0.93 (0.73, 1.20)	1.12 (0.88, 1.42)	0.84 (0.65, 1.10)	1.14 (0.84, 1.54)	0.43 (0.20, 0.91)	2.38*** (1.78, 3.19)
NB	2.21 (0.93, 5.25)	2.79* (1.15, 6.74)	1.40 (0.59, 3.31)	3.02* (1.27, 7.14)	1.28 (0.28, 5.86)	3.17* (1.04, 9.61)
NL	0.46* (0.23, 0.92)	0.37** (0.18, 0.76)	0.33** (0.14, 0.74)	0.47 (0.18, 1.22)	0.40 (0.05, 3.07)	0.50 (0.24, 1.01)
YK	0.64 (0.30, 1.39)	0.82 (0.40, 1.66)	0.82 (0.38, 1.76)	0.78 (0.29, 2.05)	1.01 (0.29, 3.51)	0.61 (0.31, 1.20)
SK	0.44 (0.16, 1.30)	0.41 (0.14, 1.22)	0.60 (0.19, 1.84)	0.44 (0.14, 1.36)	1.01 (0.62, 1.65)	0.84 (0.29, 2.46)
NS	0.86 (0.57, 1.30)	0.77 (0.51, 1.14)	1.06 (0.70, 1.62)	1.33 (0.83, 2.15)	0.72 (0.29, 1.75)	0.87 (0.59, 1.30)
During COVID Provinces/Territories						
PEI	1.03 (0.46, 2.29)	0.94 (0.44, 2.01)	1.11 (0.49, 2.49)	0.85 (0.30, 2.44)	–	0.69 (0.34, 1.40)
AB	0.88 (0.65, 1.17)	1.32* (1.00, 1.73)	0.81* (0.60, 1.10)	1.27 (0.91, 1.77)	1.39 (0.84, 3.23)	1.03 (0.78, 1.35)
BC	1.37 (0.87, 2.15)	1.69* (1.11, 2.56)	1.54 (0.96, 2.47)	1.58 (0.91, 2.75)	0.51 (0.17, 1.45)	1.34 (0.88, 2.03)
QC	0.52*** (0.35, 0.76)	0.78* (0.50, 0.99)	0.38*** (0.25, 0.58)	0.62* (0.39, 0.99)	0.26* (0.09, 0.72)	0.61** (0.44, 0.85)
NT	1.12 (0.28, 4.43)	2.04 (0.66, 6.28)	2.06 (0.56, 7.59)	5.60** (1.56, 20.12)	–	1.87 (0.50, 6.99)
NU	0.93 (0.20, 4.41)	1.25 (0.26, 5.90)	0.76 (0.15, 3.82)	0.32 (0.03, 2.96)	–	0.92 (0.17, 5.03)
Significant differences between provinces ^b	NB > NL, YK, SK, NS, AB, QC BC > NL, QC, SK MB > NL, QC ON > NL, QC AB > QC	NB > ON, NL, YK, SK, NS, MB, QC BC > ON, NL, SK, NS, QC AB > ON, NL, SK, NS, QC MB > NL, QC ON > NL, QC NT > SK, NL	NB > NL, QC MB > BC, NL, QC ON > NL, QC BC > NL, AB, QC NS > NL, QC AB > NL, QC PEI > NL, QC NT > NL, QC	NB > ON, MB, NL, YK, SK, QC NT > ON, BC, NL, YK, PEI, AB, SK, NS, MB, QC, NU BC > QC, SK, NL NS > QC, NL AB > QC, NL ON > QC MB > QC	ON > QC, MB AB > QC, MB SK > QC, MB	NB > ON, NL, YK, NS, PEI, QC MB > ON, NL, YK, NS, PEI, AB, BC, QC BC > NL, PEI, YK, QC ON > QC AB > QC

Notes. AOR = odds ratio adjusted for sociodemographic covariates (i.e., sex, age, marital status, education, household income, work location, total years of service, occupational group, and province); CI = confidence interval; ON = Ontario; MB = Manitoba; NB = New Brunswick; NL = Newfoundland and Labrador; YK = Yukon; SK = Saskatchewan; NS = Nova Scotia; PEI = Prince Edward Island; AB = Alberta; BC = British Columbia; QC = Quebec; NT = Northwest Territories; NU = Nunavut. In adjusted models, data that were missing as it was not collected by the province/territory was coded back into the variable as “missing/not collected” in order to retain those provinces/territories in multivariable analyses.

* $p < .05$; ** $p < .01$; *** $p < .001$.

^a Data from Prince Edward Island, Nunavut, and Northwest Territories were not included in the alcohol use disorder models as no one from Prince Edward Island or Nunavut met criteria for a positive screen for alcohol use disorder, and only 1 person from Northwest Territories screened positive. We were also unable to adjust for sex as a covariate in the alcohol use disorder models.

^b Differences across the provinces and territories were tested by changing the reference categories in logistic regression models (at least $p < .05$). Bold type indicates the province with significantly larger odds.

COVID-19 onset; in contrast, the positive screening prevalence proportions for PTSD (30.1% versus 26.6%) and any mental disorder (59.4% versus 54.7%) were lower for regions where data were collected after the COVID-19 onset ($ps < 0.05$). After adjustment for sociodemographic covariates, the odds of screening positive for any mental disorder remained significantly lower in the post-COVID period than the pre-COVID period (adjusted odds ratio [AOR] = 0.77, 95% CI = 0.63, 0.94, $p < .05$).

These findings were inconsistent with our hypothesis that the prevalence of mental disorders would be higher in regions where data collection occurred after the onset of the COVID-19 pandemic; therefore, a post hoc analysis was conducted to examine potential differences in mental disorder prevalence between regions where data was collected after the onset of the COVID-19 pandemic (given that QC evidenced substantially lower prevalence estimates for most mental disorders, which could have impacted the overall prevalence in the during/after COVID time frame). The post hoc analysis indicated that CWs from QC

reported a lower prevalence of PTSD than CWs from BC, a lower prevalence of MDD, GAD, and any mental disorder than CWs from BC and AB, and a lower prevalence of PD than CWs from BC, AB, and NW.

4. Discussion

The current study builds on previous research with a mixed sample of CWs in Canada (Carleton et al., 2018) by assessing the positive screening prevalence for mental disorders among CWs working in the 13 Canadian provinces and territories. More than half (57.9%) of participating territorial and provincial CWs screened positive for one or more mental disorder(s), a proportion much greater than would be expected based on the diagnostic prevalence for the general public (i.e., 10.1%; Statistics Canada, 2013). The result was consistent with our expectations in that previous research evidenced similar prevalence among the mixed jurisdictional CWs sample (i.e., 54.6%; Carleton et al., 2018), and underscores the relatively disproportionate mental health risks associated

Table 6
Associations between Data Collection Period (Pre-COVID vs. During-COVID) and Mental Disorders in Canada.

Mental disorder	Pre-COVID	During-COVID	OR (95% CI) ^a	AOR (95% CI) ^a
	Provinces/ Territories	Provinces/ Territories		
	% (n)	% (n)		
Post-traumatic stress disorder	30.1 (742)	26.6 (289)	0.84 (0.72, 0.99)*	0.86 (0.70, 1.07)
Major depressive disorder	37.0 (899)	37.8 (400)	1.04 (0.89, 1.20)	1.14 (0.94, 1.38)
Generalized anxiety disorder	28.8 (676)	25.5 (256)	0.85 (0.72, 1.00)	0.79 (0.64, 0.98)*
Panic disorder	19.2 (444)	18.4 (184)	0.95 (0.78, 1.15)	0.95 (0.99, 1.27)
Alcohol use disorder	6.3 (115)	4.5 (42)	0.74 (0.51, 1.06)	0.91 (0.58, 1.41)
Any mental disorder	59.4 (1284)	54.7 (538)	0.83 (0.71, 0.96)*	0.77 (0.63, 0.94)*

Notes. Pre-COVID provinces/territories include Ontario, Manitoba, New Brunswick, Newfoundland and Labrador, Yukon, Saskatchewan, and Nova Scotia. During-COVID provinces/territories include Prince Edward Island, Alberta, British Columbia, Quebec, Northwest Territories, and Nunavut. OR = odds ratio; CI = confidence interval; AOR = odds ratio adjusted for socio-demographic covariates (i.e., sex, age, marital status, education, household income, work location, total years of service, occupational group, and province). In adjusted models, data that were missing as it was not collected by the province/territory was coded back into the variable as "missing/not collected" in order to retain those provinces/territories in multivariable analyses.

* $p < .05$; ** $p < .01$; *** $p < .001$.

^a Pre-COVID provinces are the reference category with an odds of 1.00.

with serving as a CW in any region.

Participants who identified as female were statistically significantly less likely than men to screen positive for several mental disorders (i.e., PTSD, MDD, and AUD), and comparably likely to screen positive for other mental disorders and any mental disorder. The results contrast previous research with CWs (Carleton et al., 2018) and provincial CWs in Ontario (Carleton, Ricciardelli, Taillieu, et al., 2020), wherein females were statistically significantly more likely than males to screen positive for mental disorders. Other qualitative research reflects the gendered nature of the correctional work environment, where masculine traits may become dominant and role conflicts may be salient for women (Ricciardelli, 2017), thus constituting a potential additional workplace stressor. The current result contrasts previous research with CWs and warrants further research.

CWs who were married, common-law, or remarried were less likely to screen positive than participants who were separated, divorced, widowed, or single. The results were consistent with previous research (Carleton et al., 2018) and our expectations. Previous research indicates that social support appears to be an important resilience factor for CW mental health (Vig et al., 2020) and spouses appear to be primary social support avenues for CWs (Carleton et al., 2019). Social support may also be associated with the result indicating CWs working in rural locations were more likely than those working in urban locations to screen positive for one or more mental disorder(s). CWs working in rural locations may have less access to social support as a function of interactions between vocational and geographic isolation. Alternatively, CWs working in rural locations may have fewer resources overall, and less access to evidence-based care (Friesen, 2019). Further research to better understand urban and rural locations is warranted.

Consistent with our expectations and previous research, participating CWs 40–49 years old were statistically significantly more likely to

screen positive for most mental disorders than participants younger than 30 years old; however, participants 50 years old and older were less likely to screen positive than participants younger than 30 years old. It may be that participants 40–49 years old who experience mental health challenges and have served long enough to retire may be more likely to leave the service before turning 50. There may also be age-related resiliency factors, such as vocational experience, increased peer support, pending retirement, or specific individual differences in resiliency that might explain the non-linear relationship between age and positive screenings; however, such speculation would be inconsistent with the results indicating that more years of service were associated with a statistically significantly increased probability of screening positive for one or more mental disorder(s). The consistent relationship between mental health challenges and years of service in the current study and previous studies (Carleton et al., 2018; Ricciardelli, 2019) implicates cumulative occupational stressors as primary causal factors, including but not limited to PPTE exposures and support after PPTE exposures.

Age and years of service may also be affected by household income, education, and occupational category, which may collectively help to explain some of the current results. For example, years of service is likely associated with progressive salary advancements and therein household income, which was inversely associated with positive screens for mental disorders. The inverse relationship between household income and mental health challenges has been well-established (Hopper, Best, Wister, & Cosco, 2023) and may be similarly reflected in the current results. Relatedly, and as expected, higher levels of education were inversely associated with positive screens for PTSD and may interact with household income. Higher levels of education have consistently been inversely associated with mental health challenges among CWs (Carleton et al., 2018) and may facilitate implementation of tools provided through evidence-informed mental health specific training (Carleton et al., 2019; Johnston, Ricciardelli, Ghodrati, & Czarnuch, 2023). There may be a further relationship involving occupational category, for which correctional officers were more likely to screen positive for mental disorders than any other category (e.g., Administrative Headquarters, Community Administration/ Management, Institutional Administration/ Management). Participants identifying as occupational categories other than correctional officer may have been promoted as a function of years of service and education, which can reasonably be associated with higher household income and fewer current direct exposures to PPTE and other operational stressors, therein mitigating mental health challenges.

There were inconsistent regional differences in proportions of positive screens for mental disorders. Provinces tended to be more and less likely to screen positive relative to ON, with the most consistent differences being that 1) NB was statistically significantly more likely to screen positive for PTSD, MDD, and PD, as well as any mental disorder; and 2) QC was statistically significantly less likely to screen positive for PTSD, GAD, PD, and AUD, as well as any mental disorder. Provincial and territorial differences in the prevalence of mental disorders did not substantively change after adjustment for sociodemographic variables. Thus, differences may be explained by differences in sample sizes, or any number of other variables including, but not limited to, disparities in provincial environments, policies, or resourcing.

There was also an aggregated difference in that regions wherein data collection occurred pre-COVID-19 appeared to have comparable or lower proportions of positive screens for mental disorders than regions wherein data collection occurred after the COVID-19 onset. Importantly, the only statistically significant differences between the two groups was for PTSD and any mental disorder, which were marginally lower. Additionally, the prevalence estimates of positive mental disorder screens in provinces where data were collected after the onset of the COVID-19 pandemic could have been impacted by the lower prevalence of most mental disorders reported among CWs from QC. The post hoc analysis largely supported this speculation, and indicated that CWs from QC reported a lower prevalence of PTSD than CWs from BC, a lower

prevalence of MDD, GAD, and any mental disorder than CWs from BC and AB, and a lower prevalence of PD than CWs from BC, AB, and NW. Even without consistently statistically significantly lower proportions among regions wherein data collection occurred after the COVID-19 onset, the results may be counterintuitive. COVID-19 was particularly harmful to the mental health of essential workers (Asmundson et al., 2020), such as nurses (García-Vivar et al., 2023); accordingly, we expected regions wherein data collection occurred after the COVID-19 onset might evidence larger proportions of positive screenings for mental disorders among CWs due to additional pandemic-related stressors (e.g., concerns about infection, public health measures, lockdowns, increased caregiver responsibilities). The absence of differences may simply reflect pre-existing provincial disparities, as evidenced by the differences among regions wherein data collection occurred pre-COVID-19 onset. Without pre-COVID-19 data from each province there is no way to assess for actual changes.

There were several changes that occurred after COVID-19 onset that might have mitigated against what would have otherwise been increased mental health challenges; for example, the prison environment involved less interaction with the public, enabled some remote work opportunities, and brought changes to administrative tasks. There were also at times substantial decarceration efforts (i.e., the release of select prisoners back into the community prior to the end of their sentence) undertaken as a public health measure after the onset of COVID-19. Substantial decarceration can reasonably be expected to have mitigated otherwise compounding mental health challenges from COVID-19 stressors by potentiating reductions in overall occupational stressors through 1) improved the ratios of CWs to prisoners; 2) allowing staff more time for rehabilitative responsibilities and pervasively ensuring the wellness, safety, and security; and 3) allowing for better working conditions and work-life balance. Differences could also be due to differences in access to mental health care in the pre- and post-COVID periods. Such speculation would require additional research, but if supported, would provide another option for helping to address the disproportionate mental health challenges among CWs relative to the general public. There is also no information about how decarceration was experienced by the people who remained incarcerated (outside of the disheartening reality that despite some being released, some remained incarcerated following a risk assessment). Future longitudinal research could also assess for changes in CW mental health based on interactions between decarceration and occupational category; for example, decarceration may improve mental health among CWs working within institutions by reducing their workloads, but reduce mental health among CWs working in community correctional services as a function of increasing their caseloads.

The current study has several limitations that can help inform further directions for future research. First, voluntary participation potentiated self-selection biases, which obfuscated actual population prevalence among CWs and impeded robust descriptions of the response rate and sampling frame. Second, the absolute and relative proportions of participants to serving CWs were highly variable across and within each province or territory, suggesting the current results may not robustly generalize for each regional population. The small sample size for some of the provinces/territories (e.g., $n = 27$ in NB; $n = 11$ in NU) and associated wide confidence intervals associated with estimates suggest some of the findings need to be interpreted with caution. Future studies should endeavour to acquire even larger and more representative samples of provincial and territorial CWs. Third, there are several differences in Canada between federal and provincial or territorial correctional services, limiting the generalizability of speculations regarding factors that may interact with mental health, and requiring ongoing research to highlight similarities and differences to optimize efforts at improving supports for all who serve as CWs. Fourth, mental health was assessed using well-validated self-report tools assessing symptoms collected via an anonymous online survey, raising some questions about reliability and validity (Bethlehem, 2010); nevertheless,

a relatively recent meta-analysis did not identify substantial differences when comparing self-report assessments and interview assessments (Berger, Addis, Reilly, Syzdek, & Green, 2012). The screening tools do use different symptom duration periods, but were treated as assessing current rather than lifetime prevalence. Even with anonymity, self-report tools may result in participants under-reporting symptoms (Berger et al., 2012; Hunt, Auriemma, & Cashaw, 2003), which may be exacerbated for CWs who are concerned about stigma and confidentiality (Carleton et al., in press; Halpern, Gurevich, Schwartz, & Brazeau, 2009; Henderson, Van Hasselt, Leduc, & Couwels, 2016; Karaffa & Koch, 2016; Ricciardelli et al., 2018; Ricciardelli et al., 2018). We also did not have data comparing pre- and post-COVID mental disorder assessments within each province/territory, thus it is not possible to examine within province/territory change. As well, differences across provinces/territories related to pre- and post-COVID comparisons could also reflect different levels of the pandemic crisis in terms of outbreaks, deaths, vaccine coverage, public health restrictions, and so on (as the timeframes for data collection varied substantially). Future efforts at assessing CW mental health should consider investing in purposeful epidemiological sampling with structured clinical interviews and self-report tools. Fifth, the use of cross-sectional data precludes causal discussions regarding potential risk and resiliency factors, particularly interaction factors. Future research should include prospective mixed-methods longitudinal designs.

The unexpected evidence of female-identifying participants screening positive less often than males contrasts prior research with the general public and CWs, warranting additional research. The higher probability of CWs working in rural locations than urban locations also warrants additional research, potentially most effectively with qualitative methods. Associations between mental health and age, income, education, occupational category, and years of service appear to warrant additional research. Clarifying the interactions and directional relationships using longitudinal and/or qualitative methods may help inform novel solutions to protect CW mental health. There is also a need to better understand the mechanisms driving differences in mental disorder prevalence proportions across provinces and territories. The potential impact of COVID-19 on the mental health of CWs should also be assessed. Ideally, a prospective mixed-methods longitudinal study would have been ideal to assess for potential impacts of COVID-19 on the mental health of CWs; however, there may yet be opportunities using retrospective research designs or assessments of changes in mental health resource use (e.g., insurance claims).

5. Conclusions

We found evidence that CWs screened positive for mental disorders much more frequently than would be expected from the general public diagnostic prevalence. There was evidence that correctional officers were more likely than other CWs to screen positive, as were CWs with increasing years of service. There may be opportunities to help mitigate the impacts of occupational stressors specifically on correctional officers, and there appears to be evidence that mental health resources should be available throughout CW careers. There was also evidence that CWs who were married, common-law, or remarried were less likely to screen positive for mental disorders. There may be opportunities to support CW mental health by providing psychoeducation and supports to their spouses and their families. Finally, there appeared to be several differences across provinces and territories regarding the proportions of positive screens for mental disorders. Understanding the mechanisms driving differences in mental disorder prevalence proportions across provinces and territories, potentially focusing on the impacts of decarceration on CW mental health, may provide important insights into opportunities to improve the mental health of all CWs. Addressing and remediating the mental health challenges among CWs is inherently valuable, creates a healthier, more sustainable correctional labour force, and can potentiate a healthier prisoner/probationer population in

Canada's provincial and territorial correctional services.

Authors' contributions

All authors made substantial contributions consistent with the International Committee of Medical Journal Editors. We present below the details describing the contributions of the authors alphabetically by last name.

Initial design for the current article was a collaborative effort based on the following contributors, each of whom were responsible for overseeing their area-specific domains for assessment, and all of whom reviewed, revised as necessary, and approved the final design of the manuscript in its entirety: Conceptualization–Ricciardelli; Methodology–Carleton, Ricciardelli, Taillieu, Afifi; Validation–Carleton, Ricciardelli, Taillieu, Afifi; Formal Analyses–Afifi, Dorniani, Ricciardelli, Taillieu; Investigation, Ricciardelli; Resources–Afifi, Carleton, Ricciardelli, Taillieu; Data Curation–Afifi, Carleton, Dorniani, Ricciardelli, Taillieu; Writing–Original Draft Preparation–Johnston, Ricciardelli, Taillieu; Writing–Carbonell, Johnston, Ricciardelli, Taillieu; Review & Editing–all authors; Project Administration–Ricciardelli, Andres; Funding Acquisition–Carleton, Ricciardelli. All authors approved the submitted version of the manuscript.

Ethics approval and consent to participate

Research ethics boards at University of Regina (REB #2017–098), Memorial University of Newfoundland (ICEHR #20201330-EX), and Queen's University (#6024787) approved the data collection for the current study. We complied with Canadian Psychological Association ethical standards in the treatment of our sample. The survey was available for voluntary participation from December 2017 to June 2023. We directed all interested persons to a website with study details and participants were required to explicitly indicate consent before proceeding.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Tracie O. Afifi's research is supported by a CIHR Foundation Scheme Award and a Tier 1 Canada Research Chair in Childhood Adversity and Resilience. This research was also funded in part by a Government of Alberta as well as WorkplaceNL.

CRediT authorship contribution statement

R. Ricciardelli: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. **R.N. Carleton:** Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing, Formal analysis, Supervision. **T.L. Taillieu:** Conceptualization, Formal analysis, Methodology, Validation, Writing – original draft, Writing – review & editing. **S. Dorniani:** Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing. **M.S. Johnston:** Conceptualization, Writing – original draft, Writing – review & editing. **M. Carbonell:** Writing – original draft, Writing – review & editing. **R. Coulling:** Writing – original draft, Writing – review & editing. **E. Andres:** Project administration, Writing – original draft, Writing – review & editing. **T.O. Afifi:** Conceptualization, Formal analysis, Funding acquisition, Supervision, Writing – original draft, Writing – review & editing.

Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jcrimjus.2024.102168>.

References

- Asmundson, G. J. G., Blackstock, C., Bourque, M. C., Brimacombe, G., Crawford, A., Deacon, S. H., ... Campbell-Yeo, M. (2020). Easing the disruption of COVID-19: Supporting the mental health of the people of Canada—October 2020—An RSC policy briefing. *FACETS*, 5(1), 1071–1098. <https://doi.org/10.1139/facets-2020-0082>
- Atlantic Briefs Desk. (2023). *HMP staffing concerns highlight need for new prison: Conway Ottenheimer*. <https://www.saltwire.com/atlantic-canada/news/hmp-staffing-concerns-highlight-need-for-new-prison-conway-ottenheimer-100872515/>.
- Babor, T. F., Higgins-Biddle, J. C., Saunders, J. B., & Monteiro, M. G. (2001). *The alcohol use disorders identification test: Guidelines for use in primary care* (2nd ed.). Geneva, Switzerland: World Health Organization.
- Berger, J. L., Addis, M. E., Reilly, E. D., Syzdek, M. R., & Green, J. D. (2012). Effects of Gender, diagnostic labels, and causal theories on willingness to report symptoms of depression. *Journal of Social and Clinical Psychology*, 31(5), 439–457.
- Bethlehem, J. (2010). Selection Bias in web surveys. *International Statistical Review*, 78, 161–188. <https://doi.org/10.1111/j.1751-5823.2010.00112.x>
- Black, M. (2023). Staff shortages helped fuel tensions, brawls at Edmonton institution: Report. *Edmonton Journal*. <https://edmontonjournal.com/news/local-news/sheriffs-at-the-border-how-would-alberta-officers-work-with-cbsa-to-stop-drug-smuggling>.
- Bovin, M. J., Marx, B. P., Weathers, F. W., Gallagher, M. W., Rodriguez, P., Schnurr, P. P., & Keane, T. M. (2016). Psychometric properties of the PTSD checklist for diagnostic and statistical manual of mental disorders-fifth edition (PCL-5) in veterans. *Psychological Assessment*, 28(11), 1379–1391. <https://doi.org/10.1037/PAS0000254>
- Carleton, R. N., Afifi, T. O., Taillieu, T., Turner, S., Mason, J. E., Ricciardelli, R., ... Griffiths, C. T. (2020). Assessing the relative impact of diverse stressors among public safety personnel. *International Journal of Environmental Research and Public Health*, 17(4), 1234. <https://doi.org/10.3390/ijerph17041234>
- Carleton, R. N., Afifi, T. O., Turner, S., Taillieu, T., Duranceau, S., LeBouthillier, D. M., ... Asmundson, G. J. G. (2018). Mental disorder symptoms among public safety personnel. *Canadian Journal of Psychiatry*, 63, 54–64. <https://doi.org/10.1177/0706743717723825>
- Carleton, R. N., Afifi, T. O., Turner, S., Taillieu, T., Vaughan, A. D., Anderson, G. S., ... Camp, R. D., II. (2019). Mental health training, attitudes towards support, and screening positive for mental disorders. *Cognitive Behaviour Therapy*, 43, 374–386. <https://doi.org/10.1080/16506073.2019.1575900>
- Carleton, R. N., Ricciardelli, R., Taillieu, T., Mitchell, M. M., Andres, E., & Afifi, T. O. (2020). Provincial correctional service workers: The prevalence of mental disorders. *International Journal of Environmental Research and Public Health*, 17(7), 2203. <https://doi.org/10.3390/ijerph17072203>
- Friesen, E. (2019). The landscape of mental health services in rural Canada. *University of Toronto Medical Journal*, 96(2), 47–52.
- Fusco, N., Ricciardelli, R., Jamshidi, L., Carleton, R. N., Barnim, N., Hilton, Z., & Groll, D. (2021). When our work hits home: Trauma and mental disorders in correctional officers and other correctional workers. *Frontiers in Psychiatry*, 11, 493391. <https://doi.org/10.3389/fpsy.2020.493391>
- García-Vivar, C., Rodríguez-Matesanz, L., San Martín-Rodríguez, L., Soto-Ruiz, N., Ferraz-Torres, M., & Escalada-Hernández, P. (2023). Analysis of mental health effects among nurses working during the COVID-19 pandemic: A systematic review. *Journal of Psychiatric and Mental Health Nursing*, 30(3), 326–340. <https://doi.org/10.1111/jpm.12880>
- Halpern, J., Gurevich, M., Schwartz, B., & Brazeau, P. (2009). What makes an incident critical for ambulance workers? Emotional outcomes and implications for intervention. *Work and Stress*, 23(2), 173–189. <https://doi.org/10.1080/02678370903057317>
- Henderson, S. N., Van Hasselt, V. B., Leduc, T. J., & Couwels, J. (2016). Firefighter suicide: Understanding cultural challenges for mental health professionals. *Professional Psychology: Research and Practice*, 47(3), 224–230. <https://doi.org/10.1037/pro0000072>
- Hopper, S., Best, J., Wister, A., & Cosco, T. (2023). Contributors to mental health silence in middle-aged and older adults: An analysis of the Canadian longitudinal study on aging. *International Psychogeriatrics*, 1–10. <https://doi.org/10.1017/S1041610223000224>
- Houck, P. R., Spiegel, D. A., Shear, M. K., & Rucci, P. (2002). Reliability of the self-report version of the panic disorder severity scale. *Depression and Anxiety*, 15(4), 183–185. <https://doi.org/10.1002/DA.10049>
- Hunt, M., Auriemma, J., & Cashaw, A. C. (2003). Self-report bias and underreporting of depression on the BDI-II. *Journal of Personality Assessment*, 80(1), 26–30. https://doi.org/10.1207/s15327752JPA8001_10
- Johnston, M. S., Ricciardelli, R., Ghodrati, M., & Czarnuch, S. (2023). Assessing road to mental readiness (R2MR) training among correctional workers in Canada. *Health & Justice*, 11(2), 1–10.
- Johnston, M. S., Ricciardelli, R., & McKendry, L. (2021). Suffering in silence: Work and mental health experiences among provincial correctional workers in Canada. *Corrections: Policy, Practice and Research, OnlineFirst*, 1–19. <https://doi.org/10.1080/23774657.2021.1978906>

- Karaffa, K. M., & Koch, J. M. (2016). Stigma, pluralistic ignorance, and attitudes toward seeking mental health services among police officers. *Criminal Justice and Behavior*, 43(6), 759–777. <https://doi.org/10.1177/0093854815613103>
- Konyk, K., Ricciardelli, R., Taillieu, T., Affifi, T. O., Groll, D., & Carleton, R. N. (2021). Assessing relative stressors and mental disorders among Canadian provincial correctional workers. *International Journal of Environmental Research and Public Health*, 18(19), 10018. <https://doi.org/10.3390/ijerph181910018>
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16(9), 606–613. <https://doi.org/10.1046/J.1525-1497.2001.016009606.X>
- Kroenke, K., Spitzer, R. L., Williams, J. B. W., & Löwe, B. (2010). The patient health questionnaire somatic, anxiety, and depressive symptom scales: A systematic review. *General Hospital Psychiatry*, 32(4), 345–359.
- Lake, E. T., Narva, A. M., Holland, S., Smith, J. G., Cramer, E., Rosenbaum, K. E. F., ... Rogowski, J. A. (2022). Hospital nurses' moral distress and mental health during COVID-19. *Journal of Advanced Nursing*, 78(3), 799–809. <https://doi.org/10.1111/jan.15013>
- Regehr, C., Carey, M., Wagner, S., Alden, L. E., Buys, N., Corneil, W., ... White, N. (2021). Prevalence of PTSD, depression and anxiety disorders in correctional officers: A systematic review. *Corrections: Policy, Practice and Research*, 6(3), 229–241. <https://doi.org/10.1080/23774657.2019.1641765>
- Rhodes, B. (2023). Staff shortage at N.S. Jail at 'crisis' level, union says. *CBC News*. <https://www.cbc.ca/news/canada/nova-scotia/staffing-burnside-jail-crisis-level-1.6936065>.
- Ricciardelli, R. (2017). Canadian provincial correctional officers: Gender strategies of achieving and affirming masculinities. *Journal of Men's Studies*, 25(1), 3–24.
- Ricciardelli, R. (2019). *Also serving time: Canadian provincial and territorial correctional officers*. Toronto: University of Toronto Press.
- Ricciardelli, R., Carleton, R. N., Groll, D., & Cramm, H. (2018). Qualitatively unpacking Canadian public safety personnel experiences of trauma and their well-being. *Canadian Journal of Criminology and Criminal Justice*, 60(4), 566–577. <https://doi.org/10.3138/cjccj.2017-0053.r2>
- Ricciardelli, R., Groll, D., Czarnuch, S., Carleton, R. N., & Cramm, H. (2019). Behind the frontlines: Exploring the mental health and help-seeking behaviours of public safety personnel who work to support frontline operations. *Annual Review of Interdisciplinary Justice Research*, 8, 315–348.
- Ricciardelli, R., Haynes, S. H., Burdette, A., Keena, L., McCreary, D., Carleton, R. N., ... Groll, D. (2021). Mental health, stigma, gender, and seeking treatment: interpretations and experiences of prison employees. *Applied Psychology in Criminal Justice*, 16(1), 107.
- Ricciardelli, R., & MacDonald, N. E. (2022). Moral injury in health care: A focus on immunization. *Vaccine*, 40(49), 7011–7013. <https://doi.org/10.1016/j.vaccine.2022.10.054>
- Ricciardelli, R., Taillieu, T., Carleton, R. N., Affifi, T. O., Mitchell, M. M., Barnim, N., ... Groll, D. (2019). Correctional Work, wellbeing and mental health disorders. *Advancing Corrections Journal*, 8(4), 53–69.
- Saunders, J. B., Aasland, O. G., Babor, T. F., De La Fuente, J. R., & Grant, M. (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption—II. *Addiction*, 88, 791–804.
- Shear, M. K., Brown, T. A., Barlow, D. H., Money, R., Sholomskas, D. E., Woods, S. W., ... Papp, L. A. (1997). Multicenter collaborative panic disorder severity scale. *The American Journal of Psychiatry*, 154(11), 1571–1575. <https://doi.org/10.1176/ajp.154.11.1571>
- Shear, M. K., Rucci, P., Williams, J., Frank, E., Grochocinski, V., Vander Bilt, J., ... Wang, T. (2001). Reliability and validity of the panic disorder severity scale: Replication and extension. *Journal of Psychiatric Research*, 35(5), 293–296. [https://doi.org/10.1016/S0022-3956\(01\)00028-0](https://doi.org/10.1016/S0022-3956(01)00028-0)
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092–1097. <https://doi.org/10.1001/ARCHINTE.166.10.1092>
- Statistics Canada. (2013). *Rates of selected mental or substance use disorders, lifetime and 12 month, Canada, household population 15 and older, 2012 Canadian Community Health Survey - Mental Health*. Ottawa: Government of Canada.
- Swinson, R. P. (2006). The GAD-7 scale was accurate for diagnosing generalised anxiety disorder. *Evidence-Based Medicine*, 11(6), 184. <https://doi.org/10.1136/EBM.11.6.184>
- Vig, K. D., Mason, J. E., Carleton, R. N., Asmundson, G. J. G., Anderson, G. S., & Groll, D. (2020). Mental health and social support among public safety personnel. *Occupational Medicine*, 70, 427–433. <https://doi.org/10.1093/occmed/kqaa129>
- Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2013). The life events checklist for DSM-5 (LEC-5). *Instrument available from the National Center for PTSD at www.ptsd.va.gov*.
- Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). *PTSD checklist for DSM-5 (PCL-5)*. National Centre for PTSD.