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Mental Disorder Symptoms among Public Safety Personnel in Canada

Symptômes de trouble mental chez le personnel de la sécurité publique du Canada

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Abstract

Background: Canadian public safety personnel (PSP; e.g., correctional workers, dispatchers, firefighters, paramedics, police officers) are exposed to potentially traumatic events as a function of their work. Such exposures contribute to the risk of developing clinically significant symptoms related to mental disorders. The current study was designed to provide estimates of mental disorder symptom frequencies and severities for Canadian PSP.

Methods: An online survey was made available in English or French from September 2016 to January 2017. The survey assessed current symptoms, and participation was solicited from national PSP agencies and advocacy groups. Estimates were derived using well-validated screening measures.

Results: There were 5813 participants (32.5% women) who were grouped into 6 categories (i.e., call center operators/dispatchers, correctional workers, firefighters, municipal/provincial police, paramedics, Royal Canadian Mounted Police). Substantial proportions of participants reported current symptoms consistent with 1 (i.e., 15.1%) or more (i.e., 26.7%) mental disorders based on the screening measures. There were significant differences across PSP categories with respect to proportions screening positive based on each measure.

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Interpretation: The estimated proportion of PSP reporting current symptom clusters consistent with 1 or more mental disorders appears higher than previously published estimates for the general population; however, direct comparisons are impossible because of methodological differences. The available data suggest that Canadian PSP experience substantial and heterogeneous difficulties with mental health and underscore the need for a rigorous epidemiologic study and category-specific solutions.

Abrégé

Contexte : Le personnel de la sécurité publique (PSP) canadien (p. ex., les travailleurs des services correctionnels, les répartiteurs, les pompiers, les ambulanciers, les officiers de police) sont exposés à des événements possiblement traumatisants dans le cadre de leur travail. Ces expositions contribuent au risque de développer des symptômes cliniquement significatifs liés à des troubles mentaux. La présente étude a été conçue pour offrir des estimations de la fréquence et de la gravité des symptômes de trouble mental pour le PSP canadien.

Méthodes : Un sondage en ligne a été offert en anglais et en français de septembre 2016 à janvier 2017. Le sondage estimait les symptômes actuels, et la participation a été sollicitée dans les agences nationales de PSP et les groupes de défense d'intérêts. Les estimations ont été obtenues à l'aide de mesures de dépistage bien validées.

Résultats : Il y a eu 5813 participants (32,5 % de femmes) qui ont été regroupés en 6 catégories (p. ex., opérateurs/répartiteurs de centres d'appels, travailleurs de services correctionnels, pompiers, police municipale/provinciale, ambulanciers, Gendarmerie royale du Canada). Des proportions substantielles de participants ont déclaré des symptômes actuels compatibles avec un (c.-à-d., 15,1 %) trouble mental ou plus (c.-à-d., 26,7 %) selon les mesures de dépistage. Il y avait des différences significatives entre les catégories de PSP relativement aux proportions positives au dépistage, selon chaque mesure.

Interprétation : La proportion estimée de PSP déclarant des groupes de symptômes actuels compatibles avec un trouble mental ou plus semble plus élevée que les estimations publiées précédemment pour la population générale; toutefois, les comparaisons directes sont impossibles en raison des différences méthodologiques. Les données disponibles suggèrent que le PSP canadien éprouve des difficultés de santé mentale substantielles et hétérogènes, et elles soulignent le besoin d'une étude épidémiologique rigoureuse ainsi que des solutions propres à chaque catégorie.

Keywords
mental disorders, first responders, public safety personnel, operational stress injuries, posttraumatic stress disorder

Canadian public safety personnel (PSP) include, but are not limited to, correctional workers (security and nonsecurity roles), dispatchers, firefighters, paramedics, and police officers.[1] Regular exposure to potentially traumatic events such as exposure to threatened or actual physical assaults, fires, or explosions[2] is expected for PSP employment.[3,4] Such exposures have been associated with increased risk for the development of mental disorders, including posttraumatic stress disorder (PTSD),[2] major depressive disorder (MDD),[5] panic disorder (PD), generalized anxiety disorder (GAD), and social anxiety disorder (SAD), as well as vulnerability for an alcohol use disorder (AUD).[6,7] In Canada, mental health disorders experienced by PSP that result from active duty have increasingly been relabelled by community members as "operational stress injuries,"[1] a phrase originally coined for Canadian military experiencing mental disorders directly tied to their service.[8]

International estimates of mental disorders among PSP range from 10% to 35%,[1,9-13] but Canadian data remain sparse. There have been some relatively small or specific sample studies conducted with Canadian PSP groups[1,10,14-16]; however, there is substantial variability in the estimates based on the published international and Canadian PSP data. In addition, results from PSP outside of Canada may not apply because of differences in the populations being served and the training PSP receive.[17-19] The previously published PSP research on mental disorders has also been limited by small sample sizes from relatively small geographic areas, the exclusive use of clinical samples, the use of diverse measures, and a focus on PTSD. The diversity of previously employed research screening tools and methods limits the development of reliable baselines for symptom assessments of mental disorders. The same challenges in screening tool diversity have made comparisons of mental disorder frequencies across PSP categories difficult at best.

The Canadian Armed Forces currently benefits from broad access to reliable estimates of mental disorder type and frequency.[20] For example, researchers have reported that 14.9% of currently active Canadian Armed Forces personnel met diagnostic criteria for a mental disorder within the past year,[6,8] and a significant relationship was identified between traumatic events during deployment and mental disorders and suicide.[6,21,22] Recent efforts by several PSP leaders, advocacy groups, and researchers also now focus on perceived PSP risk for mental disorder development, emphasizing the need for evidence comparable to that available for the Canadian Armed Forces.[1]

In 2016, the Prime Minister of Canada mandated the Minister of Public Safety and Emergency Preparedness to work with the federal Minister of Health to develop a

National Action Plan to address PTSD among PSP.[1] In January 2016, the Parliamentary Secretary hosted a national roundtable to discuss mental disorders among PSP.[23] A subsequent report from the Standing Committee on Public Safety and National Security underscored that current estimates of Canadian PSP affected by mental disorders appear insufficient,[1] therein potentiating stigma and creating barriers for care seeking[1]; however, the absence of reliable estimates that facilitate comparisons across groups compromises capacity for a National Action Plan and hampers efforts to justify increasing research support for PSP.

Previous PSP research on mental disorders has been limited by small sample sizes, spanning small geographic areas, exclusive use of clinical samples, and the use of diverse measures; herein, we overcome such limitations with a large, national, diverse sample assessed using broadly-accepted and validated screening measures. The current study was designed to provide estimates of several mental disorder symptoms that can 1) provide initial data on normative responding for PSP and 2) facilitate explicit comparisons across diverse Canadian PSP. The results are intended to support the recommended National Action Plan[1] that includes ongoing increasingly robust research.

Methods

Procedure

Data were collected using a web-based self-report survey in English or French. The survey included well-established measures for screening mental disorder symptom levels that may warrant further clinical attention (details below). The research followed established guidelines for web surveys.[24] Measure selection used a collaborative approach including the authors and representatives from the Public Safety Steering Committee (PSSC) of the Canadian Institute for Public Safety Research and Treatment. The PSSC representatives include leadership from each of the Canadian Association of Chiefs of Police, the Canadian Association of Fire Chiefs, the Canadian Association for Police Governance, the Canadian Police Association, the Correctional Service of Canada (CSC), the International Association of Firefighters, the Paramedic Association of Canada, the Paramedic Chiefs of Canada, the Royal Canadian Mounted Police (RCMP), and the Union of Solicitor General Employees. The study was approved by the University of Regina Institutional Research Ethics Board (file No. 2016-107). The survey was available for voluntary participation from 1 September 2016 to 31 January 2017. Participation was solicited through emails sent to currently working PSP, including civilian members working for police and volunteer firefighters, directing interested persons to a website with study details. The website issued each participant a unique computer-generated random code that allowed for repeated nonduplicate entry into the survey to accommodate the challenging schedules of PSP and facilitate participation.

Data and Sample

Emails were sent by the PSSC as well as numerous provincial and municipal PSP agencies. The Minister of Public Safety and Emergency Preparedness also provided a video invitation encouraging participation. Each of the national public safety organizations sent the invitation email to their provincial counterparts, who were then asked to forward the invitation either directly to potential participants or to their municipal counterparts, who were then asked to invite potential participants. Several advocacy organizations also sent the invitation to their email distribution lists. The invitation was also made available through links on numerous social media outlets and websites. Accordingly, there was no way to accurately estimate the number of unique persons successfully invited for potential participation; however, based on the 2011 Statistics Canada National Household Survey data, there are approximately 161 000 Canadians working as PSP. A total of $N = 8520$ began the survey, and $n = 5813$ (32.5% women) persons chose to complete the sections on mental disorders. The result suggests approximately 5% of the potential sample responded; however, as there is no way to know how many were invited, calculating a true response rate is prohibitive.

Self-Report Symptom Measures

Indications of potentially clinically significant symptom clusters and symptom severity were assessed using the following self-report screening measures: the PTSD Check List 5 (PCL-5)[25-29]; the 9-item Patient Health Questionnaire (PHQ-9)[30-33]; the PD Symptoms Severity scale, Self-Report (PDSS-SR)[34-36]; the 7-item GAD scale (GAD-7)[33,37,38]; the Social Interaction Phobia scale (SIPS)[39-43]; and the Alcohol Use Disorders Identification Test (AUDIT).[44,45] Participants reported symptoms per the instructions for each scale: PCL-5, past month; PHQ9, past 14 days; PDSS-SR, past 7 days; GAD-7, past 14 days; SIPS, currently no specific time window; and AUDIT, past year. For the PCL-5, and in line with the *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (DSM-5),[2] participants reported on their lifetime exposure to a specific list of potentially traumatic events provided by the Life Events Checklist for the DSM-5 (LEC-5).[25-29] Unlike some studies assessing positive screening frequencies with the PCL-5,[27] the LEC-5 does not include "sudden and unexpected death of someone close to you," therein excluding such events as potential index traumas, making the screening process arguably more conservative. Further, based on experience with the populations, "natural disaster" was revised to "a life-threatening natural disaster," and "transportation accident" was revised to "a serious transportation accident" to differentiate experiences that are relatively more common for PSP. Participants were asked to provide details if they selected "any other very stressful event or experience."

Participants were then asked to select an index trauma (i.e., single worst traumatic event, most distressing event, or event that was currently causing the most distress) against which they would rate their past month symptoms using the PCL-5 items. For the PCL-5, a positive screen required participants to meet minimum criteria for each PTSD cluster and exceed the minimum clinical cutoff of >32 for their total score.[25] A positive screen for the other measures was determined based on published recommendations; specifically, a positive screen required the PHQ-9 total score to be >9,[46] the PDSS-SR total score to be >7,[34] the GAD-7 total score to be >9,[47] the SIPS total score to be >20,[39] and the AUDIT total score to be >15.[45] All measures have been validated for screening to identify individuals who may require further clinical attention, rather than validated as definitive diagnostic tools.

Self-Reported Diagnostic Status

The analyses included self-reported disorders not assessed with the screening measures. Participants were asked to report ever having been diagnosed with obsessive-compulsive disorder, persistent depressive disorder, bipolar I, bipolar II, and cyclothymic disorder. The low prevalence of these disorders required that they be grouped into larger categories to facilitate category comparisons and to protect respondent confidentiality. Obsessive-compulsive disorder was grouped into an "any anxiety disorder" category that also included a positive screen based on the anxiety screening measures (i.e., GAD, SAD, PD). Persistent depressive disorder, bipolar I, bipolar II, and cyclothymic disorder were grouped into an "any other self-reported mood disorder" category, which was then grouped into an "any mood disorder" that included a positive screen for MDD based on the PHQ-9.

Statistical Analyses

Participants were grouped into demographic categories (i.e., PSP category, sex, age, marital status, provincial region, ethnicity, education, years of service, and urban/rural work location) for comparisons. Complete case analyses were used throughout. Logistic regression models were conducted to assess associations between sociodemographic covariates and any mental disorder among the PSP categories. Post hoc regression analyses were computed to assess associations between sex and any mental disorder for each PSP category. The demographic proportions for sex, age, and provincial region in the current sample were compared with data provided by Statistics Canada for PSP using the 2011 National Household Survey and the National Occupational Classification[48] to establish the representativeness of the sample. The sex distribution was similar among police, firefighters, and paramedics. The age distribution was similar with regard to police and paramedics. Finally, the distribution according to province was similar for police, firefighters, and correctional workers.

PSP category-specific and overall estimates of positive screens for each mental disorder were calculated using the mean score and the published algorithms for dichotomous cutoffs. Logistic regression models were then computed to assess for differences between PSP categories on each mental disorder (e.g., MDD) and mental disorder category (e.g., any mood disorder). Correlation matrices were computed to examine the correlations between symptom scores on each screening measure in the total sample and then for each specific PSP category separately. The correlation matrices are available as supplementary information in online e-tables (i.e., Tables S1-S4). All correlation tests were conducted using a two-tailed alpha level of 0.05. No correction for multiple testing was used because of the exploratory nature of the study.

Results

Details of the self-reported participant demographics among PSP officers are provided in Table 1. Women were more likely than men to screen as positive for a mental disorder (odds ratio [OR], 1.54; 95% confidence interval [CI], 1.36 to 1.74). Post hoc analyses (Table 2) indicated that sex differences were significant only for municipal/provincial police (OR, 1.66; 95% CI, 1.28 to 2.15) and firefighters (2.23; 95% CI, 1.28 to 3.90).

Participants who were younger or had fewer years of service were slightly less likely to report symptoms of a mental disorder, possibly having had fewer years for exposure, but only 1 difference between ages 19 to 29 and 40 to 49 was statistically significant (see Table 1). Participants who reported being single (OR, 1.37; 95% CI, 1.13 to 1.66) or separated/divorced/widowed (OR, 1.74; 95% CI, 1.43 to 2.11) were more likely to report symptoms of a mental disorder than those who reported being married/common law (Table 1). Participants from Eastern Canada (i.e., Ontario, Quebec) were less likely to report symptoms of a mental disorder than those from Western Canada (i.e., British Columbia, Alberta, Saskatchewan, Manitoba; OR, 0.84; 95% CI, 0.74 to 0.95). Finally, participants who reported having completed a university degree or a 4-year college program or more education were less likely to report symptoms of a mental disorder than those who reported having completed high school or less education (OR, 0.78; 95% CI, 0.63 to 0.97; Table 1). No differences were identified based on ethnicity or urban/rural work location (Table 1).

Civilian employees working for police, compared with sworn/regular members, reported slightly higher mean scores and slightly more frequent positive screens for most mental disorders except for AUD, which was slightly lower. The only statistically significant difference was that civilian employees of police services were more likely than sworn officers to have an anxiety disorder (OR, 2.02; 95% CI, 1.19

Table 1. Total Sample Estimates and Association between Sociodemographic Covariates and Positive Screens for Recent Mental Disorders among Public Safety Personnel.

	Any positive screen,[a] % (*n*)	Odds ratio (95% confidence interval)
Sex		
Male	41.0 (1278)	1.00
Female	51.7 (780)	1.54 (1.36 to 1.74)***
Age, years		
19-29	40.3 (144)	1.00
30-39	43.6 (573)	1.15 (0.90 to 1.45)
40-49	46.5 (782)	1.28 (1.02 to 1.62)*
50-59	44.5 (500)	1.19 (0.93 to 1.51)
60 and older	36.6 (53)	0.85 (0.57 to 1.27)
Marital status		
Married/common-law	42.0 (1467)	1.00
Single	49.8 (242)	1.37 (1.13 to 1.66)***
Separated/divorced/widowed	55.8 (261)	1.74 (1.43 to 2.11)***
Remarried	48.8 (78)	1.31 (0.96 to 1.80)
Province of residence[b]		
Western Canada (BC, AB, SK, MB)	46.1 (1117)	1.00
Eastern Canada (ON, QC)	41.8 (663)	0.84 (0.74 to 0.95)**
Atlantic Canada (PEI, NS, NB, NFL)	44.8 (240)	0.95 (0.79 to 1.15)
Northern Territories (YK, NWT, NVT)	38.2 (21)	0.72 (0.42 to 1.25)
Ethnicity		
White	44.2 (1862)	1.00
Other	46.2 (178)	1.08 (0.88 to 1.34)
Urban/rural work location		
Urban	44.1 (1877)	1.00
Rural	46.2 (128)	1.09 (0.85 to 1.39)
Education		
High school or less	47.2 (194)	1.00
Some postsecondary (less than 4-year college/university program)	46.1 (1133)	0.96 (0.78 to 1.18)
University degree/4-year college or higher	41.0 (680)	0.78 (0.63 to 0.97) *
Years of service		
More than 15 years	45.1 (1118)	1.00
10 to 15 years	47.0 (503)	1.08 (0.94 to 1.25)
4 to 9 years	40.9 (331)	0.84 (0.72 to 0.99)*
Less than 4 years	36.8 (86)	0.71 (0.54 to 0.94)*
Public safety personnel category		
Municipal/provincial police	36.7 (439)	1.00
Royal Canadian Mounted Police	50.2 (568)	1.74 (1.47 to 2.05)***
Correctional workers	54.6 (336)	2.08 (1.70 to 2.53)***
Firefighters	34.1 (239)	0.89 (0.73 to 1.09)
Paramedics	49.1 (311)	1.67 (1.37 to 2.02)***
Call centre operators/dispatchers	48.4 (105)	1.62 (1.21 to 2.16)***

[a]Any positive screens include respondents who screened positive on any of the established mental disorder (i.e., posttraumatic stress disorder, major depressive disorder, generalized anxiety disorder, social anxiety disorder, panic disorder, alcohol abuse) screening tools and/or who self-reported being diagnosed with a mental disorder (i.e., obsessive-compulsive disorder, persistent depressive disorder, bipolar I, bipolar II, cyclothymic disorder).
[b]AB, Alberta; BC, British Columbia; MB, Manitoba; NB, New Brunswick; NFL, Newfoundland and Labrador; NS, Nova Scotia; NVT, Nunavut; NWT, Northwest Territories; ON, Ontario; PEI, Prince Edward Island; QC, Quebec; SK, Saskatchewan; YK, Yukon.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$, statistically significantly different from the reference group.

to 3.40). This suggests trauma exposure is unlikely the only, or even the most important, factor for mental health.[49,50] Accordingly, given the lack of general differences, civilian employees and sworn/regular members were assessed together. Volunteer firefighters, relative to career firefighters, reported slightly lower mean scores and less frequently met criteria for PTSD, MDD, and AUD but reported slightly higher mean scores and more frequently met criteria for PD and SAD; nevertheless, no ORs comparing disorders for volunteer and career firefighters were significant. Accordingly, volunteer and career firefighters were assessed together for the subsequent analyses.

Table 3 includes mean scores for all mental disorders across all PSP and for each PSP category. Table 4 includes overall and PSP category-specific estimates of positive screens for all mental disorders. Across the entire sample, 44.5% reported symptoms consistent with at least 1 mental disorder.

Table 2. Unadjusted Odds Ratios for Positive Screens of Any Current Mental Disorder[a] on Sex by Public Safety Personnel Group.[b]

	OR (95% CI)					
Sex	Municipal/provincial police	Royal Canadian Mounted Police	Correctional workers	Firefighters	Paramedics	Call centre operators/dispatchers
Male	1.00	1.00	1.00	1.00	1.00	1.00
Female	1.66 (1.28 to 2.15)***	1.30 (0.99 to 1.70)	1.10 (0.80 to 1.51)	2.23 (1.28 to 3.90)**	1.34 (0.98 to 1.85)	0.71 (0.38 to 1.34)

[a]Any other self-reported mood disorder includes persistent depressive disorder, bipolar I, bipolar II, and cyclothymic disorder.
[b]Any positive screens include respondents who screened positive on any of the established mental disorder (i.e., posttraumatic stress disorder, major depressive disorder, generalized anxiety disorder, social anxiety disorder, panic disorder, alcohol abuse) screening tools and/or who self-reported being diagnosed with a mental disorder (i.e., obsessive-compulsive disorder, persistent depressive disorder, bipolar I, bipolar II, cyclothymic disorder).
**$p < 0.01$, ***$p < 0.001$.

Table 3. Mean Scores on Mental Disorder Screening Measures by Public Safety Personnel Category.

	Mean (SD)						
	Total sample	Municipal/ provincial police	Royal Canadian Mounted Police	Correctional workers	Firefighters	Paramedics	Call centre operators/ dispatchers
PTSD (PCL-5)	21.27 (18.80)	18.80 (18.46)	24.94 (21.12)	24.84 (18.86)	16.98 (16.37)	22.28 (18.25)	18.78 (17.70)
Depression (PHQ-9)	6.54 (5.86)	5.65 (5.66)	7.28 (6.06)	7.33 (5.74)	5.45 (5.55)	7.10 (6.05)	7.19 (5.63)
Anxiety (GAD-7)	5.25 (5.01)	4.59 (4.91)	5.95 (5.28)	6.08 (4.97)	4.17 (4.56)	5.65 (4.96)	5.32 (4.81)
Social anxiety disorder (SIPS)	10.23 (10.81)	8.37 (9.70)	11.29 (11.58)	12.03 (11.39)	8.17 (9.48)	11.79 (10.90)	11.37 (11.41)
Panic disorder (PDSS-SR)	2.57 (4.35)	2.04 (3.93)	3.02 (4.72)	3.36 (4.74)	1.68 (3.55)	2.84 (4.55)	2.80 (4.40)
Alcohol use disorder (AUDIT)	5.52 (5.00)	5.70 (5.13)	4.89 (4.44)	5.58 (5.21)	6.53 (5.21)	5.42 (5.12)	4.99 (4.91)

PTSD, posttraumatic stress disorder; PCL-5, Posttraumatic Stress Disorder Checklist for DSM-5[25]; PHQ-9, Patient Health Questionnaire[30]; GAD-7, Generalized Anxiety Disorder Scale[47]; SIPS, Social Interaction Phobia Scale[39]; PDSS-SR, Panic Disorder Symptoms Severity Scale, Self-Report[34]; AUDIT, Alcohol Use Disorders Identification Test.[45]

Several statistically significant differences were identified across PSP categories as indicated by superscripts in Table 4. RCMP, correctional workers, and paramedics were generally significantly more likely to experience all mental disorders, except AUD, when compared with municipal/provincial police (i.e., ORs of 1.74 to 2.30 for RCMP, ORs of 1.69 to 6.02 for correctional workers, and ORs of 1.33 to 2.71 for paramedics) or firefighters (i.e., ORs of 1.83 to 2.74 for RCMP, ORs of 1.79 to 3.58 for correctional workers, and ORs of 1.63 to 2.15 for paramedics). In contrast, relative to municipal/provincial police, the positive screens for AUD were lower for RCMP (OR, 0.66; 95% CI, 0.45 to 0.95), higher for firefighters (OR, 1.42; 95% CI, 1.01 to 2.01), and comparable for correctional workers (OR, 1.19; 95% CI, 0.82 to 1.74), paramedics (OR, 1.05; 95% CI, 0.71 to 1.59), and call centre operators/dispatchers (OR, 1.26; 95% CI, 0.73 to 2.17). The intercorrelations of mental disorders across and within PSP categories are in supplemental tables online (Tables S1-S4).

Interpretation

The current study presents novel findings on how frequently diverse Canadian PSP categories (i.e., call center operators/dispatchers, correctional workers, firefighters, municipal/provincial police, paramedics, RCMP) screen positive on several well-established self-report measures assessing mental disorder symptoms. The results also include national frequency estimates of positive screens for potentially clinically significant symptom clusters across the Canadian PSP categories. The national estimates can be used to inform interpretations of individual PSP self-reported symptoms and to inform how frequently physicians and policy planners should be assessing PSP mental health needs. The results were primarily based on the current (i.e., time frame reference points ranged from past week to past month) mental health disorder symptom reports and provide mental health estimates using a positive screen as a proxy for potential diagnostic status. The observed results may be explained by PSP being more frequently exposed to potentially traumatic events in their work[1,3,4]; however, the current data cannot inform the proportion of symptoms related specifically to service.[49] In addition, the frequency of positive screens may overestimate the actual prevalence rates for diagnosable mental disorders by some currently unknowable amount.

The current frequency of positive screens among PSP (i.e., 44.5%) is much higher than the frequency of diagnosed mental disorders in the general population (i.e., $\sim$10.1%),[51] but differences in sampling and data collection make direct comparisons inappropriate. Among PSP participants, the frequency of positive screens was generally lowest for

Table 4. Frequencies of Positive Screens for Recent Mental Disorders Based on Self-Report Measures by Public Safety Personnel Category.

	% (*n*)						
	Total sample	Municipal/ provincial police	Royal Canadian Mounted Police	Correctional workers	Firefighters	Paramedics	Call centre operators/ dispatchers
PTSD (PCL-5)	23.2 (1304)	19.5 (288)d	30.0 (430)a	29.1 (225)a	13.5 (120)b	24.5 (190)c	18.3 (51)d
Major depressive disorder (PHQ-9)	26.4 (1419)	19.6 (278)b	31.7 (435)a	31.1 (235)a	20.2 (170)b	29.6 (213)a	33.2 (88)a
Generalized anxiety disorder (GAD-7)	18.6 (975)	14.6 (203)b, c	23.3 (313)a	23.6 (172)a	11.7 (97)b	20.5 (144)a	18.0 (46)a, c
Social anxiety disorder (SIPS)	15.2 (783)	10.0 (136)b	18.7 (247)a	18.3 (130)a	11.0 (90)b	20.0 (138)a	16.9 (42)a
Panic disorder (PDSS-SR)	8.9 (439)	5.9 (76)b	12.0 (151)a	12.2 (84)a	5.1 (40)b	10.3 (70)a, c	7.6 (18)b, c
Alcohol use disorder (AUDIT)	5.9 (292)	5.8 (76)c	3.9 (49)a	6.8 (47)b, c	8.0 (63)b	6.1 (40)b, c	7.2 (17)b, c
Any other self-reported mood disorder[a]	1.7 (80)	–[e]c	1.6 (19)a	4.0 (27)b	—[e]a, c	1.9 (12)a	—[e]a, b, c
Any positive screen for a mood disorder[b]	29.0 (1460)	21.3 (285)b	34.7 (442)a	35.3 (249)a	22.4 (176)b	32.0 (218)a	36.1 (90)a
Any positive screen for an anxiety disorder[c]	30.3 (1433)	23.7 (295)c	37.3 (448)a	37.9 (249)a	19.4 (145)b	33.9 (223)a	32.2 (73)a
Any positive screen for any mental disorder[d]	44.5 (1998)	36.7 (439)b	50.2 (568)a	54.6 (336)a	34.1 (239)b	49.1 (311)a	48.4 (105)a
Total number of positive screens[d]							
0	58.2 (2495)	65.9 (757)	52.7 (563)	48.4 (279)	67.7 (462)	52.9 (322)	55.7 (112)
1	15.1 (648)	13.8 (158)	14.8 (158)	16.7 (96)	13.2 (90)	19.4 (118)	13.9 (28)
2	8.7 (371)	8.0 (92)	8.1 (87)	10.9 (63)	8.7 (59)	7.4 (45)	12.4 (25)
3 or more	18.0 (771)	12.3 (141)	24.4 (261)	24.0 (138)	10.4 (71)	20.4 (124)	17.9 (36)

PTSD = posttraumatic stress disorder; PCL-5 = Posttraumatic Stress Disorder Checklist for DSM-5[25]; PHQ-9 = Patient Health Questionnaire[30]; GAD-7 = Generalized Anxiety Disorder Scale[47]; SIPS = Social Interaction Phobia Scale[39]; PDSS-SR = Panic Disorder Symptoms Severity Scale, Self-Report[34]; AUDIT = Alcohol Use Disorders Identification Test[45]. Letters in the cells indicate categories of public safety officers that are significantly different from one another at $p \leq 0.05$.

[a]Any other self-reported mood disorder includes persistent depressive disorder, bipolar I, bipolar II, and cyclothymic disorder.

[b]Any positive screen for a mood disorder includes all self-report mood disorders plus a positive depression screen (PHQ-9).

[c]Any positive screen for an anxiety disorder includes positive screen for anxiety, social anxiety, and panic disorder plus self-report obsessive-compulsive disorder.

[d]Any positive screen and the total number of positive screens include respondents who screened positive on any of the established mental disorder (i.e., posttraumatic stress disorder, anxiety, social anxiety disorder, panic disorder, alcohol abuse) screening tools and/or who self-reported being diagnosed with a mental disorder (i.e., obsessive-compulsive disorder, persistent depressive disorder, bipolar I, bipolar II, cyclothymic disorder).

[e]Not presented because of insufficient sample size (i.e., $n < 10$).

municipal/provincial police (i.e., 5.8% to 19.6%) and firefighters (i.e., 5.1% to 20.2%); similarly, police officers and firefighters appeared to have the lowest estimates for current PTSD prevalence across PSP categories assessed in a recent international meta-analysis.[9] The same meta-analysis did not identify substantial differences in rates when comparing self-report assessments and interview assessments. There is published PHQ-9 data from a large sample of the general Canadian population available as a comparator group for positive screening prevalence wherein 8.4% was the estimated prevalence rate,[52] underscoring the current positive screens as appearing much higher. Unfortunately, similar comparative data for the other screening tools were not available.

The differences across PSP may be due to diverse factors. For example, municipal/provincial police may have more access to structural and social supports from consistent urban deployment, whereas RCMP relocate frequently and often to rural areas, which would have less access to such supports.[53,54] Municipal police are more likely to be deployed in pairs, whereas RCMP are more likely to be deployed alone. Similarly, paramedics report experiencing very high rates of exposure to human suffering[9] for which they often feel responsible,[55] potentiating substantial emotional stress.[55,56] Differences may also be based on populations being served, such as for correctional workers who engage with incarcerated persons in extraordinary environments that can reasonably be hypothesized to increase risk for developing a mental disorder.[9] In any case, the substantive differences in positive screening frequencies across PSP categories underscore the need for more research to identify the diverse risk and resiliency factors that may inform changes to improve mental health.

There were several sociodemographic factors associated with positive screens for any potential mental disorder. Women were more likely than men to report mental disorder symptoms, but the difference was statistically significant only within the categories of municipal/provincial police and firefighters. The results align with evidence that women in the general population are more likely than men to report

mental disorders,[57-59] which may correlate with factors including workplace stressors.[60] Inconsistent differences, however, suggest diverse systemic variables differentially affect women PSP[61-66] and should be highlighted when designing mental health solutions. Similarly, civilian employees of police services were more likely than sworn officers to screen positive for an anxiety disorder but were otherwise quite comparable. Accordingly, direct trauma exposure appears to be only one factor associated with PSP mental health, and researchers should explore how best to provide specific civilian employee supports.

Positive and supportive relationships can be expected to serve as resiliency factors for mental health.[67] Indeed, participants in the current study who were in married/common-law relationships were significantly less likely to screen positive for a potential mental health disorder than participants who reported being single or separated/divorced/widowed. The association between married/common-law relationships and mental health in the general population is well established[59,67]; however, the association appears less consistent among PSP, with some research finding a relationship[68] and other research not.[9] Despite potentially intuitive notions that PSP have more difficulties maintaining relationships because of work-related stressors, the divorce rates for correctional workers, police, and firefighters are comparable to or lower than the general population[69]; accordingly, being married may be an important resiliency factor, suggesting benefits for investing in PSP family supports. In contrast, PSP marital status may depend on positive mental health, in which case individual PSP mental health supports may also serve as family supports. Education also appeared potentially protective, but likely interacts with several other factors, such as wealth.[70]

Positive screens for a potential mental disorder increased as a function of participant age and years of service. The concurrent increases may be due to older and longer-serving PSP having more opportunities for exposure to potentially traumatic events. Increased frequency of exposure can be associated with symptoms[2]; however, idiosyncratic experiences of potentially traumatic events remains important.[70] There may also be important changes in skill levels (e.g., practical experience, deterioration of resilience skills over time) that warrant additional investigation. Perhaps importantly, the pattern for AUD-positive screening diverged in that the frequency for RCMP was lower than other groups and firefighters were higher than other groups. The diverse frequencies may also imply differences in PSP cultural norms with respect to using alcohol as a coping mechanism. In any case, disentangling all such complex potential interactions warrants additional research, much of which will need to be longitudinal.

Limitations

The use of a large diverse Canadian PSP sample is an important strength of the current study; however, several limitations should be noted and provide critical directions for future research. First, the sample was self-selected; so, the reported proportions may not be representative of all Canadian PSP, despite general indications of proportional demographic representativeness. Further, the sampling method prohibited knowing the actual response rate. Second, responses were based on anonymous self-reporting to a web-delivered survey. The reliability and validity of web-based self-reported mental disorder symptom clusters remains ambiguous,[71] certainly for the current population; that said, a recent meta-analysis did not identify substantial differences in rates when comparing self-report assessments and interview assessments,[9] so the current results underscore the need for a more rigorous epidemiological study. Third, the screening tools used different symptom duration periods, which may have caused response difficulties for some participants; however, changing the durations would have compromised the validity of each measure, and so the durations were emphasized within each instruction set to minimize the impact of such differences.

Fourth, people may underreport clinical symptoms, even when anonymous,[72,73] and PSP concerns with stigma may have contributed to underreporting.[74-76] However, anonymity may also improve accuracy.[24] Accordingly, many previous estimates of mental disorders in PSP[1,10,14-16,77] may have been underestimated. In contrast, the current rates may be inflated because of a self-selection bias of motivated responding by clinically symptomatic persons.[71] That argument might be countered by notions that particularly symptomatic persons may also be less likely to participate in research.[78] Fifth, even a positive screen is an approximation without the use of diagnostic interviews conducted by appropriately trained assessors. Moreover, the screening measures were designed for standalone use in clinical settings, which raises questions about sensitivity and specificity within the current context wherein the measures were used collectively in a self-report setting without clinical oversight. The current methods necessarily inhibit direct comments about prevalence rates; however, the relatively large sample size and frequent positive screens justify further research with more robust assessments (e.g., interviews). Investing the necessary resources in a large-scale epidemiological study using probability-based sampling techniques, clinical interviews, measures to ensure high response and completion rates, and comparison of the general population who do not work as a PSP is a necessary next step and the only way to resolve important concerns about selection biases and self-report screening measures.

Sixth, the focus on current symptoms precluded lifetime assessments, therein obscuring important information. Future research should use clinical diagnostic interviews assessing current and lifetime symptoms[6,79] and assess the impact of mental health symptoms on quality of life and daily function. Seventh, the PSP category groupings were based on previous research[12] but could not account for potentially important differences within some categories

(e.g., paramedics vs. emergency medical technicians). More nuanced assessments of differences across categories and interactions with other variables therein (e.g., sex, age, differences between federal and provincial correctional workers) would require a much larger sample. Eighth, there was a considerable proportion who began but did not complete the survey, which may have been due to length, question difficulty, or other barriers. Many participants reported appreciating being able to answer through a mobile app between calls at work and over multiple sittings; as such, there is no reliable way to know the actual average time for completion or reasons for failure to complete. Future research should evaluate such potential barriers in detail and how best to facilitate more comprehensive participation. Finally, direct comparisons with other data sets are complicated by differences in data collection methods (e.g., interviews vs. self-report) and assessment windows (e.g., past year).

Conclusion

The current results indicate that many PSP (i.e., 44.5%) screened positive for clinically significant symptom clusters consistent with 1 or more mental disorders. The frequency of positive screens appears much higher than diagnostic rates for the general population (i.e., ~10.1%).[51] There were also significant differences between PSP categories in frequencies of positive screens that warrant further investigation. The current Canada-specific PSP results lend support to calls for a National Action Plan with emphasis on rigorous and robust research, including a full epidemiology study, to support PSP mental health.[1,23]

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