DRDC-RDDC-2016-P017

Canadian Psychiatric Association
Association des psychiatres du Canada

Original Research

The Canadian Journal of Psychiatry / La Revue Canadienne de Psychiatrie
1-10

DOI: 10.1177/0706743716628855
TheCJP.ca | LaRCP.ca
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Perceived Need for and Perceived Sufficiency of Mental Health Care in the Canadian Armed Forces: Changes in the Past Decade and Comparisons to the General Population

Besoin perçu et suffisance perçue des soins de santé mentale dans les Forces armées canadiennes : changements de la dernière décennie et comparaisons avec la population générale

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Abstract

Objectives: Failure to perceive need for care (PNC) is the leading barrier to accessing mental health care. After accessing care, many individuals perceive that their needs were unmet or only partially met, an additional problem related to perceived sufficiency of care (PSC). The Canadian Armed Forces (CAF) invested heavily in workplace mental health in the past decade to improve PNC/PSC; yet, the impact of these investments remains unknown. To assess the impact of these investments, this study 1) captures changes in PNC/PSC over the past decade in the CAF and 2) compares current PNC/PSC between the CAF and civilians.

Methods: Data were drawn from the 2013 and 2002 CAF surveys and the 2012 civilian mental health survey (total $N = \sim 40\,000$), conducted by Statistics Canada using similar methodology. Exclusions were applied to the civilian sample to make them comparable to the military sample. Prevalence rates for No need, Need met, Need partially met, and Need unmet categories across service types (Information, Medication, Counselling and therapy, Any services) were calculated and compared between 1) the 2 CAF surveys and 2) the 2013 CAF and 2012 civilian surveys after sample matching.

Results: Reports of Any need and Need met were higher in the CAF in 2013 than in 2002 by approximately 6% to 8% and 2% to 8%, respectively, and higher in the CAF than in civilians by 3% to 10% and 2% to 8%, respectively.

Conclusions: These results suggest that investments in workplace mental health, such as those implemented in the CAF, can lead to improvements in recognizing the need for care (PNC) and subsequently getting those needs met (PSC).

Abrégé

Objectif : Le manque de perception d un besoin de soins (PBS) est le principal obstacle à l'accès aux soins de santé mentale. Après avoir accédé aux soins, de nombreuses personnes perçoivent que leurs besoins n'étaient pas comblés ou qu'ils l'étaient seulement partiellement, un problème additionnel lié à la perception de la suffisance des soins (PSS). Les Forces armées canadiennes (FAC) ont investi lourdement dans la santé mentale en milieu de travail ces dix dernières années afin d'améliorer les PBS/PSS; et pourtant,

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l'effet de ces investissements demeure inconnu. Afin d'évaluer l'effet de ces investissements, cette étude : 1) repère les changements de PBS/PSS au cours de la dernière décennie dans les FAC, et 2) compare les PBS/PSS actuelles entre les FAC et les civils.

Méthode : Les données ont été tirées des enquêtes sur la santé mentale de 2013 et 2002 des FAC, et de l'enquête civile de 2012 (total N ~ 40 000), menées par Statistique Canada à l'aide de méthodologie semblable. Des exclusions ont été appliquées à l'échantillon civil pour qu'il soit comparable à celui des militaires. Les taux de prévalence des catégories Aucun besoin, Besoin comblé, Besoin partiellement comblé, et Besoin non comblé dans tous les types de services (Information, Médication, Consultation, Autre) ont été calculés et comparés entre 1) les deux enquêtes des FAC; et 2) l'enquête de 2013 des FAC et l'enquête civile de 2012, après comparaison d'échantillons.

Résultats : Les déclarations d'Aucun besoin et de Besoin comblé étaient plus élevées dans les FAC en 2013 qu'en 2002, d'environ 6-8% et 2-8%, respectivement, et plus élevées dans les FAC que chez les civils, de 3-10% et 2-8%, respectivement.

Conclusions : Ces résultats suggèrent que les investissements en santé mentale en milieu de travail, comme ceux mis en œuvre par les FAC, peuvent entraîner des améliorations de la reconnaissance du besoin de soins (PBS) et subséquemment, que ces besoins soient comblés (PSS).

Keywords
military, perceived need for care

Clinical Implications

1. Investment in occupational mental health programs (such as mental health literacy interventions and mental health screening) can lead to meaningful improvements in PNC.
2. Expansion and improvement of mental health services can lead to meaningful improvements in PSC.
3. There is a need to better understand the relationship between PSC and more objective indicators of the adequacy of mental health care.

Limitations

1. PNC and PSC were not measured in civilians in 2002; as a result, we are unable to say whether the improvements in PNC/PSC seen in the CAF over the past decade are larger than those that might have taken place in the civilian population.
2. The CAF sample was limited to regular forces; PNC and PSC will be looked at separately in reservists.
3. Data are cross-sectional; causality cannot be implied. While the findings suggest that investments in workplace mental health can lead to improvements in recognizing and meeting mental health care needs, they do not provide definitive evidence.

Mental disorders constitute a significant public health and economic problem in civilian[1] and military populations.[2,3] In Canada, the prevalence of common mental disorders in any given year may be as high as 10% in the civilian population[4] and 15% in the military population.[5] In both military[6,7] and civilian[1] populations, mental disorders are associated with presenteeism and absenteeism and reduced productivity in the workplace. In Canada, the annual cost of mental disorders is estimated to be Can$51 billion[1]; a third of that cost is due to losses in workplace productivity.

Given the significant public health and economic cost of mental disorders on the one hand and the availability of efficacious treatments for mental disorders on the other, it is imperative to ensure that those with a mental disorder seek timely, appropriate care. Unfortunately, epidemiological surveys in Canada and in other nations consistently show that a significant portion of those with a mental disorder, both in civilian and military populations, fail to seek mental health care.[8-11] The leading barrier that prevents individuals from accessing mental health care is failure to perceive need for care (PNC).[8,12-14] In population health surveys conducted a decade ago in Canada, among civilians with a mental disorder, 78.3% failed to perceive the need for care[14]; among military members with a disorder, 84% to 96.5% failed to perceive a need, depending on the type of care considered.[8] After individuals access care, they often perceive that their needs were unmet or only partially met,[15,16] an additional issue in mental health care related to perceived sufficiency of care (PSC).

In the past decade, in both civilian and military settings, various public awareness and education campaigns were launched to help individuals better recognize and access care (i.e., to improve PNC), and efforts were made to increase the availability and adequacy of care (i.e., to improve PSC). Given the impact of mental disorders on workplace productivity and the burgeoning interest in improving workplace mental health, many of these initiatives were implemented within the workplace context.

In Canada, in the past decade, the Canadian Armed Forces (CAF) invested heavily in workplace mental health, perhaps more so than any other large employer in Canada. The past decade saw the launch of the public awareness campaign for mental health "Be the Difference," the development and implementation of the Road to Mental Readiness mental health education and psychological resilience program, and the launch of various mental health screening programs such as the Enhanced Post-Deployment Screening

program.[17,18] In addition to these initiatives to improve PNC, in the CAF, significant investments were made to reinforce the mental health care system to improve PSC "by standing up regional Operational Trauma and Stress Support Centres, doubling the number of mental health professionals, and introducing team-based assessment and treatment."[18(p3)] The impact of these initiatives on improving various indicators of PNC and PSC in the CAF has remained largely unknown because in most instances, ethical and practical considerations precluded testing the efficacy of many of these initiatives, especially those that were implemented at the system level and/or made available to the entire workforce population.

Population mental health surveys provide a unique opportunity for capturing the impact of workplace mental health initiatives, such as those aimed at improving PNC and PSC in the CAF, primarily by examining changes in these outcomes over time within a given military population. As well, changes in PNC and PSC across military and civilian populations with different levels of investments in workplace mental health initiatives can be compared. However, as reviewed elsewhere,[19] a common methodological challenge in population health research is that surveys conducted at different time points within the same population and across different (military and civilian) populations rarely use the same measures and rarely employ similar methodology, significantly limiting the robustness of comparisons. This study uses data from 3 cross-sectional population health surveys that employ nearly identical methodology to 1) explore trends in PNC and PSC in CAF personnel over the period from 2002 to 2013 and 2) explore differences in PNC and PSC in CAF personnel and Canadian civilians in 2012 and 2013.

Methods

Study Participants and Procedures

Data were drawn from 3 cross-sectional population mental health surveys, all conducted by Statistics Canada using very similar methodology: the Canadian Community Health Survey, Cycle 1.2, Canadian Forces Supplement, 2002 (CFS2002); the Canadian Armed Forces Mental Health Survey, 2013 (CFS2013); and the Canadian Community Health Survey–Mental Health (for civilians), 2012 (CCHS-MH2012). Trained lay Statistics Canada interviewers collected the data in face-to-face interviews using computer-assisted personal interviewing. The CFS2002 had response rates of 79.5% and 83.5% for regular forces and reservists, respectively, and a final sample size of 8441. The CFS2013 had response rates of 79.8% and 78.7% for regular forces and reservists, respectively, and a final sample size of 8165. The CCHS-MH2012 had a response rate of 68.9% and a final sample size of 25 113. We included only regular forces, with sample sizes of 5155 (CFS2002) and 6696 (CFS2013) in the analyses for this study.[a]

We restricted the civilian sample to create a comparable group to regular forces. We limited the CCHS-MH2012 sample to those who were employed full time, aged 17 to 60 years, and had a minimum grade 9 education (or secondaire III in Quebec). We then excluded respondents who would be ineligible for military service using the same approach as Rusu and colleagues.[20] A total of 15 126 (40.90%) respondents from the CCHS-MH2012 sample were thus selected. The pooled data across the 3 surveys had a total sample of 26 977.

Measures

PNC and PSC. PNC and PSC were assessed by the Perceived Need for Care Questionnaire (PNCQ),[21] which was designed for the Australian National Survey of Mental Health and Well-being, with good reliability and validity.[21-23] The PNCQ asks respondents whether they received or perceived a need for "help for problems with emotions, mental health or use of alcohol or drugs" in the past 12 months across 4 main types of services: 1) Information about problems, treatments, or available services; 2) Medication; 3) Counselling, therapy, or help for problems with personal relationships; and 4) "Other" types of help. The CFS2002 included additional service categories of "financial/housing problems" and "employment status/work situation," which, together with the "Other" category, were excluded to make the PNC and PSC questions identical across the 3 surveys. Across Information, Medication, and Counseling Services and an "Any Services" category we created collapsing across the first three service types, different levels of PNC and PSC could be assigned: 1) No need: did not receive help and felt no need for it; 2) Need fully met: received help and felt that it was sufficient; 3) Need partially met: received help but not as much as needed; and 4) Need not met: perceived a need but did not receive any.

Sociodemographic and Clinical Covariates. PNC and PSC are known to be associated with sociodemographic and clinical characteristics.[24,25] Sociodemographic covariates, including age, sex, education, marital status, ethnicity/cultural origin, and household income, were drawn from the nondiagnostic sections of the surveys. Clinical covariates were drawn from the diagnostic sections of the surveys, based partly on the World Health Organization version of the Composite International Diagnostic Interview (WHO-CIDI),[26] a lay-administered psychiatric interview that generates diagnoses based on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition.[27] The reliability and validity of the WHO-CIDI are well established.[28,29] Clinical correlates included self-reported physical and mental health status, past 12-month diagnosis of major depressive disorder (MDD), past 12-month diagnosis of generalized anxiety disorder (GAD), and past 12-month suicide ideation and attempt. The WHO-CIDI algorithm for GAD diagnoses was slightly different in the 2 recent surveys. To have comparable GAD

Table 1. Selected characteristics of the 3 survey samples.

	CFS2013 (regular forces)	CFS2002 (regular forces)	CCHS-MH2012 (subsample)
Age (mean), y	35.39 (35.19 to 35.60)	35.69 (35.48 to 35.90)	39.99 (39.66 to 40.31)
Sex, %			
Male	86.15 (85.30 to 87.00)	87.78 (87.54 to 88.01)	56.68 (55.56 to 57.81)
Female	13.85 (13.00 to 14.70)	12.22 (11.99 to 12.46)	43.32 (42.19 to 44.44)
Highest education, %			
Less than secondary	4.08 (3.57 to 4.59)	7.35 (6.53 to 8.17)	6.28 (5.32 to 7.23)
Secondary graduation	25.74 (24.62 to 26.86)	32.88 (31.45 to 34.30)	15.85 (14.58 to 17.11)
Other postsecondary	8.87 (8.17 to 9.57)	13.50 (12.46 to 14.53)	6.15 (5.21 to 7.09)
Postsecondary graduation	61.31 (60.11 to 62.52)	46.28 (44.84 to 47.71)	71.73 (70.04 to 73.42)
Marital status, %			
Married	45.25 (44.03 to 46.46)	56.38 (54.90 to 57.86)	49.81 (47.90 to 51.72)
Common law	20.32 (19.26 to 21.39)	15.40 (14.23 to 16.56)	15.78 (14.35 to 17.20)
Widowed	0.16 (0.06 to 0.25)	0.28 (0.13 to 0.44)	0.46 (0.28 to 0.63)
Separated	3.85 (3.36 to 4.34)	3.78 (3.20 to 4.35)	3.87 (2.94 to 4.80)
Divorced	3.54 (3.09 to 4.00)	4.44 (3.80 to 5.08)	4.80 (4.06 to 5.53)
Single	26.88 (25.80 to 27.96)	19.72 (18.46 to 20.98)	25.30 (23.80 to 26.80)
Ethnicity/cultural background, %			
White	93.65 (93.00 to 94.30)	97.22 (96.71 to 97.73)	79.96 (78.07 to 81.86)
Non-white	6.35 (5.70 to 7.00)	2.78 (2.27 to 3.29)	20.04 (18.14 to 21.93)
Household income (mean), Can$	101 533 (100 362 to 102 704)	74 396 (73 544 to 75 248)	98 260 (95 466 to 101 054)
Self-perceived physical health			
Excellent	18.32 (17.35 to 19.30)	18.40 (17.31 to 19.49)	18.34 (16.84 to 19.85)
Very good	41.80 (40.53 to 43.07)	41.21 (39.70 to 42.72)	41.79 (39.86 to 43.71)
Good	29.13 (27.94 to 30.32)	30.11 (28.69 to 31.52)	32.10 (30.41 to 33.79)
Fair	8.82 (8.11 to 9.53)	8.11 (7.27 to 8.95)	7.10 (6.04 to 8.15)
Poor	1.93 (1.59 to 2.27)	2.17 (1.71 to 2.63)	0.68 (0.47 to 0.89)
Self-perceived mental health			
Excellent	18.40 (17.37 to 19.43)	21.47 (20.23 to 22.71)	25.46 (23.80 to 27.12)
Very good	41.24 (39.99 to 42.48)	43.53 (41.98 to 45.08)	44.77 (42.96 to 46.59)
Good	27.16 (26.04 to 28.28)	25.91 (24.59 to 27.24)	24.93 (23.22 to 26.63)
Fair	10.32 (9.49 to 11.14)	6.99 (6.20 to 7.78)	4.25 (3.62 to 4.88)
Poor	2.89 (2.44 to 3.34)	2.10 (1.67 to 2.53)	0.59 (0.38 to 0.80)
Past 12-month MDD, %			
Yes	7.96 (7.27 to 8.64)	7.97 (7.16 to 8.78)	3.55 (3.01 to 4.08)
No	92.07 (91.39 to 92.76)	92.03 (91.22 to 92.84)	96.45 (95.92 to 96.99)
Past 12-month GAD, %			
Yes	4.69 (4.16 to 5.22)	1.93 (1.52 to 2.33)	1.83 (1.42 to 2.25)
No	95.31 (94.78 to 95.84)	98.07 (97.67 to 98.48)	98.17 (97.75 to 98.58)
Past 12-month suicide ideation, %			
Yes	4.26 (3.70 to 4.82)	4.20 (3.62 to 4.77)	2.13 (1.69 to 2.57)
No	95.74 (95.18 to 96.30)	95.81 (95.23 to 96.38)	97.87 (97.43 to 98.31)
Past 12-month suicide attempt, %			
Yes	0.37 (0.19 to 0.55)	0.30 (0.16 to 0.43)	0.07 (0.03 to 0.11)
No	99.63 (99.45 to 99.81)	99.70 (99.57 to 99.84)	99.93 (99.89 to 99.97)

Note: The mean (95% CI) is provided for continuous variables; the percentage (95% CI) is provided for categorical variables. 95% CI is calculated based on standard errors from bootstrapping. GAD = generalized anxiety disorder; MDD = major depressive disorder.

diagnoses, we recalculated GAD diagnoses for the 2 recent surveys using the algorithm from the CFS2002.

Statistical Analyses (Details in Supplemental Online Material)

To fully assess the differences across the 3 surveys in PNC and PSC, we employed 2 approaches: first estimating the absolute difference and then the relative difference in the prevalence of PNC and PSC across the surveys. We employed sample matching on sociodemographic and clinical covariates to prevent comparisons from being biased. To assess absolute differences across the 3 surveys, we employed raking[30] to match the 3 surveys on the distribution of selected sociodemographic and clinical variables. As a poststratification procedure, raking creates samples that agree on marginal totals of selected characteristics by adjusting sample weights.[31] To assess relative differences across the 3 surveys, we created 3 binary variables for PNC for each type of service: a Need versus No need variable

Table 2. Raw prevalence of PNC and PSC in the 3 survey samples.

Type of service	CFS2013 (regular forces)	CFS2002 (regular forces)	CCHS-MH2012 (subsample)
Information			
No need	85.83 (84.92 to 86.74)	87.05 (86.05 to 88.06)	94.80 (94.15 to 95.45)
Need met	10.86 (10.03 to 11.69)	7.85 (7.04 to 8.67)	3.71 (3.17 to 4.26)
Need partially met	1.00 (0.73 to 1.27)	1.38 (1.03 to 1.74)	0.33 (0.17 to 0.48)
Need not met	2.28 (1.86 to 2.70)	3.67 (3.10 to 4.25)	1.16 (0.79 to 1.54)
Medication			
No need	86.80 (85.94 to 87.65)	93.11 (92.38 to 93.85)	92.88 (92.01 to 93.75)
Need met	12.05 (11.23 to 12.86)	5.94 (5.25 to 6.62)	6.62 (5.77 to 7.46)
Need partially met	0.56 (0.38 to 0.74)	0.40 (0.21 to 0.59)	0.26 (0.12 to 0.40)
Need not met	0.59 (0.38 to 0.80)	0.58 (0.35 to 0.82)	0.24 (0.11 to 0.37)
Counselling and therapy			
No need	74.98 (73.85 to 76.12)	83.44 (82.38 to 84.51)	89.30 (88.32 to 90.29)
Need met	16.80 (15.86 to 17.74)	8.73 (7.89 to 9.58)	6.91 (6.15 to 7.67)
Need partially met	3.69 (3.18 to 4.19)	3.31 (2.74 to 3.88)	1.52 (1.16 to 1.88)
Need not met	4.56 (4.02 to 5.10)	4.51 (3.92 to 5.10)	2.27 (1.83 to 2.71)
Any services			
No need	70.63 (69.46 to 71.80)	78.23 (77.05 to 79.41)	85.64 (84.48 to 86.81)
Need met	19.37 (18.34 to 20.40)	11.98 (10.99 to 12.97)	9.77 (8.81 to 10.72)
Need partially met	5.90 (5.26 to 6.55)	5.17 (4.45 to 5.89)	2.43 (1.96 to 2.90)
Need not met	4.06 (3.56 to 4.57)	4.62 (4.02 to 5.22)	2.16 (1.74 to 2.58)

Note: Data are shown as % (95% CI). 95% CI is calculated based on standard errors from bootstrapping. PNC = perceived need for care; PSC = perceived sufficiency of care.

Table 3. Adjusted prevalence of PNC and PSC, calculated using raking weights.

Type of service	CFS2013 (regular forces)	CFS2002 (regular forces)	CCHS-MH2012 (subsample)
Information			
No need	85.83 (84.92 to 86.74)	85.79 (84.24 to 87.34)	91.47 (90.20 to 92.74)
Need met	10.86 (10.03 to 11.69)	9.04 (7.65 to 10.43)	5.98 (4.84 to 7.12)
Need partially met	1.00 (0.73 to 1.27)	1.39 (0.88 to 1.90)	0.49 (0.18 to 0.80)
Need not met	2.28 (1.86 to 2.70)	3.78 (2.98 to 4.58)	2.06 (1.26 to 2.86)
Medication			
No need	86.80 (85.94 to 87.65)	92.60 (91.58 to 93.62)	89.46 (87.87 to 91.05)
Need met	12.05 (11.23 to 12.86)	5.96 (4.94 to 6.98)	9.62 (8.05 to 11.19)
Need partially met	0.56 (0.38 to 0.74)	0.69 (0.30 to 1.08)	0.57 (0.22 to 0.92)
Need not met	0.59 (0.38 to 0.80)	0.75 (0.30 to 1.20)	0.35 (0.06 to 0.64)
Counselling and therapy			
No need	74.98 (73.85 to 76.12)	82.73 (81.18 to 84.28)	85.19 (83.56 to 86.82)
Need met	16.80 (15.86 to 17.74)	9.10 (7.87 to 10.33)	9.26 (7.87 to 10.65)
Need partially met	3.69 (3.18 to 4.19)	3.50 (2.70 to 4.30)	2.35 (1.55 to 3.15)
Need not met	4.56 (4.02 to 5.10)	4.67 (3.81 to 5.53)	3.20 (2.30 to 4.10)
Any services			
No need	70.63 (69.46 to 71.80)	76.33 (74.62 to 78.04)	80.28 (78.52 to 82.04)
Need met	19.37 (18.34 to 20.40)	12.94 (11.29 to 14.59)	12.68 (11.05 to 14.31)
Need partially met	5.90 (5.26 to 6.55)	5.70 (4.74 to 6.66)	3.79 (2.85 to 4.73)
Need not met	4.06 (3.56 to 4.57)	5.03 (4.09 to 5.97)	3.25 (2.35 to 4.15)

Note: Data are shown as % (95% CI). 95% CI is calculated based on standard errors from bootstrapping. PNC = perceived need for care; PSC = perceived sufficiency of care.

among all subjects; then among subjects who reported a need, a Need fully met versus Need not fully met (collapsing Need not met and Need partially met) variable; and a Need at least partially met (collapsing Need fully met and Need partially met) versus Need not met variable. We employed logistic regression standardization and propensity score matching approaches in assessing relative differences.

Weighting. For each of the 3 surveys, to produce estimates from survey data that are representative of the population, a final survey weight was created by Statistics Canada and

Table 4. Association between being in the CFS2013 and PNC and PSC status[a,b,c] using logistic regression standardization for sample matching.

	Without adjustment		With adjustment of sociodemographic variables[d]		With adjustment of socio-demographic and clinical variables[e]	
Type of mental health care	CFS2013 v. CFS2002	CFS2013 v. CCHS-MH2012	CFS2013 v. CFS2002	CFS2013 v. CCHS-MH2012	CFS2013 v. CFS2002	CFS2013 v. CCHS-MH2012
Information						
Need v. no need	1.13 (1.00 to 1.27)[g]	3.16 (2.70 to 3.70)[h]	1.06 (0.92 to 1.23)	3.36 (2.78 to 4.06)[h]	0.85 (0.71 to 1.03)[i]	2.31 (1.83 to 2.90)[h]
Need fully met v. need not fully met	2.18 (1.70 to 2.82)[h]	1.28 (0.88 to 1.86)	2.00 (1.42 to 2.81)[h]	1.52 (0.97 to 2.38)[i]	2.22 (1.50 to 3.27)[h]	1.68 (1.03 to 2.75)[g]
Need at least partially met v. need not met	2.14 (1.61 to 2.84)[h]	1.45 (0.95 to 2.22)[i]	2.12 (1.44 to 3.12)[h]	1.76 (1.07 to 2.90)[g]	2.23 (1.43 to 3.48)[h]	1.86 (1.07 to 3.22)[g]
Medication						
Need v. no need	2.14 (1.86 to 2.45)[h]	2.04 (1.75 to 2.37)[h]	2.25 (1.91 to 2.65)[h]	2.44 (2.01 to 2.95)[h]	2.40 (1.93 to 2.97)[h]	1.51 (1.20 to 1.91)[h]
Need fully met v. need not fully met	1.62 (1.05 to 2.50)[g]	0.76 (0.48 to 1.19)	1.34 (0.70 to 2.57)	0.80 (0.44 to 1.46)	1.47 (0.70 to 3.11)	1.20 (0.54 to 2.68)
Need at least partially met v. need not met[f]	N/A	N/A	N/A	N/A	N/A	N/A
Counselling and therapy						
Need v. no need	1.70 (1.54 to 1.88)[h]	2.85 (2.51 to 3.23)[h]	1.64 (1.46 to 1.85)[h]	3.20 (2.71 to 3.77)[h]	1.64 (1.41 to 1.90)[h]	2.54 (2.07 to 3.12)[h]
Need fully met v. need not fully met	1.86 (1.53 to 2.26)[h]	1.16 (0.93 to 1.44)	1.91 (1.49 to 2.45)[h]	1.12 (0.84 to 1.49)	2.14 (1.64 to 2.79)[h]	1.30 (0.97 to 1.76)[i]
Need at least partially met v. need not met	1.68 (1.37 to 2.06)[h]	1.25 (0.96 to 1.62)	1.70 (1.30 to 2.20)[h]	1.27 (0.90 to 1.79)	1.85 (1.40 to 2.44)[h]	1.41 (0.97 to 2.05)[i]
Any services						
Need v. no need	1.51 (1.38 to 1.65)[h]	2.53 (2.25 to 2.83)[h]	1.47 (1.32 to 1.64)[h]	2.82 (2.44 to 3.27)[h]	1.42 (1.24 to 1.62)[h]	2.27 (1.90 to 2.71)[h]
Need fully met v. need not fully met	1.60 (1.34 to 1.91)[h]	0.92 (0.75 to 1.11)	1.62 (1.29 to 2.04)[h]	0.90 (0.70 to 1.16)	1.88 (1.47 to 2.40)[h]	1.04 (0.81 to 1.34)
Need at least partially met v. need not met	1.66 (1.35 to 2.03)[h]	1.15 (0.89 to 1.49)	1.66 (1.28 to 2.16)[h]	1.18 (0.86 to 1.61)	1.79 (1.37 to 2.35)[h]	1.27 (0.92 to 1.77)

Note: Data are shown as odds ratio (95% CI). N/A = Not available and/or was not released by Statistics Canada to protect respondent confidentiality; PNC = perceived need for care; PSC = perceived sufficiency of care.

[a]Sample includes regular forces from CFS2013, regular forces from CFS2002, and a subsample from CCHS-MH2012.

[b]For each of the 4 types of mental health care, a total of 9 binary logistic regression models were constructed depending on 1) which 1 of the 3 binary PNC/PSC variables was used as the outcome and 2) which 1 of the 3 adjustment approaches was used in the model. The 3 binary PNC/PSC variables indicated 1) if a respondent perceived a need for care or not, 2) if a respondent's PNC was fully met or not (collapsing Need partially met and Need not met), and 3) if a respondent's PNC was at least partially met (collapsing Need met and Need partially met) or not met at all. The 3 adjustment approaches were 1) no adjustment, 2) adjustment for selected sociodemographic variables, and 3) adjustment for selected sociodemographic and clinical variables. In all the regression models, a categorical variable indicating which 1 of the 3 survey samples a respondent was from was included as an independent variable. Data are presented for the effects of being in different survey samples on the probability of reporting the corresponding PNC/PSC outcome with or without adjustment.

[c]Survey population weights were used in all the regression models. 95% CIs were calculated using 500 bootstrapped weights.

[d]Adjusted sociodemographic variables include age, sex, education, marital status, ethnicity/cultural background, and household income.

[e]Adjusted clinical variables include self-reported physical and mental health status, past 12-month major depressive disorder, past 12-month generalized anxiety disorder, past 12-month suicide ideation, and past 12-month suicide attempt.

[f]The regression models could not be constructed because of an insufficient sample size of respondents reporting that their need for medication services was not met.

[g]$0.01 \leq P < 0.05$.

[h]$P < 0.001$.

[i]$0.05 \leq P < 0.10$.

applied to each respondent. All analyses were weighted using the final survey weight. Bootstrapping, a variance estimation technique, was performed to take into account the complex survey design for calculating the 95% confidence interval (CI) of all estimates. All analyses were done with SAS version 9.4.[32]

Results

Table 1 shows multiple differences in sociodemographic and clinical characteristics of the 3 survey populations. Compared to the CFS2002 sample, the CFS2013 sample had higher education and a higher average household income

and was less likely to be married and white. The CFS2013 sample had a higher prevalence of past 12-month GAD. The subsample of the CCHS-MH2012 differed from the 2 CAF samples in many sociodemographic characteristics such as sex, education, and ethnicity/cultural background. It also had a consistently lower prevalence of all mental health problems compared to the 2 CAF samples.

Table 2 shows the raw prevalence of PNC and PSC in the 3 survey samples. For all 4 types of services, the CFS2013 sample reported the highest prevalence of perceiving a need and the highest prevalence of reporting that the need was fully met.

Table 3 shows the adjusted prevalence of PNC and PSC in the 3 survey samples after raking. Again, the CFS2013 sample had the highest prevalence of perceiving a need and the highest prevalence of reporting that the need was fully met among the 3 samples for all types of mental health services (except for Information). For Information, the prevalence of perceiving a need in the CFS2013 sample was almost identical to that in the CFS2002 sample and higher than that in the CCHS-MH2012 sample. Absolute differences can be obtained by comparing the adjusted prevalence rates in Table 3. The prevalence of perceiving a need for Medication, Counselling and therapy, and Any services was higher by 5.80%, 7.75%, and 5.70%, respectively, in the CAF in 2013 compared to 2002. For the same services, compared to the contemporary CCHS-MH2012 sample, the CFS2013 sample had a higher prevalence of perceiving a need by 2.66%, 10.21%, and 9.65%, respectively. For the 4 types of services, the prevalence of reporting that the need was fully met was higher by 1.82%, 6.09%, 7.70%, and 6.43%, respectively, in CAF in 2013 compared to 2002. Compared to the contemporary CCHS-MH2012 civilian sample, the prevalence of reporting needs being fully met across the 4 types of services in the CFS2013 sample were higher by 4.88%, 2.43%, 7.54%, and 6.69%, respectively.

Table 4 and online supplementary Table S1 show relative differences in PNC and PSC across the 3 surveys. Both tables report the odds ratios (ORs) for the association between being in the CFS2013 survey sample and the probability of reporting different levels of PNC and PSC. The results in the 2 tables are very similar, an indication of the robustness of the findings. Compared to a decade ago, CAF Regular Force members have a significant 1.3 to 2.4 times increase in the probability of perceiving a need for Medication, Counselling and therapy, and Any services. In addition, across 3 types of services (Information, Counselling and therapy, and Any services), they have a significant 1.7 to 2.4 times increase in the probability of reporting a need being fully or partially met.

Compared to the contemporary CCHS-MH2012 sample, the CFS2013 sample had a significantly higher, by a factor of 1.4 to 2.5 times, probability of perceiving a need for all 4 types of services. There was also a consistent, albeit non-significant, trend in the direction of a higher probability of needs being met in the CFS2013 military sample compared to the CCHS-MH2012 civilian sample.

Discussion

Our study had a 2-fold objective: first and foremost, to capture changes in PNC and PSC over the past decade in the CAF, and as an additional point of reference, to compare current PNC and PSC between the CAF and Canadian civilians. With the aid of these comparisons, we wanted to assess the impact of a comprehensive set of investments implemented over the past decade in the CAF to improve workplace mental health in general and PNC and PSC in particular.

Temporal Trends in PNC/PSC in the CAF, 2002 to 2013

In military and civilian populations alike, the leading barrier to accessing mental health care is the failure to recognize or perceive a need for care (PNC).[8,12,13] Across the different types of mental health services assessed, Regular Force members in 2013 reported higher rates of PNC compared to Regular Force members in 2002, even after controlling for confounding sociodemographic and clinical factors. This indicates a clear pattern of improvement in recognizing the need for care in the CAF in the past decade. The only exception to this was observed for Information, for which rates remained almost the same or dropped slightly from 2002 to 2013. In military and civilian populations alike, an additional problem in mental health care is that even after individuals recognize a need for services and access care, they perceive that their needs were only partially met or not met at all,[15,16] a problem related to PSC. Looking at the prevalence of reporting mental health care needs being fully met in the CFS2013 and CFS2002, we found absolute increases of 1.82%, 6.09%, 7.70%, and 6.43%, respectively, for Information, Medication, Counselling or therapy, and Any Services; these changes in PSC capture significant improvements by a factor of 1.7 to 2.4, respectively. As previously discussed, over the past decade, the CAF invested not only in public awareness and education initiatives but also a host of measures to reinforce the mental health care system[18]; these measures would be expected to lead to improvements in both objective and subjective measures of adequacy of care. Our findings provide support for such improvements in subjective measures of sufficiency of care, or PSC.

Comparisons to Civilians

Comparing prevalence rates for PNC across different types of services, we found significantly higher rates of recognizing need in the CAF compared to civilians after controlling for important sociodemographic and clinical confounders. Again controlling for confounders, comparing prevalence rates for perceiving that needs were being fully met (i.e., PSC), we found a significantly higher rate of needs being fully met in the CAF compared to civilians for Information; we found a trend for significance for Counselling or therapy in the same direction. While the ORs for Medication and Any services

were not statistically significant, they were both greater than 1, thus again indicating a trend for higher rates of perceiving that needs were fully met in the CAF than in the civilians.

Study Strengths and Limitations

Our study has a number of notable strengths. First, we drew data from 3 large, nationally representative population health surveys. Even after applying exclusions to the civilian dataset and limiting the analyses to only Regular Force members in the military surveys, the sample size (and the resulting statistical power) for the pooled data was considerable. Second, the surveys were all conducted by Statistics Canada, using similar methodology and the same measure of PNC and PSC, thus increasing the robustness of comparisons being made.[19] Third, in looking at changes in PNC and PSC over time in the CAF and making comparisons between the CAF and the civilian population, we took a systematic approach that used a set of complementary analyses; the results from different analytic approaches produced almost identical results, indicating the robustness of the findings.

We also note a number of important limitations. First, due to differences in the sampling strategy for the reservists in 2002 and 2013, we decided to address PNC and PSC in reservists in a separate work and limited our analyses in the current work to regular forces only. Second, due to the exclusion of the PNCQ from the civilian CCHS 1.2 in 2002, we were not able to compare rates of change in the CAF and the civilian populations, which would have provided a more complete picture of differences in civilian and military populations. We therefore include comparisons to the CCHS-MH2012 as simply an additional point of reference in the current work, with plans to later conduct 4-way comparisons on measures other than the PNCQ (e.g., access to services by provider type, intensity of use). Third, although the 3 surveys used similar methodology, thus enabling us to pool them together to explore survey differences,[33,34] minor differences in sampling and interviewing procedures across the surveys could, in theory, adversely influence the validity of survey difference estimates; however, this kind of influence is expected to be too small to change our study conclusions. Fourth, the selection of matching factors in the current work was limited by the availability of theoretically meaningful sociodemographic and clinical variables in the 3 surveys. Only those factors that were available in all 3 surveys could be included as matching factors to ensure that the same sample matching approach was used between the 2 military surveys and between the 2 contemporary (military and civilian) surveys. This limitation introduces the possibility that PNC and PSC comparisons might be biased due to the omission of other relevant variables (e.g., panic disorder, social phobia) from sample matching. These variables could be associated with PNC and PSC and would likely have different distributions across the 3 surveys. To assess this potential bias, we conducted sensitivity analyses in which we included past-month psychological distress as an additional matching factor (results not shown). Since psychological distress is a general and excellent indicator for the presence of mental health disorders, adding it in sample matching would significantly reduce the confounding effects of clinical variables only if important clinical variables were indeed omitted from matching. The results from our sensitivity analyses indicate that findings remain the same, suggesting that even with the limitations in the number of clinical variables available in all 3 surveys, sufficient adjustment for clinical variables was obtained in sample matching. There are a number of additional limitations that have been noted for cross-sectional population health surveys in general (e.g., data do not imply causality, and recall bias may limit the accuracy of self-report data),[10,29] which should also be considered in interpreting our findings.

Conclusions

Over the course of the past decade, the public narrative on mental health in military personnel has focused on the high burden of mental health problems in those deployed to areas of conflict, on their special burden of stigma, and on the inadequacies of the military mental health system in meeting their needs. In Canada, these concerns came to the fore as large numbers of personnel came forward with service-related mental health problems after difficult deployments in the 1990s. In response to these concerns, the CAF invested heavily in creating a comprehensive mental health system. A variety of efforts sought to increase the awareness of the need for care and to ensure that individuals received enough care to address their needs.

The present findings provide among the first concrete evidence that these efforts have borne fruit: Since 2002, PNC has increased, well beyond that explained by the increase in the prevalence of certain mental disorders.[35] In addition, consistently favourable increases were seen in the extent to which care was perceived to be sufficient. Military and civilian comparisons in 2012 and 2013 also point to the advantages of the current CAF system over the Canadian public system.

While these findings suggest that the CAF has been on the right track in its mental health system renewal, applying these findings to other military organizations and to the Canadian public system will require a deeper understanding of which specific facets of the CAF mental health system renewal have contributed most to increasing PNC and PSC. Additional research along these lines is essential. Indeed, the CAF is engaged in research projects to assess the impact of its mental health training and education programs and its postdeployment mental health screening programs. Additional research is also needed to explore the meaning of the increase in PSC. Specifically, there is a need to document 1) that patients are receiving numbers of visits that meet clinical practice guidelines for "minimally adequate treatment"; 2) that patients are receiving evidence-based care, especially evidence-based trauma-focused psychotherapy

for posttraumatic stress disorder, given the importance of that condition in military populations; 3) that treatment outcomes meet expected benchmarks; and 4) that programs and services are being delivered as efficiently as possible.

Note

a. Reservists included in the CFS2002 sample were drawn from all primary reserve forces that had paraded in the 6 months leading up to the survey. In contrast, the CFS2013 reservists were drawn from those who had deployed to the Afghanistan mission since estimating the mental health effects of that mission was an important objective for this most recent military survey. Thus, reservists from the 2002 and 2013 military surveys were not directly comparable.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was supported by an internal grant to Dr. Fikretoglu from the Directorate of Mental Health, Canadian Forces Health Services Group, at the Department of National Defence. Dr. Liu was a contract biostatistician for the grant.

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