


BMJ Open CCWORK protocol: a longitudinal study of Canadian Correctional Workers' Well-being, Organizations, Roles and Knowledge

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ABSTRACT

Introduction Knowledge about the factors that contribute to the correctional officer's (CO) mental health and well-being, or best practices for improving the mental health and well-being of COs, have been hampered by the dearth of rigorous longitudinal studies. In the current protocol, we share the approach used in the Canadian Correctional Workers' Well-being, Organizations, Roles and Knowledge study (CCWORK), designed to investigate several determinants of health and well-being among COs working in Canada's federal prison system.

Methods and analysis CCWORK is a multiyear longitudinal cohort design (2018–2023, with a 5-year renewal) to study 500 COs working in 43 Canadian federal prisons. We use quantitative and qualitative data collection instruments (ie, surveys, interviews and clinical assessments) to assess participants' mental health, correctional work experiences, correctional training experiences, views and perceptions of prison and prisoners, and career aspirations. Our baseline instruments comprise two surveys, one interview and a clinical assessment, which we administer when participants are still recruits in training. Our follow-up instruments refer to a survey, an interview and a clinical assessment, which are conducted yearly when participants have become COs, that is, in annual 'waves'.

Ethics and dissemination CCWORK has received approval from the *Research Ethics Board of the Memorial University of Newfoundland* (File No. 20190481). Participation is voluntary, and we will keep all responses confidential. We will disseminate our research findings through presentations, meetings and publications (e.g., journal articles and reports). Among CCWORK's expected scientific contributions, we highlight a detailed view of the operational, organizational and environmental stressors impacting CO mental health and well-being, and recommendations to prison administrators for improving CO well-being.

Strengths and limitations of this study

- Our study is the most comprehensive mixed-method longitudinal, multicohort research with correctional officers in Canada, including detailed/in-depth qualitative and quantitative data collection instruments.
- We further aim to assess the impact of the COVID-19 pandemic on the well-being of correctional officers in Canada.
- Our data collection processes have been limited due to COVID-19 restrictions.
- Our findings are based on self-reported data and thus subjected to participant bias.
- Our eligibility criteria include only participants (ie, correctional officers) working in Canada's federal prison system.

INTRODUCTION

Researchers, stakeholders, organisations and policy makers have increasingly focused public and scholarly attention on work-related post-traumatic stress injuries (PTSI) public safety personnel (PSP; eg, correctional officers (COs), police, firefighters and paramedics), including police, firefighters, paramedics and Armed Forces personnel.¹ However, specific knowledge about mental health disorders among COs is still limited. COs engage in high-risk work that is critical for our communities but invisible to most members of the public.² COs are responsible for providing all essential and non-essential services for prisoners, as well as maintaining the health, safety and security of prisoners, prison employees, the prison facility and the public.^{2–4} Canadian COs can work in

the federal or provincial/territorial system.² Employed by Correctional Services Canada (CSC), federal COs oversee prisoners sentenced to 2 or more years in custody, whereas provincial/territorial COs, who are employed by the provincial and territorial governments, are responsible for prisoners remanded into custody, awaiting trial or sentenced to a maximum of 2 years less 1 day.^{2,5} Given their importance in society, Canadian COs are recognised as ‘first responders’ who respond to emergency situations among prisoners, provide life-saving interventions, respond to fires and are responsible for a wide range of other calls for service.⁶

COs incur a considerable loss of time on leave from work because of mental health disorders.^{3,7,8} Rates of mental disorders among COs are higher than in the general population.^{7,9–11} In Canada, Carleton and colleagues¹¹ found that 54.6% of federal correctional workers, including COs, reported symptoms of a mental disorder, with 31.1% screening positive for major depressive disorder (MDD) and another 29.1% screening positive post-traumatic stress disorder (PTSD). A more recent study specifically focused on COs working in the Ontario (provincial; Canada) correctional system evidenced participants were likely to experience exposure to potentially psychologically traumatic events (PPTs), sometimes called ‘critical incidents’,¹² with 26.6% reporting lifetime suicidal ideation.¹⁰

Despite alarming rates of mental health needs and disorders among COs, researchers in Canada and abroad have only given limited attention to studying CO health and well-being. The existing research has focused primarily on personality characteristics as possible risk factors that can explain the vulnerability of COs to mental disorders.^{13,14} To date, the central result from researchers is that occupational factors, including the work environment, negatively impact the mental health and well-being of COs. Scholars have demonstrated that overcrowded prisons, understaffing and increased workload with inadequate resources compromise the ability of COs to do their job effectively and raise stress levels at work.^{15–17} Bourbonnais and colleagues¹⁸ found correctional work in Quebec’s provincial prisons was characterised by high rates of job strain, involving psychologically demanding work with little autonomy, and workplace harassment, resulting in psychological distress for officers.

A report issued in 2018 by the *Standing Committee on Public Safety and National Security* of Canada’s House of Commons supported the Canadian government in acknowledging officially and publicly that correctional work is associated with substantially increased mental and physical health risks, all of which requires evidence-informed solutions.¹⁹ The report underscored that, among other PSP, COs deal with increased risk of suffering occupational stress injuries (OSIs) and PTSIs as a function of their vocation.¹⁹ OSI is a term first coined by the Canadian Armed Forces’ peer support programme with the intent to destigmatise and legitimise mental health conditions resulting from one’s work.²⁰ The term refers to a broad array of clinically

significant symptoms that can occur following exposure to one or more PPTs at work. OSI symptoms are associated with symptoms that are found in diagnoses of, among others, PTSD, acute stress disorder, MDD, panic disorder, generalised anxiety disorder (GAD), substance use disorders and chronic pain. Exposure to regular, continuous and prolonged work-related stressors and risks appears among the primary determinants of OSIs among COs. However, there is a concerning lack of knowledge about how COs develop and cope with OSIs, as well as how those mental health injuries impact their careers.

Recognising the need for additional research on OSIs and PTSIs among COs and drawing on the assumption that occupational health and safety includes well-being,²¹ in 2017, we initiated a research project on the well-being of Canadian federal COs that would elucidate how job experiences relate to OSIs, called the *Canadian Correctional Workers’ Well-being, Organizations, Roles and Knowledge* study (henceforth ‘CCWORK’). CCWORK is a multiyear (2018–2023, with possibility for a 5-year renewal), multi-cohort, mixed-methods (quantitative and qualitative data) longitudinal study.

CCWORK’s objectives

CCWORK draws on ‘appreciative inquiry’, a collaborative and participative approach that tries to identify, mobilise, enhance and implement forces that lead to optimum organisational performance.²² Inspired by appreciative inquiry, we aim at understanding how prison work shapes CO well-being over time and identifying the forces that can compromise the CO’s occupational health and safety. Practically, we focus on identifying and analysing the factors associated with CO vulnerabilities to (ie, risk factors) and resilience against (ie, protective factors) OSIs. To achieve our objective, the CCWORK team seeks to answer the following three research questions:

1. How does self-reported CO mental health (eg, self-reported interpretations of mental wellness, coping abilities, support systems and use) and mental health knowledge change from training (baseline) throughout the CO career (follow-up waves)?
2. What contextual factors (ie, the physical realities of carceral work; safety, legal, emotional and physical vulnerabilities within the prison workspace; operational and organisational stressors; personal experiences such as potentially psychologically traumatic event exposure over time in prison spaces, diagnoses and treatment for mental disorders) shape CO perceptions of mental health?
3. How does clinically assessed CO mental health change from recruit training (baseline) over time as COs experience stages of the profession (follow-up waves)?

CCWORK’s context

To become a federal correctional officer recruit, applicants must successfully complete the recruitment and training programme offered by CSC, and then be offered and accept a position at one of the 43 prisons operated by

CSC across five Canadian regions (ie, Ontario, Quebec, Atlantic, Pacific and Prairie). The correctional training programme (CTP) is comprised of three sequential stages. Stage I is a comprehensive online training course made up of multiple modules. Stage II is a series of online assignments based on information learnt in stage I. Stage III is an in-person intensive 14-week corrections-specific training programme delivered at the National Training Academy in Kingston (Ontario) or a satellite site (eg, Holland College in Prince Edward Island). A recruit who successfully completes phase III becomes a CO and is assigned a position in a federal prison. CSC employs approximately 7800 COs.²³ COs oversee about 14000 prisoners in custody.²⁴

To understand how correctional work shapes the mental health, sense of safety, social views and values of COs over time, we evaluate the role and importance of different types of stressors. Specifically, we consider how *operational stressors* (eg, job content, such as responding to prisoner suicide attempts), *organisational stressors* (eg, job context, such as supervisory arrangement, work hours) and *environmental stressors* (eg, context of the carceral institution)^{4 25–28} influence COs. To capture how correctional work transforms the mental health of COs over time, we employ a longitudinal research design. A longitudinal study design enables us to capture changes in both CO perceptions and experiences, as well as organisational, environmental and societal changes relevant to CO work dynamics and mental well-being. For instance, our longitudinal design gives us the flexibility we need to address unexpected topics that may emerge during the study period, as well as the impact of events like the COVID-19 pandemic on the prison system and CO well-being.

The longitudinal design, we employ in CCWORK is unprecedented among Canadian studies of CO mental health. Most previous research with COs has used relatively small, purposive samples, with cross sectional designs, all of which have provided important steps towards improving CO mental health and informing CCWORK. While longitudinal designs are resource intensive and can suffer from logistical challenges, longitudinal designs offer unique opportunities for researchers to bolster the reliability and validity of research findings and can identify causal relationships between exposures and outcomes of interest.

The following article sections detail our CCWORK protocol including methods, procedures and practices. Furthermore, we describe how the COVID-19 pandemic has impacted our study to date, with specific focus on the effects of the pandemic on our data collection. By publishing our research protocol, we hope to promote transparency in our research, improve the quality of the findings emerging from CCWORK and ultimately advance all efforts to support CO mental health.

METHODS AND ANALYSIS

Study overview

Our CCWORK project is comprised of three subprojects: (1) online self-report surveys conducted by recruits through CTP with annual follow-up surveys; (2) in-person qualitative interviews in stage III of CTP with annual follow-up interviews; and (3) clinical assessments in stage III of CTP with annual follow-up assessments. All subprojects are conducted in both of Canada's official languages (French and English).

Together, subproject 1 (online surveys) and subproject 2 (qualitative interviews) provide a multithematic characterisation of the study population empirically and through lived experiences. The themes explored in the first two subprojects include demographic (including lifestyle), occupational and psychological characterisations of COs at recruitment and at work. The occupational characterisation includes experiences and exposure to stressors on the job, whereas the psychological characterisation addresses psychological state, social views, clinical screenings and experiences of mental health challenges. Occupational and psychological characterisations provide data on how participants cope with diverse stressors. Through subprojects 1 and 2, we also gather data and information on the impact of CTP on participants' mental state, knowledge of mental health and views of the prison context. Prison contexts include a large range of potential challenges, such as contraband, transgender placement policies, mental health management strategies and practices, physical environment of the prison and norms of conduct in correctional work. Offering a clinical characterisation of the study population, subproject 3 draws on the *Mini International Neuropsychiatric Interview* (MINI) to screen the study population for psychiatric disorders in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) and the 10th edition of the *International Classification of Diseases* (ICD-10). The three subprojects collectively offer a relatively comprehensive basis for longitudinal comparisons, allowing us to understand the impact that correctional work and related factors (eg, family dynamics, significant life events and traumatic events) have on CO well-being over time. For details on the administration of study measures, see [table 1](#).

Participant recruitment

CSC plays a crucial role in the CCWORK project by facilitating avenues for participant recruitment and granting access to the training facilities and prisons. Project recruitment and enrolment starts when CORs are accepted into stage II of CTP. Then, CSC sends recruits an email with an invitation letter to participate in CCWORK on behalf of the research team. The email invitation explains the project and details our ethical protocols. The invitation also contains a link for participants to complete the *CTP pretest survey* remotely before arriving at the training facility. CORs willing to participate in CCWORK generate a unique access code with Qualtrics (the platform that we use to administer and store our surveys), allowing

Table 1 Schedule of administration of study measures (2018–2023)

	Study activity	Study time point						
		CTP stage II (enrolment)	CTP stage III	Year 1* (wave 1)	Year 2* (wave 2)	Year 3* (wave 3)	Year 4* (wave 4)	Year 5* (wave 5)
Subproject 1	CTP pretest survey†	×						
	CTP post-test survey†		×					
	Follow-up survey (odd year)†			×		×		×
	Follow-up survey (even year)†				×		×	
Subproject 2	Baseline interview†		×					
	Follow-up interview†			×	×	×	×	×
Subproject 3	MINI (baseline)†		×					
	MINI (follow-up)†			×	×	×	×	×

Note: as enrolment is continuous (ie, new cohorts enter the project whenever there is a CTP class) and the project is scheduled to last 5 years, not all participants will complete all waves of data collection.

*Counting from month when the specific cohort completed stage III of CTP.

†We obtain informed consent from all participants at each point of data collection.

CTP, correctional training programme; MINI, Mini International Neuropsychiatric Interview.

researchers to connect all surveys participants complete within CCWORK while protecting the anonymity of the participants. To be included in the pretest survey, potential participants must then review and accept the informed consent. During stage III of CTP, instructors briefly discuss the CCWORK project with recruits, facilitating our recruitment activities. When possible, a member of the research team, usually Ricciardelli, participates in the discussion in person or virtually, to detail the project and answer any questions the recruits may have.

When we began data collection for the CCWORK project in August 2018, we focused on participants attending CTP at the only training academy at the time, located in Kingston, Ontario, which is the National Training Academy for CSC. In January 2020, we added the newly opened CSC satellite site in Prince Edward Island as our second site for regular participant recruitment. When resuming data collection in January 2021, satellite sites were opened in the Prairie, Pacific and Quebec regions of CSC. We now recruit from all five of the CSC satellite training sites.

Population and sample size

CCWORK's samples are drawn from the populations attending the different stages of CTP. Based on records from 2019 and 2020, approximately 780 individuals participate in stage I of CTP annually. About 40% of those individuals (or 315 individuals) continue into stage II of CTP, and about 95% of those in stage II continue to stage III. As recruits move through stages I and II, they are organised into cohorts in stage III. Annually, about 20 cohorts of (16 anglophone and four francophone) go through stage III of CTP; each cohort has about 30 individuals. The CCWORK research team is driven by

the goal of collecting data from the entire recruit population in stages II and III of CTP; however, achieving that goal may not be always possible. Thus, to ensure generalisability of quantitative research findings (subprojects 1 and 3, as discussed further), considering a 5% margin of error at 95% confidence level, we aim to enrol at least 173 recruits in CCWORK annually. Given the longitudinal nature of CCWORK, we assume an overall attrition rate between 20% and 30% (from baseline to waves), which may drop sample size to up to a minimum of 121 participants in follow-up waves (in the worst case scenario) and raise margin error up to 6.86%.

Subproject 1 methods

In subproject 1, research participants complete self-reported surveys online. The survey, which are not available in hard copy, include both open-ended and closed-ended questions. Subproject 1 comprises four distinctive survey instruments: two completed at baseline (ie, during CTP) and two completed as follow-ups (ie, annually). The first baseline survey (*CTP pretest survey*) is administered during stages II of CTP. The second baseline survey (ie, *CTP post-test survey*) was added to the project in 2019 and is administered after stage III of CTP is complete but before graduation. Two different follow-up surveys are administered alternately after completion of CTP on odd years (ie, *follow-up survey (odd years)* the end of years 1, 3 and 5) and even years (ie, *follow-up survey (even years)* at the end of years 2 and 4). Most the questions posed in the surveys have well-established metrics in the field of clinical psychology, sociology, criminology and organisational studies, as indicated in the tables detailing our metrics, while others were developed by the research team.

CTP pretest survey

The *CTP pretest survey* is the first data collection point for CCWORK. The *CTP pretest survey* assesses the following for COs: demographics; correctional work preparedness; mental health disorders (using established and validated self-screening tools); mental health knowledge; mental health training; emotional regulation; support network; chronic pain; risk factors; and COVID-19 impact. For more details, see [table 2](#) (mental health screening instruments).

Post-test survey

Like the *CTP pretest survey*, the *CPT post-test survey* is delivered online using Qualtrics. The *CTP post-test survey* assesses the following for COs: demographics; personality and stressors; emotional regulation; impacts of contraband in prison; prison and sexuality; organisational affairs, including organisational commitment, culture and the correctional officer code; correctional training; and, a recent addition, COVID-19 related questions. For more details, see [table 3](#). The average survey completion time is estimated at 60 min. However, completion times may range up to several days because participant responses will determine the level of detail explored by the items. For example, participants who indicate multiple symptoms consistent with mental disorders will experience a longer survey than those who indicate not experiencing any symptoms of mental disorders. Accordingly, participants are enabled to complete the surveys at their convenience by saving their answers to submit later.

The *follow-up odd year survey* assesses the following for COs: demographics; mental health injuries; workplace concerns; inappropriate behaviours at work; work-related stress; victimisation at work; mental health knowledge; CTP mental health training; contraband in prison; organisational commitment; work relationships; culture at work; CO code; humanising behaviours; burnout; and, also a recent addition, COVID-19 related questions. For more details, see [table 4](#).

Follow-up survey (even year)

The *follow-up even year survey* assesses the following for COs: demographics; correctional work preparedness; mental health disorders; emotional regulation; mental health knowledge; social support and family; alcohol use and smoking; cannabis use; chronic pain; occupational mental health training and education; and COVID-19 related questions. For more details, see [table 5](#).

Subproject 2 methods

In subproject 2, we interview participants starting phase III of CTP at their academy (ie, *baseline interview*) and annually thereafter (ie, *follow-up interview*) (see [table 1](#) for timeline). We use a semistructured interview guide to ask participants about their expectations, experiences and perceptions of correctional work to contextualise their training, work life and well-being. The semistructured format gives participants autonomy

in answering questions and supports their unfettered showcasing of connections between themes. Nevertheless, the interviews generally explore the same topics in roughly similar ways across participants. Interview themes include the following aspects of the participant's life: prior employment experiences and career transition points; perceptions of CTP training; perceptions of prison, prisoners and correctional work, including their gendered nature; occupational-related concerns and challenges; work-life balance (eg, time off work); exposure to potentially psychologically traumatic events and other significant life events; and perceptions of stress on the body. The *follow-up interview* guide has slightly more themes than the *baseline interview* guide. In *follow-up interviews*, we additionally ask participants to evaluate the usefulness and appropriateness of the training received during CTP. Also, we ask participants who served in the armed forces to draw comparisons between their armed forces (eg, military and navy) and correctional experiences.

Interviews happened at the convenience of participants, usually in the evening (before or after dinner) or on the weekends, but outside of the CTP class schedule. Interviews are expected to last between 45 and 120 min based on previous experience. Interviews are voice recorded after obtaining verbal or written informed consent from the participant. Interviewers are members of the research team, including the principal investigator, coinvestigators and research assistants. All interviewers working with CCWORK (including those in subproject 3 have received advanced training in the specifics of data collection, 'reliability' clearance from the CSC and have signed the CCWORK confidentiality and non-disclosure agreement.

The *baseline* and *follow-up* interviews are conducted by the principal investigator and select group of research assistants and organised by the principal investigator, the project coordinator and staff as well as the training academy leaders. The *follow-up interviews* occurred annually in February, June and October, depending on whether the participant was first interviewed (ie, *baseline*) in December through March, April through July and August through November, respectively. However, this scheduling required the research team to interact with the same prison more than once a year, which created unnecessary footprint and research fatigue within the correctional facilities. Accordingly, we revised our *follow-up* procedures to optimise resources and reduce the organisational burden of CCWORK on CSC. Since January 2021, we schedule *follow-up interviews* based on province/institution of deployment, rather than participant *baseline interview* dates ([table 6](#)). Participants are now able to do their *follow-up interview* during a working shift or their personal time. For those who prefer to do the interview on their working shift, CSC helps us to schedule a times lot and provide a quiet and private space for the participants to complete their interviews.

Table 2 CTP pretest survey details

Questionnaire section/number of questions	Topics
Demographics	
Demographics/31	Prior correctional work experience; reasons for joining CSC; prior PSP work experience; current employment status; current province/territory of residence; intended province/territory of deployment; year of birth; biological sex; gender identity; sexual orientation; educational attainment; ethnicity; religious affiliation; language knowledge; marital status; household income; and children.
Workplace concerns	
Fear of correctional work/4	Fear and concerns regarding correctional work. This topic consists of four 'made-in-house' open-ended questions that request participant to discuss their fears of working in prison and with individuals who were convicted to more than 2 years.
Fear of correctional work/4	
Mental health knowledge	
CRF-MHSUQ/6	CAF Recruit Mental Health Service Use Questionnaire (CAF-R-MHSUQ), ⁴² which assesses knowledge of mental health, particularly instrumental attitudes (ie, whether mental health service is a good or a bad thing) and affective attitudes (ie, how mental health service will feel); subjective norms; perceived self-efficacy (ie, expectations around how easy or difficult mental health services would be and confidence that one can overcome difficulties) and perceived control (ie, perceived control over the performance of the behaviour); and mental health service intentions with seven, six, nine and four items, respectively. The psychometric evaluation of the CAF-R-MHSUQ is ongoing.
Mental health training	
Occupational mental health training and education/5	Training on mental health support that participants may have received during their lifetime is assessed through 5 'made-in-house' closed-ended questions that explore if participants have received training, what kind of training they have received (e.g.: Critical Incident Stress Management, Critical Incident Stress Debriefing, Mental Health First Aid, Peer Support, Road to Mental Readiness and Understanding and Responding to Inmates with Mental Health Disorders, and whether the training received was helpful for improving their mental health and the mental health of their team, reducing stigma, mitigating OSIs, increasing their knowledge of mental health and helping them to respond to inmates/clients with mental health problems.
Emotional regulation	
Emotion regulation/1	The <i>Emotional Regulation Questionnaire</i> , ⁴³ a 10-item scale designed to measure respondents' tendency to regulate their emotions through 'cognitive reappraisal' and 'expressive suppression'. Participants answer each item on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The scoring takes the average of all the scores in each subscale of cognitive reappraisal and expressive suppression. Higher the score, greater the use of a particular emotion regulation strategy, conversely lower scores represent less frequent use.
Support network	
Social Support and Family (SPS, DAS-4)/6	Perceived social support is assessed with the <i>Social Provisions Scale-10</i> (SPS), ⁴⁴ which is a 10-item short form; higher scores can be interpreted as having higher levels of social support. Cronbach's alpha of 0.88. Marital satisfaction is assessed with the <i>Dyadic Adjustment Scale</i> (DAS-4), ⁴⁵ which contains four items: three of which are on a 6-point Likert scale ranging from 0 (all the time) to 5 (never), while the final item is on a seven-point scale ranging from 0 (extremely happy) to 6 (perfect); higher the score, greater the satisfaction/adjustment, conversely lower scores represent less adjustment. Cronbach's alpha is usually around 0.96.
Chronic pain	
Former PSP – other health conditions – chronic pain questionnaire/6	Chronic pain frequency and severity (ie, intensity and duration) at different bodily locations with the <i>Chronic Pain Grade Questionnaire</i> is a seven-item instrument designed to evaluate overall severity of chronic pain based on two dimensions, pain intensity and pain-related disability in individuals who suffer from chronic pain that has lasted for at least 6 months. ⁴⁶ Items are scored on an 11-point Likert scale, with responses ranging from 0 to 10. Scores are interpreted according to three subscales (characteristic pain intensity, disability score and the disability points score), which classify subjects into one of the five pain severity grades: grade 0 for no pain, grade I for low disability-low intensity, grade II for low disability-high intensity, grade III for high disability-moderately limiting and grade IV for high disability-severely limiting. Cronbach's alpha is usually around 0.90.

Continued

Table 2 Continued

Questionnaire section/number of questions	Topics
Risk factors	
Risk factors/4	Victimisation, using the <i>Childhood Experiences of Violence Questionnaire</i> , which is an 18-item self-report measure of victimisation in seven categories (peer-on-peer violence, witnessing domestic violence, emotional abuse, physical punishment, physical abuse and sexual abuse). It also gathers information on perpetrators, severity, onset, duration and disclosure of abuse. ⁴⁷ Higher the score, greater victimisation, conversely lower scores represent less victimisation.
COVID-19	
COVID-19 operational/4	COVID-19 impact on job routine, work responsibilities, occupational risks, drug in prison, access to PPE and family members (eg, transmissibility to family members). This topic includes 'made-in-house' matrix questions with 5-point Likert scales and open questions.
COVID-19 Stress Scale/3	COVID-19 related concerns involving getting infected, keeping family safe, challenges faced by the healthcare system to deliver services, hygiene habits, commuting/travelling issues, logistics and supply issues (eg, foodstuff and medicine), foreigners, as well as stresses resulting from the pandemic and knowledge of COVID-19. This topic includes 'made-in-house' matrix questions with 5-point Likert scales and open questions.
Other	
Ethics protocols/4	Questions related to ethics protocols (eg, consent) and research feedback.
Mental health disorders (screening)	
Event exposure – PCL-5/13	PTSD is assessed using the <i>PTSD Check List 5</i> (PCL-5), ⁴⁸ which is a commonly used self-report tool that assesses 20 symptoms of PTSD as outlined in the fifth edition of the <i>Diagnostic and Statistical Manual of Mental Disorder (DSM-5)</i> . ⁴⁹ Respondents are asked to rate how bothered they have been by each of 20 items in the past month on a five-point scale (0=not at all; 1=a little bit; 2=moderately; 3=quite a bit; 4=extremely). Items are summed to provide a total severity score ranging from 0 to 80. A positive screen for PTSD on the PCL-5 requires participants to meet minimum criteria for each PTSD cluster and exceed the minimum total score of >32. Cronbach's alpha usually ranges from 0.56 to 0.77. Mean interitem correlations for the PCL-5 range from 0.22 to 0.73.
Depression – PHQ-9 and Suicide Assessment/21	Major depressive disorder (MDD) symptoms are assessed using the nine-item Patient Health Questionnaire (PHQ-9). ⁵⁰ The PHQ-9 is a nine-item questionnaire that asks individuals to rate how often symptoms of MDD have bothered them in the past 2 weeks on a three-point scale (0=not at all; 1=several days; 2=more than half the days; 3=nearly every day). The total score can range from 0 to 27, with higher scores indicating greater MDD symptom severity. MDD symptom severity can be categorised based on score as none (0–4), mild (5–9), moderate (10–14), moderately severe (15–19) or severe (20–27). A positive screen for MDD on the PHQ-9 requires a total score >9. Cronbach's alpha usually ranges from 0.422 to 0.698. Mean interitem correlations for the PHQ-9 range from 0.200 to 0.622.
Panic Disorder Questions – PDSS-SR/10	Panic Disorder (PD) using the <i>Panic Disorders Symptoms Severity Scale – Self-Report</i> (PDSS-SR), a seven-item questionnaire that asks individuals to rate their symptoms on a five-point scale (0=never; 1=occasionally; 2=half of the time; 3=most of the time and 4=all of the time). ⁵¹ The total score can range from 0 to 40, with higher scores indicating greater PD symptom severity. A positive screen for PD on the PDSS-SR requires a total score >7. Cronbach's alpha is usually around 0.92.
Generalised anxiety disorder – GAD-7/1	Generalised anxiety disorder (GAD) symptoms are assessed with <i>General Anxiety Disorder 7-Item Scale</i> (GAD-7). ⁵² The GAD-7 is a seven-item questionnaire that asks individuals to rate how often symptoms of GAD have bothered them in the past 2 weeks on a three-point scale (0=not at all; 1=several days; 2=more than half the days; 3=nearly every day). The total score can range from 0 to 27, with higher scores indicating greater GAD symptom severity. A positive screen for GAD requires a total score >9. Cronbach's alpha is usually around 0.89.
History of anxiety and mood disorders/17	History of anxiety and mood disorders is assessed through a combination of open-ended and closed-ended questions, 17 in total, that ask participants to report any history of diagnosis, age of diagnosis, professional providing the diagnosis, response to treatment and general feelings and experiences with treatment. There are five questions about anxiety, five questions about specific mood disorders (ie, major depressive disorder, bipolar disorder and cyclothymic), five questions about any mental health disorder that is not an anxiety or mood disorder and two questions about feelings and experiences undergoing treatment. These questions were designed by R N Carleton, S Duranceau and D LeBouthillier from the University of Regina (Canada).

Continued

Table 2 Continued

Questionnaire section/number of questions	Topics
Alcohol use and smoking/10	Risky (hazardous) alcohol use is assessed with the <i>Alcohol Use Disorders Identification Test</i> (AUDIT). ⁵³ The AUDIT items are consistent with ICD-10 definitions of alcohol dependence and harmful alcohol use. The AUDIT is a 10-item questionnaire where individuals are asked to describe their alcohol use on a 3- or 5-point scale, depending on the item. The total score can range from 0 to 40, with higher scores indicating greater alcohol use risk. A positive screen for problematic alcohol use requires a total score >15.
Cannabis use disorder/11	The <i>Cannabis Use Disorder Identification Test - Revised</i> (CUDIT-R) ⁵⁴ is a brief, eight-item screening instrument designed to identify problematic or harmful use within the past 6 months. Individuals are asked to describe their cannabis use on a four-point scale (0–4) that measures cannabis use frequency. The CUDIT-R diagnostic criteria are aligned with the fifth edition of the <i>Diagnostic and Statistical Manual of Mental Disorder</i> (DSM-5) ⁴⁹ ; however, the DSM-5 now classified abuse, dependence, and substance use disorders along a continuum of severity based on the number of symptoms. Scores of 8 or more indicate hazardous cannabis use, while score of 12 or more indicate a possible cannabis use disorder.
SR1 and PNC/7	Different kinds of help participants received, or thought they needed, for problems with emotions, mental health or use of alcohol or drugs. Closed-ended, these questions are from two sections of the <i>Canadian Community Health Survey</i> (CCHS), namely, the <i>Mental Health Services</i> (SR1) and the <i>Perceived Need for Care</i> (PNC) section. ⁵⁵ These questions explore types of help/resources received (eg, hospitalisation, psychiatrist, family doctor or general practitioner, psychologist, nurse, social worker, counsellor or psychotherapist, family member, friend, coworker, supervisor or boss), frequency with which participants accessed those help/resources, reason for stopping accessing them and their effectiveness.
BRS/1	Resilience (ie, the ability to bounce back or recover from stressors) is assessed with the <i>Brief Resilience Scale</i> (BRS). ⁵⁶ The BRS is a six-item questionnaire where individuals are asked to decide how much they agree or disagree with each item using a five-point scale (1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree). The total score can range from 6 to 30, with higher scores indicating greater perceptions of resilience.

ICD-10, International Classification of Diseases, 10th edition; OSIs, occupational stress injuries; PPE, personal protective equipment; PSP, public safety personnel; PTSD, Post-traumatic Stress Disorder.

Subproject 3 methods

Subproject 3 involves administering the empirically validated MINI survey to participants.^{29 30} The MINI is a psychological assessment used to screen CCWORK participants at employment entry (ie, MINI *baseline*) and at the end of each year of employment (ie, MINI *follow-up*). The MINI was designed as a brief structured diagnostic interview for many psychiatric disorders in DSM-III-R, DSM-IV and DSM-5³¹ and ICD-10.^{29 30 32} The MINI has similar reliability and validity properties to both the Structured Clinical Interview (SCID-P) for DSM-III-R and the Composite International Diagnostic Interview (CIDI; ie, a structured interview developed by the WHO), but the MINI can be administered in a shorter time (mean 18.7±11.6min, median 15min). The MINI has demonstrated inter-rater reliability exceeding 75%.^{29 30} Results from the MINI are usually associated with high inter-rater reliabilities.^{33 34} The MINI produces a series of dichotomous results regarding each of several assessed disorders which, depending on the context, can provide evidence in support of diagnoses. Results from the MINI are placed into a summary document.

Trained graduate or postdoctoral level research assistants conduct the clinical MINI interviews under the supervision of the clinical CCWORK team. Clinical

interviews are voice-recorded to assess inter-rater reliability. Interviewers type participant responses into a digital form along with clinical field notes directly into an encrypted computer. If responses indicate the immediate need for additional mental health assessment or support (eg, a death by suicide plan is in place), participants are first referred to a senior clinical psychologist within CCWORK, and then directed to mental health support in their communities. The CCWORK research team does not disclose individual MINI results, unless required to comply with ethical and legal regulations (eg, an imminent risk of harm to self or others). A clinical coinvestigator coordinates the MINI interviews (*baseline* and *follow-up*) following the interviews in subproject 2. The interviews are conducted in person at a CTP academy through a process paralleling subproject 2. Participant consent was obtained at the same time as consent for subproject 2. The research team members who conducted the *baseline* and *follow-up* interviews were different from the research team members who conducted the MINI.

COVID-19 impact on CCWORK

The COVID-19 pandemic significantly impacted CCWORK. Initially, the pandemic led us to suspend data collection between March and December 2020. Once

Table 3 CTP post-test survey details

Questionnaire section/number of questions	Topics
Demographics	
Demographics/22	CTP start and end dates; institution of deployment; age; transgender identity; province/territory of residence after deployment; *reasons for joining CSC; *current province/territory of residence; *prior PSP work experience; *biological sex; *gender identity; *educational attainment; *ethnicity; *religious affiliation; *language knowledge; *marital status; *children. The questions indicated with an asterisk are in the <i>CTP pretest survey</i> as well.
Personality and stress injuries	
Symptoms of mental health and mental injuries/2	Potential stressors tied to personality is assessed with 'made-in-house' multi-item matrix questions with four-point and five-point scales that ask participants to describe their personality and describe their feelings over the past 7 days.
Drug in prison	
Drug use in the institutions crystal meth/3	Concerns about methamphetamine in prison (eg, safety concerns and psychosis and withdrawal syndrome among prisoners) and policies/resources that can improve dealing with methamphetamine in prison are assessed with closed-ended questions, particularly multi-item matrix questions with five-point scales, and open questions ('made-in-house').
Drug use in the institutions – opioids / 7	Concerns about opioids in prison (eg, encountering opioids, safety concerns and withdrawal syndrome among prisoners), policies/resources that can improve dealing with opioid in prison, and application of naloxone are assessed with open and closed questions, particularly multi-item matrix questions, simple questions with five-point scales and dichotomous questions—all 'made-in-house'.
Needle Exchange Program/1	Perception of the <i>Needle Exchange Program</i> (eg, support, if it encourages drug use, fear of being pricked by a needle or stabbed with a needle) is assessed with a 'made-in-house' eight-item matrix question with a five-point scale.
Prison and sexuality	
Sexuality/transgender affairs/1	Feelings towards gender norms, including breaking of gender norms is assessed with a 'made-in-house' 32-item matrix question with a seven-point scale.
Organisational affairs	
Organisational commitment/1	Attitudes towards CTP, especially if participants are proud to take CTP, loyal to it, share the values advanced by CTP and inspired by CTP, is assessed with a 32-item matrix question with a seven-point scale. The items in this question were adapted from work previously published in the field of criminology. ^{57 58}
Culture/4	Views of correctional work and staff at CTP (eg, authority conferred to officers and supervisors), peer-relationship (eg, communication, respect and loyalty), and relationship officers and supervisors (eg, support, respect and fairness are assessed with matrix questions with five-point and seven-point scales, a dichotomous question and an open-ended question. The questions in this section were adapted from the <i>Staff Quality of Life (SQL)</i> survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University, ⁵⁹ as well as work previously published in the field of criminology. ⁶⁰
Correctional officer (CO) code/2	Physical fitness, cooperation with prisoners (eg, non-disciplinary contact with prisoners, compassion for prisoners, rights of prisoners, misconduct in prisons and control of prisoners), views on prisoners and their rehabilitation process (particularly who is responsible for it), as well as the challenges that COs face to fulfil their mandate (eg, being taken advantaged by prisoners) are assessed with matrix questions containing five-point scales. The questions in this section were adapted from various work previously published in the field of criminology. ^{61–64}
Humanising behaviours/2	Views of prisoners and their resocialisation process, as well contact with prisoners (eg, knowing their names and supporting them), are assessed with a 14-item and 8-item matrix question with a four-point and five-point scale, respectively. The questions in this section were adapted from the SQL survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University. ⁵⁹
Correctional training	
Occupational mental health training and education/7	Training participants may have received in mental health support in their correctional role, including during CTP. Training themes include Critical Incident Stress Management, Critical Incident Stress Debriefing, Mental Health First Aid, Peer Support, Road to Mental Readiness, Understanding and Responding to Inmates with Mental Health Disorders (CAMH/OCSC Training), Fundamentals of Mental Health and AM Strength, is assessed with 'made-in-house' open-ended and closed-ended questions (eg, dichotomous, checkbox and multiple-choice questions).
AM Strength/23	AM Strength, particularly if participants found it helpful; how much participants learnt; if participants would recommend it; skills that would be easy or difficult to implement; if participants are likely to use. Information is assessed with open-ended and closed-ended 'made-in-house' questions; closed-ended questions include dichotomous, multiple-choice and multi-item matrix questions with a five-point scale.
Burnout/1	Burnout during CTP, measured in a 16-item matrix question with a five-point scale. The items in this question were adapted from the burnout literature. ⁶⁵
COVID-19	

Continued

Table 3 Continued

Questionnaire section/number of questions	Topics
COVID-9 operational/4	Same questions in all surveys (table 2).
COVID-19 Stress Scale/3	Same questions in all surveys (table 2).
Other	
Ethics protocols/3	Same questions in all surveys (table 2).
Follow-up survey (odd year). CTP, correctional training programme.	

data collection resumed in January 2021, we revised all instruments in subprojects 1 and 2, adding questions about the impact of COVID-19 in correctional work and started to conduct interviews by telephone to comply with CSC's COVID-19 regulations. All research protocols were revised accordingly. Consent for all telephone-based interviews is audio-recorded. Some participants also contact the CCWORK project coordinator through the project email to obtain and return a signed copy of the consent form. The pandemic also affected CCWORK participants; 'pandemic fatigue'³⁵ has introduced delays to our timeline for all follow-up measures, as participants take more time to complete the surveys and book the interviews.

We further anticipated that the COVID-19 pandemic could impact our population's overall well-being. Accordingly, we have added specific COVID-19 impact scales to our data collection instruments help account for the COVID-19 effects in correctional work. Finally, we have divided the overall CCWORK timeline to acknowledge possible differences before, during and after the pandemic. CCWORK was not specifically designed or powered to assess COVID-19 longitudinal trajectories. Nevertheless, we will consider COVID-19 in our analyses.

Patient and public involvement

No patient or public involvement.

Limitations

CCWORK has several internal and external limiting factors. Internal factors include selection bias, attrition and the spontaneous nature of our initial research design. First, we only study COs working in Canada's federal prisons, which have higher compensation and better working conditions than their peers working for the provincial or territorial systems.⁵ Thus, subsequent use of our results for comparison purposes should factor in work conditions in their analysis. Second, much of our data are self-reported (ie, subprojects 1 and 2), which allows for participant bias. It is noteworthy that to protect participant confidentiality, we do not collect data from external parties, such as employer-generated human resource information (eg, sick leaves and missed workdays), which could help us assess and address participant bias. Third, we recognise the movement towards

incorporating physiological measures, including wearable devices, to studies of mental health among PSP. We consider this an avenue of possible study expansion, although such measures are beyond the scope of the current project, thus limiting the knowledge we can generate. Fourth, we anticipate attrition to become a significant limitation, particularly due to project adjustments made for COVID-19 (eg, moving to telephone interviews and not being able to have in-person interactions with participants).

Research data: management and analyses

Data management and tracking are central to longitudinal projects that involve numerous scholars, institutions and stakeholders. We manage CCWORK data collection and reporting with a comprehensive tracking system for researchers and participants. The system allows cross-sectional, cohort and longitudinal analyses. Each participant is a unique case, receiving a unique participant number (ie, participant ID), which the research team uses to track their participation across and within each subproject of CCWORK. Participant IDs are stored and retrievable only through the secure online platform Alfresco. All research materials deriving from subprojects 1 and 2 are transferred to the project coordinator via Alfresco (ie, never via email) to protect confidentiality. Alfresco is a web-based secure document management platform provided by Memorial University, used for digital files generated with CCWORK. The files include: participant information, research protocols and processed research data. CCWORK interviewers do not keep any research data on their personal computers after the data are transferred to the project coordinator.

Results for publications and reports are anonymised and cannot be linked to individual participants. We keep a case file for every participant, which contains print and digital documents including interview transcripts, recordings and notes. Case files also include a log describing CCWORK participation, such as completed surveys and interviews and participation stage (ie, data collection wave). Members of the CCWORK research team review participant case files annually for accuracy.

Table 4 Follow-Up survey odd year (waves 1, 3, 5...)

Questionnaire section/ number of questions	Topics
Demographics	
Demographics/14	Institution of deployment; current correctional work experience; province/territory of current residence; *province/territory of residence prior deployment; *year of birth; **prior PSP work experience; **biological sex; **gender identity; **children; **marital status. Questions indicated with an asterisk are in the pretest survey, while questions indicated with two asterisks are in both the <i>CTP pretest</i> and <i>CTP post-test surveys</i> .
Mental health injuries	
Mental and physical health symptoms/5	Symptoms that can be experienced as part of normal daily stressors, as well as potential indicators of a mental health injury, including exposure to infectious diseases and treatment, are assessed with open and closed questions. Closed questions comprise matrix questions with four-point and five-point scales and matrix questions with dichotomous answers. Two questions in this section are present in the <i>CTP post-test survey</i> (table 3), section 'Symptoms of Mental Health and Mental Injuries'.
Burnout/1	Same questions as in the <i>CTP post-test survey</i> (table 3).
Workplace concerns	
Workplace concerns/5	Fear to work in prison and confrontation with prisoners are assessed using open-ended and closed-ended dichotomous questions inspired by the literature previously published on the topic. ^{66 67}
Inappropriate behaviours/3	Blurred boundaries between officers and prisoners are assessed in multiple-item 'made-in-house' questions with dichotomous scales.
Work-related stressors/9	Workload, overtime, shift schedule and stress are measured with open and closed questions (information captured through dichotomous questions and matrix questions with five-point scales). Some of the questions in this section were adapted from the <i>Staff Quality of Life (SQL)</i> survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University. ⁵⁹
Victimisation/29	Victimisation of COs at duty by prisoners. ^{66 67} This topic includes open and closed questions (information captured through dichotomous questions and matrix questions with five-point scales).
Mental health knowledge	
Mental health knowledge/4	Knowledge of mental health and attitude towards mental health problems, including own problems and problems of coworkers. This topic comprises of simple and matrix questions with 5-point Likert scales. Two questions in this section are also available in the section 'Mental Health Knowledge' of the <i>pretest survey</i> .
Drug in prison	
Drug use in the institutions – crystal meth/3	Same questions as in the <i>CTP post-test survey</i> (table 3).
Drug use in the institutions – opioids/7	Same questions as in the <i>CTP post-test survey</i> (table 3).
Needle exchange programme/1	Same questions as in the <i>CTP post-test survey</i> (table 3).
Organisational affairs	
Organisational commitment/10	Views towards CSC (eg, compatibility with CSC values, pride to work at CSC and professional development expectations); role strain, daily tasks, relationship with management (eg, strains, clarity of responsibility, line of command and guidance and support from management); and disciplinary affairs (eg, authority to discipline prisoners, control of contraband and internal movement of inmates); career prospects; work environment (eg, noise, confinement, cleanliness and stay on guard at all times); impact of work environment on mental health; complaints against COs by prisoners and colleagues; and misconduct cases. This topic comprises of closed questions only. These topics are assessed with matrix questions with four-point and five-point scales, checkbox questions and simple questions (with nominal and ordinal scales). The scholarship led by Paoline, Lambert and Farkas inspired this section. ^{57 68–70} One question in this section is a variation of the question in the section 'Organisational Affairs', subtopic 'Organisational Commitment' of the <i>CTP post-test survey</i> (table 3).

Continued

Table 4 Continued

Questionnaire section/ number of questions	Topics
Culture/3	Same questions as in the CTP post-test survey (table 3) but with its context changed to reflect the institution of deployment instead of CTP.
Senior management/2	Management style, management support of employees and fairness and respect towards employees are assessed with matrix questions containing five-point scales. The questions in this section were adapted from the <i>Staff Quality of Life</i> (SQL) survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University. ⁵⁹
CO code/2	Cooperation with prisoners (eg, non-disciplinary contact with prisoners, compassion for prisoners, rights of prisoners, misconduct in prisons and control of prisoners), views on prisoners and their rehabilitation process (particularly who is responsible for it), as well as the challenges that COs face to fulfil their mandate (eg, being taken advantaged by prisoners). We capture the information with multi-item matrix questions containing five-point scales. The questions in this section were adapted from several works previously published in the field of criminology. ^{61–64} Also, some question-items in this section are the same as in the questions from the section 'Organisational Affairs / Correctional Officer Code' of the CTP post-test survey (table 3).
Humanising behaviours/2	Same questions as in the CTP post-test survey (table 3).
Correctional training	
Occupational mental health training and education/4	Same questions as in the CTP post-test survey (table 3).
AM strength/22	Same questions as in the CTP post-test survey (table 3).
COVID-19	
COVID-19 operational/4	Same questions in all surveys (table 2).
COVID-19 Stress Scale/3	Same questions in all surveys (table 2).
Other	
Ethics protocols/3	Same questions in all surveys (table 2).

CO, correctional officer; CTP, correctional training programme.

CCWORK data analyses involve several multifaceted processes, which led us to divide project members qualitative, quantitative and clinical committees according to their training, expertise and interest. The quantitative and clinical committees are responsible for overseeing analyses of data collected under the clinical psychology-related sections of the surveys in subproject 1, as well as the MINI results (subproject 3). The qualitative committee is responsible for processing and analysing data collected under subproject 2.

We will use IBM SPSS Version 27 to process, clean and code the data in subproject 1 and 3. Specifically analysing research question 1, researchers will use multivariate regressions and change scores or hierarchical linear models (HLMs) to determine how correctional work affects mental health, measured using a variety of indicators, overtime. For research question 2, empirically proven correlates of mental health will be used in multivariate models to isolate important effects of correlates on mental health outcomes. The vast number of correlates and controls in our data will provide for a robust analysis of mental health outcomes. Subproject 3 specifically addresses research question 3. To do so, multivariate regressions and HLM models will be used to determine changes in clinical assessment of mental health overtime.

Analysing data in subproject 2 requires first transcribing and then coding the data. The project coordinator manages all interview audio files, being responsible for transcribing the interviews verbatim, as well as anonymising the transcripts. Once the interviews are transcribed, the coding team analyse and classify each part of the interview transcript (ie, answer by answer) into a coding scheme that includes 50 primary codes (ie, nodes) and hundreds of subcodes organised under the following themes: (1) personal history and personal information; (2) education, employment and service history; (3) CTP; (4) occupational mindset (eg, CO perceptions of prison, correctional work and occupational aspirations); (5) occupational challenges, hazards and stressors; and (6) topics related to deployment after CTP. Our codes and themes derive from a semigrounded iterative coding process that uses QSR NVivo to tease out major themes emerging from the interviews. Within the coding process, researchers review previously coded material to ensure that all data are comprehensively coded in mutually exclusive and exhaustive groupings. The coding activity also includes comprehensive and detailed quality checking processes. Quality checking coded interviews supports capturing all emergent themes and helps to mitigate coding bias.^{36–39} Once the datasets and coding are ready, project members

Table 5 Follow-up survey even year (waves 2, 4, 6...)

Questionnaire section/ number of questions	Measure
Demographics	
Demographics/13	All surveys: children; past work experience as PSP. In CTP pretest and CTP post-test surveys: educational attainment; marital status; and household income. In CTP post-test survey and both follow-up surveys: institutional of deployment. In both follow-up surveys: province/territory of work after deployment; current correctional work experience; and institution of deployment.
Mental health disorders (screening)	
Event Exposure – PCL-5/12	Same questions as in the CTP pretest survey (table 2).
Depression – PHQ-9 and suicide assessment/20	Same questions as in the CTP pretest survey (table 2).
Panic Disorder Questions – PDSS/8	Same questions as in the CTP pretest survey (table 2).
Generalised anxiety disorder – GAD-7/2	Same questions as in the CTP pretest survey (table 2).
Anxiety disorders/16	Same questions as in the CTP pretest survey (table 2).
Alcohol use and smoking/9	Same questions as in the CTP pretest survey (table 2).
Cannabis use disorder/11	Same questions as in the CTP pretest survey (table 2).
SR1 and PNC/8	Same questions as in the CTP pretest survey (table 2).
Workplace concerns	
Work-related stressors/16	Workload, overtime, shift schedule and stress are measured with open and closed questions (information captured through dichotomous questions and matrix questions with five-point scales). Some of the questions in this section were adapted from the <i>Staff Quality of Life</i> survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University. ⁵⁹ Seven questions in this section are the same as in the follow-up survey odd year (table 4).
Prison and sexuality	
Sexuality and gender identity/3	Feelings towards gender norms, including breaking of gender norms, are assessed with a 32-item matrix question with a seven-point scale (same questions as in the CTP post-test survey, table 3), an open question and a simple question with a five-point scale—all 'made-in-house'.
Traumatic events at work	
Correctional events/3	Potentially traumatising events at work (eg, being victimised, witnessing violence, and having contact with body fluids) are assessed with multi-items matrix questions with five-point scale and an open-ended question, all 'made-in-house'.
Job satisfaction	
Job satisfaction/8	Satisfaction with compensation, fear on the job, complaints from inmates and coworkers, misconduct and overtime are assessed with multi-item matrix questions with four-point scale, simple multiple-choice questions (ratio scale) and an open-ended question, all 'made-in-house'.
Personality and stress injuries	
Symptoms of mental health and mental injuries/1	Same question as in the CTP pretest survey (table 3).
Support network	
Social support and family (SPS, DAS-4, Children Functioning)/7	Same question as in the CTP pretest survey (table 2).
Chronic pain	
Former PSP – other health conditions – Chronic Pain Questionnaire/6	Same question as in the CTP pretest survey (table 2).
COVID-19	
COVID-19 operational/4	Same questions in all surveys (table 2).
COVID-19 Stress Scale/3	Same questions in all surveys (table 2).
Other	
Ethics protocols/2	Same questions in all surveys (table 2).

All surveys in subproject 1 have an embedded consent form (table 1).

CTP, correctional training programme; DAS-4, Dyadic Adjustment Scale; PCL-5, PTSD Check List 5; PDSS, Panic Disorders Symptoms Severity Scale; PHQ-9, nine-item Patient Health Questionnaire; PSP, public safety personnel; SPS, Social Provisions Scale-10.

Table 6 Revised follow-up interview schedule since January 2021

Month	Province/institution of deployment
January	Nova Scotia
February	New Brunswick
March	Quebec/Alberta*
April	Ontario
May	Manitoba
June	Saskatchewan
September	Alberta*
October	British Columbia

Note: we have no official data collection programme in July, August, November and December because participants are usually not available due to summer holidays and other festivities.

*Many participants work in Alberta institutions, so we have dedicated 2 months for scheduling their follow-up interviews.

will be allowed to use the data to develop their own individual studies, which usually include advanced statistical analyses and important policy-based research questions.

ETHICS AND DISSEMINATION

CCWORK has received approval from the *Research Ethics Board of the Memorial University of Newfoundland* (File No. 20190481). Participation in CCWORK is voluntary and confidential but not anonymous. Correctional training programme (CTP) instructors and any liaison helping with data collection may know who is participating in CCWORK. However, Correctional Services Canada (CSC) cannot match or trace participants to the information provided to CCWORK. The CSC has no access to raw research data (eg, interview audio files, interview transcripts, survey responses and clinical assessments). We fully anonymise all qualitative data used in reports and articles and report only aggregated quantitative data in publications.

Confidentiality may be breached to access outside assistance if interview participants report imminent risk of harm to themselves or others. In such cases, interviewers are expected to confer with CCWORK mental health clinicians who are actively available when interviews are in progress. The CCWORK mental health clinicians then decide on a course of action on a case-by-case basis. To date, there has been no cause to breach confidentiality. There are also surveys with questions assessing self-harm and suicidal ideation. Such questions are followed by information advising participants in need of immediate help to contact Crisis Service Canada or 911 for the nearest emergency response agency. In addition, participants are provided with Crisis Service Canada's website.⁴⁰

CCWORK relies on an intensive collaborative process involving the CSC, Union of Canadian Correctional Officers (UCCO-SACC-CSN), Union of Safety and Justice

Employees (USJE) and numerous scholars, all central to our dissemination processes. Sharing the objective to improve the mental health and well-being of correctional staff, all parties became involved in developing the CCWORK's conceptualisation, securing funding and disseminating knowledge. CCWORK represents a central priority of the correctional leaders in the Public Safety Stakeholder Committee (PSSC) of the Canadian Institute of Public Safety Research and Treatment, and seems consistent with the National Framework on PTSD.⁴¹

To facilitate CCWORK, Memorial University of Newfoundland signed a memorandum of understanding with CSC on behalf of the research team. The Memorandum is governed by Service Exchange Agreements that are revised and reinstated each year pending available budget-related resources. They also list any changes in research protocols. For instance, the agreement signed in 2020 stipulated rules to collect data during the COVID-19 pandemic.

We disseminate and continue to disseminate our research findings through presentations, meetings and publications (eg, journal articles and reports). We present regularly to diverse persons at CSC, including the commissioner and diverse steer committees, to inform about our research findings, and we present regularly to the UCCO-SACC-CSN to ensure comprehensive extension of knowledge created to person who can immediately actualise our findings. CSC has also moved forward a *Micro Mission*, which involves a dedicated CSC employee creating relevant and effective knowledge mobilisation plans to take each article written and translate it into effect across the organisation. We also are part of a consortium with the Canadian Institute of Health Research and CIPSRT that ensures we present on findings nearly annually to interested parties. We create government reports annually as well as research articles that, once through the peer review process, contribute to knowledge in the academic community and for correctional services internationally. Our work, among CCWORK's expected scientific contributions, highlights a detailed view of the operational, organisational and environmental stressors impacting correctional officer (CO) mental health and well-being; and recommendations to prison administrators for improving CO well-being.

With CCWORK, including its objective, questions and design, we intend to help address the concerns the House of Commons Report¹⁹ raised about increasing occupational stress injuries (OSIs) among public safety personnel by clarifying the factors that underpin CO mental health, as well as to inform opportunities to improve CO working conditions. CCWORK results will inform future correctional officer training practices, correctional officer screening and recruitment processes, and proactive and therapeutic intervention targets, all in support of better lifetime mental health for COs. We expect CCWORK results will provide key insights that can be used to improve CO mental health and reduce the

impact of compromised mental health among COs, their families and their workplaces.

Overall, CCWORK was designed to evaluate the impact of correctional work and environment on the well-being and health of COs working in Canadian federal prisons longitudinally, particularly on their high rates of OSI. Understanding such an impact can help CSC to identify and address the causes and determinates of OSI among COs, including programmes for proactive training and early interventions, all of which should help to improve prisons as workplaces. Evidence-based knowledge on correctional work-related stressors and issues can also help CSC to improve training of correctional officer recruits and job satisfaction, leading to the retention of COs. Ultimately, benefits for COs potentiate benefits for prisoners because the daily interactions, rapport and relationships of prisoners and COs are mutually influential and impact the likelihood of successful desistance from crime and community reintegration after release. CCWORK results can also potentially benefit prison administrations beyond the jurisdiction of CSC and Canada. The results from CCWORK will be disseminated presentations, meetings and publications (eg, journal articles and reports).

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