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CCWORK Protocol: A Longitudinal Study of Canadian Correctional Workers' Well-being, Organizations, Roles and Knowledge

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ABSTRACT

Introduction: The prevalence of mental disorders among Correctional Officers (COs) led Canada's House of Commons to acknowledge Occupational Stress Injuries (OSI) as a normal risk for Public Safety Personnel (PSP), reinforcing the demands for additional research and support. However, knowledge about the factors that contribute to 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 paper, we share the approach we are using for the Canadian Correctional Workers' Well-being, Organizations, Roles and Knowledge study (i.e., 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 multi-year longitudinal cohort design (2018-2023, with a five-year renewal) to study 500 COs working in 43 Canadian federal prisons. We use quantitative and qualitative data collection instruments (i.e., 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 administrate when participants are still recruits in CTP. 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 responses are kept confidential. We will disseminate our research findings through presentations,

meetings, and publications (e.g., journal articles, 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:

- The most comprehensive mix-method longitudinal, multi-cohort research with correctional officers in Canada, including detailed/in-depth qualitative and quantitative data collection instruments.
- Assess the impact of the COVID-19 pandemic on the well-being of correctional officers in Canada.
- Data collection processes limited due to COVID-19 restrictions.
- Based on self-reported data and thus subjected to participant bias.
- Eligibility criteria include only participants (i.e., correctional officers) working in Canada's federal prison system.

Keywords: correctional officer; well-being; training; prison; organizations; stressors; Public Safety Personnel (PSP); mental health disorder; Posttraumatic Stress Disorder (PTSD); Occupations; Occupational Stress Injuries (OSIs); Posttraumatic Stress Injuries (PTSI); Depression; Anxiety Disorder; Panic Disorder; longitudinal; cohort.

INTRODUCTION

Researchers, stakeholders, organizations, and policy makers have increasingly focused public and scholarly attention on work-related Posttraumatic Stress Injuries (PTSIs), including but not limited to Posttraumatic Stress Disorder (PTSD), particularly among Public Safety Personnel (PSP), including police, firefighters, paramedics) and Armed Forces personnel[1].However, specific knowledge about mental health disorders among correctional officers (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]. Given their importance in society, Canadian COs are recognized as "first responders" who respond to emergency situations among prisoners, provide life-saving interventions, and respond to fires and are responsible for a wide range of other calls for service[5].

COs incur a considerable loss of time on leave from work because of mental health disorders[3 6 7]. Rates of mental disorders among COs are higher than in the general population[6 8-10]. In Canada, Carleton and colleagues[10] found that 54.6 percent of federal correctional workers, including COs, reported symptoms of a mental disorder, with 31.1 percent screening positive for major depressive disorder (MDD) and another 29.1 percent screening positive PTSD. A more recent study specifically focused on COs working in the Ontario (provincial) correctional system evidenced participants were likely to experience exposure to Potentially Psychologically Traumatic Events (PPTE), sometimes called "critical incidents"[11], with 26.6 percent reporting lifetime suicidal ideation[9].

Despite alarming rates of mental health issues and disorders among COs, researchers in Canada and internationally 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 select mental disorders[12 13]. 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[14-16]. Bourbonnais and colleagues[17] found correctional work in Quebec, Canada was characterized 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[18]. The report underscored that, among other PSP, COs deal with increased risk of suffering Occupational Stress Injuries (OSI) as a function of their vocation[18]. OSI is a term first coined by the Canadian Armed Forces' peer support program with the intent to destigmatize and legitimize mental health conditions resulting from one's work[19]. The term refers to a broad array of clinically significant symptoms that can occur following exposure to one or more PPTEs at work. OSI symptoms are associated with symptoms that are found in diagnoses of, among others, PTSD, Acute Stress Disorder (ASD), MDD, Panic Disorder, Generalized 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.

Recognizing the need for additional research on OSIs among COs, we, in 2017, conceptualized a research project on the well-being of Canadian COs that elucidates how job experiences relate to OSIs–the *Canadian Correctional Workers' Well-being, Organizations, Roles and Knowledge* study (henceforth "CCWORK"). CCWORK relies on an intensive collaborative process involving the Correctional Services of Canada (CSC), Union of Canadian Correctional Officers (UCCO-SACC-CSN), Union of Safety and Justice Employees (USJE), and numerous scholars. From more than a dozen universities in Canada, France, Germany, the UK, and the US, these academics specialize in criminology, legal studies, sociology, psychology, psychiatry, epidemiology, engineering, nursing, and geography, providing CCWORK a solid interdisciplinary disposition in the understanding of the CO well-being. CSC facilitates participant recruitment, provides key information on occupational dynamics, and offers valuable insights and feedback regarding correctional environments. Sharing the objective to improve the mental health and well-being of correctional staff, all parties became involved in developing the project's conceptualization and securing funding. 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 [20].

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.

THE PROJECT: STUDY POPULATION AND RESEARCH OBJECTIVES

CCWORK is a multi-year (2018-2023, with possibility to renew), multi-cohort, longitudinal study that uses mixed methods to gather quantitative and qualitative data from COs. Conducted in both Canada's official languages, French and English, data collection starts when COs begin as recruits in the Correctional Training Program (CTP), and continues every year thereafter. Canadian COs can work in the federal or provincial/territorial system[2]. Federal COs oversee prisoners sentenced to two or more years in custody, whereas provincial/territorial COs are responsible for prisoners remanded into custody, awaiting trial, or sentenced to a maximum of two years less one day[2 21]. CCWORK focuses on COs working in the federal correctional system managed by CSC. COs working with CSC have the mandate to provide care, custody, and control of prisoners, while also protecting the health and safety of staff, prisoners, the institution, civilians, and society more broadly[22].

To become a federal correctional officer recruit (COR), applicants must successfully complete their recruitment and training program, and then be offered and accept a position at one of the 43 prisons operated by CSC across five Canadian regions (i.e., Ontario, Quebec, Atlantic, Pacific, Prairie). The training program comprises three sequential stages that form the CTP. *Stage I* is a comprehensive online training course made up of multiple modules. *Stage II* is a series of online assignments based on information learned in Stage I. *Stage III* is an in-person intensive 14-week corrections-specific training program delivered at the National Training Academy in Kingston (Ontario) or a satellite site (e.g., 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].

CCWORK begins recruitment efforts when potential participants start Stage III of CTP and organizing them per class. In the final year of the project, we expect CCWORK to include approximately 500 interview participants and 2000 survey participants.

With the objective of better understand how the prison work shapes CO well-being over time, CCWORK focuses on identifying and analyzing the factors associated with the CO vulnerability (i.e., risk factors) to and resilience against (i.e., protective factors) OSIs. To achieve its objective, CCWORK relies on the following three research questions:

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

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, including *operational stressors* (e.g., job content, such as responding to prisoner suicide attempts), *organizational stressors* (e.g., job context, such as supervisory arrangement, work hours), and *environmental stressors* (e.g., context of the carceral institution)[4 25-28]. Also, as CCWORK aims to capture how correctional work transforms the mental health of COs over time,

it employs a longitudinal research design. The longitudinal design enables us to capture changes in both CO perceptions and experiences, as well as organizational, environmental, and societal changes relevant to CO work dynamics and mental well-being. For instance, CCWORK's longitudinal design gave 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 of 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. Despite being less frequent due to logistical and resourcing challenges, longitudinal designs offer opportunities for researchers to bolster the reliability and validity of research findings.

With CCWORK, including its objective, questions, and design, we intend to help address the concerns the House of Commons Report[18] raised about increasing OSIs among PSP 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.

The following article sections detail the CCWORK methods, procedures, and practices, as well as describing how the COVID-19 pandemic has impacted our data collection. By publishing our research protocol, we hope to advance all efforts to support CO mental health.

METHODS AND ANALYSIS

In the current section, we focus on the three subprojects that constitute the CCWORK, outlining the processes used to collect and analyze research data. Before delving into the processes, we explain the watershed influence of the COVID-19 pandemic on CCWORK.

As was the case for most projects that involve human participants, CCWORK had to be partially suspended between March and December 2020 due to COVID-19 restrictions. We stopped participant recruitment and data collection activities for approximately nine months, using this time to iteratively improve our recruitment and data collection processes. From the beginning of CCWORK (in August 2018) to the "COVID-19 suspension", project recruitment and data collection, processes that we describe in the current article operated somewhat independent of each other, despite engaging the same population. Rather than interconnected data collection among the subprojects forming CCWORK, we had three longitudinal research processes that collected overlapping but distinctive data from the same study population (i.e., CORs and COs). The challenge was that the subprojects did not necessarily share the same samples, despite much overlap, and participants could easily miss providing a data point. Thus, with the COVID-19 suspension, we centralized the project coordination and created shared protocols around recruitment and data collection. CCWORK is now organized into three integrated and simultaneous participant-centred subprojects. Each subproject has a unique objective and set of data collection instruments.

Subproject 1, using survey data, and subproject 2, employing qualitative interviews, provide a multi-thematic characterization of the study population from both a numerical and a lived experience perspective. The themes explored in subprojects 1 and 2 include demographic (including lifestyle), occupational, and psychological characterizations of COs at recruitment and at work. The occupational characterization includes experiences and exposure to stressors on the

job, whereas the psychological characterization addresses psychological state, social views, clinical screenings, and experiences of mental health challenges. Occupational and psychological characterizations provide data on how participants cope with diverse stressors. Subprojects 1 and 2 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 polices, 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* (M.I.N.I.) 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 tenth 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 (e.g., 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.

Table 1: Schedule of administration of study measures (2018-2023)

Subprojects	Study Activity	Study timepoint						
		Stages I thru II of CTP (enrollment)	Stage III of CTP	12th* month (wave 1)	24th month (wave 2)	36th month (wave 3)	48th month (wave 4)	60th month (wave 5)
Subproject 1	CTP Pretest Survey	X						
	CTP Post-test Survey		X					
	Follow-up survey odd year			X		X		X
	Follow-up survey even year				X		X	
Subproject 2	Baseline interview		X					
	Follow-up interview			X	X	X	X	X
Subproject 3	M.I.N.I			X	X	X	X	X
All subprojects	Informed consent	X	X	X	X	X	X	X

*Counting from month when the specific cohort completed Stage III of CTP.
Note: As enrollment is continuous (i.e., new cohorts enter the project whenever there is a CTP class) and the project is scheduled to last five years, not all participants will complete all waves of data collection.

CSC plays a crucial role in the CCWORK project by facilitating avenues for participant recruitment and granting access to the training facilities and prisons. When we started the CCWORK 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 (NTA) 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.

Participation in CCWORK is voluntary and confidential, but not anonymous. CTP instructors and any liaison helping with data collection may know who is participating in CCWORK. However, CSC cannot match or trace participants to the information provided to CCWORK; it has no access to raw research data (e.g., interview audio files, interview transcripts, survey responses, clinical assessments). We fully anonymize all qualitative data used in reports and articles, and report only aggregated quantitative data in publications. The following subsections describe the subprojects, including their instruments and protocols, and provide more information on our data collection and recruitment practices.

Patient and Public Involvement

No patient involved.

Subproject 1

In subproject 1, research participants complete self-reported online surveys with open-ended and closed questions. Subproject 1 comprises four distinctive survey instruments; two

completed at baseline and two complete as follow-up. The first baseline survey (i.e., *CTP pretest survey*) is administrated during Stages I and II of CTP. The second baseline survey (i.e., *CTP post-test survey*) was added to the project in 2019 and is administrated after Stage III of CTP is complete but before graduation. Comprising two distinctive instruments applied alternately each year, the follow-up surveys are administrated annually after the *CTP post-test survey*. We refer to these instruments as "follow-up survey odd year" and "follow-up survey even year" based on the order of presentation, each of which corresponds with the wave of data collection measured in years (e.g., *baseline*, *follow-up survey even year* [wave 1], *follow-up survey odd year* [wave 2], *follow-up survey even year [wave 3]*). Most questions posed in the surveys have well-established metrics in the field of clinical psychology, sociology, criminology, and organizational studies, as indicated in the tables detailing our metrics, while others were developed by the research team.

The *CTP pretest survey* is the first data collection point for CCWORK. When CORs are completing Stages I and II of CTP (i.e., training components completed remotely through the internet), 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 (i.e., the platform that we use to administrate and store our surveys), allowing researchers to connect all surveys participants complete within CCWORK. Participants use the unique access code to log into the system and complete the survey.

The *CTP post-test survey* is administrated by CTP instructors in class during the last week of training at the academy (Stage III of CTP). Like the *CTP pretest survey*, the *CPT post-test survey* is delivered through the internet using Qualtrics. CTP academy instructors have no contact

with the data information collected but allocate time for the recruits participating in CCWORK to complete the survey online. The *follow-up surveys* are also presented via Qualtrics after emailing participants a link. All surveys in subproject 1 have an embedded consent form (Table 1). The average survey completion time is 55 minutes. However, completion times have ranged up to several days because participants can complete the surveys at their convenience by saving their answers to submit later. Most study participants complete all sections and questions within the surveys.

CTP Pretest Survey

The *CTP pretest survey* contains 164 questions that assess the following for COs: demographics; correctional work preparedness; mental health disorders (using established 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.

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.
CO Preparedness	
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 two years.
Workplace Concerns	
Fear of Correctional Work / 4	
Mental Health Disorders (Screening)	
Event Exposure - PCL-5 / 13	Posttraumatic Stress Disorder (PTSD) is assessed using the *PTSD Check List 5* (PCL-5)[29], which is a commonly used self-report tool that assesses 20 symptoms of PTSD as outlined in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorder (DSM-5)*[30]. Respondents are asked to rate how bothered they have been by each of 20 items in the past month on a 5point 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.
Depression - PHQ-9 and Suicide Assessment / 21	Major Depressive Disorder (MDD) symptoms are assessed using the *Patient Health Questionnaire 9-item* (PHQ-9)[31]. The PHQ-9 is a 9-item questionnaire that asks individuals to rate how often symptoms of MDD have bothered them in the past two weeks on a 3-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 categorized 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.
Panic Disorder Questions – PDSS-SR / 10	Panic Disorder (PD) using the *Panic Disorders Symptoms Severity Scale – Self-Report* (PDSS-SR), a 7-item questionnaire that asks individuals to rate their symptoms on a 5-point scale (0=Never; 1=Occasionally; 2=Half of the time; 3=Most of the time, and 4=All of the time)[32]. 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.
Generalized Anxiety Disorder – GAD-7 / 1	Generalized Anxiety Disorder (GAD) symptoms are assessed with *General Anxiety Disorder 7-Item Scale* (GAD-7)[33]. The GAD-7 is a 7-item questionnaire that asks individuals to rate how often symptoms of GAD have bothered them in the past two weeks on a 3-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.

History of anxiety and mood disorders / 17	History of anxiety and mood disorders is assessed through a combination of open- 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 5 questions about anxiety, 5 questions about specific mood disorders (i.e., major depressive disorder, bipolar disorder, and cyclothymic), 5 questions about any mental health disorder that is not an anxiety or mood disorder, and 2 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).
Alcohol use and smoking / 10	Risky (hazardous) alcohol use is assessed with the *Alcohol Use Disorders Identification Test* (AUDIT)[34]. The AUDIT items area 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 *Cannabis Use Disorder Identification Test - Revised* (CUDIT-R)[35] is a brief, 8-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 4-point scale (0 to 4) that measures cannabis use frequency. CUDIT-R's diagnostic criteria is aligned with the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorder* (DSM-5)[30], 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.
SRI 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. Open- and closed-ended, these "made-in-house" questions explore types of help/resources received (e.g., hospitalization, psychiatrist, family doctor or general practitioner, psychologist, nurse, social worker, counsellor, or psychotherapist, family member, friend, co-worker, supervisor, or boss), frequency with which participants accessed those help resources, reason for stopping accessing them, and their effectiveness.
BRS / 1	Resilience (i.e., the ability to bounce back or recover from stressors) is assessed with the *Brief Resilience Scale* (BRS)[36]. The BRS is a 6-item questionnaire where individuals are asked to decide how much they agree or disagree with each item using a 5-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.
Mental Health Knowledge	
CRF-MHSUQ / 6	*CAF Recruit Mental Health Service Use Questionnaire* (CAF-R-MHSUQ)[37], which assesses knowledge of mental health, particularly instrumental attitudes (i.e., whether mental health service is a good or a bad thing) and affective attitudes (i.e., how mental health service will feel); subjective norms; perceived self-efficacy (i.e., expectations around how easy or difficult mental health services would be and confidence that one can overcome difficulties) and perceived control (i.e., perceived control over the performance of the behavior); 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 (R2MR), and Understanding and Responding to Inmates with Mental Health Disorders [CAMH/OCSC Training], and whether the training received was helpful for improving their mental health and the mental health of their team, reducing stigma, preventing 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 *Emotional Regulation Questionnaire* (ERQ)[38], 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 *Social Provisions Scale-10* (SPS)[39], which is a 10-item short form; higher scores can be interpreted as having higher levels of social support. Marital satisfaction is assessed with the *Dyadic Adjustment Scale* (DAS-4)[40], 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 7-point scale ranging from 0 (extremely happy) to 6 (perfect); higher the score, greater the satisfaction/adjustment, conversely lower scores represent less adjustment.
Chronic Pain	
Former PSP - Other Health Conditions - Chronic Pain Questionnaire / 6	Chronic pain frequency and severity (i.e., intensity and duration) at different bodily locations with the *Chronic Pain Grade Questionnaire* (CPGQ) 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 six months[41]. Items are scored on an 11-point Likert scale, with responses ranging from 0–10. Scores are interpreted according to three subscales (characteristic pain intensity, disability score, and the disability points score), which classify subjects into 1 of the 5 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.
Risk Factors	
Risk Factors / 4	Victimization, using the *Childhood Experiences of Violence Questionnaire (CEVQ),* which is an 18-item self-report measure of victimization 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[42]. Higher the score, greater victimization, conversely lower scores represent less victimization.
COVID-19	

COVID-Operational / 4	COVID-19 impact on job routine, work responsibilities, occupational risks, drug in prison, access to PPE, and family members (e.g., transmissibility to family members). This topic includes "made-in-house" matrix questions with 5-point Likert scales and open questions.
COVID-Stress Scale / 3	COVID-19-related concerns involving getting infected, keeping family safe, challenges faced by the health care system to deliver services, hygiene habits, commuting/travelling issues, logistics and supply issues (e.g., 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 (e.g., consent) and research feedback.

CTP Post-test Survey

The *CTP post-test survey* contains 92 questions that assess the following for COs: demographics; personality and stressors; emotional regulation; impacts of contraband in prison; prison and sexuality; organizational affairs, including organizational commitment, culture, and the correctional officer code; correctional training; and, a recent addition, COVID-19 related-questions. For more details, see Table 3.

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 *CTP pretest survey* 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 4 and 5-point scales that asks participants to describe their personality and describe their feelings over the past seven days.
Drug in Prison	
Drug Use in the Institutions - Crystal Meth / 3	Concerns about methamphetamine in prison (e.g., 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 5-point scales, and open questions ("made-in-house").
Drug Use in the Institutions – Opioids / 7	Concerns about opioids in prison (e.g., 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 5-point scales, and dichotomous questions—all "made-in-house."
Needle Exchange Program / 1	Perception of the *Needle Exchange Program* (e.g., 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" 8-item matrix question with a 5-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 7-point scale.
Organizational Affairs	
Organizational 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 7-point scale. The items in this question were adapted from work previously published in the field of criminology[43 44].
Culture / 4	Views of correctional work and staff at CTP (e.g., authority conferred to officers and supervisors), peer-relationship (e.g., communication, respect, and loyalty), and relationship officers and supervisors (e.g., support, respect, fairness are assessed with matrix questions with 5 and 7-point scales, a dichotomous question, and an open-ended question. The questions in this section were adapted from the *Staff Quality of Life* (SQL) survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University[45], as well as work previously published in the field of criminology[46].

Correctional Officer Code / 2	Physical fitness, cooperation with prisoners (e.g., 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 fulfill their mandate (e.g., being taken advantaged by prisoners) are assessed with matrix questions containing 5-point scales. The questions in this section were adapted from various work previously published in the field of criminology[47-50].
Humanizing Behaviors / 2	Views of prisoners and their resocialization process, as well contact with prisoners (e.g., knowing their names and supporting them), are assessed with a 14- and 8-item matrix question with a 4- and 5-point scale, respectively. The questions in this section were adapted from the *Staff Quality of Life* (SQL) survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University[45].
Correctional Training	
Occupational Mental Health Training and Education / 7	Training that 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 (R2MR), 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 (e.g., dichotomous, checkbox, and multiple-choice questions).
AM Strength / 23	AM Strength, particularly if participants found it helpful; how much participants learned; 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 5-point scale.
Burnout / 1	Burnout during CTP, measured in a 16-item matrix question with a 5-point scale. The items in this question were adapted from the burnout literature[51].
COVID-19	
COVID-Operational / 4	Same questions in all surveys (Table 2).
COVID-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)

The *follow-up odd year* survey contains 138 questions that assess the following for COs: demographics; mental health injuries; workplace concerns; inappropriate behaviours at work; work-related stress; victimization at work; mental health knowledge; CTP Mental Health Training; contraband in prison; organizational commitment; work relationships; culture at work; Correctional Officer Code; humanizing behaviours; burnout; and, also a recent addition, COVID-19 related questions. For more details, see Table 4.

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 *CTP pretest* and *CTP post-test surveys*.
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 4 and 5-point scales and matrix questions with dichotomous answers. Two questions in this section are present in the *CTP post-test survey* (Table 3), section "Symptoms of Mental Health and Mental Injuries."
Burnout / 1	Same questions as in the *CTP post-test survey* (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[52 53].
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 5-point scales). Some of the questions in this section were adapted from the *Staff Quality of Life* (SQL) survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University[45].
Victimization / 29	Victimization of COs at duty by prisoners[52 53]. This topic includes open and closed questions (information captured through dichotomous questions and matrix questions with 5-point scales).
Mental Health Knowledge	
Mental Health Knowledge / 4	Knowledge of mental health and attitude toward 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 *pretest survey.*
Drug in Prison	
Drug Use in the Institutions - Crystal Meth / 3	Same questions as in the *CTP post-test survey* (Table 3).
Drug Use in the Institutions – Opioids / 7	Same questions as in the *CTP post-test survey* (Table 3).
Needle Exchange Program / 1	Same questions as in the *CTP post-test survey* (Table 3).
Organizational Affairs	
Organizational Commitment / 10	Views toward CSC (e.g., compatibility with CSC values, pride to work at CSC, and professional development expectations); role strain, daily tasks, relationship with management (e.g., strains, clarity of responsibility, line of command, and guidance and support from management); and disciplinary affairs (e.g.,

	authority to discipline prisoners, control of contraband, and internal movement of inmates); career prospects; work environment (e.g., 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 4 and 5-point scales, checkbox questions, and simple questions (with nominal and ordinal scales). The scholarship led by Paoline, Lambert, and Farkas inspired this section[43 54-56]. One question in this section is a variation of the question in the section "Organizational Affairs," sub-topic "Organizational Commitment" of the *CTP post-test survey* (Table 3).
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 5-point scales. The questions in this section were adapted from the *Staff Quality of Life* (SQL) survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University[45].
Correctional Officer Code / 2	Cooperation with prisoners (e.g., 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 fulfill their mandate (e.g., being taken advantaged by prisoners). We capture the information with multi-item matrix questions containing 5-point scales. The questions in this section were adapted from several works previously published in the field of criminology[47-50]. Also, some question-items in this section are the same as in the questions from the section "Organizational Affairs / Correctional Officer Code" of the *CTP post-test survey* (Table 3).
Humanizing Behaviors / 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-Operational / 4	Same questions in all surveys (Table 2).
COVID-Stress Scale / 3	Same questions in all surveys (Table 2).
Other	
Ethics Protocols / 3	Same questions in all surveys (Table 2).

Follow-up Survey (even year)

The *follow-up even year* survey has 152 questions that assess 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.

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; 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; 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).
Generalized 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).
SRI 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 5-point scales). Some of the questions in this section were adapted from the *Staff Quality of Life* (SQL) survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University[45]. 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 7-point scale (same questions as in the *CTP post-test survey*, Table 3), an open question, and a simple question with a 5-point scale—all "made-in-house."
Traumatic Events at Work	
Correctional Events / 3	Potentially traumatizing events at work (e.g., being victimized, witnessing violence, and having contact with body fluids) are assessed with multi-items matrix questions with 5-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 4-point scale, simple multiple-choice questions (ratio scale), and an open-ended question, all "made-in-house."
Personality and Stress	

Symptoms of Mental Health and Mental Injuries / 1	Same question as in the *CTP pretest survey* (Table 2).
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-Operational / 4	Same questions in all surveys (Table 2).
COVID-Stress Scale / 3	Same questions in all surveys (Table 2).
Other	
Ethics Protocols / 2	Same questions in all surveys (Table 2).

Subproject 2

Subproject 2 involves interviewing participants starting Phase III of CTP at their academy (i.e., *baseline interview*), and annually thereafter (i.e., *follow-up interview*) (Table 1). We use a semi-structured interview guide to ask participants about their expectations, experiences, and perceptions of correctional work to contextualize their training, work life, and well-being. The semi-structured 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 (e.g., 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 differs slightly from the *baseline interview* guide. In *follow-up interviews*, we 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 military and correctional experiences. Participant perceptions of the COVID-19 pandemic's impact on CO well-being have been included in the interview guide since August 2020.

Interviews usually last between 45 and 120 minutes. 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, Co-Investigators, 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 happened in person at a CSC training facility until the COVID-19 suspension in March 2020. To conduct *baseline interviews*, the CCWORK Principal Investigator visited the training facilities to meet the recruits in person, discuss the project, and invite them to participate in the project. The visits were organized by the Principal Investigator and the training academy leaders. Lasting about 30 minutes, each visit included a 10-minute description of the study, and an approximately 20-minute Q&A session for recruits to raised questions or concerns; those willing to participate signed the consent form and were contacted by an interviewer afterwards. 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. The visits were intended to develop trust between the participants and CCWORK, to improve the quality of data collected, and to reduce attrition.

While *baseline interviews* were conducted during the Principal Investigator's visit to the training facilities, *follow-up interviews* were organized by the Research Coordinator, who grouped participants based on CCWORK enrollment dates. The *follow-up interviews* occurred annually in February, June, and October, depending on whether the participant was first interviewed (i.e., *baseline*) in December through March, April through July, and August through November, respectively. However, this scheduling required the research team to visit the same prison more than once a year, which created unnecessary travelling costs and enlarging the CCWORK footprint within the organization. The CCWORK team were also worried about participant research fatigue across levels of measurements. With the COVID-19 suspension, we revised our *follow-up* procedures to optimize resources and reduce the organizational burden of CCWORK on CSC.

Since resuming data collection in 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 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

*Many participants work in Alberta institutions, so we have dedicated two months for scheduling their follow-up interviews.
Note: We have no official data collection program in July, August, November, and December because participants are usually not available due to summer holidays and other festivities.

Since we resumed data collection in January 2021, we have been conducting all interviews in subproject 2 (*baseline* and *follow-up*) by telephone to comply with COVID-19 regulations. Audio recorded verbal consent is used for the telephone-based interviews. Some participants also contact the Project Coordinator through the project email to obtain and return a signed copy of the consent form.

Subproject 3

Subproject 3 involves administering the empirically validated M.I.N.I. survey to participants[57 58]. The M.I.N.I. is a psychological assessment used to screen CCWORK participants at employment entry (i.e., M.I.N.I. *baseline*) and yearly during employment tenure (i.e., M.I.N.I. *follow-up*). The M.I.N.I. was designed as a brief structured diagnostic interview for many

psychiatric disorders in DSM-III-R, DSM-IV and DSM-5[59] and ICD-10[57 58 60]. The M.I.N.I. has similar reliability and validity properties to both the SCID-P for DSM-III-R and the CIDI (i.e., a structured interview developed by the World Health Organization), but the M.I.N.I. can be administered in a shorter time (mean 18.7 ± 11.6 minutes, median 15 minutes). The M.I.N.I. has demonstrated inter-rater reliability exceeding 75%[57 58]. Results from the M.I.N.I. are usually associated with high inter-rater reliabilities[61 62]. The M.I.N.I. 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 M.I.N.I. are placed into a summary document.

Trained graduate or post-doctoral level Research Assistants conduct the clinical M.I.N.I. interviews under the supervision of the clinical CCWORK team. Clinical interviews are not voice recorded to protect participant rights to medical privacy. Interviewers type participant responses in digital form along with clinical field notes directly into an encrypted computer. If responses indicate the need for additional mental health assessment or support, the participant is referred to mental health resources. The CCWORK research team does not disclose individual M.I.N.I. results to anyone other than the participant, unless legally required to comply with ethical and legal regulations (e.g., an imminent risk of harm to self or others). Before integrating the three CCWORK subprojects data collection process, a clinical Co-Investigator coordinated the M.I.N.I. interviews (*baseline* and *follow-up*), which are conducted at a CTP academy through a process paralleling subproject 2. However, with the data collection integration, we started conducting the interviews in subproject 2 and the M.I.N.I. interview in a consecutive manner. The *baseline* and *follow-up interviews* were followed by the M.I.N.I.; as such, we used the same form to obtain participant consent. The research team members who conducted the *baseline* and *follow-up interviews* were different from the research team members who conducted the M.I.N.I. Since

resuming the collection in January 2021, the M.I.N.I. interviews have been conducted by telephone. All research materials deriving from subprojects 1 and 2 are transferred to the Project Coordinator via Alfresco (i.e., never via email) to protect confidentiality. Alfresco is a web-based secure document management platform used for digital files generated with CCWORK. The files include participant information, research protocols, and processed research data. Interviewers are instructed to keep no research data on their personal computers after the data is transferred to the Project Coordinator.

RESEARCH DATA: MANAGEMENT AND ANALYSIS

Data management and tracking are central to longitudinal projects that involve numerous scholars, institutions, and stakeholders. CCWORK data collection and reporting is managed 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 (i.e., 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. Results for publications and reports are anonymized 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 (i.e., data collection wave). Participant case files are reviewed annually by the research team for accuracy. The case files will be retained by the research team for five years after CCWORK to comply with the ethics protocols approved by the Research Ethics Board of the Memorial University of Newfoundland (File No. 20190481).

CCWORK data analyses involve several multifaceted processes, which led us to divide project members into three committees, namely qualitative, quantitative, and clinical, 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 M.I.N.I. results (subproject 3). The qualitative committee is responsible for processing and analyzing data collected under subproject 2.

We use IBM SPSS to process, clean, and code the data in subproject 1 and 3. Once the dataset is ready, project members focused on subprojects 1 and 3 use the data to develop their own individual projects, which usually include advanced statistical analyses. Analysing data in subproject 2 requires first transcribing and than coding the data. The Project Coordinator manages all interview audio files, being responsible for transcribing the interviews verbatim, as well as anonymizing the transcripts. Once the interviews are transcribed, the coding team analyze and classify each part of the interview transcript (i.e., answer by answer) into a coding scheme that includes 50 primary codes (i.e., nodes) and hundreds of sub-codes organized under the following themes: 1) personal history and personal information; 2) education, employment, and service history; 3) CTP; 4) occupational mindset (e.g., 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 semi-grounded 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 is 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[63-66].

When we account for the COVID-19 suspension, CCWORK is into is twenty-second month of data collection (as of May 2021). In this period, CCWORK has conducted 209 *CTP pretest surveys*, 47 *CTP post-test surveys*, and 28 *CTP follow-up surveys*, all under subproject 1 (Table 7). It is noteworthy that wave 1 results from participants who entered the project in 2019/2020 will be reported in 2021/2022 because of COVID-19 restrictions and delays.

Table 7: Subproject 1: Data Collection Status

Project Year (Fiscal Year)	Number of participants
2018/2019	
CTP pretest	67
CTP post-test	NA (introduced in fiscal year 2019/2020)
2019/2020	
CTP pretest	61
CTP post-test	36
Follow-up Survey (wave1)	22
2020/2021	
CTP pretest	81
CTP post-test	11
Follow-up Survey (wave 1)	delayed due to COVID-19
Follow-up Survey (wave 2)	6

Under subproject 2, we conducted 383 *baseline* and 76 *follow-up interviews* (Table 8).

Table 8: Subproject 2: Data Collection Status

Project Year (Fiscal Year)	Number of participants
2018/2019	
Baseline interviews	126
2019/2020	
Baseline interviews	228
Follow-up Survey (wave1)	58
2020/2021	
Baseline interviews	29
Follow-up Survey (wave 1)	6 (delayed due to COVID-19)
Follow-up Survey (wave 2)	12

Within the scope of subproject 3, which uses the M.I.N.I to clinically diagnose the participants' mental health, we conducted 171 *baseline* and 29 *follow-up* assessments (Table 9).

Table 9: Subproject 3: Data Collection Status

Project Year (Fiscal Year)	Number of participants
2018/2019	
M.I.N.I baseline	95
2019/2020	
M.I.N.I baseline	47
M.I.N.I follow-up (wave 1)	14
2020/2021	
M.I.N.I baseline	29
M.I.N.I follow-up (wave 1)	15
M.I.N.I follow-up (wave 2)	delayed due to COVID-19

* Wave 1 results from participants who entered the project in 2019/2020 will be reported in 2021/2022 because of COVID-19 restrictions and delays.

The COVID-19 pandemic has delayed CCWORK data collection remarkably. Firstly, the pandemic forced us to completely suspend in-person interactions with participants and adopt telephone-based interviews, restricting our ability to interact with participants who were already enrolled in the project and recruit from the target population. The pandemic also affected CCWORK participants; "pandemic fatigue"[67] has introduced delays to all follow-up measures, as participants take more time to complete the surveys and book the interviews. The pandemic has had limited or practically no impact on our capacity to process and analyse research data, and has provided an opportunity to streamline the data collection strategies.

ETHICS AND DISSEMINATION

CCWORK data research participants are treated as confidential and anonymized. 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[68].

CONCLUSION

CCWORK has several internal and external limiting factors. Internal factors include selection bias, attrition, and the spontaneous nature of our initial research design. Firstly, 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[21]. Thus, subsequent use of our results for comparison purposes should factor in work conditions in their analysis. Secondly, our data is self-reported, 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 (e.g., seek leaves and missed workdays), which could help us assess and address participant bias. Thirdly, a small number of participants who entered CCWORK before the data collection streamlining process, which occurred during the COVID-19 suspension, are missing *baseline* data. Although we isolated their files, and spared these cases for cross-sectional analysis only, participants with missing data limit the longitudinal power and thus generalizability of our analysis. Lastly, we anticipate attrition to become a significant limitation, particularly due to project adjustments made for COVID-19 (e.g., moving to telephone interviews and not being able to have in-person interactions with participants).

External limiting factors include the COVID-19 pandemic, which negatively impacted population overall well-being *per se*, including COs. We have changed our data collection instruments to account for the COVID-19 effects in correctional work; however, we acknowledge there is no way to control for (i.e., isolate) the pervasive pandemic impact on life of COs. The CCWORK timeline will necessarily have analyses that are 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 such impacts this in a revised analysis plan.

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 programs 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 CORs 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 (e.g., journal articles, reports).

ABBREVIATIONS

Acute Stress Disorder (ASD)

Alcohol Use Disorders Identification Test (AUDIT)

Brief Resilience Scale (BRS)

Canadian Forces Recruit Mental Health Service Use Questionnaire (CAF-R-MHSUQ)

Cannabis Use Disorder Identification Test - Revised (CUDIT-R)

Chronic Pain Grade Questionnaire (CPGQ)

Correctional officer recruits (CORs)

Correctional officers (COs)

Correctional Services Canada (CSC)

Correctional Training Program (CTP)

Diagnostic and Statistical Manual of Mental Disorders (DSM-5)

Dyadic Adjustment Scale (DAS-4)

General Anxiety Disorder 7-Item Scale (GAD-7)

International Classification of Diseases (ICD-10)

Major Depressive Disorder (MDD)

Mini International Neuropsychiatric Interview (M.I.N.I.)

National Training Academy (NTA)

Occupational Stress Injuries (OSI)

Panic Disorder, Generalized Anxiety Disorder (GAD)

Panic Disorders Symptoms Severity Scale – Self-Report (PDSS-SR)

Patient Health Questionnaire 9-item (PHQ-9)

Personal Protective Equipment (PPE)

Posttraumatic Stress Disorder (PTSD)

Posttraumatic Stress Injuries (PTSIs)

Potentially Psychologically Traumatic Events (PPTE)

Public Safety Personnel (PSP)

Road to Mental Readiness (R2MR)

Social Provisions Scale-10 (SPS)

Staff Quality of Life (SQL)

Union of Canadian Correctional Officers (UCCO-SACC-CSN)

DECLARATIONS

Ethics approval and consent to participate

CCWORK has received approval from the *Health Research Ethics Board of the Memorial University of Newfoundland* (File No. 20190481).

Consent to publish

Not applicable.

Availability of data and material

The datasets generated and/or analysed during the current study are not publicly available due to participant confidentiality but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Author's contributions

Primary author of this manuscript, RR co-led the conceptualisation, design, and implementation of this research protocol. LA coordinated the project; JS coordinated data sharing processes; MMM and NC oversaw data collection in subproject 1; DG and NC oversaw data collection in subproject 3; BQ and RR oversaw data collection in subproject 2; MSC contributed to writing and conceptualizing the manuscript; all the other co-authors contributed to the conceptualisation, design, and implementation of CCWORK as well as reviewing the current article.

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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 multi-year longitudinal cohort design (2018-2023, with a five-year renewal) to study 500 COs working in 43 Canadian federal prisons. We use quantitative and qualitative data collection instruments (i.e., 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, 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 mix-method longitudinal, multi-cohort 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 (i.e., correctional officers) working in Canada's federal prison system.

Keywords: correctional officer; well-being; training; prison; organizations; stressors; Public Safety Personnel (PSP); mental health disorder; Posttraumatic Stress Disorder (PTSD); Occupations; Occupational Stress Injuries (OSIs); Posttraumatic Stress Injuries (PTSI); Depression; Anxiety Disorder; Panic Disorder; longitudinal; cohort.

INTRODUCTION

Researchers, stakeholders, organizations, and policy makers have increasingly focused public and scholarly attention on work-related Posttraumatic Stress Injuries (PTSIs) Public Safety Personnel (PSP; e.g., correctional officers, police, firefighters, paramedics), including police, firefighters, paramedics and Armed Forces personnel.[1] However, specific knowledge about mental health disorders among correctional officers (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 two 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 two years less one day.[2 5] Given their importance in society, Canadian COs are recognized 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 colleagues[11] 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 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 (PPTE), 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 colleagues[18] found correctional work in Quebec's provincial prisons was characterized 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 (OSI) and Posttraumatic Stress Injuries (PTSIs) as a function of their vocation.[19] OSI is a term first coined by the Canadian Armed Forces' peer support program with the intent to destigmatize and legitimize 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 PPTEs at work. OSI symptoms are associated with symptoms that are found in diagnoses of, among others,

PTSD, acute stress disorder (ASD), MDD, panic disorder, generalized 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.

Recognizing 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 multi-year (2018-2023, with possibility for a five-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, mobilize, enhance, and implement forces that lead to optimum organizational 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 analyzing the factors associated with CO vulnerabilities to (i.e., risk factors) and resilience against (i.e., 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 (e.g., 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 (i.e., the physical realities of carceral work; safety, legal, emotional, and physical vulnerabilities within the prison workspace; operational and organizational 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 (COR), applicants must successfully complete the recruitment and training program offered by CSC, and then be offered and accept a position at one of the 43 prisons operated by CSC across five Canadian regions (i.e., Ontario, Quebec, Atlantic, Pacific, Prairie). The correctional training program (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 learned in Stage I. *Stage III* is an in-person intensive 14-week corrections-specific training program delivered at the National Training Academy in Kingston (Ontario) or a satellite site (e.g., 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* (e.g., job content, such as responding to prisoner suicide attempts), *organizational stressors* (e.g., job context, such as

supervisory arrangement, work hours), and *environmental stressors* (e.g., 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 organizational, 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. Further, 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 multi-thematic characterization of the study population empirically and through lived experiences. The themes explored in the first two subprojects include demographic (including lifestyle), occupational, and psychological characterizations of COs at recruitment and at work. The occupational characterization includes experiences and exposure to stressors on the job, whereas the psychological characterization addresses psychological state, social views, clinical screenings, and experiences of mental health challenges. Occupational and psychological characterizations 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 polices, 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* (M.I.N.I.) 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 tenth 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 (e.g., 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.

Table 1: Schedule of administration of study measures (2018-2023)

	Study Activity	Study time point						
		CTP Stage II (enrollment)	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‡	X						
	CTP Post-test Survey‡		X					
	Follow-up survey (odd year)‡			X		X		X
	Follow-up survey (even year)‡				X		X	
Subproject 2	Baseline interview‡		X					
	Follow-up interview‡			X	X	X	X	X
Subproject 3	M.I.N.I (baseline)‡		X					
	M.I.N.I (follow-up)‡			X	X	X	X	X

† 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
Note: As enrollment is continuous (i.e., new cohorts enter the project whenever there is a CTP class) and the project is scheduled to last five years, not all participants will complete all waves of data collection.

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 enrollment 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 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 (NTA) 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 organized 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 generalizability of quantitative research findings (subprojects 1 and 3, as discussed below), considering a 5% margin of error at 95% confidence level, we aim to enroll 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 thru 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 (i.e., during CTP) and two completed as follow-ups (i.e., annually). The first baseline survey (*CTP pretest survey*) is administered during Stages II of CTP. The second baseline survey (i.e., *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 (i.e., *Follow-up survey (odd years)* the end of years 1, 3 and 5)

and even years (i.e., *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 organizational 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 Tables 2.1 and 2.2 (mental health screening instruments).

Table 2.1: *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 two years.
Fear of Correctional Work / 4	
Mental Health Knowledge	
CRF-MHSUQ / 6	*CAF Recruit Mental Health Service Use Questionnaire* (CAF-R-MHSUQ)[29], which assesses knowledge of mental health, particularly instrumental attitudes (i.e., whether mental health service is a good or a bad thing) and affective attitudes (i.e., how mental health service will feel); subjective norms; perceived self-efficacy (i.e., expectations around how easy or difficult mental health services would be and confidence that one can overcome difficulties) and perceived control (i.e., perceived control over the performance of the behavior); 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 (R2MR), and Understanding and Responding to Inmates with Mental Health Disorders [CAMH/OCSC Training], 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 *Emotional Regulation Questionnaire* (ERQ),[30] 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 *Social Provisions Scale-10* (SPS),[31] 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 *Dyadic Adjustment Scale* (DAS-4), 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 7-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 (i.e., intensity and duration) at different bodily locations with the *Chronic Pain Grade Questionnaire* (CPGQ) 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 six months[33]. Items are scored on an 11-point Likert scale, with responses ranging from 0–10. Scores are interpreted according to three subscales (characteristic pain intensity, disability score, and the disability points score), which classify subjects into 1 of the 5 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.
Risk Factors	
Risk Factors / 4	Victimization, using the *Childhood Experiences of Violence Questionnaire (CEVQ),* which is an 18-item self-report measure of victimization 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.[34] Higher the score, greater victimization, conversely lower scores represent less victimization.
COVID-19	
COVID-Operational / 4	COVID-19 impact on job routine, work responsibilities, occupational risks, drug in prison, access to PPE, and family members (e.g., transmissibility to family members). This topic includes "made-in-house" matrix questions with 5-point Likert scales and open questions.
COVID-Stress Scale / 3	COVID-19-related concerns involving getting infected, keeping family safe, challenges faced by the health care system to deliver services, hygiene habits, commuting/travelling issues, logistics and supply issues (e.g., 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 (e.g., consent) and research feedback.

Table 2.2: *CTP pretest survey* details (mental health screening).

Mental Health Disorders (Screening)	
Event Exposure - PCL-5 / 13	Posttraumatic Stress Disorder (PTSD) is assessed using the *PTSD Check List 5* (PCL-5)[35], which is a commonly used self-report tool that assesses 20 symptoms of PTSD as outlined in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorder (DSM-5)*.[36] Respondents are asked to rate how bothered they have been by each of 20 items in the past month on a 5point 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 inter-item 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 *Patient Health Questionnaire 9-item* (PHQ-9).[37] The PHQ-9 is a 9-item questionnaire that asks individuals to rate how often symptoms of MDD have bothered them in the past two weeks on a 3-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 categorized 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 inter-item correlations for the PHQ-9 range from 0.200 to 0.622.
Panic Disorder Questions – PDSS-SR / 10	Panic Disorder (PD) using the *Panic Disorders Symptoms Severity Scale – Self-Report* (PDSS-SR), a 7-item questionnaire that asks individuals to rate their symptoms on a 5-point scale (0=Never; 1=Occasionally; 2=Half of the time; 3=Most of the time, and 4=All of the time).[38] 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.
Generalized Anxiety Disorder – GAD-7 / 1	Generalized Anxiety Disorder (GAD) symptoms are assessed with *General Anxiety Disorder 7-Item Scale* (GAD-7).[39] The GAD-7 is a 7-item questionnaire that asks individuals to rate how often symptoms of GAD have bothered them in the past two weeks on a 3-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- 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 5 questions about anxiety, 5 questions about specific mood disorders (i.e., major depressive disorder, bipolar disorder, and cyclothymic), 5 questions about any mental health disorder that is not an anxiety or mood disorder, and 2 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).
Alcohol use and smoking / 10	Risky (hazardous) alcohol use is assessed with the *Alcohol Use Disorders Identification Test* (AUDIT)[40]. The AUDIT items area 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 *Cannabis Use Disorder Identification Test - Revised* (CUDIT-R)[41] is a brief, 8-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 4-point scale (0 to 4) that measures cannabis use frequency. The CUDIT-R diagnostic criteria are aligned with the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorder* (DSM-5)[36], 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.
SRI 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. Open- and closed-ended, these "made-in-house" questions explore types of help/resources received (e.g., hospitalization, psychiatrist, family doctor or general practitioner, psychologist, nurse, social worker, counsellor, or psychotherapist, family member, friend, co-worker, supervisor, or boss), frequency with which participants accessed those help/resources, reason for stopping accessing them, and their effectiveness.
BRS / 1	Resilience (i.e., the ability to bounce back or recover from stressors) is assessed with the *Brief Resilience Scale* (BRS).[42] The BRS is a 6-item questionnaire where individuals are asked to decide how much they agree or disagree with each item using a 5-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.

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; organizational affairs, including organizational 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 minutes. 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.

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 *CTP pretest survey* 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 4 and 5-point scales that asks participants to describe their personality and describe their feelings over the past seven days.
Drug in Prison	
Drug Use in the Institutions - Crystal Meth / 3	Concerns about methamphetamine in prison (e.g., 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 5-point scales, and open questions ("made-in-house").
Drug Use in the Institutions – Opioids / 7	Concerns about opioids in prison (e.g., 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 5-point scales, and dichotomous questions—all "made-in-house."
Needle Exchange Program / 1	Perception of the *Needle Exchange Program* (e.g., 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" 8-item matrix question with a 5-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 7-point scale.
Organizational Affairs	
Organizational 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 7-point scale. The items in this question were adapted from work previously published in the field of criminology.[43 44]
Culture / 4	Views of correctional work and staff at CTP (e.g., authority conferred to officers and supervisors), peer-relationship (e.g., communication, respect, and loyalty), and relationship officers and supervisors (e.g., support, respect, fairness are assessed with matrix questions with 5 and 7-point scales, a dichotomous question, and an open-ended question. The questions in this section were adapted from the *Staff Quality of Life* (SQL) survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University[45], as well as work previously published in the field of criminology.[46]

Correctional Officer Code / 2	Physical fitness, cooperation with prisoners (e.g., 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 fulfill their mandate (e.g., being taken advantaged by prisoners) are assessed with matrix questions containing 5-point scales. The questions in this section were adapted from various work previously published in the field of criminology.[47-50]
Humanizing Behaviors / 2	Views of prisoners and their resocialization process, as well contact with prisoners (e.g., knowing their names and supporting them), are assessed with a 14- and 8-item matrix question with a 4- and 5-point scale, respectively. The questions in this section were adapted from the *Staff Quality of Life* (SQL) survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University.[45]
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 (R2MR), 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 (e.g., dichotomous, checkbox, and multiple-choice questions).
AM Strength / 23	AM Strength, particularly if participants found it helpful; how much participants learned; 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 5-point scale.
Burnout / 1	Burnout during CTP, measured in a 16-item matrix question with a 5-point scale. The items in this question were adapted from the burnout literature[51].
COVID-19	
COVID-Operational / 4	Same questions in all surveys (Table 2.1).
COVID-Stress Scale / 3	Same questions in all surveys (Table 2.1).
Other	
Ethics Protocols / 3	Same questions in all surveys (Table 2.1).

Follow-up Survey (odd year)

The *follow-up odd year* survey assesses the following for COs: demographics; mental health injuries; workplace concerns; inappropriate behaviours at work; work-related stress; victimization at work; mental health knowledge; CTP Mental Health Training; contraband in prison; organizational commitment; work relationships; culture at work; Correctional Officer Code; humanizing behaviours; burnout; and, also a recent addition, COVID-19 related questions. For more details, see Table 4.

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 *CTP pretest* and *CTP post-test surveys*.
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 4 and 5-point scales and matrix questions with dichotomous answers. Two questions in this section are present in the *CTP post-test survey* (Table 3), section "Symptoms of Mental Health and Mental Injuries."
Burnout / 1	Same questions as in the *CTP post-test survey* (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.[52 53]
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 5-point scales). Some of the questions in this section were adapted from the *Staff Quality of Life* (SQL) survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University.[45]
Victimization / 29	Victimization of COs at duty by prisoners.[52 53] This topic includes open and closed questions (information captured through dichotomous questions and matrix questions with 5-point scales).
Mental Health Knowledge	
Mental Health Knowledge / 4	Knowledge of mental health and attitude toward 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 *pretest survey.*
Drug in Prison	
Drug Use in the Institutions - Crystal Meth / 3	Same questions as in the *CTP post-test survey* (Table 3).
Drug Use in the Institutions – Opioids / 7	Same questions as in the *CTP post-test survey* (Table 3).
Needle Exchange Program / 1	Same questions as in the *CTP post-test survey* (Table 3).
Organizational Affairs	
Organizational Commitment / 10	Views toward CSC (e.g., compatibility with CSC values, pride to work at CSC, and professional development expectations); role strain, daily tasks, relationship with management (e.g., strains, clarity of responsibility, line of command, and guidance and support from management); and disciplinary affairs (e.g.,

	authority to discipline prisoners, control of contraband, and internal movement of inmates); career prospects; work environment (e.g., 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 4 and 5-point scales, checkbox questions, and simple questions (with nominal and ordinal scales). The scholarship led by Paoline, Lambert, and Farkas inspired this section[43 54-56]. One question in this section is a variation of the question in the section "Organizational Affairs, sub-topic "Organizational Commitment" of the *CTP post-test survey* (Table 3).
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 5-point scales. The questions in this section were adapted from the *Staff Quality of Life* (SQL) survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University.[45]
Correctional Officer Code / 2	Cooperation with prisoners (e.g., 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 fulfill their mandate (e.g., being taken advantaged by prisoners). We capture the information with multi-item matrix questions containing 5-point scales. The questions in this section were adapted from several works previously published in the field of criminology.[47-50] Also, some question-items in this section are the same as in the questions from the section "Organizational Affairs / Correctional Officer Code" of the *CTP post-test survey* (Table 3).
Humanizing Behaviors / 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-Operational / 4	Same questions in all surveys (Table 2.1).
COVID-Stress Scale / 3	Same questions in all surveys (Table 2.1).
Other	
Ethics Protocols / 3	Same questions in all surveys (Table 2.1).

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.

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; 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; institution of deployment.
Mental Health Disorders (Screening)	
Event Exposure - PCL-5 / 12	Same questions as in the *CTP pretest survey* (Table 2.2).
Depression - PHQ-9 and Suicide Assessment / 20	Same questions as in the *CTP pretest survey* (Table 2.2).
Panic Disorder Questions – PDSS / 8	Same questions as in the *CTP pretest survey* (Table 2.2).
Generalized Anxiety Disorder - GAD-7 / 2	Same questions as in the *CTP pretest survey* (Table 2.2).
Anxiety Disorders / 16	Same questions as in the *CTP pretest survey* (Table 2.2).
Alcohol use and smoking / 9	Same questions as in the *CTP pretest survey* (Table 2.2).
Cannabis use disorder / 11	Same questions as in the *CTP pretest survey* (Table 2.2).
SRI and PNC / 8	Same questions as in the *CTP pretest survey* (Table 2.2).
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 5-point scales). Some of the questions in this section were adapted from the *Staff Quality of Life* (SQL) survey developed by the Prisons Research Centre at the Institute of Criminology of Cambridge University.[45] 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 7-point scale (same questions as in the *CTP post-test survey*, Table 3), an open question, and a simple question with a 5-point scale—all "made-in-house."
Traumatic Events at Work	
Correctional Events / 3	Potentially traumatizing events at work (e.g., being victimized, witnessing violence, and having contact with body fluids) are assessed with multi-items matrix questions with 5-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 4-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 2.1).
Chronic Pain	
Former PSP - Other Health Conditions - Chronic Pain Questionnaire / 6	Same question as in the *CTP pretest survey* (Table 2.1).
COVID-19	
COVID-Operational / 4	Same questions in all surveys (Table 2.1).
COVID-Stress Scale / 3	Same questions in all surveys (Table 2.1).
Other	
Ethics Protocols / 2	Same questions in all surveys (Table 2.1).

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

Subproject 2 Methods

In Subproject 2 we interview participants starting Phase III of CTP at their academy (i.e., *baseline interview*), and annually thereafter (i.e., *follow-up interview*) (see Table 1 for timeline). We use a semi-structured interview guide to ask participants about their expectations, experiences, and perceptions of correctional work to contextualize their training, work life, and well-being. The semi-structured 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 (e.g., 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 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 (e.g., military, 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 minutes 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, Co-Investigators, 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 organized 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 (i.e., *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 optimize resources and reduce the organizational 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 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

*Many participants work in Alberta institutions, so we have dedicated two months for scheduling their follow-up interviews.
Note: We have no official data collection program in July, August, November, and December because participants are usually not available due to summer holidays and other festivities.

Subproject 3 Methods

Subproject 3 involves administering the empirically validated M.I.N.I. survey to participants.[57 58] The M.I.N.I. is a psychological assessment used to screen CCWORK participants at employment entry (i.e., M.I.N.I. *baseline*) and at the end of each year of employment (i.e., M.I.N.I. *follow-up*). The M.I.N.I. was designed as a brief structured diagnostic interview for many psychiatric disorders in DSM-III-R, DSM-IV and DSM-5[59] and ICD-10.[57 58 60] The M.I.N.I. has similar reliability and validity properties to both the SCID-P for DSM-III-R and the CIDI (i.e., a structured interview developed by the World Health Organization), but the M.I.N.I. can be administered in a shorter time (mean 18.7 ± 11.6 minutes, median 15 minutes). The M.I.N.I. has demonstrated inter-rater reliability exceeding 75%.[57 58] Results from the M.I.N.I. are usually associated with high inter-rater reliabilities.[61 62] The M.I.N.I. 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 M.I.N.I. are placed into a summary document.

Trained graduate or post-doctoral level Research Assistants conduct the clinical M.I.N.I. interviews under the supervision of the clinical CCWORK team. Clinical interviews are voice-recorded to assess interrater 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 (e.g., 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 M.I.N.I. results, unless required to comply with ethical and legal regulations (e.g., an imminent risk of harm to self or others). A clinical Co-Investigator coordinates the M.I.N.I. 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 M.I.N.I.

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 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"[63] 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 is self-reported (i.e., 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 (e.g., sick leaves and missed workdays), which could help us assess and address participant bias. Third, we recognize the movement toward 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 (e.g., 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 (i.e., 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 (i.e., 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 is transferred to the Project Coordinator.

Results for publications and reports are anonymized 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 (i.e., data collection wave). Members of the CCWORK research team review participant case files annually for accuracy.

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 M.I.N.I. results (subproject 3). The qualitative committee is responsible for processing and analyzing data collected under subproject 2.

We will use IBM SPSS to process, clean, and code the data in subproject 1 and 3. Specifically analyzing research question 1, researchers will use multivariate regressions and change scores or hierarchal linear models (HLM) 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 than coding the data. The Project Coordinator manages all interview audio files, being responsible for transcribing the interviews verbatim, as well as anonymizing the transcripts. Once the interviews are transcribed, the coding team analyze and classify each part of the interview transcript (i.e., answer by answer) into a coding scheme that includes 50 primary codes (i.e., nodes) and hundreds of sub-codes organized under the following themes: 1) personal history and personal information; 2) education, employment, and service history; 3) CTP; 4) occupational mindset (e.g., 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 semi-grounded 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 is 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.[64-67] Once the datasets and coding are ready, project members 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. CTP instructors and any liaison helping with data collection may know who is participating in CCWORK. However, CSC cannot match or trace participants to the information provided to CCWORK. The CSC has no access to raw research data (e.g., interview audio files, interview transcripts, survey responses, clinical assessments). We fully anonymize 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.[68]

CCWORK relies on an intensive collaborative process involving the Correctional Services of Canada (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 conceptualization, 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.[69]

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 (e.g., journal articles, 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 actualize our findings. CSC has also moved forward a *Micro Mission,* which involves a dedicated CSC employee creating relevant and effective knowledge mobilization plans to take each article written and translate it into effect across the organization. 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, organizational, and environmental stressors impacting 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 Report[19] raised about increasing OSIs among PSP 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 programs 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 CORs 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 (e.g., journal articles, reports).

ABBREVIATIONS

Acute Stress Disorder (ASD)

Alcohol Use Disorders Identification Test (AUDIT)

Brief Resilience Scale (BRS)

Canadian Forces Recruit Mental Health Service Use Questionnaire (CAF-R-MHSUQ)

Cannabis Use Disorder Identification Test - Revised (CUDIT-R)

Chronic Pain Grade Questionnaire (CPGQ)

Correctional officer recruits (CORs)

Correctional officers (COs)

Correctional Services Canada (CSC)

Correctional Training Program (CTP)

Diagnostic and Statistical Manual of Mental Disorders (DSM-5)

Dyadic Adjustment Scale (DAS-4)

General Anxiety Disorder 7-Item Scale (GAD-7)

International Classification of Diseases (ICD-10)

Major Depressive Disorder (MDD)

Mini International Neuropsychiatric Interview (M.I.N.I.)

National Training Academy (NTA)

Occupational Stress Injuries (OSI)

Panic Disorder, Generalized Anxiety Disorder (GAD)

Panic Disorders Symptoms Severity Scale – Self-Report (PDSS-SR)

Patient Health Questionnaire 9-item (PHQ-9)

Personal Protective Equipment (PPE)

Posttraumatic Stress Disorder (PTSD)

Posttraumatic Stress Injuries (PTSIs)

Potentially Psychologically Traumatic Events (PPTE)

Public Safety Personnel (PSP)

Road to Mental Readiness (R2MR)

Social Provisions Scale-10 (SPS)

Staff Quality of Life (SQL)

Union of Canadian Correctional Officers (UCCO-SACC-CSN)

DECLARATIONS

Ethics approval and consent to participate

CCWORK has received approval from the *Health Research Ethics Board of the Memorial University of Newfoundland* (File No. 20190481).

Consent to publish

Not applicable.

Availability of data and material

The datasets generated and/or analysed during the current study are not publicly.

Competing interests

The authors declare that they have no competing interests.

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Author's contributions

RR conceptualized the project with support of co-authors. AH, AE, BQ, CG, DS, DG, DM, EA, GSA, HC, HA, JG, JS, JT, JP, JCM, KM, MSC, MM, MHE, MMM, MA, MW, RNC, RM, RR, SHH, and SC contributed to the research procedures discussed in this protocol. They also revised this article critically, approved its final version, and agreed to be accountable for this article's accuracy and integrity. RR, EA, JS, MA, MMM, and MSC also drafted the work and made substantial contributions to the acquisition, analysis, and interpretation of the data for this article. RR also led the project, integrating everyone's contributions.

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