

Article

Mental Health Risk Factors Related to COVID-19 among Canadian Public Safety Professionals

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Abstract: Public safety personnel (PSP) are known to experience difficult and demanding occupational environments, an environment that has been complicated by the COVID-19 pandemic. Firefighters, paramedics, and public safety communicators were among the front-line workers that continued to serve the public throughout the course of the pandemic. The present study considered the potential impacts of the COVID-19 pandemic on self-reported symptoms of mental health challenges in Canadian firefighters, paramedics, and public safety communicators. Participants were firefighters ($n = 123$), paramedics ($n = 246$), and public safety communicators ($n = 48$), who completed an online survey, including demographics, questions related to COVID-19 exposure and worry, the Patient Health Questionnaire-9, the Generalized Anxiety Disorder-7, the Social Interaction Phobia Scale, and the Posttraumatic Stress Disorder Checklist-5. Results revealed that risk factors for increased mental health symptom reporting were paramedic occupation, self-identified female, younger in age, COVID-19 personal contact, requirement to self-isolate, and self-perception of COVID-19 contraction (without confirmation through testing). The COVID-19 pandemic should be considered a risk factor for increased mental health symptom reporting in PSP.

Keywords: firefighters; paramedics; public safety communicators; COVID-19; mental health



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1. Introduction

As a result of the rapid escalation of the novel coronavirus (Coronavirus Disease 2019; COVID-19) across the globe (caused by the coronavirus SARS-CoV-2) the World Health Organization recognized COVID-19 as a pandemic on 12 March 2020. Governments around the globe were quick to look for ways to reduce the spread of the virus [1] with a large portion of the world's population being impacted by government restrictions [2]. Public Health Orders imposed restrictions that typically included restricted domestic and/or international travel, wearing of masks, physical distancing, restricted gathering sizes, limited size of social gatherings, closing venues where public gatherings took place, shelter in place, and complete lockdown measures. In Canada the quarantine mandates were either “recommended” and voluntary in nature, or “mandatory” which were legally enforceable [3] and at times included mandates restricting contact with individuals outside, or even those within, the household [4].

The COVID-19 pandemic has had a global impact on coping and mental health [5]. A deterioration in mental health and coping has been evidenced in Canadian populations, particularly for those with health, social, or structural vulnerabilities [6]. The level of

uncertainty regarding the virus was especially pronounced during the initial stages of the COVID-19 pandemic when information about the virus was unclear and evolving, compounding fears of infection and panic [7]. The mental health of frontline healthcare workers (e.g., doctors, nurses, public safety personnel [PSP]) has been a research priority due to their direct involvement with COVID-19 patients and the subsequent increased risk of contracting the virus [8,9]; early studies have also indicated that, especially for non-medical staff less familiar with communicable disease protocols, pandemic training and preparedness was very important. A recent review has suggested that greater psychological stress may be experienced by those in occupations where work occurs outside of a controlled environment, such as is the case with PSP [10]. Within the Chinese health workers, psychological concerns such as symptoms of generalized anxiety disorder (GAD), major depressive disorder (MDD), and emotional exhaustion have been exacerbated [11]. Results have evidenced significant increases in anxiety [12], attributed to several factors, including dealing directly with infected patients, insufficient personal protective equipment, poor access to hand sanitizers or liquid soaps, and existing mental health challenges [13]. The prolonged nature of the pandemic has also contributed to increased emotional exhaustion in healthcare workers [7].

The pandemic has increased risk for mental health symptoms among PSP, who have been required to provide ongoing service throughout the pandemic [8]. Firefighters, paramedics, and public safety communicators (e.g., dispatchers, 911 operators) have experienced increased risks to their mental health related to direct patient contact, insufficient access to necessary protective measures, increased call volume, and intensified public stress, expectation, and demand [14]. Personal responsibility, personal safety risks, emotional activation, and levels of empathy [15] also affected the risk to the mental health of these workers. There is research from other countries suggesting the negative impact and effects of COVID-19 observed in the general population [5] and healthcare workers [16] would also be reflected in the mental health and well-being of PSP working through the pandemic [14].

1.1. Mental Health and Emergency Services

Due to their occupational demands, firefighters (including Emergency Medical Services who respond but do not transport patients), paramedics (ambulance service personnel who respond, treat, and transport patients), and public safety communicators (who have no in person contact with patients but deal with vicarious trauma) are exposed to potentially psychologically traumatic events (PPTE) at rates much higher than the general population [17]. PSP also report considerable difficulties with other occupational stressors, including organizational (e.g., staff shortages, inconsistent leadership styles) and operational elements (e.g., shift work, public scrutiny) [18]. Prior to the COVID-19 pandemic, there was evidence of associations between complex, specific vocational stressors and an increased risk for symptoms of posttraumatic stress injuries (PTSI; e.g., MDD, GAD, panic disorder [PD], social anxiety disorder [SAD], alcohol use disorder [AUD], posttraumatic stress disorder [PTSD]) [18,19] as well as suicidality (i.e., ideation, planning, attempts; [20,21]).

Research examining the mental health impacts of COVID-19 for paramedics, firefighters, and public safety communicators is limited, but growing. PSP in the United Kingdom reported fewer mental health symptoms during the early months of the pandemic than the general population, possibly related to playing a critical role early in a time of societal crisis [22]. Conversely, a sample of United States PSP who had been exposed to COVID-19 reported higher alcohol use severity compared to PSP who had not been exposed [8]. Participants in the United States study who reported increased COVID-19 worry and vulnerability, reported more symptoms of GAD and MDD; similarly, for those who had both COVID-19 worry and exposure, increased PTSD symptom severity was demonstrated [8].

A convenience sample of 31 PSP reported feelings of “isolation, lack of support and understanding by family or friends, decreased or forced removal in immediate social interaction (e.g., within family and friend circles), sentiments of being infected or dirty,

increased feeling of sadness and anxiety, and reluctance to ask for help or get treatment (e.g., self-approval of being isolated)” in an investigation regarding COVID-19 stigmatization [23], p. 375. Social distancing required by public health measures and within the workplace was also associated with increased anxiety and stress for PSP and may have contributed to poorer mental health outcomes [24].

A recent scoping review identified key themes for assisting with mental health of paramedic practitioners during the pandemic. Key themes included increasing confidence in personal protective equipment, improved understanding of ways to protect self and family, and enhanced managerial communication [25]. During the pandemic public safety communicators reported an increase in occupational burnout, emotional exhaustion and loss of professional effectiveness [26]. Additional research considering the impacts of the pandemic on the mental and emotional health of PSP is necessary.

1.2. Current Study

The current study was designed to address gaps in the literature with respect to the mental health of PSP over the course of the COVID-19 pandemic; specifically, the relationships between COVID-19 and symptoms related to MDD, GAD, SAD, and PTSD in a sample of Canadian paramedics, firefighters, and public safety communicators were examined. The data is a cross-sectional sample of PSP who recalled two points in time (current day, and when COVID restrictions were first presented). Our primary hypotheses were:

1. Given increased patient contact, paramedics were expected to report greater self-reported symptoms of MDD, GAD, SAD, and PTSD compared to firefighters and public safety communicators.
2. Given age as a significant risk factor for COVID-19 [27,28], increasing age was expected to be associated with increased self-reported symptoms of MDD, GAD, SAD, and PTSD.
3. Given that women are more likely to experience post-traumatic stress injury and suffer from it as a chronic condition [29,30], and are reported to be the most common elder care providers [31], female participants as determined through sex at birth were expected to report greater self-reported symptoms of MDD, GAD, SAD, and PTSD compared to male participants. These symptoms would be related to increased concerns that workplace exposure may be shared with older family members.
4. Participants with confirmed (or suspected confirmed) contacts were expected to report increased self-reported symptoms of MDD, GAD, SAD, and PTSD related to concerns that workplace exposure may be shared with older family members.
5. Participant responses were expected to demonstrate differences across professional groups (i.e., firefighters, paramedics, public safety communicators) based on self-reported need to complete self-isolation. Similarly, we expected that there would be a positive relationship between mental health symptoms and number of days in self-isolation.
6. Participant responses were expected to differ across professional groups (i.e., firefighters, paramedics, public safety communicators) based on self-reported suspicion of contracting COVID-19, even if it was not confirmed through testing.

2. Methods

Between March of 2020 and March of 2021, during the first year of the pandemic, the British Columbia Paramedics Association, British Columbia Professional Fire Fighters' Association (BCPFFA), and Dispatch Centre Managers emailed their members invitations to participate in an online survey hosted on Qualtrics (Qualtrics, Provo, UT); invitations with login information were provided and linked to individual email addresses. The invitation email indicated that participants would receive two reminders to complete the survey. Participation was voluntary and participants were requested to complete a demographic questionnaire, as well as a series of validated measures related to COVID-19 and mental health).

Public health restrictions in British Columbia (BC) were changing rapidly during data collection such that participants were requested to report on the public health response currently in place at the time of questionnaire completion. Specifically, the BC government used a phased approach to Public Health Orders that included varying level of restrictions from Phase 1 (declaration of provincial “public health emergency” on 17 March 2020, included closure of restaurants, bars, and personal care services, travel-related quarantine, reduced in-person school and childcare, restriction of non-emergency medical procedures and visitors to long-term care facilities) to Phase 4 (declared 24 June 2020, that included reopening of restaurants, bars, personal care services, shopping malls, recreational facilities, parks, places of worship, and small outdoor events with capacity limits). Each participant worked through each of the four phases during the period of this study.

Ethical approval for the current study was provided by the Queen’s University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board (HSREB Certificate #6030697).

2.1. Measures

Demographic Information: Participants were asked to provide demographic and occupational information (i.e., sex, age, occupation, role, rank, years of service, full- or part-time status) and to describe the current phase of COVID-19 as defined by their local public health agency (ranging from 1–4). Details regarding their confirmed or suspected COVID-19 exposures and associated actions (i.e., self-isolating, missed work, how long), along with two open-ended response questions describing the impact of COVID-19 on their life at home and work, respectively were also collected (reported elsewhere).

Patient Health Questionnaire: Symptomology for MDD was assessed using the Patient Health Questionnaire 9-item (PHQ-9) [32]. The PHQ-9 asks individuals to consider the past two weeks and to rate nine symptoms of MDD on a scale of 0 (not at all) to 3 (nearly every day).

General Anxiety Disorder: Symptoms of GAD were assessed using the GAD 7-item Scale (GAD-7) [33]. The GAD-7 is a seven-item questionnaire in which individuals are asked to rate how often symptoms of GAD (e.g., “Feeling nervous, anxious, or on edge”) have bothered them on a scale of 0 (not at all) to 3 (nearly every day).

Social Interaction Phobia Scale: SAD was assessed using the Social Interaction Phobia Scale (SIPS) [34]. The SIPS is a 14-item measure of SAD symptoms that can be divided into three subscales; Social Interaction Anxiety, Fear of Overt Evaluation, and Fear of Attracting Attention.

PTSD Check List: Symptoms of PTSD were assessed using the PTSD Check List 5 (PCL-5) [35]. The PCL-5 is commonly used 20 item self-report tool that assesses symptoms of PTSD as outlined by the Diagnostic and Statistical Manual of Mental Disorder-Fifth edition [36]. Participants are asked to rate how much they were bothered by items (e.g., “Repeated, disturbing, and unwanted memories of the stressful experience”) on a scale of 0 (not at all) to 4 (extremely).

2.2. Statistical Analyses

Hypothesis 1 was examined using a repeated-measures ANOVA with measure (e.g., PHQ-9; GAD-7; SIPS; PCL-5) as the within participant factor, and occupation as the between participant factor. Partial correlation was completed to examine Hypothesis 2, using age and measure (PHQ-9; GAD-7; SIPS; PCL-5) as factors and years of service as a covariate. Hypothesis 3 through 6 we examined using independent samples *t*-tests.

3. Results

Participants included firefighters ($n = 123$), paramedics ($n = 246$), and public safety communicators ($n = 48$); additionally, there were seven participants who reported a different occupation and were therefore not included in the analyses. The firefighter sample predominantly self-identified as male (96.7%), with an average age of 29.80 years ($SD = 9.74$) and 14.24 years of service ($SD = 7.54$). One firefighter (0.8%) reported a COVID-19 diagnosis,

while 16 (13.0%) others reported suspected cases of COVID-19. There were three firefighters (2.4%) who reported a COVID-19 diagnosis in their household, 60 (48.8%) reported having been in contact with a COVID-19 case, and 60 reported having to isolate.

The paramedic sample predominantly self-identified as male (59.8%) with an average age of 30.18 years ($SD = 10.30$) and 16.87 years of service ($SD = 9.81$). There were 2 paramedics (0.8%) who reported having been diagnosed with COVID-19 and 52 (21.1%) others who reported a suspected case of COVID-19. There were 5 (2.0%) paramedics who reported a COVID-19 diagnosis in their household, 190 (77.2%) members reported having been in contact with a COVID-19 case, and 132 (53.7%) reported having to isolate.

The public safety communicator sample predominantly self-identified as female (77.1%) with an average age of 25.08 years ($SD = 9.39$) and 11.69 years of service ($SD = 5.80$). No public safety communicators reported having been diagnosed with COVID-19; however, 12 (25.0%) reported a suspected case of COVID-19. There were 2 (4.2%) public safety communicators who reported a COVID-19 diagnosis in their household and 22 (45.8%) members reported having been in contact with a COVID-19 case, with 25 (52.1%) reporting a requirement to isolate.

3.1. Hypothesis 1

Hypothesis one examined the relationship between self-reported symptoms of MDD, GAD, SAD, and PTSD between firefighters, paramedics, and public safety communicators. A repeated-measures ANOVA was completed with measure (e.g., PHQ-9; GAD-7; SIPS; PCL-5) as the within participant factor and occupation as the between participant factor, with both age and gender as covariates. Wilks' Lambda indicated a significant measure by occupation interaction, ($F(6, 574) = 3.79, p < 0.001$). For the PHQ-9, post hoc analyses indicated that paramedics self-reported statistically significantly greater symptoms of MDD than firefighters (mean difference 3.63; $p < 0.001$), but no statistically significant differences relative to public safety communicators; across all analyses for all hypotheses, conservative alpha criteria were set ($p < 0.001$) to control for Type 1 error. For the GAD-7, post hoc analyses indicated that paramedics self-reported statistically significantly greater symptoms of GAD than firefighters (mean difference 3.30; $p < 0.001$), but no statistically significant differences relative to public safety communicators. For the SIPS, post hoc analyses indicated that paramedics self-reported statistically significantly greater symptoms of SAD than firefighters (mean difference 5.70; $p < 0.001$), but no statistically significant differences relative to public safety communicators. For the PCL-5, post hoc analyses indicated that paramedics self-reported significantly greater symptoms of PTSD than firefighters (mean difference 10.29; $p < 0.001$), but no statistically significant difference relative to public safety communicators. Across all measures, paramedics self-reported significantly higher symptoms of mental health challenges as compared to firefighters but were not significantly different relative to public safety communicators.

3.2. Hypothesis 2

Hypothesis 2 states that increasing age was expected to be associated with increased self-reported symptoms of MDD, GAD, SAD, and PTSD at baseline. Partial correlation was completed, using age and measure (PHQ-9; GAD-7; SIPS; PCL-5) as factors and years of service as a covariate. There were statistically significant relationships between age and each measure, with inverse relationships for PHQ-9 ($r = -0.182, p < 0.002$), GAD-7 ($r = -0.118, p < 0.05$), SIPS ($r = -0.182, p < 0.002$), and PCL-5 ($r = -0.156, p < 0.01$).

3.3. Hypothesis 3

Female participants were expected to report greater baseline self-reported symptoms of MDD, GAD, SAD, and PTSD compared to male participants. Independent sample *t*-tests were completed (all occupations included). On the PHQ-9 [$t(1, 298) = -2.417, p = 0.016$], GAD-7 [$t(1, 323) = -3.562, p < 0.001$], SIPS [$t(1, 319) = -2.491, p = 0.013$], and PCL-5

[$t(1, 299) = -2.947, p = 0.003$], female participants (as determined by sex at birth) reported significantly higher symptoms than male participants.

3.4. Hypothesis 4

Independent sample *t*-tests were completed to investigate differences in self-reported symptoms of MDD, GAD, SAD, and PTSD, according to COVID-19 contact (all occupations included). On the PHQ-9 [$t(1, 298) = -4.673, p < 0.001$], GAD-7 [$t(1, 323) = 5.580, p < 0.001$], SIPS [$t(1, 319) = 4.098, p < 0.001$], and PCL-5 [$t(1, 299) = 4.773, p < 0.001$], participants with COVID-19 contact reported significantly higher self-reported symptoms than participants who did not report contact. When analyzed by occupation, for firefighters GAD-7 [$t(1, 98) = 2.802, p = 0.006$], PCL-5 [$t(1, 92) = 2.285, p = 0.025$], and PHQ-9 [$t(1, 92) = 2.719, p = 0.008$] symptoms were significantly more likely to be reported by those that had suspected or confirmed contact; whereas, for public safety communicators, there were no significant differences. For paramedic personnel GAD-7 [$t(1, 183) = 3.220, p = 0.002$], SIPS [$t(1, 182) = 3.317, p = 0.001$], PCL-5 [$t(1, 168) = 2.616, p = 0.010$], and PHQ-9 [$t(1, 167) = 2.231, p = 0.027$] scores were significantly higher in those that had suspected or confirmed contact.

3.5. Hypothesis 5

Independent sample *t*-tests were completed to determine whether, at baseline, there was a statistically significant difference in self-reported symptoms between workers who were required to self-isolate, as compared to those workers that were not required to self-isolate. For firefighters, there was no revealed differences for symptoms of MDD, GAD, SAD, or PTSD between those with and without confirmed exposure. In comparison, for public safety communicators higher scores on SIPS [$t(1, 36) = 3.279, p = 0.002$], PCL-5 [$t(1, 35) = 2.510, p = 0.017$] and PHQ-9 [$t(1, 35) = 2.694, p = 0.011$] were significantly more likely to be reported by those who suspected they had contracted COVID, and GAD symptoms were nearly significantly greater [$t(1, 38) = 1.935, p = 0.060$]. Similarly, for paramedic personnel GAD-7 [$t(1, 183) = 3.251, p = 0.001$], SIPS [$t(1, 182) = 2.361, p = 0.019$], PCL-5 [$t(1, 168) = 3.140, p = 0.002$], and PHQ-9 [$t(1, 167) = 2.622, p = 0.010$] results indicated significantly more symptoms reported by those that were required to self-isolate.

Further, bivariate correlations were completed to determine whether length of isolation was positively related to self-reported mental health symptoms. For firefighters and public safety communicators, there were no significant correlations revealed for length of isolation and GAD-7, SIPS, PCL-5, and PHQ-9 scores. For paramedics, significant correlations were evident for length of self-isolation and SIPS score ($r = 0.269; p < 0.001$), and patterns of similar relationships were evident for PCL-5 ($r = 0.156; p < 0.071$), and PHQ-9 ($r = 0.166; p < 0.056$).

3.6. Hypothesis 6

Independent sample *t*-tests were completed on baseline measures to determine whether there was a statistically significant difference between workers who believed that they had contracted the virus (even if not confirmed by testing), as compared to those first responders that did expect that they had contracted the virus. For firefighters, there was no revealed differences for symptoms of MDD, GAD, SAD, or PTSD between those with and without confirmed exposure. In comparison, for public safety communicators, increased GAD-7 [$t(1, 38) = 2.925, p = 0.006$], PCL-5 [$t(1, 35) = 2.647, p = 0.012$], and PHQ-9 [$t(1, 35) = 2.280, p = 0.029$] were significantly more likely to be reported by those who suspected they had contracted COVID, and SIPS was nearly significant higher [$t(1, 36) = 1.952, p = 0.059$]. Similarly, for paramedics increased GAD-7 [$t(1, 183) = 2.158, p = 0.032$] scores were significantly more likely to be reported by those who suspected they had contracted COVID, and differences PCL-5 scores were nearing significance [$t(1, 168) = 1.964, p = 0.051$].

4. Discussion

Firefighters, paramedics, and public safety communicators are required to support individuals in distress, which necessarily means close physical or psychological contact with members of the public during the pandemic. Usul et al. [37] found over 83% of paramedics in their sample reported treating patients with COVID-19. Direct contact between workers and patients with COVID-19 has been associated with higher levels of stress and burnout, as well as lower levels of compassion satisfaction [38]. Various factors (e.g., working conditions, personal responsibility, personal safety risks, emotional activation, levels of empathy) may exacerbate the experience of stress for different frontline groups managing COVID-19 [13]. Uncertainty can be inherently stressful [38]. Uncertainties surrounding the COVID-19 virus, increased risk of personal exposure to a highly infectious virus, increased precautions needed to protect against infection, fears of unknowingly infecting families or co-workers, and shifts in work patterns during periods of social distancing and stay-at-home orders have compounded negative experiences for PSP during the pandemic [6,7,37,39]. Further, pandemic-related stressors may have increased stress in personal relationships [40], impairment in physical [41] and mental [42] performance, and risks for mental health challenges among PSP [43,44].

The current study intended to contribute to the scant literature regarding PSP well-being during the COVID-19 pandemic. Specifically, we assessed self-reported mental health symptoms among firefighters, paramedics, and public safety communicators using data collected between March 2020 through March 2021 in British Columbia, Canada. We were particularly interested in considering risk factors for the mental health impacts of COVID-19, including occupation, gender, age, COVID-19 exposure, phase of pandemic, and COVID-related worry across a group of professions that differed in exposure to COVID-19 at work. Paramedics had high exposures (77% had direct contact with a COVID-19 positive case) as they were required to treat and transport, while firefighters responded in person without transport of patients (49% had contact with a COVID positive case) and public safety communicators had no in person contact with those requiring assistance (although 46% had been in contact with a COVID-19 positive person).

In April 2020, BC firefighters were “ordered to stop responding to all but the most dire medical emergency calls during the COVID-19 pandemic”, reducing the amount of exposure to COVID-related calls for BC firefighters compared to BC paramedics [45]. Similarly, public safety communicators have a lower risk of occupational related exposure to COVID-19 patients compared to paramedics, as public safety communicators do not respond physically to emergency calls. The hypothesis that paramedics would be most at risk for self-reported mental health symptoms was supported by the results; however, while paramedics were more likely to report symptoms of MDD, GAD, SAD, and PTSD than firefighters, neither paramedics nor firefighters differed from public safety communicators on any of the mental health variables.

With respect to self-reported sex at birth, nearly half of the paramedic participants in our data set were male, compared to the predominately male firefighter participants and predominantly female public safety communicator participants. Previous literature suggests women are more likely to experience post-traumatic stress injury and suffer from it as a chronic condition even though men are more likely to live through potentially traumatic events [29,30]. As such, female participants (as identified by sex at birth) in the present study were expected to report more mental health symptoms than male participants, which was supported by the current results. Given that our sex-based analysis indicated that females reported greater mental health symptoms, and paramedic participants appeared to have increased risk related to increased occupationally defined physical contact, our results are consistent with previous literature. Together, the results suggest that risk factors for reporting symptoms one or more mental health disorders for PSP during the pandemic were likely linked to both occupation type and sex.

Age has been consistently associated with severe health outcomes related to COVID-19 [27,28]. Consequently, it was hypothesized that PSP age would be related to increased self-reported

mental health symptoms, as PSP with increased age would be expected to experience more worry regarding the potential for severe outcomes to self and family. The current results contrasted this hypothesis; age was inversely related to self-reported symptoms of MDD, GAD, SAD, and PTSD (years of service was used as a covariate) such that older PSPs in this sample were less likely to report mental health symptoms. It is difficult to present possible explanations for our unexpected finding, but perhaps the relationship between age and psychological symptoms during the COVID-19 pandemic is more complicated than our current analyses. That is, we suggest that this relationship may be mediated by multiple factors including mental health status pre-pandemic, years of service, and a shift to managerial and less operational duties, in particular service related to communicable disease; consequently, future research considering modelling analyses that can take all of these factors into account simultaneously is suggested.

The current results indicate that PSP who had experienced a personal contact with COVID-19 reported more mental health symptoms. The link between confirmed contact and mental health symptoms may be related to feelings of increased risk, impact of related isolation, inability to continue with daily activities, or a variety of other possible contributing factors (as demonstrated by Vujanovic et al. [8]). This finding seemed to be particularly true for firefighters and paramedics [8]. The results further suggested that the requirement for self-isolation and length of time in isolation were predictive of increased mental health symptoms for public safety communicators and paramedics, with a positive relationship between mental health symptoms and length of self-isolation also evident for paramedics. This is similar to results reported by Wu et al. [46] who found increased mental health problems in persons who were required to quarantine [46,47], potentially compounded by reduced access to mental health services during the pandemic. Finally, paramedics and public safety communicators were also found to be more at risk of self-reporting mental health symptoms if they perceived that they had contracted the COVID-19 virus (even if not confirmed through testing).

The present study contributes to the limited data on Canadian PSP during the COVID-19 pandemic. The limitations of the current study provide important directions for future research. First, the data were collected cross-sectionally. Longitudinal data would help to clarify causal relationships and patterns of change over time. Second, the current study used only a single sample for each of only three PSP occupations. Including data from more diverse samples, including family status, may help to identify differences that can inform important opportunities for supporting PSP mental health. Third, Phase 1 self-reported COVID-worry relied on participant memory, which means there is an unknowable amount of recall bias associated with the results. Future research should collect the data over time to minimize such biases. Fourth, we did not collect information on baseline MDD or GAD symptoms such that we were not able to determine differences between pre-pandemic mental health symptoms and those experienced during the pandemic specifically. Finally, participation in the study was voluntary leading to the possibility that selection bias may have been a factor in the responses collected; similarly, because invitations to participate were sent by union executives and management, we were unable to determine a response rate for completion of surveys.

5. Conclusions

The present study provides a first glance at the impacts of COVID-19 on the mental health profiles of firefighters, paramedics, and public safety communicators and some of the factors associated with self-reported symptoms of one or more mental health disorders. The data demonstrates that both sex and occupation are factors related to increased symptoms, as were periods of isolation and expecting having been COVID-19 positive. PSP reported feeling less worried about COVID-19 as the pandemic progressed. Higher COVID-related worry was associated with higher mental health symptoms for all PSP, and self-reported mental health symptoms were also related to personal contact with COVID-19 infection. In conclusion, results suggest that the COVID-19 pandemic may have had notable impacts on

mental health status for PSP and tailored supports are prudent to manage the COVID-19 pandemic stressors in PSP populations.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data is only available on request due to privacy/ethical restrictions. The data are not publicly available due to their containing information that could compromise the privacy of research participants.

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Conflicts of Interest: The authors declare no conflict of interest. Written informed consent for publication must be obtained from participating patients who can be identified (including by the patients themselves). Please state “Written informed consent has been obtained from the patient(s) to publish this paper” if applicable.

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