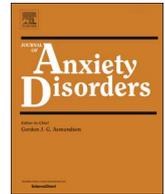




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## Anxiety-related psychopathology and chronic pain comorbidity among public safety personnel

R.N. Carleton<sup>a,\*</sup>, T.O. Afifi<sup>b</sup>, T. Taillieu<sup>b</sup>, S. Turner<sup>b</sup>, R. El-Gabalawy<sup>b</sup>, J. Sareen<sup>b</sup>, G.J.G. Asmundson<sup>a</sup>

<sup>a</sup> Anxiety and Illness Behaviour Laboratory, Department of Psychology, University of Regina, Regina, SK, S4S 0A2, Canada

<sup>b</sup> Rady Faculty of Health Sciences, University of Manitoba, Winnipeg, MB, R3E 0W3, Canada

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## ABSTRACT

Canadian Public Safety Personnel (PSP; e.g., correctional service officers, dispatchers, firefighters, paramedics, police officers) regularly experience potentially traumatic, painful, and injurious events. Such exposures increase risk for developing mental disorders and chronic pain, which both involve substantial personal and social costs. The interrelationship between mental disorders and chronic pain is well-established, and both can be mutually maintaining; accordingly, understanding the relationship between mental health and chronic pain among PSP is important for improving health care. Unfortunately, the available research on such comorbidity for PSP is sparse. The current study was designed to provide initial estimates of comorbidities between mental disorders and chronic pain across diverse PSP. Participants included 5093 PSP (32% women) in six categories (i.e., Call Center Operators/Dispatchers, Correctional Workers, Firefighters, Municipal/Provincial Police, Paramedics, Royal Canadian Mounted Police) who participated in a large PSP mental health survey. The survey included established self-report measures for mental disorders and chronic pain. In the total sample, 23.1% of respondents self-reported clinically significant comorbid concerns with both mental disorders and chronic pain. The results indicated PSP who reported chronic pain were significantly more likely to screen positive for posttraumatic stress disorder (PTSD), major depressive disorder, generalized anxiety disorder, social anxiety disorder, and alcohol use disorder. There were differences between PSP categories; but, the most consistent indications of comorbidity were for chronic pain, PTSD, and major depressive disorder. Comorbidity between chronic pain and mental disorders among PSP is prevalent. Health care providers should regularly assess PSP for both symptom domains.

### 1. Introduction

Public Safety Personnel (PSP) can include, but are not limited to, persons working as Correctional Workers (security and non-security roles), Call Center Operators/Dispatchers, Firefighters, Paramedics, and Police Officers (Oliphant, 2016). The nature of PSP employment inherently involves exposure to emotionally and physically stressful events (e.g., fires, resuscitations, arrests), many of which may be traumatic or injurious (American Psychiatric Association, 2013; Galatzer-Levy, Madan, Neylan, Henn-Haase, & Marmar, 2011; Komarovskaya et al., 2011). Indeed, such exposures appear to increase risk for several mental disorders (e.g., posttraumatic stress disorder; PTSD), major depressive disorder, panic disorder, generalized anxiety disorder, social anxiety disorder, alcohol use disorder; American Psychiatric Association, 2013; Carleton, Afifi, Turner, Taillieu, Duranceau et al., 2018; Fetzner, McMillan, Sareen, & Asmundson,

2011; Sareen et al., 2007). PSP employment typically involves regular periods of substantial physical stress (e.g., engaging with public safety incidents such as fires, resuscitations, arrests), as well as extended periods of potential inactivity (e.g., time between duty calls; Parsons, 2004). The result can be increased risk for physical injuries (e.g., Corbeil et al., 2017; Frost, Beach, Crosby, & McGill, 2015; Lyons, Radburn, Orr, & Pope, 2017) and chronic pain (i.e., pain persisting longer than three months; International Association for the Study of Pain, 1994) for PSP (Carleton et al., 2017).

International estimates of mental disorders among PSP are relatively uncommon and the available estimates range from 10% to 35% (Haugen, Evces, & Weiss, 2012; Oliphant, 2016); however, most available estimates have been based on single categories of PSP (e.g., assessing only police) and often with relatively small samples (Asmundson & Stapleton, 2008; Haugen et al., 2012; Horswill, Jones, & Carleton, 2015; Oliphant, 2016). Recent Canadian research with a large

\* Corresponding author.

E-mail addresses: [Carleton@uregina.ca](mailto:Carleton@uregina.ca) (R.N. Carleton), [Tracie.Affifi@umanitoba.ca](mailto:Tracie.Affifi@umanitoba.ca) (T.O. Afifi), [Tamara.Taillieu@umanitoba.ca](mailto:Tamara.Taillieu@umanitoba.ca) (T. Taillieu), [Sarah.Turner@umanitoba.ca](mailto:Sarah.Turner@umanitoba.ca) (S. Turner), [Renee.El-Gabalawy@umanitoba.ca](mailto:Renee.El-Gabalawy@umanitoba.ca) (R. El-Gabalawy), [Jitender.Sareen@umanitoba.ca](mailto:Jitender.Sareen@umanitoba.ca) (J. Sareen), [Gordon.Asmundson@uregina.ca](mailto:Gordon.Asmundson@uregina.ca) (G.J.G. Asmundson).

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sample of diverse PSP suggests many (i.e., 44.5%) screen positive for one or more mental disorders based on established self-report measures (Carleton, Afifi, Turner, Taillieu, Duranceau et al., 2018). The results for PSP mental disorder estimates starkly contrast global epidemiology meta-analytic estimates that are based on interviews for Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013) criteria instead of self-report screening measures from the general global population (i.e., 17.6%; Steel et al., 2014) and from Canada specifically (i.e., ~10.1%; Statistics Canada, 2012). Mental illness accounts for approximately one third of global disability (Vigo, Thornicroft, & Atun, 2016), with associated annual economic costs for mental disorders in Canada estimated in the billions (Whiteford et al., 2013) and in the USA estimated in the hundreds of billions (Greenberg, Fournier, Sisitsky, Pike, & Kessler, 2015).

International estimates of chronic pain among PSP are also relatively uncommon and the available estimates vary greatly. Among samples of police officers, 1-year prevalence estimates range between 44% and 62%, with many reporting their chronic pain began after joining the police force (Beaton, Murphy, & Pike, 1996; Brown, Wells, Trottier, Bonneau, & Ferris, 1998; Cho, Jeon, Lee, Seok, & Cho, 2014; Gershon, Lin, & Li, 2002). Paramedics and emergency medical technicians have self-reported similarly high rates of chronic pain, ranging from 48% to 71% or more (Beaton et al., 1996; Rahimi, Vazini, Alhani, & Anooosheh, 2015; Studnek, Crawford, Wilkins, & Pennell, 2010). Firefighters have reported a broader range, from 16 to 47%, with evidence that the prevalence of chronic pain increases with length of service (Beaton et al., 1996; Bos, Mol, Visser, & Frings-Dresen, 2004; Lusa, Miranda, Luukkonen, & Punakallio, 2015; Punakallio, Lusa, Luukkonen, Airila, & Leino-Arjas, 2014). Recent Canadian PSP estimates suggest chronic pain may be experienced by as many as 54.9% of PSP (Brown et al., 1998). The results for PSP chronic pain estimates also starkly contrast epidemiology estimates from the general population. A pooled global estimate suggests approximately 31% of people report chronic pain (Steingrimsdottir, Landmark, Macfarlane, & Nielsen, 2017), with 11.1% of a large American sample ( $n = 8781$ ) reporting having pain most days and another 20.2% reporting having pain every day (Nahin, 2015). In Canada, approximately 25% of the general population reports chronic pain (Boulanger, Clark, Squire, Cui, & Horbay, 2007), with 12-year incidence rates up to 39% (Reitsma, Tranmer, Buchanan, & VanDenKerkhof, 2012), point prevalence rates of 12%, and 1-month prevalence rates of 23% (Hoy et al., 2012). The associated annual economic costs for chronic pain in Canada are estimated in the billions (Park et al., 2015) and in the United States are estimated in the hundreds of billions (Gatchel, McGeary, McGeary, & Lippe, 2014).

There is substantial evidence of comorbidity between chronic pain and mental disorders (Demmytenaere et al., 2007; McWilliams, Cox, & Enns, 2003). Contemporary pain and trauma theories (Asmundson & Katz, 2009) as well as DSM-5 classifications (American Psychiatric Association, 2013) suggest an important and interactive relationship between PTSD and chronic pain (Asmundson, Coons, Taylor, & Katz, 2002; Asmundson, Norton, Allardings, Norton, & Larsen, 1998; Sharp & Harvey, 2001). Comorbidity between PTSD and chronic pain appears particularly high, ranging up to 80% (Brennstuhl, Tarquinio, & Montel, 2014), argued as potentiated by shared underlying vulnerabilities and mutual maintenance (Asmundson et al., 2002; Sharp & Harvey, 2001). Indeed, a recent meta-analysis underscored the broad importance of the shared underlying vulnerabilities for PTSD throughout the general population (Pacella, Hruska, & Delahanty, 2013).

The shared vulnerability model (Asmundson et al., 2002) posits psychological and biological vulnerabilities interact with potentially traumatic exposures to produce emotional responses characterized by hypervigilance, cognitive biases, and avoidance. The mutual maintenance model posits that pain cues memories of exposures to potential traumas, and memories of exposures to potential traumas cue experiences of pain (Sharp & Harvey, 2001). Accordingly, understanding the relationship between mental disorders and chronic pain may be

particularly important for PSP who appear regularly exposed to potentially traumatic and injurious stressors (American Psychiatric Association, 2013).

Previous PSP research on the comorbidity between mental disorders and chronic pain has been limited by small sample sizes, work with a single category of PSP (e.g., only police officers), small geographic catchment areas, use of exclusively clinical samples, the use of diverse measurement tools, and a focus on PTSD. The current study was designed to overcome such limitations by using a large, national, diverse sample of PSP assessed using broadly-accepted and validated screening measures. The results are intended to provide initial PSP estimates of the comorbidities between mental disorder symptoms and chronic pain. Doing so will help inform growing efforts in support of PSP (Oliphant, 2016), provide insights for assessment recommendations to health professionals working with PSP as well as PSP leaders, and inform efforts at bolstering PSP resilience (Varker & Devilly, 2012).

## 2. Methods

### 2.1. Data and sample

Data were collected using web-based survey methods using established guidelines for web-based survey research (Ashbaugh, Herbert, Butler, & Brunet, 2010). The survey was available in English or French from September 1, 2016 to January 31, 2017. Participants were recruited using several strategies, including email invitations to PSP from the Public Safety Steering Committee (PSSC) of the Canadian Institute for Public Safety Research and Treatment (CIPSRT), provincial and municipal public safety organizations, and several advocacy organizations. A video invitation to participate was also prepared by the Minister of Public Safety and Emergency Preparedness. Further details of participant recruitment and data collection methods have been published elsewhere (Carleton, Afifi, Turner, Taillieu, Duranceau et al., 2018; Carleton et al., 2017).

A total of  $n = 8520$  began the survey and answered at least the first question (i.e., “Please indicate which category of First Responders or other Public Safety Personnel you feel best describes your current occupation”); however, only  $n = 5093$  (59.8%) persons progressed far enough through the survey to complete the sections required for the current analysis (i.e., chronic pain and mental disorder symptoms modules) and could be definitively placed into one of the six PSP categories of interest (i.e., Municipal/Provincial Police, RCMP, Corrections, Firefighters, Paramedics, and Call Centre Operators/Dispatchers) in this study. The data collection procedure prohibited an accurate estimate of the response rate; however, based on the 2011 Statistics Canada National Household Survey data, there are approximately 161,000 Canadians working as PSP (Statistics Canada, 2011). The study was approved by the University of Regina Institutional Research Ethics Board (File #2016-107).

### 2.2. Measures

#### 2.2.1. Chronic pain

Current chronic pain experiences were assessed with self-report items based on work done by the International Association for the Study of Pain (Loeser & Treede, 2008) and previous reviews (Katz, Rosenbloom, & Fashler, 2015; Steingrimsdottir et al., 2017); as such, in all cases chronic pain was based on self-report, even when referred to only as chronic pain. In the current study we asked participants to self-report on the following questions: “Do you experience chronic pain defined by pain more days than not, lasting longer than 3 months?”, with response categories including “Yes” ( $n = 1859$ ), “Yes, but I’d rather not discuss it” ( $n = 176$ ), “No” ( $n = 3030$ ), and “Prefer not to answer” ( $n = 28$ ). Dichotomous coding was used to compute the chronic pain variable: Participants who reported “Yes” or “Yes, but I’d rather not discuss it” were coded as experiencing chronic pain

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