A ROLE IDENTITY PERSPECTIVE ON PARAMEDIC MENTAL HEALTH

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LAY ABSTRACT

Role identity theory explains having a sense of purpose and meaning people from social roles (such as a parent or volunteer) is good for health and well-being. Paramedics are an important part of Canada's public safety infrastructure and generally hold a respected position in society, but there is growing recognition of a mental health crisis within the profession. I used role identity theory to explore why and how role identity theory could contribute to poor mental health among paramedics. By surveying and interviewing paramedics from a single paramedic service in Ontario, Canada, I discovered that 25% of active-duty paramedics met the criteria for either post-traumatic stress disorder, depression, or anxiety. The risk varied across demographic categories, including gender. During the interviews, I discovered that role identity conflict – a discrepancy between what the paramedic thinks their role should be and what is achievable – can lead to significant psychological distress.

ABSTRACT

Introduction

Role identity theory explains that people derive a sense of purpose and meaning from holding social roles, which, in turn, is linked with health and well-being. Paramedics have a respected role in society but high rates of mental illness. I used role identity theory to explore what might be contributing to poor mental health among paramedics.

Objectives

My objectives were to estimate the prevalence of Post-Traumatic Stress Disorder (PTSD), depression, and anxiety; assess for relationships with a measure of paramedic role identity; and finally, explore how role identity conflict could lead to distress.

Methods

I used a mixed methods approach situated in a single paramedic service in Ontario, Canada, distributing a cross-sectional survey during the fall 2019/winter 2020 Continuing Medical Education (CMEs) sessions while also interviewing a purposively selected sample of 21 paramedics. The survey contained a demographic questionnaire, a battery of self-report measures, and an existing paramedic role identity scale. Each interview was transcribed verbatim and analyzed thematically with role identity theory as a conceptual framework.

Results

In total, 589 paramedics completed the survey (97% of CME attendees), with 11% screening positive for PTSD, 15% for major depressive disorder, 15% for generalized anxiety disorder, and 25% for any of the three. Full-time employees, women, those with ‘low’ self-reported resilience, and current or former members of the peer support team were more likely to screen positive. The dimensions of paramedic role identity were not associated with an increased risk; however, I defined a framework through the interviews wherein chronic, identity-relevant disruptive events contribute to psychological distress and disability.

Conclusions

Our prevalence estimates were lower than have been previously reported but point to a mental health crisis within the profession. Role identity theory provided a useful framework through which to reconceptualize stressors.

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Finally, I would like to thank the members of Peel Regional Paramedic Services for their selfless participation in this research, without which, the findings I share here would not be possible.

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

LIST OF ABBREVIATIONS

ACP = Advanced Care Paramedic
ANOVA = Analysis of Variance
BRS = Brief Resilience Scale
CAF = Canadian Armed Forces
CAS = Children's Aid Society
CBC = Canadian Broadcasting Corporation
CI = Confidence / Compatibility Interval
CIHR = Canadian Institutes of Health Research
CIPSRT = Canadian Institute for Public Safety Research and Treatment
CISD = Critical Incident Stress Debriefing
CISM = Critical Incident Stress Management
CME = Continuing Medical Education
COVID = Coronavirus Disease
CSA = Canadian Standards Association
DSM = Diagnostic and Statistical Manual of Mental Disorders
EMS = Emergency Medical Services
EMS-RIS = Emergency Medical Services Role Identity Scale
EMT = Emergency Medical Technician
GAD-7 = Generalized Anxiety Disorder
HiREB = Hamilton Integrated Research Ethics Board
IES = Impact of Events Scale
OLS = Ordinary Least Squares Regression
OPSEU = Ontario Public Service Employees Union
OR = Odds Ratio
PAC = Paramedic Association of Canada
PCL-5 = Post-Traumatic Stress Disorder Checklist
PCP = Primary Care Paramedic
PHQ-9 = Patient Health Questionnaire
ProQOL = Professional Quality of Life Scale
PRPS = Peel Regional Paramedic Services
PSP = Public Safety Personnel
PTSD = Post-Traumatic Stress Disorder
R2MR = Road to Mental Readiness
RCMP = Royal Canadian Mounted Police
UTI = Urinary Tract Infection

DECLARATION OF ACADEMIC ACHIEVEMENT

The work presented here contributes to our scholarly knowledge of the prevalence of, risk factors for, and theoretical understanding of mental illness among paramedics submitted in partial fulfillment of the requirements for the degree Doctor of Philosophy at McMaster University in the Department of Health Research Methods, Evidence, and Impact.

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Drs. Elizabeth Anne Donnelly, Sandra Moll, Sheila Harms, Walter Tavares and Meghan McConnell are co-investigators on the research and co-author the papers contained in this thesis.

Chapter 2 has been accepted for publication in the *International Journal of Environmental Research and Public Health* as part of a special call for papers on mental health and well-being among public safety personnel. Chapter 3 has been published in the *Journal of Workplace Behavioral Health*. Chapter 4 has been published in the *International Journal of Environmental Research and Public Health* as part of a special call for papers on mental health and well-being among public safety personnel.

I was responsible for the conception of the research program and design of the methods; the preparation of the grant and research ethics board applications; the collection, analysis, and interpretation of data; and finally, the preparation, submission, and correspondence related to of all manuscripts described in this thesis.

CHAPTER 1: INTRODUCTION

1.1 Background

Paramedic mental health in Canada has garnered significant attention over the last five years, thanks, in part, to a growing number of paramedics who have publicly shared their struggles with post-traumatic stress disorder (PTSD) (Abedi, 2017; Wilson, 2018). Advocacy efforts by community groups such as the Tema Conter Memorial Trust, Wings of Change, Boots on the Ground, Badge of Life Canada, and the Canadian chapter of the Wounded Warriors foundation have helped 'raise alarm' over PTSD and - in particular - suicide in the paramedic community. For example, the 2018 full-length documentary *After the Sirens* produced by the Canadian Broadcasting Company (CBC) highlighted the mental health challenges faced by paramedics (Eastwood, 2018). This paralleled growing media coverage of several high-profile instances in which paramedics died by suicide, including the 2018 death of 31-year-old Andréanne Leblanc. Andréanne was one of the paramedics who responded to a 2017 mass shooting at a Quebec City Mosque that left 6 people dead and 19 wounded (Dougherty, 2018). After her death, Andréanne's mother spoke publicly about her daughter's struggles with PTSD after the shooting and the need for more support for paramedics who experience mental health challenges because of their work. The result has been a growing awareness of the mental health challenges paramedics face in the course of their duties, and an urgency to address a plethora of suicides among public safety personnel that has since been described as a crisis in Canada (Koopmans et al., 2017). In response, the paramedic community has seen a growing number of mental health services and programs, including the introduction of workplace resilience training (Szeto et al., 2019), peer support teams (Anderson et al., 2020), therapy dogs (Hill et al., 2021), the development of standards for workplace psychological health and safety (Canadian Safety Association, 2018), and legislative changes that alleviate the burden of proof previously required to attribute a diagnosis of PTSD to work-related causes (Government of Ontario, 2016). In addition, federal budgets have expanded to include funds for research as well as memorial grants to support the family of public safety personnel who have died by suicide (Public Safety Canada, 2018). It is important, however, to ensure that the organizational and legislative response to this important health issue is grounded in an appropriate evidentiary basis, lest we implement well-intentioned programs that outpace the science. Such a concern is not without precedent, as happened, for example, with the development and wide scale implementation of critical incident stress debriefing programs (Everly et al., 2000) for first responders in the 1990s. Despite their popularity, later investigations discovered either a lack of effectiveness or, in some cases, an increased risk of harm (Devilly & Cotton, 2003; Flannery & Everly, 2004).

There are a number of barriers to implementing evidence-informed strategies to support paramedic mental health. First, research describing the topic is a challenging body of literature to review. There are no paramedic or even first responder-specific mental health journals, and only a small portion of the research finds its way into the handful of paramedic journals that exist. Investigations into paramedic mental health cut across multiple disciplines, including psychology, psychiatry, social work, occupational therapy, occupational health and safety, and sports medicine, to name a few. Although 'post-traumatic stress disorder' and 'critical incident' are two frequently used terms in this literature, the commonalities end there. As a construct, mental health is broad, with a focus that increasingly looks beyond a pathological (or diagnostic) orientation on illness, and instead takes a more holistic view of wellness. In reviewing the extant literature on paramedic mental health, my goal was to cast an intentionally broad net to acclimate

to the topic, language, journals, and authors, and then narrow in on specific issues around which to structure a research program. This meant using an iterative rather than systematic approach to reviewing the literature, in a manner that was essentially analogous to the purposive and theoretically guided sampling strategies (Gentles et al., 2015) common to some qualitative research methodologies. I defined three questions to guide my literature review:

1. **What is the scope of the problem** in terms of the existing epidemiological data describing mental illness among paramedics?
2. **What are the stressors**, working conditions, risk factors and features of organizational or professional culture ('**the issues**') that are contributing to adverse mental health outcomes; or, put another way, what are we collectively 'talking about' in terms of paramedic mental health?
3. And lastly, **what aren't we talking about** in terms of methodological and conceptual gaps in the literature that limit our understanding of the topic?

1.2 What is the scope of the problem? The Epidemiology of Paramedic Mental Health

In 2012, Berger and colleagues estimated the international prevalence of PTSD among 'rescue workers' at 10% (Berger et al., 2012). Their meta-analysis included 28 publications from 14 countries with a pooled sample of more than 20,000 participants, and when stratified by occupation, they found that 'ambulance workers' had a pooled prevalence rate of 15% (Berger et al., 2012). Beyond their suggestion of higher rates of PTSD among ambulance workers, the study by Berger et al. is instructive for a few reasons. First, as they themselves noted, the category of 'rescue worker' is heterogeneous, particularly among the subgroup of ambulance workers. What we would typically think of as ambulance services in a Canadian context looks very different in other countries; who works on the ambulance, their level of training and education, their pay, the funding model, the social status of the work, the working conditions, and even the type of work itself all vary widely across countries. Second, the methods used in generating the prevalence estimates included in the individual studies were also inconsistent. While most studies used cross-sectional surveys with self-report measures, some used clinical interviews, and within both groups, the screening instruments themselves, the diagnostic threshold, and the degree of functional impairment all varied. Self-report measures with an a priori cut score tended to return slightly higher prevalence rates (~10.5%) than interview methods (~9.3%) blueprinted to the Diagnostic and Statistical Manual of Mental Disorders (DSM) (Berger et al., 2012). Importantly, even within the DSM, the diagnostic criteria changed with the transition from the DSM-IV to the DSM-V. In total, just 8 of the 28 included studies studied ambulance personnel (Berger et al., 2012). Lastly, the study focused exclusively on PTSD as its health outcome of interest. While undeniably important, the approach excludes other forms of ill mental health that may result from paramedic work.

In light of this heterogeneity, I decided to focus my review on studies reporting prevalence estimates in a Canadian context. As Berger and colleagues (2012) noted, geopolitical differences matter; regional variations in paramedic service delivery, caseload, working conditions, pay, and political climate are all likely to influence mental health. While I considered international studies

as ‘sensitizing’ (Charmaz, 2008) concepts, I developed my program of research based on a focused review of studies that had been conducted in Canada specifically.

1.3 Studies of Paramedic Mental Health in Canada

Our understanding of the epidemiology of paramedic mental health in Canada is quite limited. For example, in 2002 study using a convenience sample of 86 (of ~800) paramedics in Toronto, Ontario, Regehr and colleagues reported that 29% of survey participants had taken a mental health stress leave from work (Regehr et al., 2002). Although not specifically intended to estimate the prevalence of mental illness, their survey included various measures to explore exposure to critical incidents, and symptoms consistent with depression and post-traumatic stress. The goal was to examine the relationship between traumatic stress symptoms, social support, demographic characteristics and mental health stress leave. In total, 29% of participants met the criteria for high levels of traumatic stress (Regehr et al., 2002). Participants who had taken a mental health stress leave were more likely to have symptoms of high levels of traumatic stress and report lower levels of perceived social support.

Some years later, as part of a program of research into critical incident stress among paramedics, Halpern and colleagues recruited a sample of 228 (of 906; 25%) paramedics in Toronto and found that 24% of participants had high levels of depressive symptoms, 29% met the criteria for burnout, and 8% reported post-traumatic stress symptoms (Halpern et al., 2011). Here, again, the goal was not specifically to estimate the prevalence of mental illness per se, but rather to examine the association between exposure to critical incidents and adverse mental health outcomes, and whether that relationship is modified by symptoms of an acute stress response. They found that the risk of post-traumatic stress and depressive symptoms increased significantly if a paramedic reported experiencing symptoms of an acute stress reaction, such as disturbed sleep, irritability, social withdrawal, or a racing heart - particularly if these symptoms persisted for more than one night (Halpern et al., 2011). Halpern and colleagues’ related research explored the features of emergency calls that make the incident ‘critical’ for the paramedics (Halpern et al., 2009b) and also examined what organizational supports are most meaningful to paramedics after experiencing a critical incident (Halpern et al., 2009a; Halpern et al., 2014); more about both later.

Another study by Regehr examined the relationship between involvement in a postmortem review (such as a medical review that occurs after the potentially preventable death of a patient) or a coroner’s inquest on symptoms of post-traumatic stress and depression among paramedics and firefighters in the Greater Toronto Area (Regehr et al., 2016). Their sample included 178 firefighters and 86 paramedics, each group having been recruited from a single fire or paramedic service, respectively. Although a denominator and response rate were not provided, and the goal was not to specifically estimate prevalence, their analysis found that 20% of the sample met the criteria for high or severe levels of post-traumatic stress, and 8.4% met the criteria for mild depressive symptoms (Regehr et al., 2016). Participants who reported exposure to a critical incident or who had participated in a postmortem review or coroner’s inquest had higher levels of post-traumatic stress and depressive symptoms (Regehr et al., 2016).

Finally, Donnelly and colleagues recruited a sample of 145 paramedics (of 269 eligible; 54%) from a single paramedic service in Ontario with the goal of examining the relationship between chronic and critical incident stress with symptoms of post-traumatic stress (Donnelly et al., 2016). Similar to the other investigations, the goal was not to estimate prevalence specifically, but to examine various factors (in this case, different forms of workplace stress) on post-traumatic stress symptoms. Donnelly and colleagues found that critical incident and operational stress (and an interaction between the two) were significantly associated with post-traumatic stress, collectively accounting for 39% of the variance in PTSD symptom scores (Donnelly et al., 2016).

While each of these investigations recognized the possibility that potentially diagnosable levels of symptoms consistent with various mental illnesses (most commonly PTSD) were high among paramedics, none were specifically intended to estimate the prevalence of mental illness. This means that, to this point, the epidemiology of mental illness among paramedics in Canada had not been previously explored. Where we see this as a specific goal for the first time is in a study by the (then newly formed) Canadian Institute for Public Safety Research and Treatment (CIPSRT).

1.4 The Canadian Institute for Public Safety Research and Treatment (CIPSRT) Studies

As part of a federal mandate to develop a national action plan to address PTSD among public safety personnel (PSP) in Canada (Canadian Institute for Public Safety Research and Treatment, 2020), CIPSRT undertook the first of several investigations to estimate the prevalence of mental disorder symptoms among a diverse sample of public safety personnel from across the country. Carleton and colleagues made available a comprehensive online survey across a broad range of PSP categories, including federal, provincial, and municipal police services; corrections services; professional and volunteer firefighters; 911 communications personnel; and paramedics (Carleton, et al., 2018). The survey contained a battery of well validated and widely used self-report symptom measures to assess for symptoms of PTSD, depression, anxiety disorders (Carleton, et al., 2018) , chronic pain (Carleton et al., 2017), alcohol use (Carleton, et al., 2018), suicidality (Carleton et al., 2018), disturbed sleep (Angehrn et al., 2020), problems with physical health (Sommer et al., 2020), and a history of exposure to traumatic events (Carleton et al., 2019; Carleton et al., 2020), and childhood trauma (Turner et al., 2018), in addition to a comprehensive demographic questionnaire. Among paramedics specifically, the survey was distributed through the Paramedic Association of Canada (PAC) and its constituent provincial chapters, as well as various individual paramedic services (Carleton, et al., 2018). A link to the survey was also circulated on social media, and the (then) Minister of Public Safety and Emergency Preparedness encouraged participation through an online video address.

In total, 8,520 public safety personnel began the survey (Carleton, et al., 2018). The number of participants who completed the survey varies depending on the publication (i.e., *how far* into the survey the participants progressed), but the completion rate across manuscripts is around 60%, for a sample of approximately 5,000-6,000 participants, of which between 600-700 were paramedics (Carleton, et al., 2018). Among the paramedic subgroup specifically, Carleton and colleagues discovered that 311 (49.1%) of paramedics met the screening criteria for any one of the mental disorders they included in their investigation (Carleton, et al., 2018). This made

paramedics the third largest - behind corrections workers (54.6%), and the Royal Canadian Mounted Police (RCMP; 50.2%) - in terms of the proportion of positive screens (Carleton, et al., 2018). More specifically, 24.5% of paramedics met the screening criteria for PTSD, 29.6% for major depressive disorder, 20.5% for generalized anxiety disorder, 20.0% for social anxiety disorder, 10.3% for panic disorder, and 6.1% for problematic alcohol use (Carleton, et al., 2018). In subsequent publications from the same dataset, Carleton and colleagues reported that 44.1% of paramedic participants reported chronic pain (Carleton et al., 2017), 60% met the screening criteria for insomnia (Angehrn et al., 2020), and 15.4%, 7.1%, and 1% of paramedics reported suicidal ideation, planning, or attempts, respectively within the past year (Carleton et al., 2018). When expanded to lifetime suicidal ideation, planning, or attempts, the estimates rose to 44.1%, 23.8%, and 9.8%, respectively (Carleton et al., 2018) - rates of suicidality second only to correctional workers. The same dataset also revealed high rates of neurological, digestive, endocrine/metabolic, and respiratory disorders among paramedics (Sommer et al., 2020). At the same time, Carleton and colleagues found that paramedics reported high rates of exposure to potentially traumatic events (Carleton et al., 2019; Carleton et al., 2020), low levels of perceived social support (Carleton et al., 2019), high rates of childhood experiences of violence, with 60.4% of surveyed paramedics disclosing been abused as a child (Turner et al., 2018). In terms of risk, self-reported experiences of traumatic events (Carleton et al., 2019; Carleton et al., 2020), childhood abuse (Turner et al., 2018), and low levels of perceived social support (Carleton et al., 2019; Vig et al., 2020) were all associated with an increased risk of screening positive for a mental disorder (Carleton, et al., 2018) or suicidality (Carleton et al., 2017; Carleton et al., 2018), and positive psychiatric screens were often comorbid with other health outcomes, such as chronic pain (Carleton, et al., 2018; Carleton et al., 2017). Generally speaking, and compared to other public safety categories, the paramedic subgroup tended to have higher rates of exposure to trauma (Carleton et al., 2019), child abuse (Turner et al., 2018), and positive mental disorder screens (Carleton, Afifi, Turner, et al., 2018).

The survey by Carleton and colleagues was a landmark investigation into mental health among public safety personnel. Indeed, it was the *only* study specifically intended to gather comprehensive data about the prevalence of mental illness among paramedics and was the first to make an attempt at gathering nationally representative data. There have now been more than a dozen publications resulting from the initial survey, and their findings provide a baseline to which subsequent investigations can compare.

1.5 What are the Issues, Stressors, Working Conditions, & Risk Factors Contributing to Paramedic Mental Health?

Exposure to potentially traumatic events is an established risk factor for psychological sequelae, such as PTSD (Creamer et al., 2003). Given that paramedic work involves repeated exposures to many incidents that satisfy the criteria of being potentially traumatic over the course of many years, one early line of inquiry has been to identify the subset of emergency calls most likely to cause emotional and psychological distress. These are emergency calls that overwhelm a paramedic's ability to cope and have been termed *critical incidents* (Mitchell, 1983). This is perhaps the workplace stressor within paramedicine we know the most about, and as a result, a number of investigations, including several studies in Canada, have sought to define the features of critical incidents (i.e., what makes an incident 'critical') and correlate exposure with later

psychological distress (Carleton et al., 2019; Donnelly, 2012; Halpern et al., 2009b; Halpern et al., 2011, 2014). The result has been the production of various critical incident *inventories* (Donnelly & Bennett, 2014; Halpern et al., 2012) that describe especially distressing emergency calls (such as the death of a child), and a number of strategies on an organizational level intended to manage the stress associated with critical incident exposure, such as Critical Incident Stress Management (CISM) programs (Everly et al., 2000; Flannery & Everly, 2004). CISM describes a systematic framework to mitigate the risk of critical incident exposure that includes pre-incident training, post-incident debriefing, and organizational resiliency strategies, such as confidential peer support teams (Devilly & Cotton, 2003). The concept of critical incident stress debriefing (CISD) specifically - as a component of a larger CISM framework - had gained early traction in the emergency services in the 1990s and early 2000s. Debriefings involved post-event group sessions, in which participants discuss the incident and share their emotional responses using a structured approach (Devilly & Cotton, 2003; Linton et al., 1993). In some iterations of this approach, attendance and participation is compulsory. Since then, however, CISD has become controversial after reviews indicating either limited benefit or potential harm from participating in structured debriefing sessions (Flannery & Everly, 2004).

Resilience

One strategy to mitigate the potential psychological harms from exposure to critical incidents has been the proliferation of workplace resiliency training programs in the public safety professions broadly and in paramedicine in particular. Resilience is generally described as a person's ability to 'bounce back' from adversity (Joyce, Shand, Tighe, et al., 2018), and the resilience narrative suggests that: (1) individuals can develop concrete skills to enhance their resilience; and (2) 'more resilient' individuals are less susceptible to mental illness, owing to proactive psychological protection (Clompus & Albarran, 2016; Gayton & Lovell, 2012; Grant & Kinman, 2014; Jackson et al., 2007; Stelnicki et al., 2021). The result has been a growing interest in workplace resiliency training through programs such as the Road to Mental Readiness (R2MR) developed by the Canadian Armed Forces (Szeto et al., 2019), its civilian analogue The Working Mind (Dobson et al., 2019) and a new, PSP-specific program called Before Operational Stress (Stelnicki et al., 2021). Evidence supporting the resilience hypothesis, however, has generally been underwhelming, with recent studies showing only small effects on mental health literacy, stigma, or mental disorder symptoms (Carleton, Korol, et al., 2018; Joyce, Shand, Bryant, et al., 2018; van der Meulen et al., 2018).

While the relationship between exposure to critical incidents and subsequent distress holds intuitive appeal and has at least modest evidentiary support (Declercq et al., 2011; Donnelly, 2012; Halpern et al., 2011), the focus on critical incident stress provides only part of the picture of paramedic mental health. In Halpern and colleagues' qualitative study of critical incident stress among paramedics in Toronto, interview participants often noted that it was less a matter of the incident itself and more the organizational response that affected their wellbeing (Halpern et al., 2009b). This led to a series of studies that explored what support from colleagues and supervisors that paramedics would find most beneficial after attending critical calls. Halpern et al. identified that having supervisors acknowledge that a call was stressful and provide the

paramedics involved with a short 'time out' period after the call was associated with a reduced risk of later distress (Halpern et al., 2009a; Halpern et al., 2014). Critical incidents rarely occurred in a vacuum, and instead, were often described as being situated within the context of other chronic workplace stressors, such as staffing shortages, shift overrun, heavy caseloads, and strained relationships with management (Donnelly, 2012; Donnelly et al., 2014; Halpern et al., 2009b; Regehr & Millar, 2007). This perhaps helps explain why something as simple as acknowledging a call was stressful and having 'downtime' to process the event were described as being particularly meaningful in Halpern's studies. Both allude to the importance of responding to potentially distressing events with compassion, but highlight the limiting effect of organizational constraints, in the form of chronic workplace stressors such as the prioritization of service operations over employee health. Coupled with the stress inherent to paramedic work - such as long hours, shift work, and risks to personal safety (Donnelly et al., 2020; Donnelly & Siebert, 2012) - critical incident stress is often exacerbated by chronic workplace stressors (Donnelly, 2012; Donnelly et al., 2016; Donnelly et al., 2014). Donnelly and colleagues have examined this issue specifically, developing both a critical incident inventory (Donnelly & Bennett, 2014) and measure of chronic workplace stress (Donnelly et al., 2014) to study the relative contributions of different stressors on the mental health of Emergency Medical Technicians (EMTs) and paramedics. Across multiple investigations, what Donnelly et al. found was that PTSD symptoms are the product of a combination of critical incident and operational stressors - and an interaction between the two - particularly in the context of alcohol use (Donnelly, 2012; Donnelly et al., 2014). Collectively, regressing the various stressors on PTSD symptoms accounted for around 40% of the variability in PTSD scores (Donnelly, 2012; Donnelly et al., 2016). What this convincingly tells us is that exposure to trauma itself is not the only, or potentially even the most significant contributor to mental illness among paramedics. What the research leaves unanswered, however, is what accounts for the remaining ~60% of variability in PTSD scores, both in a literal sense in terms of how we can increase the predictive power of models, but perhaps more importantly in a figurative sense in terms of understanding *why* paramedic work is associated with such an increased risk of ill mental health.

1.6 What Aren't We Talking About? The Missing Perspectives on Paramedic Mental Health

In short, the answer is theory. Consider, for example, the issue of non-urgent calls for service. The extant research tells us that (1) the sort of life-threatening emergencies paramedics are classically trained for make up only a minority of the typical paramedic's caseload (Bray et al., 2020; Dyson et al., 2015); instead, (2) less urgent, non-life-threatening calls for service resulting from exacerbations from chronic health problems, mental illness, addictions, and social inequity are far more common (Booker et al., 2014; Scott et al., 2014; Tavares et al., 2016); and (3) these non-urgent calls for service are frequently cited as an example of chronic workplace stress (Corman, 2017; Nurok & Henckes, 2009). Paramedics often characterize patients who call 911 for non-life-threatening issues as 'system abusers' (Nurok & Henckes, 2009; Palmer, 1983). We understand from Donnelly and colleagues' work that chronic workplace stress - such as dealing with 'system abusers'- forms an important part of the constellation of paramedic mental health. On the opposite end of the spectrum (in terms of illness acuity), the sudden death of a patient and having to communicate a death notification to family are both frequently cited as examples of

critical incident stress (Barbee et al., 2016; Donnelly & Bennett, 2014; Halpern et al., 2012; Cheryl Regehr et al., 2002). Both non-urgent service calls and death are relatively common features of paramedic work, but both are associated with an increased risk of ill mental health (Carleton et al., 2019; Carleton et al., 2020; Donnelly et al., 2014). What's missing from our understanding, and what we aren't 'talking about' in the paramedic mental health literature, is a conceptual basis for understanding why these two seemingly disparate examples of workplace stress cause the distress that they do.

Part of the answer is that research into paramedic mental health has tended to adopt a biomedical lens in studying what is increasingly accepted as a complex social issue. The extant research has primarily used cross-sectional approaches with validated survey instruments to measure symptoms and then identify correlates in terms of demographic characteristics or measured stressors. This approach of 'what's the disease?' and 'what are the risk factors?' holds intuitive appeal, particularly for its potential to answer the next logical question of 'what's the cure?' But the approach misses the potentially important role that theory may play in helping to understand the issues. In that respect, social sciences perspectives and qualitative methodologies have significant potential to help advance our understanding of paramedic mental health and wellbeing. While there are examples of qualitative research methods being used in studying paramedic mental health, their application has tended to involve convenience samples of paramedics recruited for focus group discussions (Halpern et al., 2009b) or the thematic analysis of unstructured survey comments (Ricciardelli et al., 2020). Both have well-recognized limitations (LaDonna et al., 2018; McLafferty, 2004), and neither can leverage the full value of the epistemological traditions that allow qualitative researchers to explore an issue in rich detail. Purposive and theoretically guided sampling strategies (Gentles et al., 2015), for example, situated within an interpretive epistemology (Carter & Little, 2007) give researchers the methodological flexibility and rigor to develop theory (Collins & Stockton, 2018). Although we do see scholars using very rich ethnographic and narrative approaches to theorize about elements of paramedic culture (such as storytelling (Tangherlini, 2000), or humor (Charman, 2013)), or professionalization (Corman, 2017; McCann & Granter, 2019), none have had a specific focus on health and wellbeing. Instead, research that does examine paramedic mental health has tended to be atheoretical, neither using nor contributing to theory in a meaningful way.

1.7 Where Does This Leave Us?

Despite research interest on paramedic mental health waxing and waning for decades, we're still very early in our understanding of the topic. In my view, the reasons are equal parts methodological and conceptual, with interactions between the two.

On the methodological side, the extant research has tended to use survey-based, cross-sectional approaches, which - even when executed perfectly - have important limitations. Chief among them is the difficulty in establishing the directionality of the associations, making causality difficult to determine. In the context of paramedic mental health in Canada specifically, the issue is further complicated by the sampling strategies used in the only large-scale cross-sectional study to specifically estimate the prevalence of mental illness. In generating their dataset, Carleton and colleagues recruited paramedics through a patchwork of social media advertising, employee email lists, and the Paramedic Association of Canada (PAC) with its constituent

provincial chapters (Carleton, Afifi, Turner, et al., 2018). Although the goal was to cast an intentionally broad net to recruit a diverse sample of paramedics from across the country, the effect was to introduce potentially significant selection bias into the data. While no investigation is immune from such effects, recruitment via social media gave the researchers limited insight into the population from which the participants self-selected. Meanwhile, the paramedic associations themselves are increasingly engaged in lobbying to advance the interests of the profession, particularly on issues such as self-regulation (Ontario Paramedic Association, 2013). Unlike a regulatory college, provincial registry, or medical oversight body (institutions that exist in varying degrees within the profession in Canada), membership in the paramedic associations is neither compulsory nor free, with members required to pay annual dues. This means that recruitment through the associations is likely to attract a sample of paramedics who are especially invested in the work, providing an incomplete and potentially skewed picture. It may be, for example, that paramedics who have experienced mental illness were more likely to participate; or, conversely, the opposite may be true. Finally, the surveys themselves were apparently quite laborious. While the rates vary by publication, the overall non-completion rate for the survey ranges between 30% and 40% (Carleton et al., 2019; Carleton, et al., 2018; Carleton et al., 2018), suggesting that even *within the recruited sample*, response bias persists. Although the CIPSRT dataset and the resulting publications are undeniably useful in serving as early work that draws attention to an important issue, taken together, the sampling strategy casts some uncertainty over the representativeness of the findings.

On the conceptual side, the relative absence of theory-oriented research into paramedic mental health gives us only a superficial understanding of the phenomenon. This is problematic, not just because of the degree to which it limits completeness, but also because atheoretical research hinders our ability to ask informed questions. Theory serves as an organizing conceptual framework that helps bring into focus social processes and phenomena (Bordage, 2009). Research that uses and contributes to theory sets the stage for subsequent investigations to examine issues, ask informed questions, and consider hypotheses that follow logically from the tenants of a conceptual framework (Varpio et al., 2020). This programmatic approach to scholarship has been described as the metaphorical difference between making a pile of bricks and building a house (Forscher, 1963). When we 'follow the blueprint', so to speak, in the organization of studies, the resulting structure is much more useful. While there are notable examples of scholars in the field whose research is certainly programmatic (Donnelly, 2012; Halpern et al., 2009b), and theoretical (Donnelly et al., 2015) - this tends to be the exception rather than the rule. The result, I would argue, is the following:

1. Methodological limitations mean our existing prevalence estimates lack precision, and the rates of mental illness we have observed may under *or* overestimate the scope of the problem.

2. While we have broadened our understanding of *what* contributes to the risk of ill mental health among paramedics beyond a focus on traumatic and critical incident stress, the lack of theory limits our understanding of *how* and *why* other forms of chronic workplace stress contribute to mental health and wellbeing

1.8 Scope of the Present Research

Overview & Approach

Having defined both a methodological and conceptual gap in the research describing paramedic mental health, we adopted a mixed methods approach, using a convergent parallel design in which quantitative and qualitative data are gathered simultaneously to generate a complimentary understanding of a central phenomenon (Creswell, 2014). Our work is situated within a realist ontology (Creswell, 2013; Fletcher, 2016), in which the existence of a single 'objective' reality is presumed, but is acknowledged to be experienced subjectively. Adopting a realist view of the world allows us to consider both the biomedical and social sciences perspectives of illness in ways that allow us to deductively test hypotheses and inductively construct theory in which the experience of the research participant is centered.

Critics of mixed methods approaches argue that the philosophical assumptions underpinning quantitative and qualitative methodologies are too disparate to resolve and meaningfully integrate (Bergman, 2012). Adopting a realist approach helped us to ontologically reconcile the differing philosophical positions of deductive-objectivist approaches to quantitative methods with the inductive-interpretivist tenants of many contemporary qualitative methods. This meant structuring the investigations in a way that allowed for epistemological flexibility depending on the objective, while triangulating on a theoretically informed exploration of paramedic mental health as a central organizing issue.

Conceptual Framework

In one of the notable examples of a theoretically informed study of paramedic mental health, Donnelly and colleagues drew on *role identity theory* to derive and validate an Emergency Medical Services Role Identity Scale (EMS-RIS; hereafter called 'paramedic role identity') (Donnelly et al., 2015).

Role identity theory originates in the broader family of identity theories (Stets & Burke, 2000) and flows broadly from the tenets of symbolic interactionism (Blumer, 1980) in explaining that individuals experientially construct a negotiated understanding of the self through the enactment of social roles (Kaplan & Garner, 2017). Roles - such as being a parent, a spouse, a community member, a volunteer, or a professional - are an important means by which people define their sense of self (van Ingen & Wilson, 2016). Individuals tend to organize roles hierarchically by their perceived relevance or importance, identifying more strongly with more *salient* roles (Marcussen et al., 2004). Competently performing an especially salient role identity is an important source of purpose and meaning, which - in turn - has been robustly linked to health and well-being (Thoits, 1991, 2011). This has been studied, for example, among older people who take on volunteer roles after retirement (Thoits, 2012). The propositions of the theory lay out four relevant scenarios that may be problematic for health and well-being, where an individual:

1. Lacks salient role identities and may experience a perceived lack of purpose (Thoits, 1991); or

2. 'Over-endorses' an especially salient role identity to the degree to which the perceived requirements of the role overshadow personal needs (Siebert & Siebert, 2007); or
3. Has too few role identities, creating an 'all your eggs in one basket' scenario where an individual's sense of purpose and meaning in life is tied to just one or two roles - a potentially precarious situation if,
4. The role identity is threatened because the individual is no longer able to fulfil the perceived functional attributes or requirements of the role in the way that they believe (or feel others believe) that they should. Situations that threaten the enactment of salient role identities have been labeled 'identity-relevant disruptive events' (DeGarmo & Kitson, 1996; Marcussen, 2006).

Scenario two has been specifically studied in health care, where social workers who identify very strongly with a *caregiver* role identity limit their own ability to ask for help when confronted with personal or professional stressors and experience an increased risk of burnout (Reid et al., 1994). This was the conceptual basis for Donnelly and colleagues to explore role identity among paramedics. Because paramedics generally hold a respected position in society (often portrayed in a heroic light), it follows that identifying with the paramedic role identity may convey a deep sense of purpose and meaning. What Donnelly and colleagues did was to qualitatively define the potential attributes of 'paramedic role identity' and then translate the dimensions into a validated scale to quantify the degree of endorsement (Donnelly et al., 2015). Donnelly et al. proposed four dimensions of paramedic role identity in which personal and professional fulfillment is derived from helping people in need (*caregiving*); enjoying the excitement of the dramatic aspects of paramedic work (*thrill-seeking*); providing an important community service (*duty*); and competently performing challenging work (*capacity*), respectively (Donnelly et al., 2015). This early work provides a useful conceptual basis to further the line of inquiry given the links between role identities and well-being. Specifically, the relationship between paramedic role identity and mental health has not previously been studied; nor has the issue of mental health among paramedics been examined through a role identity lens. Both are likely to yield novel insights into an important challenge facing the paramedic community.

1.9 Objectives

Therefore, given the methodological and conceptual gaps in the paramedic mental health literature, and drawing on early work using role identity theory as a conceptual framework, we had three objectives in this program of research:

1. Estimate the prevalence of symptom clusters consistent with various mental disorders and other, non-diagnostic indicators of mental health and well-being among paramedics in a single paramedic service.
    a. Relatedly, explore the risk of positive mental disorder screens as a function of demographic characteristics (such as age, gender, provider classification, and years of experience) and self-reported resilience, given existing research suggesting relationships with mental health

2. Explore the relationship between the four dimensions of paramedic role identity described by Donnelly et al. (2014) and the risk of a positive mental disorder screen and other measurements of non-diagnostic mental health and well-being.

3. Qualitatively explore the paramedic role identity and its intersection with health and well-being, particularly situations in which a salient role identity is incongruent with concrete experiences in enacting the role – what we describe as *role identity dissonance*.

All of this work was situated within a single, large, suburban paramedic service in Ontario, Canada and took place pre-COVID, with data collection occurring between March 2019 through February 2020. Each objective was addressed in individual empirical studies that formed chapters two through four of my dissertation. Each is explained in more detail below.

In *Study 1* (Objectives 1 and 1.a), we used a cross-sectional survey approach to gather quantitative data on the prevalence of and risk factors for three mental disorders among paramedics. Specifically, we distributed a paper survey to paramedics attending in-person continuing medical education sessions during the fall 2019/winter 2020 Continuing Medical Education (CME) sessions. The survey contained a demographic questionnaire and three widely used, and well validated screening instruments to assess for clinically significant symptoms of PTSD, depression, and anxiety. Our objective here was to replicate the approach used in the *CIPSRT* studies by Carleton et al (2018) while structuring participant recruitment to minimize selection and response bias by limiting the study to a single site and using an approach likely to generate a high response rate. This strengthened the internal validity of the study and provided important contextual information when considering the potential transferability of the findings. We also tested for relationships between demographic characteristics and self-reported resilience given existing research both within and outside of paramedicine that suggests the risk of mental disorders is borne unevenly across important personal characteristics (i.e., gender, age, relationship status) (Carleton, et al., 2018) and may vary as a function of resilience (Gayton & Lovell, 2012; Streb et al., 2014).

In *Study 2* (Objective 2), we leveraged our survey approach during the CMEs to evaluate the quantitative relationship between paramedic role identity and mental health. In addition to the demographic questionnaire and self-report measures for PTSD, depression, and anxiety, our survey also contained the paramedic role identity measure developed by Donnelly and colleagues as well as additional screening tools to assess for perceived stress, burnout, and secondary traumatic stress. Here, we were interested in exploring whether endorsement of the existing constituent dimensions of paramedic role identity was associated with both diagnosable and non-diagnosable symptoms of psychological distress. Importantly, however, we did not attach any directionality to the hypotheses; rather, we were open to the possibility that any of the dimensions of paramedic role identity were associated with either increased *or* decreased risk of psychological distress, given the exploratory nature of our study. Although the data for both Studies 1 and 2 were collected simultaneously, the analyses were separated.

Finally, in *Study 3* (Objective 3), we qualitatively explored the construct of paramedic role identity and its implications for mental health. We were specifically interested in the potential for identity-relevant disruptive events (Marcussen, 2006) to create dissonance among participants

for whom paramedic role identity held particular salience. This is a reconceptualization of identity disruption within the role identity framework; traditionally, identity-relevant disruptive events are studied in the context of discrete life events (i.e., death of a spouse, loss of a job, taking on a new role) (Thoits, 1995). Instead, we made a conceptual argument that identity disruption can be more nebulous and chronic, resulting from incongruence between what a paramedic articulates as an important dimension of paramedic role identity and what is or is not realistically feasible in the role. This created an 'expectations versus reality' scenario in which the paramedics were unable to fulfill the perceived functional requirements of the role, leading to - what we call - role identity dissonance and psychological distress. Here, we used purposive and theoretical sampling strategies to recruit paramedics to participate in multi-stage, semi-structured interviews to explore role identity dissonance, both leading up to and during the CME survey recruitment. We used the if-then propositions of our conceptual framework to evaluate alignment with the existing dimensions of paramedic role identity, identify and define the features of two new dimensions, and propose a framework for the development and consequences of role identity dissonance.

Meaningful Integration

A core component of mixed methods research is that the differing research approaches are meaningfully integrated to enhance the investigators' understanding of a phenomenon (Creswell et al., 2011). In our program of research, we used quantitative methods and their attendant epistemological privileging of objective-deductivist approaches to generate descriptive data on prevalence and test hypotheses suggested by our conceptual framework. At the same time, we used qualitative methods with interpretivist epistemological traditions to embrace the subjectivity inherent in human experience. This allowed us to define the parameters of the problem under study (prevalence and risk factors) while facilitating a deep and meaningful exploration of the surrounding context in a thoughtful way.

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CHAPTER 2: MENTAL DISORDER SYMPTOMS AMONG PARAMEDICS IN A SINGLE CANADIAN SITE

2.1 Prologue

In Chapter 2, I present the results from our first of three empirical papers. The paper describes a cross-sectional study to assess the prevalence of symptom clusters consistent with post-traumatic stress disorder, major depressive disorder, and generalized anxiety disorder (*Objective 1)* and to explore potential risk factors associated with positive mental disorder screens (*Objective 1a*). In particular, this included exploring the potential contribution of self-reported resilience on the risk of a positive mental disorder screen.

For this study, I was responsible for the conception of the project; development of the methods; selection of the screening instruments included in the survey; the collection and analysis of data; and the preparation and submission of the manuscript.

Data from this study has been presented in a poster at the Canadian Institute for Military and Veteran Health Research (CIMVHR) Forum in 2021 and in a poster at the National Association of EMS Physicians Annual Meeting in 2021, both held virtually. An abstract describing this work has been published in *Prehospital Emergency Care.* This article has been published in the *International Journal of Environmental Research and Public Health* and has been posted as a Pre-Print at *preprints.org.* The content is reproduced here under a creative commons agreement as part of open access publishing at the journal.

Citations

Mausz, J., Donnelly, E. A., Moll, S., Harms, S., & McConnell, M. (2022). Prevalence of mental disorder symptoms and the relationship with resilience among paramedics in a single, Canadian site. *International Journal of Environmental Research and Public Health, 19(8). doi: 10.3390/ijerph19084879.*

Mausz, J., Donnelly, E. A., Moll, S., Harms, S., Tavares, W., & McConnell, M. (2021). Prevalence of operational stress injuries (OSIs) among paramedics. Poster presentation at the National Association of EMS Physicians Annual Meeting, January 11-16, 2021

Mausz, J., Donnelly, E. A., Moll, S., Harms, S., Tavares, W., & McConnell, M. (2021). Prevalence and risk factors of mental illness among paramedics: a cross-sectional survey. Poster presentation at the Canadian Institute for Military and Veteran Health Research (CIMVHR) Forum, October 25-27, 2021

Mausz, J., Donnelly, E. A., Moll, S., Harms, S., Tavares, W., & McConnell, M. (2021). Prevalence of operational stress injuries (OSIs) among paramedics. *Prehospital Emergency Care, 25(1), https://doi.org/10.1080/10903127.2020.1837312*

2.2 Abstract

There is growing recognition in research and policy of a mental health crisis among Canada's paramedics but despite this, epidemiological surveillance of the problem is in its infancy. Just weeks before the emergence of the COVID-19 pandemic, we surveyed paramedics from a single, large, urban paramedic service in Ontario, Canada to assess for symptom clusters consistent with Post-Traumatic Stress Disorder (PTSD), major depressive disorder, and generalized anxiety disorder and to identify potential risk factors for each. In total, we received 589 completed surveys (a 97% completion rate) and found that 11% screened positive for PTSD, 15% for major depressive disorder, and 15% for generalized anxiety disorder, with 1 in 4 active-duty paramedics screening positive for any of the three as recently as February 2020. In adjusted analyses, the risk of a positive screen varied as a function of employment classification, gender, self-reported resilience, and previous experience as a member of the service's peer support team. Our findings support the position that paramedics screen positive for mental disorders at high rates – a problem likely to have worsened since the onset of the COVID-19 pandemic. We echo the calls of researchers and policymakers for urgent action to support paramedic mental health in Canada.

Keywords: Public Safety Personnel; First Responders; Mental Disorders; Mental Health; Well-Being; Trauma; Operational Stress Injuries; Post-Traumatic Stress Injuries; Resilience; Peer Support

2.3 Introduction

A 2012 systematic review and meta-analysis calculated the international pooled prevalence of Post-Traumatic Stress Disorder (PTSD) among 'rescue workers' at 10% (Berger et al., 2012). When stratified by occupation, 'ambulance workers' were found to have a pooled prevalence of PTSD of 14% (Berger et al., 2012). In fact, the 'ambulance worker' strata was used as the reference category in the authors' relative risk modelling, with Berger et al. suggesting that 'ambulance personnel' may be "more susceptible to PTSD" (p. 1009) (Berger et al., 2012). The findings parallel a growing body of research internationally that points to high rates of *mental disorders* among Emergency Medical Services (EMS) workers (Bentley et al., 2013; Brooks & Brooks, 2021; Luftman et al., 2017; Reardon et al., 2020; Renkiewicz & Hubble, 2021a, 2021b; Vigil et al., 2019) both in general and comparatively within *first responder* occupations. Addressing a conspicuous absence of similar research in Canada, a recent national survey of *Public Safety Personnel* (PSP) found that 1 in 4 participating paramedics screened positive for PTSD, 1 in 3 for major depressive disorder, and 1 in 3 for an anxiety disorder, with nearly half screening positive for any one mental disorder (Carleton, Afifi, Turner, et al., 2018) and more frequent positive screens observed among women paramedics. Related research has also suggested that exposure to *potentially psychologically traumatic events* (Carleton et al., 2019; Carleton et al., 2020; Harenberg et al., 2018; Regehr et al., 2016; Ricciardelli et al., 2018; Ricciardelli, Czarnuch, et al., 2020; Sommer et al., 2020); symptoms consistent with chronic pain, (Carleton et al., 2017) clinical insomnia (Angehrn et al., 2020) and alcohol use disorder (Carleton, Afifi, Turner, et al., 2018); suicidal ideation, planning, and attempts (Carleton et al., 2018); and a history of adverse childhood experiences (Turner et al., 2018) are prevalent among paramedics, again varying across demographic categories, including gender. The downstream consequences are potentially significant, and can include lost time from work (Regehr et al., 2002), family hardship (Regehr, 2005), reduced quality of life (Berger et al., 2007; Bracken-Scally et al., 2014; Rahimi et al., 2015; Studnek et al., 2010), and suicidality (Sterud et al., 2008; Vigil et al., 2019), all of which can contribute to burnout (Crowe et al., 2020; Reardon et al., 2020), workplace incivility (Cash et al., 2019; Fullerton et al., 2019), attrition (Dopelt et al., 2019) and potentially compromise patient care (Donnelly et al., 2020). As a result, the situation has been characterized in research and policy as a 'crisis in Canada' (Koopmans et al., 2017; *Supporting Canada's public safety personnel: An action plan on post-traumatic stress injuries*, 2019).

One response to the problem has been a growing interest in workplace resiliency training programs. Resilience is generally held to be the ability for individuals to 'bounce back' from adversity (Joyce, Shand, Tighe, et al., 2018), and the resilience narrative suggests that: (1) individuals can cultivate skills that enhance their resilience; and (2) 'more resilient' individuals may be less susceptible to mental health challenges, owing to proactive psychological protection (Clompus & Albarran, 2016; Gayton & Lovell, 2012; Grant & Kinman, 2014; Jackson et al.,

2007; Stelnicki et al., 2021). The result has been an increasing adoption of workplace resiliency training within the public safety professions through programs such as the Road to Mental Readiness (R2MR) developed by the Canadian Armed Forces (Szeto et al., 2019), its civilian analogue The Working Mind (Dobson et al., 2019) and a new, PSP-specific program called Before Operational Stress (Stelnicki et al., 2021). Evidence supporting the resilience hypothesis, however, has generally been underwhelming, with recent research showing only small effects on mental health literacy, stigma reduction, or mental disorder symptoms (Carleton, Korol, et al., 2018; Joyce, Shand, Bryant, et al., 2018; van der Meulen et al., 2018).

Any response to the mental health crisis within the paramedic community requires a nuanced understanding of the epidemiology of mental disorders among paramedics. Although the extant research in Canada paints a concerning picture, there are methodological limitations that cloud its interpretation. In generating the dataset, the research team cast an intentionally broad net, using a combination of social media advertising, and employer and paramedic association list servers to recruit participants. In total, approximately 600 paramedics from across Canada participated, but both the response rate and characteristics of the population from which the sample was drawn are unknown. This makes understanding the scope of the problem challenging, as results from self-selected samples can be difficult to interpret. It may be, for example, that paramedics with (current or former) mental health challenges are more likely to volunteer for survey research on the topic. Or, conversely, the opposite may be true. In either case, however, the precision of the existing prevalence estimates - and by extension, our understanding of risk factors – may be called into question when the representativeness of study samples is uncertain. Therefore, our objective was to estimate the proportion of symptom clusters consistent with various mental disorders among paramedics in a single, large, urban paramedic service in Ontario, Canada. Given the growing interest in the resilience narrative in the population, we also sought to explore the relationship between self-reported resilience on the risk of a positive screen for a mental disorder. Our study draws on and (to a degree) replicates the work of Carleton and colleagues (Carleton, Afifi, Turner, et al., 2018) on a smaller scale while carefully controlling participant selection within a single site.

2.4 Methods

Overview

Our study took place pre-COVID-19 between September 2019 through February 2020. We distributed an in-person cross-sectional survey to a single, large, urban paramedic service in Ontario, Canada. In addition to a demographic questionnaire, our survey contained validated self-report symptom measures for PTSD, generalized anxiety disorder, and major depressive disorder, as well as a self-report measure for resilience. Our study received ethics approval from the Hamilton Integrated Research Ethics Board (HiREB protocol number 7595), and all

respondents provided informed consent to participate. Italicized terms are in reference to the definitions provided by the Canadian Institute for Public Safety Research and Treatment in their Glossary of Terms (version 2.1) ((CIPSRT), 2019).

Setting and Participants

We conducted our study in Peel Region, Ontario, Canada. Peel Regional Paramedic Services is the publicly funded sole provider of land ambulance and paramedic services to the municipalities of Brampton, Mississauga, and Caledon, with a total population of 1.3 million residents across a mixed suburban and rural geography of 1,200km^2. At the time of recruitment, the service employed a total of 714 paramedics responding to approximately 130,000 emergency calls annually, making the service the second largest in the province by staffing and caseload. Workplace resiliency training in the form of the R2MR program (Szeto et al., 2019) was launched in the service in 2017.

Paramedics in Peel Region are required to complete semi-annual continuing medical education (CME) days. We distributed our survey during the fall 2019 / winter 2020 CME sessions. Following a brief presentation by the principal investigator, surveys were distributed to every paramedic and consenting paramedics were given approximately 20 minutes at the beginning of the day to complete the (paper) survey, filling in their responses with black ink pen. All participants were assured of confidentiality (but not necessarily strict anonymity), given a list of mental health resources available in the community and a $10 Tim Horton's gift card. Completed surveys were sealed in an opaque envelope and deposited into a locked study drop box. Attendees who did not want to complete the survey were instructed to drop their blank survey package in the same locked drop box as completed surveys but were free to keep the gift card with our thanks. This recruitment strategy has been used previously among paramedic services in Ontario (Bigham et al., 2014) and was specifically chosen for its potential to generate high response rates.

Survey

Unlike in previous studies, in which participants could complete surveys over multiple sittings, our participants had only a limited amount of time during their CME to participate. This necessarily constrained the number, length, and complexity of questionnaires we could include in our survey. Each instrument is described below.

Demographics

Our demographic questionnaire was developed through consensus among the research team and was intended to gather data on criteria identified in the literature to be associated with *mental disorder symptoms* among paramedics. This included age, gender, relationship status, education,

provider classification (primary or advanced care), employment classification (full vs. part-time), years of experience, and current or previous participation on the service's peer support team. The peer support team was established in 2017 and was originally intended to provide non-clinical, empathetic support for home and family stressors.

We decided not to collect data on race or ethnicity. While the link between race and ethnicity and health is well-established (Thoits, 2010, 2011), and other studies of symptom clusters consistent with mental disorders among paramedics have included ethnicity as a potential predictor (Carleton, Afifi, Turner, et al., 2018), the relative racial and ethnic homogeneity of our sample (an extrapolation based on similar research (Carleton, Afifi, Turner, et al., 2018; Donnelly, 2012; Donnelly et al., 2014; Rivard et al., 2021)) would likely have left our study under-powered to detect such an effect.

Resilience

We evaluated self-reported resilience using the 5-item Brief Resilience Scale (BRS) (Smith et al., 2008). The BRS asks respondents to rate their agreement with various statements that characterize how well they recover from adversity (i.e., "I tend to bounce back quickly after hard times"). Response options range from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). After reverse coding three items, the scores are summed and divided by the number of items answered. The scale categorizes respondents into 'low' (<3), 'normal' (3.00-4.30) or 'high' (>4.31) levels of resilience (Smith et al., 2008) and has been used in at least one previous study among *Public Safety Personnel* in Canada (Carleton, Korol, et al., 2018). Based on the resilience narrative, we hypothesized that self-reported resilience scores would be inversely associated with the risk of a positive screen for a *mental disorder*.

Self-Report Symptom Measures

The PTSD Checklist-5 (PCL-5; (Blevins et al., 2015)) is a 20-item self-report measure that assesses four criteria specified in the Diagnostic and Statistical Manual (DSM) version 5 for diagnosing PTSD: intrusion, avoidance, alterations in cognition or mood, and arousal or reactivity. Typically, the diagnosis of (or screening for) PTSD is made in reference to an index trauma ('Criterion A'), evaluated using a separate questionnaire. However, given the increasing recognition in scholarship and policy that public safety personnel encounter multiple *potentially psychologically traumatic events* during their work (Carleton et al., 2019; Carleton et al., 2020), we omitted the Criterion A screen. Participants were instead told that the questionnaire asked about "problems that first responders sometimes have in response to a stressful work experience" and asked to rate the frequency with which they had been bothered by symptoms in relation to the stressful work experience in the past 30 days. Symptoms are rated on a 5-point anchored scale from 0 ("Not at all") to 5 ("Extremely"). Possible scores range from 0 to 80, with a summed score >31-33 providing a sensitivity of 88% and a specificity of 69% for probable

PTSD (Wortmann et al., 2016) when compared to clinical interviews. Consistent with recommendations from the National Center for PTSD (2022), we used a cut score of >32 to indicate a positive screen for PTSD.

To evaluate for symptoms of major depressive disorder, we used the 9-item Patient Health Questionnaire (PHQ-9) (Kroenke et al., 2001). The PHQ-9 assesses the degree to which depressive symptoms (such as loss of interest, or difficulty concentrating) have affected the respondent over the past 14 days. Symptoms are rated on a 4-point anchored scale from 0 ("Not at All") to 3 ("Nearly Every Day"), with summed scores >9 corresponding to an 85% sensitivity and 82% specificity for probable depression when compared to clinical interviews (Kroenke et al., 2010).

Finally, to evaluate for symptoms of generalized anxiety disorder, we used the 7-item Generalized Anxiety Disorder (GAD-7) scale (Spitzer et al., 2006). The GAD-7 assesses the degree to which symptoms of anxiety (such as feeling on edge) have affected the respondent over the last 14 days on a 4-point anchored scale from 0 ("Not at All") to 3 ("Nearly Every Day") with summed scores >9 corresponding to an 89% sensitivity and an 82% specificity for probable generalized anxiety disorder when compared to clinical interviews (Spitzer et al., 2006).

Analyses

We used descriptive statistics to characterize our data, including measures of central tendency, distribution (e.g., skewness and kurtosis), and dispersion for continuous variables and counts and percentages for categorical data. To explore group differences among our participants, we used one-way analysis of variance (ANOVA) and chi-square tests for continuous and categorical data, respectively. To evaluate the internal consistency of the self-report measures, we calculated Cronbach's alpha for each screening tool.

We used logistic regression modelling to explore the relationship between demographic characteristics and self-reported resilience on the risk of positive *mental disorder* screens. We first constructed unadjusted, univariate logistic regression models to test the association between each demographic variable and our outcomes of interest. Given the exploratory nature of our study, we then entered all demographic variables into adjusted logistic regression models, making no effort to organize the variables hierarchically based on theoretical or statistical significance. Where we made an effort at organizing our model parameters was in the exploration of interaction effects. Here, we constructed interaction terms based on group differences in demographic variables and their association with our outcomes of interest in our unadjusted models. Importantly, our primary interest was in the individual odds ratios of the covariates we included, rather than the predictive capacity of the models as a whole.

2.5 Results

Participation & Response Rate

We distributed a total of 607 surveys to paramedics attending the fall 2019 CME sessions, of which 600 completed surveys were returned. Of these, we excluded 11 for large portions of incomplete data, leaving a final sample of 589 surveys for analysis, corresponding to a response rate of 98.8% and a completion rate of 97%.

During the CME sessions, a total of 107 paramedics (15% of the total workforce) were on long-term leave (Figure 1). Although we originally intended to distribute surveys to paramedics on leave via postal mail early in the new year, personnel within the service who could have facilitated this stage of recruitment were redeployed in response to the COVID-19 pandemic and we were unable to contact paramedics on leave.

Participant Characteristics

In total, 354 of our participants (60.1%) were men, 232 (39.3%) women, and a small number (not reported to preserve anonymity) provided another, non-binary gender. The participants were on average 34.58 (± 8.21) years of age and reported an average of 9.30 (± 0.44) years of experience as paramedics. The majority (59.1%) of our participants were married or living common-law (later collapsed into single (143; 24.3%) or relationship (446; 75.7%)), had completed a college diploma as their highest education (49.2%), were working full-time (66.8%), in a front-line role (93.8%), and practicing at the primary care paramedic certification (67.7%). Five percent (n = 29) of our participants reported being a current or former member of the service's peer support team.

When stratified by gender, women were on average younger (33.61 vs. 35.13 years of age, $F = 5.35$; $p = 0.02$), had less experience (8.45 vs. 9.79 years, $F = 5.2$; $p = 0.02$), and were more likely to have completed an undergraduate university degree (Odds Ratio [OR] 2.02, 95% Confidence Interval [CI] 1.44-2.83; $p < 0.001$), but less likely to practice at the advanced care paramedic certification (OR 0.61, 95% CI 0.42-0.88; $p = 0.009$). Our point estimates suggested women were also less likely to work full-time (OR 0.77, 95% CI 0.54-1.09) and more likely to be (or to have been) members of the peer support team (OR 1.25, 95% CI 0.59-2.65); however, neither difference reached the 5% significance threshold ($p = 0.14$ and 0.55, respectively).

Resilience

The internal consistency for the BRS in our survey was 0.85, consistent with previous investigations (Carleton, S. Korol, et al., 2018). Across all participants, the average BRS score

was 3.73 (95% Confidence Interval [CI] 3.68-3.79), corresponding to "Normal" levels of resilience (Smith et al., 2008). A total of 63 (10.6%) of our participants met the criteria for "Low" levels of resilience. While mean BRS scores were higher among participants in a relationship (3.77 (SD 0.68) vs. 3.62 (SD 0.61), p=0.002) and advanced (compared to primary) paramedics (3.82 (SD 0.65) vs. 3.69 (SD 0.67), p= *0.02*), we did not observe any significant differences in the proportions of participants meeting the threshold for "Low" resilience across demographic categories.

Mental Disorder Symptom Clusters

Internal consistency measures for the PCL-5 ($\boldsymbol{\alpha}$ = 0.94), PHQ-9 ($\boldsymbol{\alpha}$ = 0.87), and GAD-7 ($\boldsymbol{\alpha}$ = 0.92) were all high and consistent with other investigations (Beard & Bjorgvinsson, 2014; Beard et al., 2016; Mat Salleh et al., 2020; Wortmann et al., 2016). Mean reporting scores stratified by demographic characteristics are presented in Table 1. In total, 66 participants (11.2%) met the criteria for a positive screen for PTSD, 91 (15.4%) for major depressive disorder, and 87 (14.7%) for generalized anxiety disorder, with 145 participants (24.6%) screening positive for any of the three.

Unadjusted Models

In our unadjusted models (Table 2a), age (OR 1.04, 95% CI 1.01-1.06 p<0.001), experience (OR 1.05, 95% CI 1.02-10.7, p <0.001), working full-time (OR 2.72, 95% CI 1.77-4.50, p = 0.003), being (or having been) a member of the peer support team (OR 3.03, 95% CI 1.42-6.45, p = 0.004), and "low" resilience (OR 8.15, 95% CI 4.62-14.36, p<0.001) were all associated with an increased risk of screening positive for any one of PTSD, major depressive disorder, or generalized anxiety disorder.

The risk of a positive screen additionally varied across demographic categories, depending on the outcome being tested, the results of which are presented in Table 2a.

Adjusted Models

Given the exploratory nature of our study, we included all demographic variables in our adjusted models. We also included interaction terms for gender*education (college versus university) and gender*employment status (part-time versus full-time) given the group differences we observed.

In our adjusted models, working full-time (OR 3.06, 95% CI 1.70-5.50, p<0.001) and having "low" resilience (OR 10.41, 95% CI 5.59-19.40, p<0.001) were the only characteristics associated with an increased risk of our composite outcome of a positive screen for any one of PTSD, major depressive disorder, or generalized anxiety disorder.

While "low" resilience persisted as a significant association when evaluating *mental disorder* symptom clusters, the associations with other demographic characteristics varied depending on the outcome being tested (Table 2b).

2.6 Discussion

The goals of this study were to estimate the proportions of symptom clusters consistent with three specific *mental disorders* potentially associated with public safety work, and to explore the relationship between *mental disorder* symptoms and demographic variables and self-reported resilience. Because much of the extant research has relied on social media or email list servers to recruit participants, the concern is that the possibility of response bias may produce results that over or underestimate the true prevalence. In that respect, our response rate of 98% is a strength of our investigation, but our results findings are simultaneously encouraging and concerning.

Among our sample, 11% of our participants screened positive for PTSD, 15% for major depressive disorder, and 15% for generalized anxiety disorder, with 25% screening positive for any one of the three *mental disorders*. Our estimates are lower than those reported among paramedics in a recent national study of *Public Safety Personnel* in Canada (Carleton, Afifi, Turner, et al., 2018). This is encouraging because, while our findings are admittedly limited to a single site, it suggests that when participant selection is carefully controlled, the prevalence of *mental disorder* symptoms among paramedics may be lower than has been previously described in this population.

Nevertheless, our findings are concerning for two reasons. First, our study supports the position that the prevalence of *mental disorder* symptoms among paramedics is significantly higher than rates observed in the general population in Canada (Carleton, Afifi, Taillieu, et al., 2018; Carleton et al., 2019; Carleton et al., 2020; Carleton, Afifi, Turner, et al., 2018; Carleton et al., 2018). In total, 1 in 4 of the active-duty paramedics in our study site met the screening threshold for any one of the three *mental disorders* we screened for – a problem that has likely only worsened since the emergence of the COVID-19 pandemic. What we don't know is the degree to which this proportion of participants have sought or are undergoing care for these symptoms. A number of studies speak to the stigmatization of *mental illness* within the public safety professions (Carleton et al., 2019; Ricciardelli et al., 2019; Ricciardelli, Carleton, et al., 2020), and the reluctance of *Public Safety Personnel* to seek out professional help (Carleton et al., 2019; Donnelly et al., 2016; Renkiewicz & Hubble, 2021a). It is unfortunately likely that many are not receiving care at all. Understanding barriers to accessing mental health care among paramedics is an important topic for future research.

Our second objective was to examine the associations between various demographic characteristics and the risk of screening positive for PTSD, major depressive disorder, or

generalized anxiety disorder. Previous research in the Canadian population would suggest that women are more likely than men to report current or past-year prevalence of any of the three, and that age, socioeconomic status, and education are also important predictors of *mental health* (Statistics Canada, 2014). Similarly, recent findings point to differences in the risk of *mental disorder* symptoms among paramedics when stratified by gender, age, education, and relationship status (Carleton, Afifi, Taillieu, et al., 2018; Carleton, Afifi, Turner, et al., 2018; Carleton et al., 2018). Our findings both align and contrast with this body of research. First, we did observe differences in risk attributable to gender. In our adjusted models, women were more likely to screen positive for major depressive disorder and generalized anxiety disorder, but less likely for PTSD. Help-seeking behavior has been shown to differ across genders (Affleck et al., 2018). This plays out particularly with depression, where, among men, hegemonic conceptualizations of masculinity and stigma conspire to limit reporting and diagnosis (Affleck et al., 2018; Whitley, 2018). Among our sample, it may be that women are more willing to disclose symptoms and - for PTSD - more likely to be off work because of this gendered difference in help-seeking. In total, 61 members of the paramedic service were on leave due to 'disability' (using the language of the paramedic service) during the study, although we do not know the distribution of genders of the paramedics who were on leave. Further exploration of gendered differences in help-seeking and stigma in the context of public safety work is a topic worthy of further study.

Our findings also diverged from previous research among paramedics in the risk of *mental disorder* symptoms when stratified by relationship status, education, and provider classification. Whereas previous studies have found higher rates of *mental disorders* among advanced care paramedics (Donnelly et al., 2016) and protective effects of higher education (Carleton, Afifi, Taillieu, et al., 2018; Carleton, Afifi, Turner, et al., 2018) and being in a relationship (Carleton, Afifi, Taillieu, et al., 2018; Carleton, Afifi, Turner, et al., 2018), our findings did not bear this out. The only exception was where we found that participants with university level education were half as likely to screen positive for generalized anxiety disorder. Given that women in our sample were more likely to attend university than men and more likely to screen positive for major depressive disorder or generalized anxiety disorder, we tested an interaction term between gender and education. While our point estimates for the term generally favored a protective effect (except for PTSD), our confidence intervals suggest that the effect is compatible with either an increased or decreased risk of *mental disorder* symptoms. Where we did observe significant associations were in the relationships between self-reported resilience, employment classification, age, and experience as a member of the service's peer support team. Of the three, resilience and experience as a peer supporter warrant careful consideration.

Resilience is generally held to be the degree to which an individual can 'bounce back' from adversity (Hartmann et al., 2019). The thought is that resiliency skills are teachable, and we have seen a growing trend of developing (and marketing) workplace resiliency training programs.

When evaluated empirically, the effects of workplace resiliency training are modest (Dobson et al., 2019; Hartmann et al., 2019; Jones et al., 2019; Joyce, Shand, Tighe, et al., 2018; Leppin et al., 2014; Robertson et al., 2015), with research suggesting only small improvements in *mental disorder* symptoms, stigma-reduction, or attitudes toward help-seeking. For example, a longitudinal study of Calgary police officers after completing the R2MR program did not indicate improvement in self-reported *mental disorder* symptoms or resilience at 6 or 12 months following the intervention (Carleton, S. Korol, et al., 2018). As a whole, the topic of resiliency training is not without controversy. Though cultivating resilience may be desirable, the narrative risks shifting the locus of control onto the individual, potentially removing the responsibility of employers to mitigate the risks posed by chronic workplace *stressors* or exposure to *potentially psychologically traumatic events*. Controversy aside, our findings consistently and strongly point to a relationship between self-reported resilience and the risk of a positive *mental disorder* screen. The topic warrants further study.

Peer support as a concept has been the subject of discussion in the public safety professions for many years, owing, in part to, critical incident stress management programs (Everly et al., 2000). More broadly, peer support was popularized by the consumer-survivor movement of the 1970s in which patients eschewed the (at the time) paternalistic medical models of psychiatric care in favor of seeking out the support of likeminded *people with lived experience* (Cyr et al., 2010). Among *Public Safety Personnel*, evidence of peer support teams is mixed (Anderson et al., 2020; Feuer, 2021; Gillard, 2019), but the health of the peer supporters themselves has not (to our knowledge) been studied. In our sample, we observed that being or having been a member of the service's peer support team was associated with a 4-fold increase in the risk of screening positive for PTSD and a more than 3-fold increase in the risk of screening positive for major depressive disorder. Interpreting this relationship is difficult. In our site, peer supporters were recruited on the basis of having lived experience with adversity, including *mental health challenges*, potentially confounding the association. That said, recruitment for the program occurred two years before our study, and our self-report symptom measures probe for symptoms present within the last 14-30 days. Although it is certainly possible that members of the peer support team screened positive for *mental disorders* at higher rates due to persistent symptoms from pre-existing *mental health conditions*, it is also possible that the vicarious exposure to *potentially psychologically traumatic events* in providing empathetic support to their colleagues places peer supporters at an increased risk of poor *mental health*, including *mental disorders*. Given the growing popularity of these programs and the dearth of both effectiveness (Anderson et al., 2020) and safety evidence, our findings emphasize the importance of studying peer support programs more closely, including the potential *health* consequences for peer supporters.

Limitations

Our findings should be interpreted within the context of certain limitations. First, cross-sectional research does not lend itself to establishing causality. We acknowledge that we are assuming that

the *mental disorder* symptoms we studied are attributable in some way to the participants' work as paramedics. This is increasingly supported by policy, however, given the growth in legislation in which a diagnosis of PTSD among *Public Safety Personnel* is presumed to be work related to help facilitate access to treatment. Second, we acknowledge that self-report symptom measures, while widely used, are a surrogate outcome and not *diagnostic* in and of themselves. Also in that respect, our decisions to omit a specific Criterion A screen and to use the total symptom score in determining caseness create an additional limitation. Third, while our study site was carefully selected to be illustrative of a large, sophisticated, urban paramedic service, it is nevertheless a single site, and readers must exercise caution in generalizing our findings. Fourth, our approach to modelling and subsequent statistical power depended on the event rate observed in our study. We could estimate this beforehand, but the basis for our study was predicated on an assumption of overestimated prevalence, the degree of which was difficult to know at the outset. We attempted to account for this in the design of our survey to limit the number of predictors, but we acknowledge a risk of overfitting our models. We would evaluate this risk as low, given that we had between seven and nine events per covariate (Vittinghoff & McCulloch, 2007). Finally, our study excluded 107 members of the service who were on leave during recruitment, making our sample vulnerable to a degree of selection bias, but even so, we would suggest that our findings have unique value in reflecting the mental health of the active-duty workforce.

2.7 Conclusion

Our findings are encouraging in that the rates of symptom clusters consistent with various *mental disorders* that we observed in our study are lower than have been previously reported among paramedics in Canada. Although admittedly limited to a single site, this suggests that the ways in which we gather this data may have important implications for its interpretation. At the same time, the rates of *mental disorder* symptoms we observed are higher than reported in the Canadian population at large. Fully 1 in 4 active-duty paramedics in our study met the screening criteria symptom clusters consistent with either PTSD, major depressive disorder, or generalized anxiety disorder, pointing to a *mental health* crisis within the profession that – with the emergence of the COVID-19 pandemic – has likely only worsened. We echo the growing calls within scholarship and policy for urgent action to support the *mental health* and *well-being* of *Public Safety Personnel* in Canada.

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Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Hamilton Integrated Research Ethics Board (HiREB Project Number 7595), approved August 16, 2019.

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

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy restrictions and data security procedures stipulated in the Research Ethics Board (REB) review of this project.

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2.9 Figures

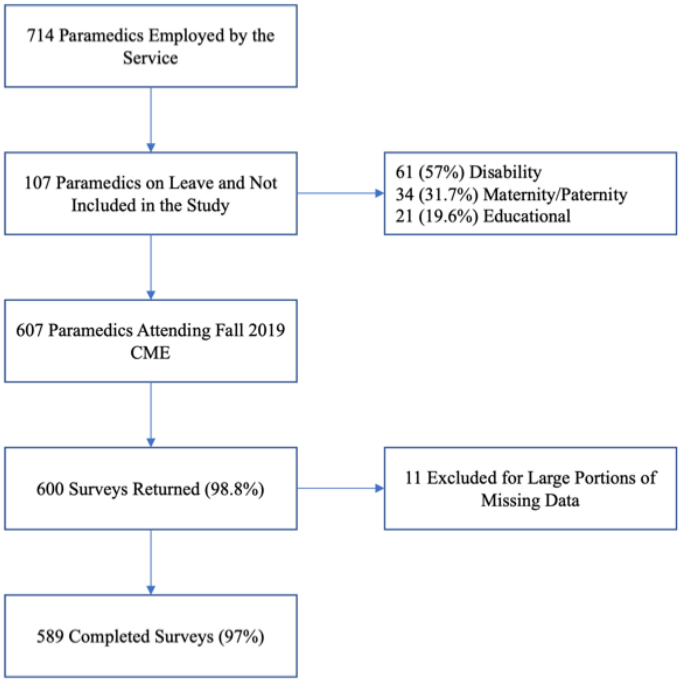

Figure 1: Participant flow

2.10 Tables

Demographic Category		**N** (%)	**BRS** Range 1-5 Mean (SD)	**PCL-5** Range 0-80 Mean (SD)	**PHQ-9** Range 0-27 Mean (SD)	**GAD-7** Range 0-21 Mean (SD)
All Participants		589	3.73 (0.67)	13.98 (4.16)	4.73 (4.74)	4.46 (4.76)
Gender	Men	354 (60%)	3.77 (0.65)	13.69 (0.72)	4.34 (4.28)	3.87 (4.23)
	Women	232 (39%)	3.67 (0.69)	14.50 (0.99)	5.34 (5.34)*	5.38 (5.38)***
Relationship Status	Single	143 (24%)	3.62 (0.61)	14.17 (14.28)	5.25 (4.79)	4.71 (4.75)
	Relationship	446 (76%)	3.77 (0.68)*	13.92 (14.14)	4.57 (4.72)	4.37 (4.70)
Employment	Part-Time	194 (33%)	3.74 (0.66)	10.85 (11.90)	3.70 (4.32)	3.29 (4.08)
	Full-Time	394 67%)	3.73 (0.67)	15.56 (14.92)***	5.24 (4.86)***	5.04 (4.97)***
Education	College	330 (56%)	3.71 (0.67)	14.77 (14.33)	4.97 (4.97)	4.75 (4.84)
	University	259 (44%)	3.76 (0.65)	12.98 (13.91)	4.42 (4.60)	4.09 (4.64)
Provider Classification	PCP	398 (67%)	3.69 (0.67)	13.30 (13.62)	4.77 (4.82)	4.45 (4.82)
	ACP	188 (32%)	3.82 (0.65)*	15.42 (15.16)	4.64 (4.57)	4.48 (4.64)
Peer Support Team	Member	29 (45%)	3.54 (0.82)	23.41 (22.59)***	7.76 (6.42)***	7.38 (6.50)**
	Non-Member	560 (95%)	3.74 (0.66)	13.53 (13.46)	4.58 (4.60)	4.31 (4.62)

Table 1: **Mental health measures (mean score) stratified by demographic category**. SD = Standard Deviation; BRS = Brief Resilience Scale; PCL-5 = Post-Traumatic Stress Disorder Checklist; PHQ-9 = Patient Health Questionnaire; GAD-7 = Generalized Anxiety Disorder. $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

	BRS <3.00		**PCL-5** >32		**PHQ-9** >9		**GAD-7** >9		**Any**	
All Participants [N (%)]	63 (10.7%)		66 (11.2%)		91 (15.4%)		87 (14.7%)		145 (24.6%)	
Covariate	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Age	0.99	0.96-1.02	1.06***	1.02-1.09	1.04***	1.02-1.07	1.03*	1.00-1.06	1.04***	1.01-1.06
Experience	0.99	0.95-1.02	1.05***	1.02-1.09	1.04**	1.01-1.07	1.03**	1.00-1.06	1.04***	1.02-1.07
Women	1.35	0.79-2.27	0.73	0.43-1.26	1.61*	1.02-2.52	1.88**	1.19-2.98	1.38	0.94-2.02
Single	1.38	0.78-2.46	0.81	0.43-1.52	1.21	0.73-2.00	1.13	0.67-1.90	1.25	0.81-1.91
Full-Time	0.78	0.45-1.34	2.72**	1.39-5.33	2.87***	1.60-5.16	2.63***	1.50-4.83	2.82***	1.77-4.50
College	0.97	0.57-1.64	1.53	0.89-2.61	1.32	0.78-1.94	1.78*	1.10-2.89	1.43	0.97-2.11
ACP	0.76	0.42-1.36	1.54	0.91-2.60	0.98	0.61-1.59	1.00	0.61-1.63	1.06	0.71-1.58
Peer Supporter	1.35	0.45-4.01	4.70***	2.08-10.62	4.72***	1.96-9.28	2.76*	1.21-6.28	3.02**	1.42-6.45
Low Resilience (BRS <3.00)			9.30***	5.12-16.89	6.34***	3.61-11.12	6.29***	3.57-11.08	8.15***	4.62-14.36

Table 2a: **Positive screens stratified by demographics and resilience in unadjusted analyses**. SD = Standard Deviation; OR = Odds Ratio; PCP = Primary Care Paramedic; ACP = Advanced Care Paramedic; BRS = Brief Resilience Scale; PCL = Post-Traumatic Stress Disorder Checklist; GAD = Generalized Anxiety Disorder. "Any" = any positive screen excluding BRS. $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

Model [(x^2 (p)]	**PTSD** (PCL-5 >32) 82.19 (p<0.001)		**Depression** (PHQ-9 >9) 78.30 (p<0.001)		**Anxiety** (GAD-7 >9) 72.14 (p<0.001)		**Any Positive Screen** 101.3 (p<0.001)	
Covariate	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Age	1.07*	1.00-1.13	1.06*	1.00-1.11	1.02	0.96-1.08	1.02	0.97-1.07
Experience	0.96	0.90-1.03	0.97	0.91-1.03	0.99	0.93-1.05	1.00	0.95-1.06
Women	0.73	0.39-1.37	1.78*	1.07-2.95	2.20**	1.32-3.67	1.52	0.98-2.34
Single	0.95	0.46-1.96	1.35	0.76-2.40	1.22	0.68-2.19	1.45	0.88-2.34
Full-Time	2.15	0.93-4.96	2.85**	1.41-5.77	2.85**	1.41-5.77	3.06***	1.70-5.50
University	0.70	0.37-1.32	0.82	0.48-1.39	0.50*	0.29-0.86	0.70	0.45-1.10
Advanced Care	1.19	0.62-2.28	0.77	0.40-1.29	0.82	0.45-1.46	0.76	0.46-1.24
Peer Supporter	4.05**	1.57-10.43	3.31**	1.40-7.84	2.07	0.83-5.14	2.13	0.92-4.89
'Low' Resilience (BRS<3.00)	13.09***	6.70-25.54	7.65***	4.14-14.10	7.33***	3.96-13.55	10.41***	5.59-19.40
Model [x^2 (p)]	0.41 (p=0.81)		0.911 (p=0.63)		0.75 (p=0.68)		1.06 (p=0.58)	
Interaction Term	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Gender*University	1.48	0.42-5.32	0.62	0.22-1.75	0.97	0.33-2.85	0.68	0.28-1.66
Full-Time*Gender	0.90	0.19-4.19	0.77	0.22-2.72	0.56	0.15-2.07	0.70	0.24-1.97

Table 2b: **Positive screens stratified by demographics and resilience in adjusted analyses**. SD = Standard Deviation; OR = Odds Ratio; PCP = Primary Care Paramedic; ACP = Advanced Care Paramedic; BRS = Brief Resilience Scale; PCL = Post-Traumatic Stress Disorder Checklist; GAD = Generalized Anxiety Disorder; "Any" = any positive screen $^{*}p<0.05$ $^{**}p<0.01$ $^{***}p<0.001$

2.11 Epilogue

My goals in this study were to estimate the prevalence of post-traumatic stress disorder, major depressive disorder, and generalized anxiety disorder and to explore the potential relationship between positive screens for each mental disorder and self-reported resilience and demographic characteristics. As I had expected, the rates of current mental disorder symptoms we observed were lower than had been previously reported in this population in Canada, but the rates are still concerningly high. We also observed that the risk of a positive mental disorder screen varied as a function of self-reported resilience, gender, employment classification, and previous experience on the service's peer support team. Having established a baseline of symptom prevalence and risk factors, our next goal was to explore the potential relationship between mental disorder symptoms and endorsement of the four dimensions of the paramedic role identity as described by Donnelly and colleagues. This investigation is presented in the next chapter.

CHAPTER 3: THE RELATIONSHIP BETWEEN ROLE IDENTITY AND MENTAL HEALTH AMONG PARAMEDICS

3.1 Prologue

In Chapter 3, I present the results from our second of three empirical papers. The paper describes a new analysis from the cross-sectional survey described in Chapter 2. In additional to self-report symptom measures for post-traumatic stress disorder, major depressive disorder, and generalized anxiety disorder, the survey also contained measures to assess for perceived stress, burnout, and secondary traumatic stress. We also included the Emergency Medical Services Role Identity Scale (EMS-RIS) developed by Donnelly and colleagues (2014). Here, we were interested in exploring the distributions of role identity endorsement across demographic categories and the relationships between endorsement of the dimensions of the EMS-RIS and mental health. Specifically, we were interested in understanding whether aligning with specific dimensions of paramedic role identity as associated with the risk of screening positive for a mental disorder or other, non-diagnostic indicators of psychological distress. This study addresses *Objective 2* in our research program.

For this study, I was responsible for the conception of the project; development of the methods; selection of the screening instruments included in the survey; the collection and analysis of data; and the preparation and submission of the manuscript.

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3.2 Abstract

Role identity theory describes the beneficial effects on health as a result of the purpose and meaning from occupying social roles. Amid high rates of mental illness among paramedics, we surveyed 589 (97%) paramedics from a single site in Ontario, Canada and evaluated for relationships between four dimensions of a previously validated paramedic role identity scale and symptoms of various mental disorders. Although we did not observe a relationship between role identity and mental disorder symptoms, we note with interest various differences in paramedic role identity across demographic categories that challenge previous characterizations of the profession and warrant further investigation.

Key Words: Paramedic, Mental Health, Role Identity, Post-Traumatic Stress Disorder, Emergency Medical Services

3.3 Introduction

A multitude of investigations have convincingly demonstrated that paramedics are at an increased risk of adverse mental health outcomes as a result of their work (Berger et al., 2012; Brooks & Brooks, 2021; Lawn et al., 2020). Data from a recent, nationally drawn cross-sectional survey of public safety personnel in Canada (Carleton et al., 2018) suggest that 1 in 4 have potentially diagnosable levels of symptoms of post-traumatic stress disorder (PTSD), 1 in 3 of depression, and 1 in 3 of various anxiety disorders. Nearly half of the paramedics included in the study met the screening criteria for a mental disorder (Carleton et al., 2018), and self-reported symptoms of mental illness were frequently comorbid with chronic pain (Carleton et al., 2017), poor physical health (Sommer et al., 2020), exposure to trauma (Carleton et al., 2019), alcohol use disorder (Carleton et al., 2018), and suicidality (Carleton et al., 2018).

While there have been numerous studies that have attempted to define and quantify the contribution of various acute and chronic workplace stressors on paramedic mental health the answer has been elusive. We know, for example, that approximately 30-40% of the variability in PTSD symptom scores is explainable through a combination of demographic characteristics, alcohol use, and features of both critical incidents (referring to the characteristics of emergency calls themselves) and chronic workplace stress (Donnelly, 2012; Donnelly et al., 2014). The challenge, however, is in accounting for the remaining variability, and - importantly - looking beyond symptomatology to a more holistic view of wellbeing. Mental health is complex, extending beyond the diagnosis of symptoms, and our understanding of the topic among paramedics can be enhanced by adopting a theoretically informed social sciences perspective.

Role identity theory

Originating within broader identity theory (Stets & Serpe, 2013), and flowing from the tenets of symbolic interactionism (Carter & Fuller, 2015), role identity theory explains that when an individual occupies a role within society, they construct an identity around the role through the enactment of its attendant attributes (Thoits, 1983). Role identities can be personal (such as a parent) or professional (such as a physician or lawyer) and prescribe a set of attitudes, values, beliefs, and behavioral expectations that are espoused in social norms, law, and ethics (Simon, 1995; Thoits, 1991). Where a role identity holds particular subjective importance to the individual – described as role salience (Thoits, 2012) – the attributes of the role become superimposed on personal characteristics and the role identity can become an integral part of the person's sense of self (van Ingen & Wilson, 2016). This can be psychologically adaptive, in that the role identity provides a sense of purpose and meaning in life (Thoits, 2012) that has been robustly linked to health and wellbeing (Thoits, 2001, 2011). However, an especially salient role identity can become problematic if embodying its attributes overshadows personal needs, or if the person is unable to fulfil the perceived requirements of the role in the way that they (or others) feel they should (Stets & Serpe, 2013; Thoits, 1991). This has been observed among social workers, for example, where identifying strongly with a caregiver role limits the degree to which social workers are willing to seek or accept help for personal or work-related stress, in turn creating an increased risk of professional burnout (Siebert & Siebert, 2007). Paramedics hold a prominent and generally respected role within society, often portrayed as heroes who place their own safety at risk to help others (Palmer, 1983, 2010). It is possible that 'over'-

endorsement of a paramedic role identity may create an increased risk of work-related mental illness. Conversely, it is also possible that identifying as a paramedic confers a sense of meaning and purpose in life that, in turn, is protective. Our goal in this study was to explore the relationship between role identity and mental health among paramedics.

3.4 Methods

Overview

We distributed an in-person, paper-based survey as part of a larger cross-sectional investigation into the prevalence and risk factors of mental illness among paramedics in a single paramedic service in Ontario, Canada (Donnelly, et al., 2015) In addition to a previously validated Emergency Medical Services Role Identity Scale (Donnelly, et al., 2015), our survey contained a demographic questionnaire and several widely used and well-validated self-report mental health measures. Our objective was to examine the relationship between endorsement of the dimensions of paramedic role identity and various mental health outcomes, including post-traumatic stress disorder (PTSD), depression, anxiety, perceived stress, burnout, and secondary traumatic stress. Our study was reviewed by the Hamilton Integrated Research Ethics Board (HiREB protocol number 7795) and all respondents provided informed consent prior to participating in the study.

Setting and Participants

Our study took place in Ontario, Canada. Peel Regional Paramedic Services provides publicly funded land ambulance service to the municipalities of Brampton, Mississauga, and Caledon. At the time of the study, the service employed 714 Primary and Advanced Care Paramedics (P/ACPs) with an annual caseload of more than 130,000 emergency calls, making the service the second largest in Ontario. Paramedics within the service are required to complete twice annual in-person continuing medical education (CME) sessions. In partnership with the service, we distributed our survey during the fall 2019 CME sessions. Consenting paramedics were provided with a package that contained a paper version of the survey, a list of mental health resources in the community, a $10 gift card, and were afforded approximately 20 minutes during the beginning of the day to complete the survey.

Measurements

Demographics

We included a demographic questionnaire developed through consensus among the research team and a review of relevant first responder-focused mental health literature. In addition to personal characteristics (e.g., age, gender, relationship status, education), the questionnaire asked participants about their professional experience, including provider level (primary or advanced care), employment classification (full- vs. part-time), years of experience, and current or previous service on the peer support team.

The emergency medical services role identity scale

The development and validation of the emergency medical services role identity scale (EMS-RIS) has been described elsewhere (Donnelly et al., 2015). The scale measures self-reported endorsement of four constituent dimensions of role identity in the context of paramedic work. *Caregiving* describes helping people in need, including, for example, connecting with patients on a personal level and providing an empathetic presence. *Thrill-Seeking* refers to the excitement of engaging with the more dramatic parts of paramedic work, including fast driving and responding to calls for patients with serious injury or illness. *Duty* refers to the importance of paramedic work and the corresponding pride in fulfilling a valuable role in the community. Finally, *capacity* describes a sense of self efficacy in the ability to do work that others find difficult, such as being calm under pressure. Each dimension contains between four (*capacity)* and eight (*caregiving*) items, and participants are asked to rate their endorsement of each on an anchored scale from 1 ("entirely untrue") to 7 ("entirely true"). In scoring the EMS-RIS, we centered participant responses on '4' ("neither untrue or true") and recoded the values to correspond to a new range from -3 ("entirely untrue") to +3 ("entirely true"). We then calculated the average score by dimension for each participant with the participant's largest mean score used to indicate their 'dominant' (or most prominent) role identity dimension.

Mental health measures

We evaluated mental health outcomes using a series of self-report screening tools that assess for clinically significant symptoms of post-traumatic stress disorder, depression, and anxiety. For PTSD, we used the PTSD Checklist adapted for the Diagnostic and Statistical Manual of Mental Disorder (DSM) version 5 (PCL-5) (Blevins et al., 2015). The PCL-5 is a 20-item measure evaluating symptoms across four diagnostic criteria for PTSD: intrusion, avoidance, alteration in cognition or mood, and alteration in arousal or reactivity. Participants are asked to rate each item on an anchored scale from 0 ("Not at all") to 5 ("Extremely") for symptoms experienced within the past 30 days. Total scores range between 0 and 80, with a score of >31-33 having 88% sensitivity and 66% specificity for probable PTSD (Wortmann et al., 2016). In keeping with previous investigations in this population (Carleton et al., 2018), we used a cut-score of >32 as our threshold for a positive screen.

For depression, we used the Patient Health Questionnaire 9 (PHQ-9). The PHQ-9 is a 9-item measure that asks participants to rate the degree to which they have been bothered by various symptoms (e.g., loss of interest or pleasure in doing things, difficulty concentrating) over the last 14 days (Kroenke et al., 2001). Symptoms are rated on a 4-point anchored scale from 0 ("Not at all") to 3 ("Nearly every day") with a score >9 having 85% sensitivity and 82% specificity for probable depression (Kroenke et al., 2010).

For anxiety, we used the 7-item Generalized Anxiety Disorder scale (Spitzer et al., 2006). The GAD-7 asks participants to indicate how often they have been bothered by symptoms such as feeling down, anxious, or on edge over the last 14 days on a 4-point anchored scale ranging from 0 ("Not at all") to 3 ("Nearly every day"). Scores >9 have a sensitivity of 90% and a specificity of 82% for probable generalized anxiety disorder (Spitzer et al., 2006).

Lastly, we included two additional measures describing stress and professional quality of life: Cohen's 10-item Perceived Stress Scale and the 21-item (healthcare) Professional Quality of Life

(ProQOL) measure. Both the PSS-10 (Cohen, 1983) and ProQOL (Stamm, 2010) are well validated and widely used (Hemsworth et al., 2018; Lee, 2012), particularly in healthcare contexts. Each asks participants to rate how often the scale items have been true for them over the past 30 days on an anchored scale from 1 ("Never") to 4 ("Very Often"). The ProQOL is further divided into three subscales: compassion satisfaction, burnout, and secondary traumatic stress. We scored each instrument according to published recommendations with established cut-scores for potentially problematic symptom levels.

Analysis

We used summary and descriptive statistics to characterize our data. To compare group differences across demographic characteristics, we used one-way analysis of variance (ANOVA) and chi-square tests for continuous and categorical data, respectively. For psychometric analysis of the self-report measures included in our survey, we calculated Cronbach's alpha as a measure of internal consistency. With respect to our primary objective of exploring the relationship between dimensions of EMS role identity and mental health, we analyzed our data two ways. First, we entered the average score for each RIS dimension into unadjusted ordinary least squares (OLS) regression equations to assess for linear relationships. We evaluated model fit through the proportion of variance explained and significance of the model. Second, to evaluate for the possibility of a nonlinear relationship, we identified each participant's 'dominant' role identity based on the largest mean score by dimension and entered it as a categorical covariate into a logistic regression model for each mental health outcome. Here we were interested in the odds of a positive screen for each of PTSD, depression, and anxiety given endorsement of a particular RIS domain. In establishing our threshold for a significant relationship, we accepted a p-value of less than 5% for both model and covariate and a 95% confidence interval that does not cross 1. All analyses were performed in SPSS version 26 (IBM Corporation, 2019).

3.5 Results

Participation

From September 4th through October 17th, 2019, we received 600 completed surveys out of 607 paramedics attending CME. Of these, we excluded 11 for large portions of incomplete data, leaving a final sample of 589 surveys for analysis and a response rate of 97%. During the fall CME, 107 paramedics were on various long-term leaves of absence, and while we originally intended to recruit paramedics on leave through postal mail, the emergence of the novel coronavirus pandemic early in the new year prevented this phase of recruitment.

Participant Characteristics

Our participants' demographic characteristics are presented in Table 1. Briefly, 354 (60.1%) of our participants were men, 232 (39.4%) were women, and a small number provided another, non-binary gender – not described here to preserve anonymity. On average, our participants were 34.58 (Standard Deviation [SD] 8.21) years of age and reported an average of 9.30 (±7.44) years of experience, having entered the profession, on average, at 25.25 (±4.27) years of age. Most participants were married or living common-law (n = 348; 59.1%), had completed a college

diploma (n = 290; 49.2%), were employed full-time (n = 394; 66.8%) and practicing as a primary care paramedic (n = 399; 67.7%). In total, 29 (4.9%) indicated they are currently or have previously been a member of the service's peer support team. Women tended to be younger (mean 33.61 vs. 35.13 years of age, $p = 0.02$) and reported less experience (mean 8.45 vs. 9.79 years, p 0.02) than men. Compared with men, women were more likely to have attended university (54.3% vs. 37.0%, Odds Ratio [OR] 2.02, 95% Confidence Interval [CI] 1.44-2.83, $p < 0.001$), but less likely to practice at the advanced care paramedic level (25.8% vs. 36.1%, OR 0.61, 95% CI 0.42-0.88, p = 0.009).
[Table 1 About Here]

Role Identity Distributions

Internal consistency for each dimension of the EMS-RIS was good ($\boldsymbol{\alpha}$ = 0.83 for caregiving, $\boldsymbol{\alpha}$ = 0.84 for thrill-seeking, $\boldsymbol{\alpha}$ = 0.80 for duty, and $\boldsymbol{\alpha}$ = 0.87 for capacity), with an overall reliability coefficient of 0.88. Across all participants, *capacity* had the largest mean score at 1.98 (±0.80), followed by *caregiving* (1.55 [±0.68]), *duty* (1.31 [±0.90]), and *thrill-seeking* (0.92 [±1.20]). Similarly, the majority (n = 305, 51.8%) of participants endorsed capacity as their 'dominant' role identity. In comparison, just 12% (N = 70) of participants endorsed *thrill-seeking* as their 'dominant' role identity. A total of 34 participants (5.7%) had identical mean scores for more than one role identity dimension and were excluded from any categorical analyses.

When stratified by demographic characteristics (Tables 2a & b), we observed several differences. Mean scores for *caregiving* (1.70 vs. 1.45, $p < 0.001$), *duty* (1.41 vs. 1.25, $p = 0.041$), and *capacity* (2.08 vs. 1.92, $p = 0.017$) were higher for women than men, and when evaluated categorically, women were more likely to endorse *caregiving* as their dominant role identity (22.4% vs 13.2%, OR 1.88, 95% CI 1.22-2.91, $p = 0.004$). We similarly observed more endorsement of *thrill-seeking* among single paramedics, both by mean score (1.11 vs. 0.58, $p = 0.03$) and categorically by 'dominant' dimension (18% vs. 9%, OR 2.01, 95% CI 1.19-3.41, $p = 0.008$). Primary care paramedics were more likely to endorse *duty* as their dominant role identity (16.3% vs. 8.5%, OR 2.10, 95% CI 1.17-3.73, $p = 0.01$) while advanced care paramedics more commonly endorsed *capacity* (62.2% vs. 46.7%, OR 1.87, 95% CI 1.31-2.67, $p < 0.001$). Finally, while mean scores for *caregiving* (1.85 vs. 1.53, $p = 0.017$), *duty* (1.66 vs. 1.29, $p = 0.036$), *and capacity* (2.37 vs. 1.96, $p = 0.008$) for current or former members of the peer support team (N = 29) were higher than non-members, we did not observe a significant categorical relationship by 'dominant' role identity dimension, likely due to small group numbers. [Tables 2a & b About Here]

Mental Health Outcomes

Internal consistency measures for the PCL-5 ($\boldsymbol{\alpha}$ = 0.94), PHQ-9 ($\boldsymbol{\alpha}$ = 0.87), GAD-7 ($\boldsymbol{\alpha}$ = 0.92), PSS-10 ($\boldsymbol{\alpha}$ = 0.87), and the ProQOL compassion satisfaction ($\boldsymbol{\alpha}$ = 0.89), (burnout ($\boldsymbol{\alpha}$ = 0.80), and secondary traumatic stress subscales ($\boldsymbol{\alpha}$ = 0.84) were all high and consistent with previous studies (Beard & Bjorgvinsson, 2014; Beard et al., 2016; Wortmann et al., 2016). In total, 66 participants (11.2%) met the criteria for a positive screen for PTSD, 91 (15.4%) for depression, and 87 (14.7%) for anxiety, with 145 participants (24.6%) screening positive for any of the three. With respect to non-diagnostic psychological distress, a total of 309 (52.7%), 276 (47.1%), and

115 (19.6%) participants met the criteria for moderate levels of perceived stress, burnout, and secondary traumatic stress, respectively.

In our unadjusted models, we found that *caregiving* (ß -1.90, 95% CI -2.65 - -1.15, p <0.001), *thrill-seeking* (ß -0.56, 95% CI -0.99 - -0.14, p = 0.009), and *duty* (ß -2.24, 95% CI -2.79 - -1.70, p <0.001) were inversely associated with the total score of the burnout subscale of the ProQOL, with the relationships accounting for 4%, 1%, and 10% of the total variability in burnout scores, respectively. We found no other relationship significant at or below the 5% threshold between any role identity dimension and total score on the PCL-5, PHQ-9, GAD-7, or PSS-10. Similarly, we found no nonlinear relationship significant at or below the 5% threshold between any RIS dimension and the odds of screening positive for PTSD, depression, or anxiety in logistic regression modelling (Table 3). [Table 3 About Here]

3.6 Discussion

We sought to evaluate the degree to which endorsement of four previously identified constituent dimensions of role identity within paramedicine might be related to adverse mental health outcomes. While we observed an inverse linear relationship between endorsement of the *caregiving, thrill-seeking* and *duty* dimensions and the burnout subscale of the ProQOL measure, self-identifying within any one of these dimensions as a 'dominant' role identity was not associated with a categorical risk of burnout. We also did not find a robust relationship with the dimensions of the EMS-RIS and other mental health outcomes, such as PTSD, depression, or anxiety. Based on our theoretical framework, we hypothesized that we would observe both linear and dichotomous relationships between the dimensions of the role identity scale and our mental health measures, although we made no a priori estimations of the direction or strength of the relationship. We were open to the possibility, for example, that endorsement of a particular role identity dimension may be associated with increased *or* decreased odds of clinically significant symptoms of PTSD, depression, or anxiety – all of which have been found to be concerningly prevalent among paramedics. That we didn't observe such a relationship in our data is interesting and points to opportunities for future research.

One possibility is that the relationship between role identity and mental health is less a matter of which dimension of role identity is endorsed and more a function of the resulting cognitive dissonance that manifests from the incongruence of an espoused versus enacted identity. For example, if the *thrill-seeking* role identity resonates strongly for a particular paramedic, but the day-to-day reality of the work is perceived as mundane, the incongruence between 'expectation' and 'reality' is likely more responsible for any resulting psychological distress rather than the *thrill-seeking* identity itself. Exploring this relationship further would involve extending the EMS-RIS to specifically probe about the degree to which the paramedic endorses *and is able to enact* the attitudes, values, and behaviors of each role identity dimension.

More broadly, the topic of cognitive dissonance resulting from role conflict among paramedics is worthy of further study in its own right. We have abundant literature describing the myriad of both acute and chronic workplace stressors in paramedicine, but comparatively little work that provides theoretically informed insight into *why* certain workplace stressors cause the distress that they do. Situating the question within a role identity framework may yield important

insights. It may be, for example, that the stress from non-urgent calls for service (a common chronic stressor (Nurok & Henckes, 2009)) may have less to do with the acuity of the patient and more with the perceived incompatibility with what the paramedic believes their role *should* be. From a practical perspective, if role dissonance is a problem, its solution likely lies (at least in part) in reframing expectations of the work during entry-to-practice training.

On another note, we observed that the dimensions of role identity among participants were endorsed differently across demographic categories. For example, women were more likely than men to align with the *caregiving* dimension, reporting a higher mean score and more frequently endorsing the dimension as their 'dominant' category. The difference is likely attributable, at least in part, to gender stereotypes that frequently portray women as more 'nurturing' and 'caring' than men (Springer et al., 2012). As a profession, however, paramedicine keeps the company of the military, law enforcement, and firefighting as having historically been described as a predominantly masculine occupation (Rivard et al., 2021). That women in a 'traditionally masculine' job view themselves in a 'traditionally feminine' role is interesting, as it may call into question the broad strokes characterization of the profession. To our knowledge, this has not been previously studied and warrants further investigation. Similarly, we observed that primary care paramedics more frequently endorsed the *duty* dimension of the EMS role identity, while advanced care paramedics were more aligned with the *capacity* dimension. The job characteristics of the two provider classifications are functionally different. Advanced care paramedics have a larger and more complex scope of practice, are entrusted with more responsibility (and, by extension, have greater accountability), and are dispatched to patients with more severe illness. Historically, advanced care paramedics have also been primarily responsible for notifying family after the out-of-hospital death of a patient, a task which previous research has identified as inherently stressful (Donnelly & Bennett, 2014; Halpern et al., 2009). It may be that paramedics self-select into the advanced care role because they feel they are capable of managing the additional challenges. Previous research, however, has identified an increased risk of PTSD among advanced care paramedics (Donnelly et al., 2016), although we did not observe this relationship in our data. Disentangling these complex findings is worthy of further study.

Limitations

Our findings should be interpreted within the context of certain limitations. As with any study reporting a null result, we acknowledge the possibility of a type II error. We note, however, that our sample of 589 participants gives us a participant to predictor ratio of almost 150:1, which ought to be reasonable. Similarly, our event rate per covariate for the logistic regression modelling is between 16:1 (PTSD) and 22:1 (depression). Second, although the self-report measures in our study are widely used and well-validated, they are not intended to be diagnostic. Diagnoses of PTSD, depression, and anxiety can only be made in the context of a structured clinical interview by a mental health professional, and self-assessment carries with it an inherent risk of misclassification (Levis et al., 2019), the degree of which is difficult to estimate. Finally, cross-sectional studies do not lend themselves to establishing causality and care must be taken when interpreting study findings. We do not claim causal relationships in our investigation, and our results should more properly be viewed as inviting further study on a variety of topics, which, themselves, may actually be more amenable to qualitative methodologies.

3.7 Conclusion

Contrary to initial expectations, we did not observe a quantifiable relationship between endorsement of four constituent dimensions of paramedic role identity and mental health. In retrospect - and extrapolating from our theoretical framework - we think the relationship has more to do with the cognitive dissonance that may be experienced where perceived and enacted roles are incongruent. We did find, however, that the dimensions of paramedic role identity vary across demographic and professional categories – an interesting finding that warrants further study.

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3.9 Tables

Parameter		**All Participants**	**Men**	**Women**	**Difference** (Men vs. Women)
		Mean (SD)	Mean (SD)	Mean (SD)	
Age		34.58 (8.21)	35.13 (8.43)	33.61 (7.56)	+1.6*
Experience		9.30 (7.44)	9.79 (7.56)	8.45 (6.99)	+1.4*
Category		**N** (%)	**N** (% within men**)**	**N** (% within women)	**Odds Ratio** (Men vs. Women)
Relationship Status	Single	143 (24.3)	82 (23.2)	61 (26.3)	0.84
	Relationship	446 (75.7%)	272 (76.8)	171 (73.7)	
Employment	Full-Time	394 (66.9)	244 (69.1)	147 (63.4)	1.29
	Part-Time	194 (32.9)	109 (30.9)	85 (36.6)	
Education	College	330 (56)	223 (63.0)	106 (45.7)	0.49**
	University	508 (44)	131 (37.0)	126 (54.3)	
Provider Classification	Primary Care	399 (67.7)	226 (63.8)	172 (74.1)	1.62**
	Advanced Care	190 (32.3)	128 (36.2)	60 (25.9)	
Peer Support Team (Current or Former)	Member	29 (4.9)	16 (4.5)	13 (5.6)	0.79
	Non-Member	560 (95.1)	338 (95.5)	219 (94.4)	

Table 1: **Participant demographic** characteristics. SD = Standard Deviation *p<0.05 **p<0.01 ***p<0.001

Demographic Category		**N** (%)	**Caregiving Mean (SD)**	**Thrill-Seeking Mean (SD)**	**Duty Mean (SD)**	**Capacity Mean (SD)**
All Participants		589	1.55 (0.68)	0.92 (1.20)	1.31 (1.42)	2.00 (0.81)
Gender	Men	354 (60.1)	1.45 (0.69)	0.93 (1.20)	1.25 (0.92)	1.92 (0.88)
	Women	232 (39.3)	1.70*** (0.64)	0.89 (1.19)	1.41* (0.87)	2.08* (0.66)
Relationship Status	Single	143 (24.2)	1.52 (0.60)	1.11*(1.08)	1.30 (0.91)	1.86 (0.72)
	Relationship	446 (75.7)	1.55 (0.71)	0.85 (1.23)	1.31 (0.90)	2.02* (0.83)
Employment	Part-Time	194 (32.9)	1.50 (0.65)	1.08* (1.10)	1.38 (0.83)	1.85 (0.80)
	Full-Time	394 66.8)	1.57 (0.70)	0.83 (1.24)	1.27 (0.93)	2.04 (0.80)
Education	College	330 (56)	1.59 (0.68)	0.98 (1.12)	1.33 (0.90)	1.98 (0.83)
	University	259 (43.9)	1.49 (0.69)	0.83 (1.29)	1.28 (0.90)	1.98 (0.78)
Provider Classification	Primary Care	398 (67.5)	1.53 (0.66)	0.98 (1.18)	1.39** (0.85)	1.90 (0.82)
	Advanced Care	188 (31.9)	1.58 (1.74)	0.77 (1.22)	1.14 (0.98)	2.15*** (0.76)

Table 2a: **Role Identity Scale dimensions (mean scores) stratified by demographic category**. SD = Standard Deviation. *p<0.05 **p<0.01 ***p<0.001

Demographic Category		**Caregiving N (%)**	**Thrill-Seeking N (%)**	**Duty N (%)**	**Capacity N (%)**
All Participants		99 (16.8)	70 (11.9)	81 (13.8)	305 (51.8)
Gender	Men	47 (13.2)	48 (13.5)	50 (14.1)	185 (52.2)
	Women	52 (22.4)	22 (9.5)	31 (13.3)	118 (50.9)
	Odds Ratio	0.53**	1.49	1.06	1.05
	95% CI	0.34-0.81	0.87-2.55	0.65-1.72	0.75-1.43
Relationship Status	Single	25 (17.5)	26 (18)	25 (17.5)	63 (44)
	Relationship	74 (16.5)	44 (9.8)	56 (12.5)	240 (53.8)
	Odds Ratio	1.05	2.01**	1.46	0.66*
	95% CI	0.64-1.73	1.19-3.41	0.87-2.44	0.45-0.97
Employment	Part-Time	31 (15.9)	28 (14.4)	37 (19)	89 (45.8)
	Full-Time	68 (17.2)	42 (10.6)	44 (11.1)	213 (54)
	Odds Ratio	0.90	1.40	1.86*	0.70
	95% CI	0.56-1.43	0.83-2.34	1.15-2.99	0.50-1.00
Education	College	52 (15.7)	43 (13)	45 (13.6)	164 (49.7)
	University	47 (18.1)	27 (10.4)	36 (13.9)	141 (54.4)
	Odds Ratio	0.84	1.29	0.98	0.83
	95% CI	0.54-1.29	0.76-2.13	0.60-1.56	0.60-1.17
Provider Classification	Primary Care	72 (18)	53 (13.3)	65 (16.3)	186 (46.7)
	Advanced Care	27 (14.3)	17 (9)	16 (8.5)	117 (62.2)
	Odds Ratio	1.31	1.54	2.10*	0.53***
	95% CI	0.81-2.13	0.86-2.75	1.17-3.73	0.37-0.75

Table 2b: **'Dominant' Role Identity Scale dimension stratified by demographic category**. Odds Ratios within strata are calculated for top vs. bottom row (i.e., men vs. women). *p<0.05 **p<0.01 ***p<0.001

Mental Health Measure		Mean (SD)	N (%)	Caregiving		Thrill-Seeking		Duty		Capacity	
				ß	OR	ß	OR	ß	OR	ß	OR
PTSD	PCL-5	13.98 (4.16)	66 (11.3)	1.80	0.86	0.14	1.77	-0.18	0.98	0.04	0.70
	95% CI			0.12-3.47	0.42-1.76	-0.80-1.01	0.89-3.50	-1.44-1.07	0.46-2.07	-1.38-1.46	0.42-1.17
Depression	PHQ-9	4.73 (4.74)	91 (15.5)	0.37	0.75	-0.01	0.85	-0.11	1.22	0.04	1.12
	95% CI			-0.19-0.93	0.40-1.42	-0.33-0.31	0.42-1.75	-0.54-0.30	0.66-2.26	-0.43-0.51	0.70-1.77
Anxiety	GAD-7	4.46 (4.76)	87 (14.8)	0.40	1.01	0.12	1.84	-0.26	0.98	-0.11	0.72
	95% CI			-0.16-0.97	0.55-1.86	-0.19-0.44	1.00-3.41	-0.69-0.15	0.50-1.91	-0.59-0.36	0.45-1.16
Perceived Stress	PSS-10	14.93 (6.58)	309 (52.7)	0.22	0.94	-0.08	1.50	-0.38	1.02	-0.50	0.85
	95% CI			-0.56-1.01	0.61-1.46	-0.53-0.36	0.90-2.52	-0.98-0.22	063-1.64	-1.17-0.15	0.61-1.19
ProQOL	Burnout	22.79 (6.26)	276 (47.1)	-1.90***	0.66	-0.56**	1.43	-2.24***	0.67	-0.45	1.31
	95% CI			-2.65- -1.15	0.42-1.04	-0.99 - -0.14	0.86-2.36	-2.79 - -1.70	0.41-1.09	-1.80-0.18	0.93-1.83
	STS	17.80 (5.74)	115 (19.6)	1.09	0.96	0.15	1.13	0.07	0.92	0.06	0.93
	95% CI			0.40-1.77	0.55-1.67	-0.24-0.55	0.61-2.09	-0.44-0.59	0.50-1.68	-0.51-0.64	0.62-1.41
Any Positive Screen	Any		145 (24.7)		0.90		1.47		1.25		0.78
	95% CI				0.54-1.51		0.85-2.54		0.73-2.12		0.53-1.15

Table 3: **Mental health measures stratified by role identity dimension**. STS = Secondary Traumatic Stress subscale. ß coefficients for linear regression models, OR = Odds Ratio for logistic regression models. N (%) describes the proportion of survey participants meeting the threshold for a positive screen for each mental health measure. *p<0.05 **p<0.01 ***p<0.001

3.10 Epilogue

In this study, we explored the relationship between endorsement of the four dimensions of the emergency medical services role identity scale and the risk of a positive screen for a mental disorder or symptoms of burnout, perceived, or secondary traumatic stress. We did not observe a quantifiable increase in risk between the dimensions of the role identity scale and any indicator of mental health we assessed for. This was contrary to expectations. Given the observed increased risk of burnout among social workers who aligned with a caregiver role identity, I expected to see some influence on risk attributable to caregiving in our own sample. At the very least, I thought we would see a relationship between *thrill-seeking* and *burnout* – if for no other reason than my own experience in seeing my colleagues express their frustration with having to attend non-urgent calls. Our conceptual framework would suggest that for people who align very strongly with *thrill-seeking* but can't find the 'thrills', some evidence of emotional of psychological distress would result. What I think we were missing in this analysis, however, was the 'but can't find the 'thrills'' part – the idea that there is incongruence between an espoused versus able-to-enact role identity. In that respect, the relationship is still theoretically sound, but probably non-linear and less a function of *which* role identity dimension is endorsed and more about the inability to realize the identity if it is important to the espouser. I'm reminded of an expression often cited in favor of qualitative research: 'not all that can be counted counts and not all that counts can be counted'. It rings true here, and the premise sets the stage for our qualitative study into the intersection between role identity and mental health in the next chapter.

CHAPTER 4: ROLE IDENTITY, DINNONANCE, AND DISTRESS AMONG PARAMEDICS

4.1 Prologue

In Chapter 4, I present the results from our third and final empirical study. The paper describes a qualitative analysis of semi-structured interviews with a purposively selected sample of paramedics from our study site in which we explored paramedic role identity and its implications for mental health and well-being. I was specifically interested in understanding what happens when an espoused conceptualization of paramedic role identity is incongruent with what is realistically achievable in paramedic work. I also sought to explore the alignment with the extant dimensions of paramedic role identity described by Donnelly and colleagues and to identify any potential new dimensions.

For this study, I was responsible for the conception of the project; development of the interview guide and methods; recruitment and selection of participants; conducting the interviews; analysis of data; and the preparation and submission of the manuscript.

Findings from this study have been shared in a poster at the Canadian Institute of Military and Veteran Health Research (CIMVHR) Forum in 2021. The paper is published in the *International Journal of Environmental Research and Public Health* as part of a special issue on public safety personnel mental health and well-being and can be cited as: Mausz, J., Donnelly, E. A., Moll, S., Harms, S., & McConnell, M. (2022). Role identity, dissonance, and distress among paramedics. *International Journal of Environmental Research and Public Health, 19(4), 2115.* *https://doi.org/10.3390/ijerph19042115*

4.2 Abstract

Role identity theory describes the purpose and meaning in life that comes, in part, from occupying social roles. While robustly linked to health and well-being, this may become problematic, however, when an individual is unable to fulfil the perceived requirements of an especially salient role in the way that they believe they should. Amid high rates of mental illness among public safety personnel, we interviewed a purposely selected sample of 21 paramedics from a single service in Ontario, Canada to explore incongruence between an espoused and able-to-enact paramedic role identity. Situated in an interpretivist epistemology, and using successive rounds of thematic analysis, we developed a framework for *role identity dissonance* wherein chronic, identity-relevant disruptive events cause emotional and psychological distress. While some participants were able to recalibrate their sense of self and understanding of the role, for others, this dissonance was irreconcilable, contributing to disability and lost time from work. In addition to contributing a novel perspective on paramedic mental health and well-being, our work also offers a modest contribution to the theory in using the paramedic context as an example to consider identity disruption through chronic workplace stress.

Keywords: Public Safety Personnel; First Responders; Mental Disorders; Mental Health; Well-Being; Trauma; Operational Stress Injuries; Post-Traumatic Stress Injuries; Role Identity Theory; Qualitative Research

> "You're at your peak here (having just attended a call for a cardiac arrest), and you feel good about yourself. And then some guy calls for 'I can't sleep'. I actually felt like a paramedic, (and) now I'm your taxi driver who's taking you to the hospital because you can't sleep*"* ('Shawn')

4.3 Introduction

Shawn is an experienced advanced care paramedic who I interviewed to ask about how *role identity* - how we see ourselves in relation to the roles that we hold in society (Stets & Serpe, 2013) - intersects with his mental health and wellbeing as a paramedic. The question is both important and timely, given the growing recognition of the mental health challenges that paramedics face because of their work. In a recent cross-sectional survey of public safety personnel in Canada, 1 in 4 participating paramedics met the screening criteria for post-traumatic stress disorder (PTSD), 1 in 3 for depression, and 1 in 3 for an anxiety disorder (Carleton et al., 2018). All told, nearly half of the surveyed paramedics met the screening criteria for at least one mental disorder (Carleton et al., 2018), which - combined with high rates of chronic pain (Carleton et al., 2017), exposure to trauma (Carleton et al., 2019), substance use (Carleton et al., 2018), and a history of childhood abuse (Turner et al., 2018) - conspired to place the cohort at an alarmingly increased risk of suicide (Carleton et al., 2018).

Although several studies have attempted to define and quantify the impact of various stressors on the risk of mental illness among paramedics, a precise answer has been elusive. Much of the extant research has relied on cross-sectional surveys that view the topic of paramedic mental health through a biomedical (or diagnostic) lens and have tended to be atheoretical. Although informative, this approach risks missing part of the picture. Theoretically-informed social science perspectives have contributed much to our understanding of health and wellbeing (Thoits, 2010) and have the potential to shed new light on the topic among paramedics. One early line of inquiry that shows promise is the use of *role identity theory* (Mausz et al., 2021) to study paramedic mental health.

Role Identity Theory

Originating within the broader family of identity theories (Stets & Serpe, 2013) and flowing from the tenets of symbolic interactionism (Stryker & Burke, 2000), role identity theory explains that individuals experientially construct a sense of self through the enactment of social roles (Thoits, 2012). *Roles* are relational positions within society to which there are attendant behavioral expectations and norms, including various attitudes, values, and beliefs (Thoits, 1991). Being a parent, for example, carries with it responsibilities that are articulated in law, ethics, and social scripts (Laurent-Simpson, 2017). Where a role holds particular salience - defined as the perceived importance (Thoits, 2012) - for the individual, the role becomes a central part of the person's sense of self, providing an answer to the existential question '*who am I?*' Role identities serve as a signal to ourselves and to others about how we fit into society, and the performative nature of role identities means that perceptions of self hinge to a degree on how we think others see us (Simon, 1995). Role-affirming experiences help reinforce the stability of the identity (Noor, 2004), and the resulting sense of purpose and meaning that come from competently fulfilling an important role have been robustly linked to physical, emotional, and

psychological well-being (Thoits, 2011). This has been observed, for example, among older volunteers, who after retirement, derive meaning through community service (Piliavin & Siegl, 2007; Thoits, 2001, 2012).

Paramedic Role Identity

A four-dimension paramedic role identity has been previously defined (Donnelly et al., 2015). Within this construction, personal and professional fulfillment can be drawn from helping people in need (*caregiving)*; finding excitement in the dramatic aspects of paramedic work (*thrill seeking*); deriving a sense of self-efficacy from competently performing challenging work (*capacity*); or the altruism of providing an important community service (*duty*) (Donnelly et al., 2015). Viewing paramedic mental health through a role identity lens may provide useful insights. Because paramedics hold a respected position in society, the role identity is inherently high stakes, both in its attendant function of responding to life-threatening emergencies, and in its social capital, where paramedics are often portrayed in a heroic light (Tangherlini, 2000). If the paramedic role identity holds particular salience for an individual, it follows that their sense of purpose and meaning in life may run equally deep. Where this may become problematic, however, is if the individual is unable to fulfil the attributes of the role in the way that they feel (or believe others feel) that they should - what Thotis and others have called 'identity-relevant disruptive' events (DeGarmo & Kitson, 1996; Thoits, 1995). Although usually discussed in the context of discrete life events such as the loss of a job or the death of a spouse (Thoits, 1992), it may be reasonable to extrapolate the concept to more nebulous chronic stressors. Shawn's comments at the beginning of the paper are illustrative of a discrepancy between perceived and enacted role identity that, over the course of a career, could lead to potentially significant chronic stress. We sought to explore this issue of incongruence and its implications for mental health among paramedics, asking the question *what happens when a paramedic is unable to fulfil the attributes of the role in the way they believe they should*?

4.4 Materials and Methods

Overview

We positioned this study within an interpretivist epistemology (Creswell, 2013), under the methodological banner of generic approaches to qualitative research (Kahlke, 2014), and adopted what Varpio and colleagues (Varpio et al., 2020) call a 'fully theoretically-informed' study design. Sensitized by an existing definition for paramedic role identity (Donnelly et al., 2015), we conducted in-depth, multi-stage, semi-structured interviews with a purposely selected sample of 21 paramedics from a single, large, urban paramedic service in Ontario, Canada. Our goal in this study was to explore the incongruence between an espoused and able-to-enact role identity and its potential implications for mental health and wellbeing. In practical terms, this meant using the 'if-then' propositions of the theory to answer five specific questions:

1. How do the dimensions of paramedic role identity align with the ways in which our participants see themselves in relation to their role?
2. Relatedly, is anything 'missing' in terms of new dimensions of paramedic role identity?

3. How does incongruence between an espoused and able-to-enact role identity (what we call 'role identity dissonance') manifest?
4. What consequences result from role identity dissonance in terms of emotional or psychological distress?
5. And finally, how is role identity dissonance reconciled?

Theoretical Orientations & Approach

Because our construct of interest flows broadly from the tenets of symbolic interactionism (Blumer, 1980) and role relationships themselves are necessarily performative (Stets & Serpe, 2013), we acknowledge the inherent centering of subjective experience in making sense of the lived world. This aligns with interpretivist thinking (Creswell, 2013) in understanding that reality is experienced subjectively and negotiated collaboratively, allowing us to explore the richness of multiple, and at times, seemingly divergent or contradictory truths. In interpretivist approaches to research, the role of the investigator in the co-construction of knowledge is embraced rather than bracketed out. Strategies to distance the influence of the researcher from the topic of study or make the research process 'objective' tend to be eschewed in favor of being transparent about the positionality and role of the researcher in the construction of knowledge. We discuss this in more detail in our section on reflexivity.

Ethics & Consent

Ethics review for this study was provided by the Hamilton Integrated Research Ethics Board (project number 5599) and approval for the research within the study site was provided jointly by the paramedic leadership team and the elected local executive committee of the union representing the paramedics. All participants provided informed, written consent to participate, were assured of confidentiality, and had the option to withdraw from the study at any point. We also put in place additional safeguards for the participants given the sensitivity of the interview subject. This included taking breaks when discussing difficult topics, debriefing participants following each interview, providing each interviewee with a list of mental health resources, and having referral and crisis procedures for distressed participants (a contingency plan that, fortunately, was not required).

Setting and Context

Our study took place pre-COVID in a single paramedic service in Ontario, Canada. The publicly funded, lower-tier municipal service employs more than 700 primary and advanced care paramedics who respond to an average of 130,000 emergency calls per year, making the service the second largest in the province by staffing and caseload. The topic of mental health has been particularly salient within the service in recent years after the deaths by suicide of two senior paramedics.

Researcher Characteristics & Reflexivity

This investigation forms one part of my[1] doctoral dissertation in health research methods. Our team blends a variety of disciplinary backgrounds, including social work, occupational therapy, psychiatry, cognitive psychology, and paramedicine, with each member having experience in a variety of research approaches, including qualitative methodologies. I am also a practicing paramedic at the study site, thus positioning me as an insider (Asselin, 2003) in the community. This afforded me access and insight into the phenomenon under study that would otherwise be difficult to obtain, but it came, however, with the acknowledged risk of unchallenged assumptions shared between me and the participants. On balance, we felt that the affordances outweighed the risks; my relationship with the participants as a respected colleague gave me a unique position as a trusted confidant. Because I have shared in many of the same experiences as my interview participants, it gave me the legitimacy to ask difficult questions and a common language to interpret the responses. To help counterbalance my insider perspective, I engaged in a variety of reflexive processes, including the reflective journaling and memoing common to qualitative methods (Charmaz, 2014c), debriefing interviews with our research assistant and bringing annotated interview excerpts to the members of the research team for discussion. The goal here was not to eliminate or even substantially reduce 'bias' per se, but to instead build transparency in the research process and incorporate different perspectives into the interpretation of findings, but in a way that is still in alignment with the conceptual framework that guides our study.

Recruitment & Sampling

Our sampling strategy followed the methodological principles of purposive sampling as described by Charmaz (Charmaz, 2014d), recruiting a sample of 21 paramedics using maximum variation across demographic characteristics, but also making an effort to saturate various conceptual categories relevant to our research questions. This included recruiting participants who had taken an occupational stress leave (*N=7*); or who had been diagnosed with or were receiving treatment for a work-related mental health problem (*N=6*). We solicited participation for the study through workplace and union email list servers, closed workplace social media groups, and in person during the fall 2019 / winter 2020 Continuing Medical Education (CME) sessions. All recruitment was handled by the principal investigator – himself a practicing paramedic in the study site – and involved an explanation of the study goals and the range of participant experiences the team was interested in documenting (i.e., variety in gender, age, years of experience, level of clinical certification, employment classification, and lived experience with work-related mental illness).

Data Collection

We used multi-stage, semi-structured interviews for data collection. I interviewed every participant at least once, with most participants providing two interviews, and a two providing three. The interviews loosely followed a biographical narrative approach (Corbally & O'Neil, 2014). Each interview referenced a semi-structured interview guide developed through consensus among the research team, with sensitizing concepts drawn from a review of the

[1] For clarity, where I write in the first person singular, I am referring to actions, procedures, decisions, or interpretations that I (JM) make as the first author and lead investigator on the study. Where we write in the first-person plural, we are referring to actions, procedures, or decisions that the research team made as a group.

paramedic mental health literature and our conceptual framework (Thoits, 2010). As an indicator of role salience (Thoits, 2012), I asked each participant the following question: "Imagine your sense of self as a pie chart. How big a 'slice' does being a paramedic get and why?"

Because our theoretical framework posits that identity-challenging events may be more distressing for especially salient role identities, I was particularly interested in the effects of incongruence between espoused and able-to-enact role identity among participants for whom the identity formed a central part of their sense of self (i.e., "*it [paramedic identity] gets all of my pies*" 'Johnathan').

I conducted the interviews in person at workplace facilities, taking care to ensure the participant's privacy. I recorded the conversation, made handwritten notes to document initial observations and flag ideas for follow-up, and then wrote (or typed) more detailed notes after the interviews. Each interview lasted between 60 and 120 minutes, and we gave the participants a gift card for a vendor of their choosing in the amount of $90.

Data Analysis

We used a web-based transcription program (www.temi.com) to generate transcripts from the audio recordings. My assistant and I reviewed each completed transcript to correct for errors, add in paralanguage (long pauses, laughing, crying, etc.), and edit out non-relevant false starts or fillers to achieve a 'clean verbatim' level of transcription. This review also served as a useful first level of analysis in becoming oriented to the data. Finalized transcripts were prepared as Microsoft Word documents and imported into NVivo (QSR International) for manual coding.

I used successive rounds of open (Charmaz, 2014b) and focused (Charmaz, 2014a) coding to answer our research questions. First, drawing on the extant dimensions of paramedic role identity as sensitizing concepts, I looked for alignment in the ways in which the participants spoke about their motivations to do the work and how they derive meaning from it, but being cognizant not to 'force' data into rigid a priori categories. Second, I looked for ways in which the participants spoke about their work that did not align with the existing dimensions of paramedic role identity. I used descriptive in-vivo codes composed of the participants' own words to 'flag' these areas of divergence. In subsequent rounds of focused coding, I grouped 'divergent' perspectives by conceptual similarity. I assigned each (N=2) a new label using gerunds (*protecting* and *problem-solving*) and then compared each with the definitions of the extant dimensions as articulated in the original publication to ensure they were distinct constructs.

Lastly, I reviewed the transcripts for areas of incongruence between (what I interpreted as) espoused dimensions of role identity and the participants' ability to fulfil the attributes of that role. I mostly inferred this incongruence from the more readily apparent dissonance articulated by the participants, often cited as a source of workplace stress. I organized codes thematically, using gerunds in successive rounds of open and focused coding to define the processes of how role identity dissonance manifests and may or may not be reconciled.

Returning here to the issue of role salience, I drew on (and quote more heavily from) participants for whom paramedic identity formed a large part of their sense of self. This was in part a

deliberate methodological choice and also a natural happenstance explainable by the theory. Role identities are arranged hierarchically within the self (Stets & Burke, 2000), and because the effects of identity-disruptive events are felt more keenly for more salient role identities (Thoits, 2011), the consequences of incongruence were more pronounced, making the phenomenon more accessible analytically speaking. That is not to say, however, that any participants were *excluded* from the analysis, just that in presenting the findings, there is more of some than others.

Note to Readers

Our interviews touched on difficult topics and the participants occasionally used strong language, which, for the purposes of presenting their experiences faithfully, we have not edited or redacted. The interview excerpts we present **may be triggering** to readers who have personal or professional experience with life threatening illness or injury, violence (including child abuse and intimate partner violence), mental illness, or suicide. Please read carefully.

4.5 Results

Participant Characteristics

Our sample of 21 participants included women (*N=11*) and men (*N=10*) between 27 and 56 (mean 36 ±6.7) years of age who had between 1 and 28 (mean 12, ±6.5) years of experience as paramedics, and worked in a front line, supervisory, or special operations role at both the primary and advanced care provider classifications. We also recruited participants who had previously been or were currently members of the service's peer support team - a group of trained volunteers who provide empathic support to colleagues. Finally, our sample also included participants who were in the process of returning to work after an occupational stress leave. All names presented are gender-consistent pseudonyms.

Question 1: Alignment with the Existing Dimensions

The participants generally used language that was quite consistent with the definitions provided by Donnelly and colleagues (see Table 1 for examples). Of the four dimensions, *caregiving, thrill-seeking*, and *capacity* tended to come through the strongest and generally in that order. The *thrill-seeking* dimension presented an unexpected division among the participants: most of the paramedics I spoke with who aligned with the dimension made veiled, almost self-conscious references to enjoying the excitement of emergency work.

> "I don't want to say it's an adrenaline junkie thing, but at the same time, like, what am I learning (by being in a less busy part of the city) … Like it's not *bad*. But, I was like, I want to do *other* calls." (Rowan)

Conversely, other participants were very explicit about seeking out the 'rush' of paramedic work:

> "We're all 'adrenaline junkies', we do it for the adrenaline rush. You can say you do it for the patients, or this or that, (but) no, we

> do it because (we) want to drive lights and sirens and (we) want to be put on the spot to make a decision that makes the difference between life and death. You know it, I know it, everybody knows it." (Shawn)

The contrast in framing hints at a degree of cognitive dissonance. The '*other*' calls to which Rowan refers involve serious illness or injury, under often tragic circumstances, and to appear to find excitement in the suffering of others may be perceived as antisocial or incongruent with other dimensions of paramedic role identity (i.e., *caregiving*). The dimensions themselves are not mutually exclusive, however, and the participants expressed sentiments that aligned with multiple dimensions.

Pseudonym	**Gender**	**Role Identity Dimensions**	**Notes**
Shawn	Man	Protector, Thrill Seeking, Caregiving, Capacity: *"We do it because we want to be put on the spot (to) make a decision that makes the difference between life and death.*" "*I like the pressure. The more fucked up the call is, the calmer I get*."	Peer Supporter, Mid-Career
Elaine	Woman	Caregiver, Protector, Capacity: "*(I'm) a stranger they can trust and rely on … (to) offer them help when they don't think there's any other way of getting out of whatever spot they're in.*"	Returning from Long-Term Disability Leave, Mid-Career
Meredith	Woman	Thrill Seeking, Caregiver: "*I very quickly became bored of being a PCP … it didn't really feel like I was helping as many people as I thought I was going to be … I need a much bigger high, like (calls) that would have excited me for a couple of days before, I'm over in, like, 10 minutes now."*	Acting Superintendent, Mid-Career
Johnathan	Man	Thrill Seeking, Caregiving, Capacity: "*I'm resilient in the sense that 99% of this job doesn't bother me. I've been in it long enough to realize you can't fix everything, so you can't let it bother you when it comes to calls.*" "(Being a paramedic) is important because I know that I'm one of a few in the province that can do what I do (special operations). … those skills make me really happy."	Special Operations, Mid-Career
John	Man	Duty, Thrill Seeking, Problem Solving: "*I identified as a paramedic. It was that self sacrifice, serve the public before my needs that always came first.*" *"I'm a third generation paramedic." "I think that's the biggest question that drives paramedics is 'why?' Why is this patient the way they are now?"*	Superintendent, Peer Supporter, Late-Career
David	Man	Protecting: "*To help people, period. To be that safety net when everything else fails."* (On becoming a supervisor): *"I came to the realization that now I'm responsible for not just the patient, myself, and my partner, but I'm responsible for all of these guys, these crews."* (Who do you turn to after a difficult call) "*Myself. Everyone else has their own shit to deal with."*	Superintendent, Late-Career
Elizabeth	Woman	Caregiving, Protecting, Thrill Seeking: "*Honestly, probably at the beginning, I would (have) said yeah, I'm frustrated (by non-urgent calls), but now it's nice when you can just talk to somebody … It's a lot of stress and pressure dealing with life and death all the time."*	Peer Supporter, Late-Career
Edward	Man	Thrill Seeking: "*I think like anyone else, it was the expectation of, like, every call is going to be a 'real' call.*" *"There's some VSAs (vital signs absent; cardiac arrest) that are almost boring... you're almost standing there with your hands in your pockets and you're like 'I am not stimulated at all'"*	Special Operations, Mid-Career
Sophie	Woman	Thrill Seeking, Capacity: "*I've found that I've had way more hot calls in (this service) than I had in (a service she worked in previously), so it was kind of resparked the job for me a little." "I always knew that I was good at walking into a situation and controlling it, so it was kind of a cool niche, because I could do that when people are in crisis."*	Early Career
Catherine	Woman	Thrill Seeking, Problem Solving: "*I probably thought it was a lot more dramatic than it actually is, you know, more high acuity." "I always thought I would do something 'sciency'"*	Acting Superintendent, Mid-Career
Nadine	Woman	Caregiving, Protecting: "*I wanted to be that person who took away the worry from people … We're here, we'll take care of it, you can just let it go. We've got this now*"	Returning from Long-Term Disability Leave, Mid-Career
Jeremiah	Man	Caregiving, Capacity, Problem Solving: *"I had worked for two or three years at the YMCA, and I'd responded to a whole bunch of medical emergencies, and I just felt a calmness about it, even with the minimal training I had. I felt like I was able to handle it." "I'm just very curious."*	Peer Supporter, Mid-Career

Dean	Man	Problem Solving: "*I've always had an interest in the science aspect. The science behind what breaks down, what works, how do you fix people, that sort of thing." "I remember going through school and thinking' wow, this isn't cut and dry', you really have to think this through and there's a lot of judgement in it. Experience means a lot."*	Superintendent, Late-Career
Rowan	Man	Thrill-seeking, Problem Solving: *"I've always liked hands on work. That's why I like this job too; there's a lot of skills that are hands-on. Assessing a patient is an actual skill, it's not like I just look at somebody and know what's wrong."*	Mid-Career
Seamas	Man	Thrill-Seeking, Problem Solving, Protecting: *(On memorable moments) "Calls that fundamentally changed the way I practice. That my education, my background helped me figure out what was actually wrong with them. Feeling that you have an impact"* (On expectations) *"I thought I would be shot at more. I've been attacked a few times, but not nearly as dramatic as I would've hoped, but that being said, I found so much more beauty in the job. .. I didn't appreciate how much thought went into paramedicine."*	Mid-Career

Table 1: Demographic details for quoted participants with examples of role identity dimensions. Superintendent/Acting Superintendent = paramedic supervisor; Special Operations = specialized teams (e.g., tactical rescue)

Question 2: New Dimensions: Problem Solving and Protecting

We defined the features of two new dimensions of paramedic role identity. The first involves a curiosity-driven and scientifically informed desire to solve problems. Paramedic training includes several courses in anatomy, physiology, pathophysiology, and biology that the participants described as giving the work a 'mental' quality: "I've always had an interest in the science aspect" (Dean). Extending their natural curiosity to paramedic work provided a deep sense of fulfilment in drawing on their science training to solve clinical puzzles.

> "Another (patient) was having a stroke. It was a DVT (deep vein thrombosis) that became a stroke, and then I started thinking 'wait a minute, shouldn't the clot be in your lungs?' So, I brought it up with the doctor and they're like 'oh, we'll take a look' and sure enough there was a hole through the septum (in her heart) where the clot went into the other side (of her heart) and then into her brain. … But, like, the fact that I came up with that independently made me feel very good about myself" (Seamas)

The second dimension refers to a desire among the participants to not just help people in need (*caregiving),* but to actively *protect* people from harm: "*(We are here) to be that safety net when* ***everything*** *else fails*" (David). Although not exclusively, this sense of protecting others came through particularly strongly when the participants spoke about calls involving children or other vulnerable groups:

> "(I had) this nasty patient, some alcoholic old man who was trying to justify to me why it was okay for him to beat his wife because she did not want to have sex with him the night before, and I said 'Look at me: *shut the fuck up*. I don't want to hear it.'" (Elaine)

The difference between *caregiving* and *protecting* is perhaps subtle, but it carried a great deal of importance for the participants and appeared to hinge on the distinction between reacting to problems versus proactively preventing harm. This desire to have proactive, 'upstream' impacts on people's lives was what attracted many of the participants to the profession. The cruel irony is that the majority of paramedic work is inherently reactive - *responding* to emergencies after they have occurred and being left to pick up the pieces. Invariably, however, the participants would see other problems in the making at the scenes they attended and want to intervene. For example, Elaine later described a call she attended for a woman who had overdosed and was unconscious with two young children at home:

> "You start to get that protective instinct, and we had to just leave them (the children) there, and they got sent to their aunt's, I think, that night. But then they were just going right back. … Seeing kids who are being looked after by CAS (the Children's Aid Society) and they're just dumped back into a house that's awful in every single possible way because there's nothing else they can do. I just

> thought we would be more a part of the solution and it just seems like we're a smokescreen."

The incongruence of being a "smokescreen" when you feel like you should be "more a part of the solution" is the crux of this analysis, and we describe the resulting dissonance in more detail below.

Question 3: The Development of Role Identity Dissonance

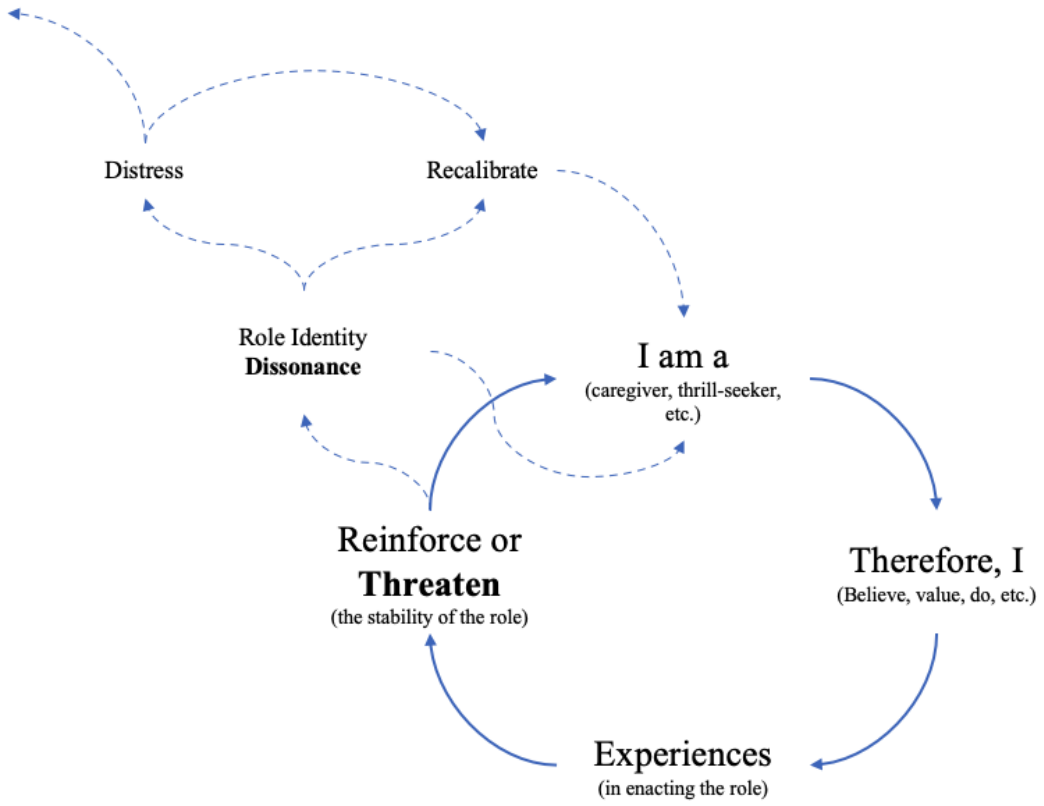

Figure 1: Process diagram illustrating the development and possible resolution paths of role identity dissonance in the context of paramedic role identity. "I am" refers to the concept of self in relation to an espoused role identity. The role identity, in turn, prescribes a set of beliefs, values, actions, etc. ("Therefore, I"). "Experiences" are events and interactions in enacting the role that have the potential to either reinforce or threaten the stability of the individual's sense of self in relation to the role that they identify with. Where the experiences threaten the stability of the role identity, dissonance can result and may lead to potentially significant distress or prompt a recalibration of the individual's understanding of their sense of self, the role, or both (with potential paths indicated by dashed lines).

We illustrate this process in Figure 1. Role identities ("I am") provide a set of attitudes, values, beliefs, and behavioral norms that are important in fulfilling the role ("Therefore, I"). Concrete experiences in enacting the role can, in turn, either reinforce or potentially threaten the stability of the role identity (Marcussen et al., 2004). Where the experiences do not align with the perceived functional requirements or attributes of the role, the conflict can create a sense of cognitive dissonance (Marcussen et al., 2004; Thoits, 1991) that we term *role identity dissonance*. Shawn's story at the beginning of the paper offers an illustrative example. Shawn aligns very strongly with the thrill-seeking and protecting dimensions of paramedic role identity and takes pride in his ability to "*make decisions that make the difference between life and death*". His juxtaposition of the professional satisfaction from attempting to resuscitate a cardiac arrest patient ("*you're at your peak here*") with the disillusionment of attending a subsequent and much lower acuity call (*"and then some guy calls for 'I can't sleep'"*) is illustrative of the discrepancy between how he sees his role and what the role sometimes requires: "*now I'm your taxi driver*." High acuity illness or injury makes up only a small proportion of a paramedic's day-to-day caseload (Weiss et al., 2018) and single instances where a specific decision or intervention is lifesaving for a patient are rarer still. This sets the stage for an 'expectations versus reality' conflict in terms of what the paramedic believes their role *should* be and what is or is not realistically achievable.

> "Like I had never called 911 in my entire life, and to me, 911 was always like: somebody's dead, the house is on fire. Like it's...you would just never call 911 for the things that we see.'" (Catherine)

Another manifestation of this incongruence is in the paramedics' ability to effect 'upstream' meaningful impacts on the lives of the people they encounter. For example, Nadine - who aligns very strongly with the *protecting* dimension - recalled a case where she attended an 18-month-old child who had died after (allegedly) being abused by her parents. Because the family had other children in the home and the suspicion of abuse was particularly high, she spoke at length with the police and the Children's Aid Society in the hopes of preventing similar harm to the surviving children:

> "Like I, I put a lot of time in, and it feels like it was for nothing because it's over. It's over. They're not, it's like, nobody goes - nobody has been charged. The family got their children back - their other children back. Nobody paid the price for this child's death." (Nadine)

Elizabeth and Shawn echoed this sentiment in explaining that calls involving children who had been deliberately harmed or killed by their caregivers as being particularly distressing: "I find those (calls) really difficult. … I see what humans do to each other, and (it's) just appalling." (Elizabeth). In my experience, it's uncommon for paramedics to use patients' names in conversation, but during our interview, Shawn spoke at length about a child (referring to her by name) who had been abducted and later killed by her estranged father.

> "I found out it was her birthday right after I pronounced her. The Amber Alert was going off on all of our phones and I had to get her birthday for my paperwork, and they told me it was her birthday today." (Shawn)

The dissonance between seeing himself as a protector and being unable to protect patients (children, in particular) began to create distress – one possible consequence of role identity dissonance that we define in Figure 1 – that manifested in his home life, especially in his other role as a father: "*I think that's, that's my breaking point. I find the kid stuff is bothering me more now than it ever did before*." (Shawn)

Question 4: The Consequences of Role Identity Dissonance

Role identity dissonance can result in potentially significant emotional, psychological, and even existential distress. In our interviews, one common consequence of role identity dissonance was - in a word - anger. In some cases, the anger was omnidirectional, stemming from a general disillusionment at the realization that paramedics often can't affect the kind of lifesaving or otherwise meaningful impacts on patients' lives that they had hoped for: "*I went through a year of just being angry with everything*" (Edward)

> "I've become a disgruntled medic." (Why do you see yourself that way?) "Because I hate everybody and everything. … I just feel like we're overpaid taxi drivers. We can sometimes delay death, which, I guess is kind of cool. But ultimately, those people die, and you really didn't do much." (Nadiene)

> "I was really disappointed once I started working and realized that the system is so abused, and I found it super upsetting because I really thought I was going to come into this job making this great positive impact on people." (Meredith)

In other cases, the participants were angry at the training programs for - in their view - failing to prepare them for the fact that paramedic work more commonly involves responding to low acuity manifestations of complex health and social inequities.

> "The colleges teach you that you're only going to come across problems you can fix. You have an asthmatic, here's how to fix it. You have an anaphylactic, here's how to fix it. … At the end of the day, I think that accounts for maybe 4% of our job?" (Jonathan)

Other participants, meanwhile, were disillusioned with the larger health and social systems - and, by extension, being complicit within systems that fail the people they are supposed to help.

> "(We're) 'pretend help' … It's maybe a little bit of help, but overall, we send people back into a lot of really horrible situations." (Elaine)

Being unable to fulfil the attributes of these roles in a professional setting sometimes meant that the participants would try to embody the roles even more strongly in other aspects of their lives:

> "I'm probably more of a neurotic parent. … I freak my kids out, because I'm like 'kay, you guys need to stay where I can see you' and then they get freaked out, and then I'm trying to explain to them, '*nobody is gonna hurt you,* but you need to stay where I can see you.'" (Elizabeth)

Shawn echoed this sentiment, explaining that his hypervigilance for his son's safety in everyday settings was a 'red flag' that he needed to get help: "*Somebody walked between me and my child and I was going to rip their fucking head off. Just for walking in front of my child*." Particularly for the *protectors,* this all-encompassing need to safeguard others in their lives had an unfortunate downstream effect:

> "My husband is not medical. He's not, like, somebody I can go to (to talk about) work stuff. He can't handle that. I would injure him" (Elizabeth)

This was a common sentiment and meant that many of the participants would carry some of their most difficult experiences alone: "*It's hard to talk to people because you try so hard not to traumatize them*" (Nadiene).

Question 5: Reconciling Role Identity Dissonance

Our last research question examined how role identity dissonance might be reconciled. Some, such as Edward, were able to recalibrate their expectations of either the role, themselves, or both, and come to a new understanding of the work:

> You know, the nursing home UTI (urinary tract infection; a routine call) *is* the job, whether you want it to be or not. So being angry about it is only going to affect me. You have your turn to do the 'big calls' and then, you know, it's someone else's turn." (Edward)

Similarly, Meredith leveraged her tendency to - in her words - become 'bored' with the routinized aspects of the work to take on new and interesting challenges in terms of career development: "*I very quickly became bored of being a (primary care paramedic).*" She went on to pursue her advanced care training, then later, a leadership position within the service and involvement with project work. Meanwhile, other participants leaned into different role identities:

> "I know that as shitty as this (job) can be, that there's things in my life (athleticism) that I'm really good at and (that) make me happy. That won't change." (Sophie)

We outline the possible resolutions to role identity dissonance in Figure 1, with pathways from distress to recalibration (i.e., Edward), or from dissonance to finding fulfillment in new or other role identity (i.e., Sophie and Meredith). Still, for some participants, the consequences of a dissonant and all-encompassing paramedic role identity appeared to be irreconcilable, contributing to mental illness, disability, and lost time from work: "*That's something that came up at my last psychology session was that I do not have an identity outside of being a paramedic*" (Shawn). Particularly as an insider in the community, it is painful to admit that I don't know how these 'stories' end – with an unsatisfyingly open-ended pathway from distress in Figure 1. While some participants were receiving care for the trauma they were carrying, others were not, and the long-term effects of what we have described here are largely unknown.

4.6 Discussion

Examining paramedic mental health through a role identity lens, our goals in this study were threefold: first, we sought to qualitatively explore the degree to which the definitions of paramedic role identity that have been previously described aligned with the ways in which our participants related to their work as paramedics. Second, we aimed to identify and define new potential dimensions of paramedic role identity. And finally, we sought to explore the development of role identity dissonance and its consequences for mental health and wellbeing among paramedics. We found generally very good alignment between the extant role identity dimensions and the language our participants used in describing how they relate to their work as paramedics. *Caregiving*, *thrill seeking*, *capacity*, and, to a lesser degree, *duty* came through strongly in our interviews. We also identified two new potential dimensions of paramedic identity (our second objective) that describe a curiosity-driven desire to solve problems, and a desire to protect vulnerable people from harm.

Because role identities are an important means by which we find meaning and purpose in life (Thoits, 2011), being unable to fulfil the perceived or actual requirements, behaviors, or values (collectively, the attributes) of the role can create an existential threat to our sense of self (Thoits, 1991). Although the circumstances varied, we saw this play out among our participants, with the commonality being the inability to realize what the participant saw as important functions or attributes of their role. We illustrate this process in Figure 1 in describing how role identity dissonance manifested and may or may not be resolved. The incongruity between an espoused role identity and what may or may not be realistically achievable in the role created cognitive dissonance that led to potentially significant distress, both in and out of their professional lives. For some of our participants, this cognitive dissonance and resulting distress was difficult to reconcile, while others used the incongruity to reframe their expectations of themselves or the work, take on new roles within the profession, or lean into other salient role identities.

In terms of the contributions of our work, we believe that our framework extends our understanding of both identity-relevant disruptive events within *role identity theory* and sheds additional light on workplace stress among paramedics. Disruptive stressors within the role identity literature have tended to focus on discrete life events (DeGarmo & Kitson, 1996), such as a divorce or death of a spouse, or transitional periods between employment and retirement (van Ingen & Wilson, 2016). Where we contribute is in offering the paramedic context as an example of how identity-relevant disruptive events can be chronic in addition to discrete. These

chronic disruptive events are more nebulous, playing out in the day-to-day work of the paramedics that, over the course of a career, have the potential to contribute significant emotional and psychological distress.

Our findings also give unique insight into why some of the acute and chronic workplace stressors described in the paramedic mental health literature may cause the distress that they do. For example, non-urgent calls for service have been identified as a source of workplace stress, with paramedics expressing frustration with (what they call) 'system abusers' (Nurok & Henckes, 2009). Viewed through a role identity lens, the frustration may be less with the nature of the call itself and more with the dissonance between seeing themselves as someone who responds to emergencies, protects vulnerable patients from harm, and helps people with more 'legitimate' (or possibly more 'fixable') problems. At the same time, however, our analysis leaves several questions unanswered that are opportunities for further research.

First, if having a role identity is linked with a sense of meaning and purpose in life, it follows that having more (and more diverse) role identities provides for greater meaning and more purpose (Thoits, 1986). This has been described as the role accumulation hypothesis (Simon, 1995), support for which has been found in population surveys examining the intersection of health and quality of life indicators with self-reported roles (Ahrens & Ryff, 2006). One important issue that is worth exploring is the potential health consequences that result from the loss of paramedic role identity (i.e., through disability) when the identity features prominently or exclusively in the person's sense of self (i.e., "*I do not have an identity outside of being a paramedic*"). Although studied in the context of military service (Romaniuk & Kidd, 2019), an equivalent line of inquiry among paramedics has not been advanced, despite many similarities.

Second, the relationship between role identity dissonance and mental health outcomes should be quantified. This would involve further developing the paramedic role identity scale to (1) include and psychometrically assess the new proposed dimensions of *problem solver* and *protector;* and (2) develop and validating items that assess the degree to which the paramedic feels they can enact an endorsed dimension of role identity. On a practical matter, addressing the incongruence between espoused and enacted (or 'enact-able') role identities may lie in part at the point of entry-to-practice training. Educators can provide future paramedics with a more nuanced understanding of what is and is not realistically feasible in terms of the ability for paramedics to have (what they describe as) meaningful impacts on patients' lives. Helping to reframe those expectations could potentially avoid future distress. At the same time, providing paramedics with specific training and resources to better manage the more prevalent low acuity manifestations of chronic health and social problems may bolster the paramedics' self-efficacy by making them feel empowered to have different kinds of meaningful impacts.

Third, the distress we identify that results in part from role identity dissonance overlaps significantly with *moral injury*, which has been defined as events that involve "perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations" (Litz et al., 2009) (p. 697). This topic has been studied extensively in military populations (Griffin et al., 2019) but has not been examined in the context of paramedic work. Several of our participants described situations that could broadly be classified as morally injurious, such as cases involving children who have been deliberately harmed or killed by

caregivers. The resultant moral injury is likely worsened when the paramedic conceptualizes themselves as someone who is 'supposed to protect' vulnerable groups. Extending a line of inquiry that examines moral injury among paramedics within a conceptual framework of role identity is a topic worthy of further study.

Limitations

Our findings should be interpreted within the context of certain limitations. First, our work is inherently situated. We made a deliberate methodological choice to limit our investigation to a single study site, choosing depth over breadth that potentially limits the transferability of our findings. Second, qualitative research is often framed as theory-generating (Timmermans & Tavory, 2012), but we made a conscious decision to adopt *one* conceptual framework in structuring our research questions, analysis, and the inferences we drew. Some might critique this approach as being overly rigid to the exclusion of emergent findings that are possible with a comparatively more open analytical gaze that could consider the influence of, among other things, personality, moral injury/distress, illness scripts, or other conceptual frameworks that would illuminate other aspects of health and well-being. Our findings are very much in the light of the lamppost of role identity theory, specifically. Third, in positioning our investigation under the banner of generic qualitative research, we acknowledge that we eschew the theoretical and methodological richness of, say, phenomenology, narrative inquiry, or grounded theory. As is common with qualitative inquiry, a different investigator, a different theoretical or conceptual framework, or a different methodological approach would yield different insights.

4.7 Conclusions

Amid growing concern over high rates of mental illness among paramedics, role identity theory provides a useful perspective by which to conceptualize the problem. Leveraging an existing definition for paramedic role identity, we identified two new potential dimensions of role identity that appeared to resonate strongly with our participants. We also described ways in which incongruencies between an espoused and 'enactable' role identity can create cognitive dissonance among paramedics. In that respect, our findings begin to shed light on why some common chronic stressors within the profession cause the distress that they do. Role identity dissonance, in turn, can lead to potentially significant emotional, psychological, or existential distress – effects that can prompt an adaptive recalibration of the role or sense of self, but for some are nevertheless difficult to reconcile. Finally, in reconceptualizing identity-relevant disruptive events to include more nebulous chronic stressors, we offer a modest contribution to the theory.

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Author Contributions
Conceptualization, JM & MM; Methodology, JM, SH, & SM; Formal Analysis, JM & SH; Investigation, JM, SH, & SM; Writing – Original Draft Preparation, JM; Writing – Review & Editing, ED, SH, SM, & MM, Supervision – ED, SH, & MM; Project Administration, MM; Funding Acquisition, JM, ED, & MM.

Institutional Review Board Statement
The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Hamilton Integrated Research Ethics Board (HiREB Project Number 5599), approved April 16, 2019.

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

Data Availability Statement
The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy restrictions and data security procedures stipulated in the Research Ethics Board (REB) review of this project.

Conflicts of Interest
The authors report no conflicts of interest to declare. The Canadian Institutes of Health Research (CIHR) had no role in the design, execution, interpretation, or writing of the study.

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4.9 Epilogue

This final study was the last 'piece of the puzzle' in my mixed methods investigation into paramedic mental health using role identity theory as a conceptual framework. To this point, we have observed that one in four members of the paramedic service met the screening criteria for at least one mental disorder, that the risk of a positive mental disorder screen varied as a function of self-reported resilience and demographic characteristics, but not as a function endorsement of the constituent dimensions of paramedic role identity. Our goal here was to qualitatively explore paramedic role identity as a construct, with particular emphasis on what happens when an individual is unable to fulfil the attributes of the role identity in the way that they believe they should. This was the 'able-to-enact' piece that we were unable to measure quantitatively, but the interviews proved fruitful in providing very granular insights into the relationship between role identity and mental health. We also described the characteristics of two new potential dimensions of paramedic role identity that were not included in the original derivation study by Donnelly and colleagues. Finally, using the paramedic context as an example, we demonstrated how identity-relevant disruptive events can be nebulous chronic stressors in addition to discrete life events – a modest contribution to the theory. In the next chapter, I discuss our contributions to scholarship and the implications for research and policy that result from this program of research into paramedic mental health.

CHAPTER 5: GENERAL DISCUSSION

5.1 Overview

My overarching goal in this mixed methods program of research was to contribute a theoretically informed social sciences perspective to the issue of mental health and well-being among paramedics. Given methodological and conceptual gaps in the literature describing paramedic mental health, my specific objectives were to:

1. Estimate the prevalence of symptom clusters consistent with Post-Traumatic Stress Disorder (PTSD), major depressive disorder, and generalized anxiety disorder among paramedics.
    a. Explore the relationship between each mental health indicator and theoretically plausible risk factors, including demographic characteristics and self-reported resilience.
2. Evaluate the relationship between paramedic role identity and mental disorder symptoms and other non-diagnostic indicators of mental health.
3. Qualitatively explore paramedic role identity and the specific implications for mental health when a salient role identity conflicts with the paramedic role.

In developing this research program, I made a deliberate methodological choice to situate the research in a single paramedic service in Ontario, Canada – a service where I am currently employed as a paramedic. I also decided at the outset to gather quantitative and qualitative data simultaneously in a convergent parallel approach (Creswell, 2014) that allowed me to triangulate our understanding around the central issue of paramedic mental health viewed primarily through a role identity lens. Collectively, these methodological choices allowed us to sample from a well-defined participant population, attend more deeply to context, and leverage my own status as an insider within the community to gain a deeper level of access to the phenomenon than may have otherwise been feasible.

5.2 Summary of Findings

I want to take a moment here to provide a high-level summary of our findings from across the research program to help orient the reader before diving more deeply into our contributions to scholarship and implications for research and policy. In respect of *Objective 1*, and with the caveat that our measurements were taken prior to the declaration of the COVID-19 pandemic in March 2020, we would estimate the prevalence of PTSD at 11%, major depressive disorder at 15%, and generalized anxiety disorder at 15% (Mausz, Donnelly, et al., 2022a). In total, 25% of the active-duty paramedic workforce in Peel Region met the screening criteria for one of the three mental disorders (Mausz, Donnelly, et al., 2022a).

Study	PTSD	Major Depressive Disorder	Generalized Anxiety Disorder	Any
Carleton et al., 2018	24%	30%	30%	49%
Mausz, et al., 2022	11%	15%	15%	25%

Table 2: Prevalence estimates from this program of research compared to the paper by Carleton et al. in 2018 using the same screening instruments but different recruitment and sampling strategies.

We also found that the adjusted risk of a positive mental disorder screen varied as a function of employment classification, and self-reported resilience, with full-time members and those meeting the scoring criteria for 'low' levels of resilience as being at increased risk of a positive mental disorder screen (*Objective 1a*) (Mausz, Donnelly, et al., 2022a). We also observed that women were at increased risk of screening positive for major depressive disorder and generalized anxiety disorder and that current or former members of the service's peer support team were at an increased risk of screening positive for PTSD and major depressive disorder (Mausz, Donnelly, et al., 2022a). Endorsement of the dimensions of paramedic role identity, meanwhile, was not associated with mental disorder symptoms, symptoms of burnout, or perceived or secondary traumatic stress (Mausz, Donnelly, et al., 2021) (*Objective 2*). These findings were contrary to the hypothesis predicted by our conceptual framework, in which we expected to see protective effects from endorsement of some role identities (*capacity*, for example), and risks from others (*thrill-seeking*, or *caregiving*), but on reflection was perhaps explainable by a more nuanced extrapolation of the theory that hinged on role salience and 'enactability'.

My goal in interviewing paramedics was to explore the nuances of paramedic role identity in more detail and to specifically study the development, consequences, and potential means of reconciling the cognitive dissonance that results when a highly salient role identity is threatened through identity-relevant disruptive experiences during enactment (*Objective 3*). Or, put plainly, how paramedics think about themselves in relation to their work and what it means for them when they are unable to fulfil the paramedic role in the way that they believe they should. What I found was that the paramedics I spoke with generally aligned quite well with the dimensions of paramedic role identity that Donnelly and colleagues proposed, with *caregiving, thrill-seeking,* and *capacity* coming through the strongest, and generally in that order (Mausz, Donnelly, et al., 2022b). But I also identified two new potential dimensions of paramedic role identity wherein the paramedics derived personal and professional fulfilment from solving clinical puzzles (*problem solving*) and protecting vulnerable patient populations from harm (*protecting*) (Mausz, Donnelly, et al., 2022b). Among those for whom paramedic identity as a whole was especially salient, the consequences of being unable to fulfil the attributes of the role identity were severe. The resulting existential threat to the sense of self was both well supported by existing theory (Thoits, 1991, 2010, 2011) and provided the 'missing link' in being able to quantify the relationship in our survey data, namely that the distress is less a function of which role identity is endorsed and more a product of incongruence with experience in a cruel 'expectations versus reality' scenario (Mausz, Donnelly, et al., 2022b). Collectively, our findings help shed some

additional light on what might be contributing to the mental health crisis observed among paramedics (Koopmans et al., 2017). I discuss our contributions to scholarship and the implications of our findings for research and policy in more detail below.

5.3 Contributions to Scholarship

On the Prevalence of Mental Disorder Symptoms Among Paramedics

Much of this work was based on a scholarly critique of the recruitment and sampling strategies used by Carleton and colleagues in their 2016-2017 survey of paramedics in Canada (Carleton, Afifi, et al., 2018). I saw Carleton's use of social media advertising and recruitment through the paramedic association of Canada, coupled with the lack of a calculable response rate, as introducing potentially significant selection bias into the study that could skew the results, biasing the prevalence toward overestimation. I was also struck by the fact that between 30-40% (Carleton, Afifi, et al., 2018) (depending on the publication) of participants who began their survey didn't complete it – in my view, deepening the potential for response bias even within the recruited sample. The result, I argued, was that the prevalence estimates (the only such data in Canada) suffered from a concerning lack of precision. On a personal note, I also found it difficult to fathom that nearly half of my colleagues were working with potentially diagnosable levels of symptoms consistent with one or more mental disorders (Carleton, Afifi, et al., 2018). But that was a pandemic ago and to say that a lot has changed would be an understatement.

The still unfolding effects of the pandemic on society and – in particular – on healthcare workers have been nothing short of devastating. Lauded as heroes during the early months of the crisis, healthcare professionals, including paramedics, are increasingly finding themselves the target of growing antipathy and hostility (Andrews, 2021; Zimonjic, 2021). Coupled with waves of rising and falling COVID-19 cases, staffing shortages and an overburdened healthcare infrastructure, I'm left wondering whether the prevalence rates we observed – less than half of those reported by Carleton (Carleton, Afifi, et al., 2018) – are, themselves, now gross underestimates. Regardless, the critique, in my view, still stands; in generating epidemiological data on a health state, approaches to sampling matter a great deal. In the absence of stratified random or probabilistic sampling strategies (as has been done, for example, in some US studies on the topic (Donnelly, 2012)), the goal in convenience sampling must be to take measurements from as many within the eligible population as possible to strengthen the internal validity of the study. In that respect, our response rate of 98% is a strength of our investigation in giving us a very representative picture of the health of the *active-duty* paramedic workforce in our study site. This is, of course, with the acknowledged limitations that our study included just one site and only three mental disorders. Still, there are examples of similar work within Canada from which we can draw important lessons. For example, the prevalence of PTSD among active-duty members and veterans of the Canadian Armed Forces has been extensively studied (Sareen et al., 2017),

using repeated sampling/longitudinal approaches in partnership with Statistics Canada and Veterans Affairs. Meanwhile, sampling through provincial regulatory, clinical oversight, or employer groups offers a viable alternative to population-level studies. Such bodies exist in at least five provinces in Canada that could yield well-defined population pools from which to draw participants and calculate response rates. These and other approaches should be considered in future research on paramedic mental health to better understand what may be contributing to the high rates of mental disorder symptoms that have been observed. That said, despite our point estimates for PTSD, major depressive disorder, and generalized anxiety disorder being lower than have been previously reported, our findings still point to a mental health crisis within the profession – one that has almost certainly worsened since the onset of the COVID-19 pandemic.

On Resilience

Resilience is generally held to be the ability of individuals to recover (commonly 'bounce back') from adversity (Hartmann et al., 2019). The resilience narrative tells us that resiliency skills are learnable and more resilient individuals are less likely to experience emotional or psychological distress after stressful experiences (McAllister & McKinnon, 2009). Given the concerning rates of mental disorders among paramedics (Carleton, Afifi, et al., 2018) and the frequent exposure to potentially psychologically traumatic events (Carleton et al., 2019), it's no surprise that we have seen a proliferation of programs intended to cultivate resilience among this at-risk group. The *Road to Mental Readiness* (R2MR) (Szeto et al., 2019) developed by the Canadian Armed Forces and its civilian analogue *The Working Mind* (Dobson et al., 2019) are two notable examples, but there are others, many of which are offered by third party consulting companies in what is becoming a growing niche market. The trouble is that evidence supporting resiliency training in enhancing workplace mental health is underwhelming (Dobson et al., 2019; Hartmann et al., 2019; Leppin et al., 2014). Studies of the R2MR program in military (Fikretoglu et al., 2014; Fikretoglu et al., 2019) and public safety contexts (Carleton, Korol, et al., 2018) have demonstrated only small gains in mental health literacy, stigma reduction, or well-being. The specific hypothesis that resilience training in an at-risk group provides psychological protection against developing a mental disorder in response to a traumatic exposure remains – in my view – unsupported. Nevertheless, our findings consistently and strongly point to an association between resilience as a measured construct and symptoms of PTSD, major depressive disorder, and generalized anxiety disorder (Mausz, Donnelly, et al., 2022a). Interpreting this finding, however, is challenging, and how our results fit into the resilience narrative warrants careful consideration.

First, the cross-sectional design of our study necessarily limits the degree to which we can draw causal inferences because the directionality of the association is indeterminable. It may be, for example, that people who "have a hard time making it through stressful events" (a question on the Brief Resilience Scale (Smith et al., 2008) included in our survey) are indeed at an increased

risk of mental illness *because* of this difficulty. Or, conversely, "feeling down, depressed, or hopeless" – a symptom of depression we screened for in our survey (Kroenke et al., 2001) – may understandably make you feel less resilient. In my own experience, when I talk to mental health clinicians about resilience, they often tell me that the construct itself may have a definition in language but is hard to pin down in concrete terms. For example, resilience bears at least some resemblance to self-efficacy, which, in turn is also associated with well-being (Bandura, 1982; Shakespeare-Finch et al., 2014). What concerns me about our findings is that the nuance of correlation and causation being distinct may be lost on those who insist the industry should select paramedics based on 'suitability' for the profession, such as being 'resilient' against the stressors inherent to paramedic work. This was a prevalent theme in one of Ricciardelli's qualitative analyses of survey comments collected from Carleton and colleagues' survey, in which participants emphasized being inured against the stressors of public safety work as an important indicator of professional suitability (Ricciardelli et al., 2019). I observed this in an unrelated study on violence in which the ability for paramedics to 'brush off' and 'move on from' verbally abusive or assaultive patients becomes implicitly positioned as an expected professional competency (Mausz, Johnston, et al., 2021). Those who can't are seen as unsuitable for the profession, again, playing into the idea that cultivating individual resilience is a necessary skill given the stressors inherent to paramedic work. The counterpoint to the populous resilience narrative is that a focus on individuals risks downplaying the role of chronic workplace stressors or organizational culture in contributing to stress. I had originally hoped to weigh in on the debate by including the *GuardingMinds@Work Organizational Review* – a proprietary five item measure of organizational culture blueprinted to the Canadian Standards Association (CSA) Standard for Psychological Health and Safety at Work (Canadian Standards Association, 2013) in our study. My plan was to regress scores on the *Brief Resilience Scale* and the *Organizational Review* on mental disorder symptoms and compare the proportion of variance explained from both measures, but the lack of published validity evidence on the *Organizational Review* would have compromised the integrity of the analysis. Nevertheless, I would suggest that a similar approach with a validated measure of organizational culture is a reasonable step to further contribute to the debate.

On Peer Support

Interest in the concept of peer support has waxed and waned in the public safety professions since the introduction of Critical Incident Stress Management (CISM) programs in the early 1990s (Linton et al., 1993; Mitchell, 1983). Within CISM, structured, peer or facilitator-led post-incident debriefings are one organizational response intended to mitigate the harms of exposure to potentially psychologically traumatic events (Devilly & Cotton, 2003). The concept of peer support itself, however, traces back to the consumer-survivor movement of the 1970s in which people diagnosed with mental illness sought out support from likeminded people with similar lived experience (Sunderland et al., 2013). In 'civilian' applications, peer support can take many

forms, including one-on-one coaching or large support groups. The use of peer support in the public safety professions, however, has tended to include components of psychological intervention, most commonly in response to critical incidents. In a comprehensive review on the topic, CIPSRT drew a distinction between empathic listening from co-workers (*peer support*) and what they described as crisis-focused psychological intervention teams, such as those described in the CISM frameworks (Anderson et al., 2020; Beshai & Carleton, 2016). Regardless, in the paramedic context, efficacy evidence for either peer support or crisis-focused psychological interventions teams is sparse (Anderson et al., 2020). Whether providing empathic support or psychological intervention, it's reasonable to assume there is a risk to the peer supporter from vicarious exposure to trauma and direct exposure to the suffering of a co-worker. In our work, we found that survey participants with current or former experience on the service's peer support team had higher levels of endorsement of the *caregiving*, *duty*, and *capacity* dimensions of paramedic role identity, perhaps speaking to their motivations for taking on the role. Importantly, however, peer supporters were also at an increased risk of screening positive for PTSD and major depressive disorder (Mausz, Donnelly, et al., 2022a). Again, the cross-sectional design limits our ability to draw causal inferences, particularly given that peer supporters in our study site were recruited on the basis of having (among other things) lived experience with adversity, including mental illness. Nevertheless, recruitment for the team occurred two years before being surveyed for symptoms present within the past 14 to 30 days, lending plausibility to the argument that the peer support work may create additional risk of mental illness. Research on the topic has focused primarily on its potential effectiveness, and despite the lack of evidence supporting their use, there are calls in policy (Cyr et al., 2010; Sunderland et al., 2013) and research (Feuer, 2021) for increased use of these teams in the public safety professions, including in paramedic services specifically (Canadian Standards Association, 2018). The well-being of the peer supporters has been conspicuously absent from these conversations, and where I think we contribute is in providing some empirical data to draw attention to the potential health risks for peer supporters. In that respect, those considering peer support teams in their organizations would do well to reference a set of consensus recommendations for peer support teams in high-risk organizations advanced by Creamer et al. that specifically point out the need to "(look) after peer supporters" (Creamer et al., 2012) by having regular check-ins and facilitating easy access to mental health professionals.

On The How and Why of Paramedic Mental Health

My goal here was to use role identity theory as a conceptual framework to better understand paramedic mental health, and in particular, why the stressors that have been described in the population cause the distress that they do. We have a fairly robust literature describing common sources of stress among paramedics, with the stressors themselves broadly falling into the categories of critical incident (or often interchangeably, traumatic) stress (Carleton et al., 2019; Carleton et al., 2020; Donnelly & Bennett, 2014; Halpern et al., 2009; Halpern et al., 2011, 2012;

Ricciardelli et al., 2018) and chronic workplace stress (Donnelly & Siebert, 2012; Donnelly et al., 2014). The first category includes the myriad of undeniably tragic events to which paramedics often bear witness. Consider, for example, Shawn's recounting of a call in which he pronounced a child dead after she had been abducted and later killed by her estranged father.

> "I found out it was her birthday right after I pronounced her. The Amber Alert was going off on all of our phones and I had to get her birthday for my paperwork, and they told me it was her birthday today." (Shawn, in Chapter 4)

Calls like that are horrifying. I really feel for him, in large part because I've attended similar calls, including while I was interviewing my colleagues about their own experiences. It's no surprise that the death of a child consistently makes the 'top 10' lists of stressful calls or critical incident inventories (Carleton et al., 2019; Carleton et al., 2020; Donnelly & Bennett, 2014; Halpern et al., 2009) that are defined in research or used in practice. Other contenders for critical incidents commonly include encountering a dead body, communicating a death notification, attending a suicide, or encountering vulnerable victims (such as children) (Carleton et al., 2019; Carleton et al., 2020; Donnelly & Bennett, 2014; Halpern et al., 2009; Halpern et al., 2012). On the other hand, non-urgent (or, less politely, "bullshit" [Meredith]) calls are often cited as an example of chronic workplace stress (Corman, 2017; Devenish, 2014; Nurok & Henckes, 2009; Palmer, 1983). Again, from Chapter 4, Catherine and Meredith provide useful examples of the frustration paramedics commonly experience when attending 'bullshit' calls:

> "Like I had never called 911 in my entire life, and to me, 911 was always like: somebody's dead, the house is on fire. Like it's…you would just never call 911 for the things that we see." (Catherine, in Chapter 4)

> "I thought I was going to be making a much greater impact on patients' lives. But most of the time, the things they call for are bullshit and I grow old of it. I would rather be doing something that's more productive." (Does it bother you?) "A lot … 100%. (it's) one of the biggest stressors of my job." (How come?) "It's a waste of taxpayer's money. It's a waste of (my) time. I just don't like the abuse of the system." (Meredith, unpublished data)

What strikes me is that sources of workplace stress among paramedics span the spectrum of acuity from traumatic to mundane, but events at both ends are relatively common features of paramedic work. What has generally been missing from the conversation is a detailed exploration of why the acute and chronic workplace stressors cause the distress that they do. One notable exception is Halpern and colleagues' qualitative study of what makes an incident 'critical' for paramedics (Halpern et al., 2009). Through a series of focus groups and individual interviews with paramedics and supervisors in Toronto, Halpern et al. found that the reason

critical incidents were experienced as distressing was in large part because of the intense emotions that arose when the paramedics realized they were unable to help the victims (Halpern et al., 2009). As Halpern described, "there is a clear expectation on the part of the ambulance personnel that they rescue" (p. 179), and the inability to do so prompted frustration, and – in many cases – anger, as the participants suppressed overwhelming feelings of compassion mixed with profound guilt (Halpern et al., 2009). What Halpern and colleagues' work touched on was the idea that professional identity can contribute to psychological distress. This was intriguing and something I wanted to explore further.

Role identity theory explains that people derive a sense of purpose and meaning in life from holding social roles (Stryker & Burke, 2000). Roles are positions in society to which there are attendant behavioral expectations, attitudes, and values (Thoits, 2011). Roles can be professional (such a physician or lawyer), volunteer, religious, or familial, but the commonality is that the conceptualization of the role helps provide the individual with a sense of who they are as a person and how they fit into society (Thoits, 2012; van Ingen & Wilson, 2016). Role-affirming experiences serve to reinforce the role's stability and the resulting sense of purpose that comes from competently fulfilling social roles has been robustly linked to health and well-being (Thoits, 1991, 2010, 2011, 2012). In applying role identity theory as a conceptual framework to study paramedic mental health, our contributions, I think, are twofold: first, we shed some light on why seemingly conceptually disparate stressors cause the distress that they do; and second, we modestly advance the thinking of identity disruption within the theory itself.

I should preface the first point by saying that there are any number of other conceptual frameworks that could be used to study the topic. Moral injury comes to mind, given, for example, Shawn's story about the child who had been murdered. Contemporary definitions of moral injury focus on committing, failing to prevent, or witnessing acts that transgress deeply held moral values (Griffin et al., 2019). Incidents in which children were negligently or deliberately harmed or killed came up often during my interviews as being particularly distressing. But what interested me about role identity theory was the focus on the intersection of the individual with the role that they hold and how roles are integrated into our sense of self. While moral transgressions are subject to normative definitions, dissonant role identities, I would argue, have an additional layer of complexity. Roles are subject to a myriad of behaviors, values, attitudes, beliefs, and 'shoulds' that are enshrined in the organizational culture of the role, but the 'failure' to enact the perceived or actual requirements of the role can be deeply personal. Put plainly, harming a child may well be an affront to everyone who considers themselves a moral person, but the effects can be doubly devastating to someone whose sense of self is defined by the perceived expectations of an especially salient 'protector' role. Consider Elaine's story (again, from Chapter 4), for example, about a mother who was unconscious in her home after an overdose and her young children were left unattended.

> "Seeing kids who are being looked after by CAS (the Children's Aid Society) and they're just dumped back into a house that's awful in every single possible way because there's nothing else they can do. I just thought we (paramedics) would be more a part of the solution and it just seems like we're a smokescreen." (Elaine, Chapter 4)

Although Elaine's story can certainly be considered morally injurious, what strikes me is how much ownership she seems to take over her failure to protect the children, given the role that she holds. The theory supports this idea: role identities sit at the intersection of a 'job' and the sense of self, with the latter being dependent (in varying degrees) on the former. Where a role holds particular salience, defined (in some interpretations) as the degree of subjective importance assigned to the role by the individual (Simon, 1995; Stets & Serpe, 2013; Thoits, 2011), failures to fulfil the role's attributes become as much personal as professional. In Elaine's conceptualization of the paramedic role, she believes that she *should* be able to effect upstream impacts on patients' lives – actively preventing problems and protecting people from harm. In practice, this is rarely possible. The nature of paramedic work is inherently *reactive*, responding to problems after they have occurred and being left to pick up the pieces. For many of my participants, this was deeply troubling, leading others – like Elaine – to echo the sentiment of being "pretend help" (Nadiene). Among participants for whom (their conceptualizations of) the paramedic identity featured prominently in their sense of self, the inability to fulfil the attributes of the role in the way that they believe they should was incredibly destabilizing – not just to their conceptualization of the work, but to who they are as people. This, too, is supported by the theory; whereas role-affirming experiences provide stability to the identity (and the sense of self), disruptive experiences can cause existential distress, particularly if the person does not have other salient role identities to lean into (DeGarmo & Kitson, 1996; Marcussen, 2006; Thoits, 2011). What I find appealing about this framework is that, when applied to stressors in paramedic work, our explanation of role identity dissonance is durable across the spectrum of stressors discussed earlier. This, I think, is our contribution to the literature: we move beyond the categorization of stressors and instead have a framework for understanding why the stressors can cause distress regardless of whether the stressor is acute or chronic or morally injurious. Our framework for role identity dissonance also hints at some potential solutions (more about that later).

The second contribution of the research is to offer is an alternative conceptualization of identity disruption within role identity theory. Identity-relevant disruptive events have typically been described in this literature as singular, discrete life events, such as a divorce, the death of a family member, the loss of a job, or the transition from employment to retirement (DeGarmo & Kitson, 1996; Reitzes & Mutran, 2016; Thoits, 1995). The theory explains that where these identities feature prominently in the sense of self, their removal is inherently disruptive (Marcussen et al., 2004). Although the path between the identity-relevant disruptive event and

deleterious effects on health and well-being is not always linear. Peggy Thoits (a prominent theorist in this area) provided an insightful commentary on how the context surrounding the event can be an important effect modifier (Thoits, 1995). If working, for example, is important to your sense of self, but your job is stressful, the net effect on health of voluntarily leaving your job could be quite positive, depending on when the measurement is taken and what else happens to be occurring in your life at the time. In our work, we used the paramedic context as a way of demonstrating how identity-relevant disruptive events can be nebulous and chronic as well as acute and discrete. The stories our participants shared illustrate the ways in which their conceptualizations of the paramedic role are threatened in the day-to-day interactions that take place over years during their careers. Although theorists talk about role strain as an indicator of fulfilling an onerous role (Thoits, 1995), this is distinct from a chronic inability to fulfil the role's attributes that fundamentally threatens the person's conceptualization of the role, their sense of self, or both. Emotions add another dimension worthy of consideration. Halpern and colleagues (2009) identified anger, guilt, and compassion as manifesting from an inability of their participants to fulfil the expectation that paramedics rescue victims in need. Anger was a common feature in our interviews as a result of chronic, identity-relevant role disruption and in that respect, we offer a modest contribution to the theory.

5.4 Implications for Research and Policy

Our work has a number of important implications for research and policy with regard to paramedic mental health. First, we join a growing number of scholars and policymakers in recognizing a mental health crisis among paramedics. Although the rates of mental disorder symptoms are lower than have been previously reported among paramedics in Canada, they are high enough to be concerning in their own right (Mausz, Donnelly, et al., 2022a). Moreover, between a third and nearly half the sample of active-duty paramedics met the threshold for moderate symptoms of burnout on the ProQOL inventory and perceived stress on Cohen's measure (Mausz, Donnelly, et al., 2021). Our measurements were taken just a short time before the onset of the COVID-19 pandemic, and it's reasonable to speculate that the mental health and well-being of paramedics will have suffered over the past two years as a result. What was widely recognized a crisis (Public Safety Canada, 2019) before the pandemic has almost certainly worsened, and the need for action is indeed dire. Having said that, this urgency must not compromise the industry's commitment to implementing interventions that are appropriately vetted and evidence based. We – as a community – need to 'study and do' in parallel, drawing on translational and implementation science approaches that embed program evaluation within development to implement solutions that are (1) culturally-acceptable; (2) appropriate to the stressors; and (3) blueprinted to measurable improvements in health, well-being, and safety. Resilience training and peer support programs, for example, have tended to fail on all three criteria, in part because of the focus on the individual experience of trauma to the exclusion of chronic workplace stressors and organizational culture. Paramedics have been telling researchers

in this space for years that exposure to trauma is not the only – or even the most influential – determinant of health and well-being (Donnelly, 2012; Donnelly & Siebert, 2012; Donnelly et al., 2016; Halpern et al., 2009). Across studies (ours included), PTSD ranks lower than depression, anxiety, or burnout (Carleton, Afifi, et al., 2018; Mausz, Donnelly, et al., 2022a; Mausz, Donnelly, et al., 2021), but dominates the policy discourse in developing critical incident inventories, presumptive diagnosis legislation, and federal frameworks on post-traumatic stress injuries (Public Safety Canada, 2019). The relative contribution of chronic stressors (Donnelly et al., 2014), such as under-staffing (Donnelly, 2012; Donnelly et al., 2014), misaligned resourcing (McCann et al., 2013), workplace incivility (Cash et al., 2019), and violence (Maguire & O'Neill, 2017) tend to be excluded from the conversations on how to address the mental health crisis among paramedics. Returning here to the issue of role identity, our framework for role identity dissonance points to some potential solutions that should be studied in the context of paramedic health and well-being, described in more detail below.

The role identity dissonance we described results primarily from a fundamental misalignment between the person's expectations of the role and reality in terms of what is or is not achievable within the context of paramedic work. Both sides of the equation are modifiable. Responsibility for the first arguably lies with educators preparing paramedic students for entry to practice. In Chapter 4, Johnathan explains his frustration with the education system in saying "*the colleges teach you that you're only going to come across problems you can fix*." The focus tends to be on acute, life-threatening scenarios amenable to immediate intervention. There is now growing recognition that such cases represent only a small part of paramedic work (Jarvis et al., 2021). The result has been the proliferation of 'community paramedicine' programs in which teams of specially trained paramedics provide outpatient primary care for chronic health problems (Bigham et al., 2013; Tavares et al., 2016). I wonder if it should be the other way around: if the 'specialists' should be reserved for the emergencies (Mausz, Jackson, et al., 2022) and the core training of paramedics adapted to better reflect the apparent demand on the profession. This work, too, is underway with efforts within the paramedic education community to narrow the gap between entry-to-practice curriculum and on-the-road practice (Batt et al., 2021). Beyond developing the necessary technical skills, however, taking a role identity approach to entry-to-practice training can set more realistic expectations for what the work involves and where the paramedic's role fits in within the larger health care and public safety systems.

On the other side of the 'expectations versus reality' equation there may be opportunities for health benefits here as well. Our findings consistently point to a desire among the participants to be able to effect meaningful impacts on patients' lives. Given that most of the problems paramedics encounter are not immediately life-threatening (Mausz, Jackson, et al., 2022), developing programs, tools, and clinical pathways that are better aligned with the kinds of calls paramedics attend could not only ameliorate the frustration of encountering 'unfixable' 'bullshit' problems, but also better meet the needs of patients.

Finally, there is an element of paramedic role identity that I did not get into during the research that is nevertheless an important line of inquiry to pursue; namely, the loss of paramedic identity. The theory explains that role identities are organized hierarchically within the self, and that individuals derive more meaning from more salient identities. But there is also an accumulation effect, wherein people who have multiple salient roles have a larger and more diversified pool of roles from which to derive purpose and meaning. This has been described as the role accumulation hypothesis (Dietz & Ritchey, 1996; Thoits, 1983). There were participants in our sample for whom paramedic identity featured very prominently in their sense of self: "It gets all of my pies" (Jonathan) & "I do not have an identity outside of being a paramedic" (Shawn). Having all your 'eggs in one basket' sets the stage for catastrophe if the basket is taken away. Indeed, both in my interviews and in informal conversations with coworkers, there is a sizable proportion of paramedics who are having to come to terms with the prospect of no longer working as a paramedic. The loss of so prominent a role amounts to the loss of the self. Even among paramedics for whom the identity is not so all encompassing, the idea of having to leave the profession due to disability, for example, can be confronting. The ways in which paramedic role identity comes to feature so prominently in the sense of self, the effects of its loss, and ways to ameliorate the harm are questions worthy of further study. This is an area that I think we can glean lessons from the Canadian Armed Forces (CAF). The loss of military identity has been identified as an important consideration in releasing CAF members (Lee et al., 2020; Williams et al., 2022) and part of the release process is to support the member during the transition from soldier to civilian. The idea of living in a different world because of their work was a common sentiment among my interview participants. Having to transition from one world to the next was seen as inherently destabilizing. In that respect, it may be analogous to the transition from soldier to civilian. If that's the case, there may be value in either (1) narrowing the conceptual gap between 'paramedic' and 'civilian'; or (2) putting a name to the transition in the way that the CAF has in supporting the member to leave one identity and take on another could be viable solutions – or some combination of the two. This would require careful study.

5.5 Limitations

This work should be interpreted within the context of certain limitations. Most have been discussed in the respective chapters, but it is worth reiterating the limitations here – most notably, that the work is inherently situated. The cross-sectional approach to the surveys and the interviews are a snapshot in a particular context and moment in time. As I have mentioned earlier, this moment in time was before the onset of the COVID-19 pandemic, the resulting societal disruption, eroding trust in institutions, and (most recently) the war in Europe with its renewed prospect of nuclear conflict. The years since 2019 have been challenging to say the least, and the effects will likely be felt for years to come. While our numbers may change if the study was repeated, the underlying messages I have tried to convey in this dissertation would

remain: there is a mental health crisis within the profession, and its resolution requires circumspect, robust, evidence-informed solutions. Prospective and longitudinal research at the point of entry into the profession is needed to establish directionality in risks to health and well-being. In limiting this work to a single site, I made a deliberate methodological choice to prioritize depth over breadth, given the potential affordances of my insider status (Berger, 2013; Brannick & Coghlan, 2007) to add to the richness of the data. My selection of the study site was not merely a matter of convenience. Our site is a large, urban, sophisticated paramedic service and affords at least some resemblance to the urban paramedic experience. However I fully acknowledge the limitation that regardless of its contextual features, limiting the study to a single site compromises the transferability of the findings (Asselin, 2003) and the reader should exercise care in extrapolating what I report here to other contexts. In that respect, situating future research in rural/remote settings is an important step in identifying the contextual influences on health and well-being that we were unable to assess here.

5.6 Conclusions

My goal in this mixed methods program of research was to address a number of methodological limitations and conceptual gaps in the literature describing paramedic mental health in Canada. In our study site and prior to the onset of the COVID-19 pandemic, the prevalence of mental disorder symptoms among our participants was lower than has been reported among paramedics previously. Our response rate of 98% in our cross-sectional survey gives a high degree of confidence in the representativeness of our findings in characterising the mental health of the active-duty paramedic workforce within the context of the mental disorders and indicators of psychological distress that we screened for. Those findings – specifically that 1 in 4 active-duty paramedics met the screening criteria for either PTSD, major depressive disorder, or generalized anxiety disorder – support the position of a mental health crisis within the profession that has likely only worsened with the events of recent years. The risk of mental disorder symptoms varied as a function of self-reported resilience and demographic characteristics, with women and current or former members of the peer support team having a higher risk of some mental disorder symptoms. The risk of mental disorder symptoms or other, non-diagnostic indicators of distress did not, however, vary as a quantifiable function of endorsement of the four extant dimensions of paramedic role identity that have been described. In exploring the intersection of role identity and mental health among paramedics, I defined the features of two new potential dimensions of paramedic role identity and proposed a framework for emotional and psychological distress that may be nonlinear but is nevertheless worthy of careful consideration. Within the framework, chronic, identity-relevant disruptive events cause role identity dissonance that can lead to significant distress. Reconciling this distress requires coming to a new understanding of the role, the self, or both, and the process points to several strategies that could be considered on a macro level to narrow the gap between ‘expectations and reality’ in paramedic work that sets the stage for role identity dissonance.

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