

CANADIAN RESPIRATORY THERAPISTS DURING THE COVID-19 PANDEMIC

PSYCHOLOGICAL AND OCCUPATIONAL OUTCOMES AMONG CANADIAN
RESPIRATORY THERAPISTS DURING THE COVID-19 PANDEMIC

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A Thesis Submitted to the School of Graduate Studies in Partial Fulfillment of the
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Descriptive Note

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Lay Abstract

Healthcare providers (HCPs) have reported psychological distress and thinking about leaving their jobs during the COVID-19 pandemic, but little is known about respiratory therapists' (RTs') experiences. This thesis explored how Canadian RTs have been affected during the COVID-19 pandemic. In Study 1, we asked RTs about mental health and functioning and found that RTs had symptoms of depression, anxiety, stress and moral distress, with one third of the RTs likely meeting criteria for Post-Traumatic Stress Disorder. In Study 2, we asked RTs if they were thinking about leaving their jobs and found that one in four were considering leaving. RTs who were considering leaving had greater negative psychological symptoms, but analyses suggested that ongoing issues in healthcare may play a greater role in RTs leaving their jobs. Together, these studies show that RTs had negative psychological impacts and were considering leaving their jobs, just like other HCPs during the pandemic.

Abstract

Despite pre-COVID-19 pandemic evidence to suggest that respiratory therapists (RTs) may experience elevated symptoms of anxiety and distress due to the nature of their occupation, the extant literature on healthcare providers (HCPs') experiences during the pandemic is largely limited to other HCP groups, such as nurses and physicians. Global reports demonstrate widespread adverse psychological impacts to HCPs during the pandemic, including symptoms of depression, anxiety, burnout, moral distress and post-traumatic stress disorder (PTSD). Furthermore, occupational impacts, namely turnover intention, are increasingly reported as the pandemic persists. This Master's thesis investigated the psychological and occupational impacts associated with COVID-19 pandemic service among Canadian RTs during the Spring of 2021. A review of the relevant literature on HCPs' experiences during the pandemic is presented in Chapter 1, along with a synthesis of knowledge on RTs. An exploration of psychological and functional outcomes among RTs during the COVID-19 pandemic is presented in Chapter 2. Here, almost half of the sample reported clinically relevant symptoms of depression, anxiety and stress, and one in three RTs screened positively for likely PTSD. In Chapter 3, we investigated consideration of position departure, finding that one in four RTs were considering leaving. Despite over half of those considering leaving screening positive for likely PTSD, adverse psychological experiences contributed little to the predictive model of departure consideration compared to past consideration to leave. We posit that longstanding organizational issues may play an important role in RTs' consideration to leave. Overall, these studies expand the literature investigating the impact of COVID-19

pandemic service among HCPs and advance knowledge on the impacts of pandemic service among RTs who have, up until recently, been neglected. Altogether, the evidence presented in this thesis suggests that RTs require adequate mental health supports and resources alongside their HCP colleagues during and beyond the COVID-19 pandemic.

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List of Abbreviations and Symbols

COVID-19	Coronavirus Disease 2019
CSRT	Canadian Society of Respiratory Therapists
HCPs	Healthcare Providers
ICU	Intensive Care Unit
MERS	Middle Eastern Respiratory Syndrome
PMIDEs	Potentially Morally Injurious or Distressing Events
PMIEs	Potentially Morally Injurious Events
PPE	Personal Protective Equipment
PTSD	Post-Traumatic Stress Disorder
PTSS	Post-Traumatic Stress Symptoms
RTs	Respiratory Therapists
SARS	Severe Acute Respiratory Syndrome

Declaration of Academic Achievement

This Master's thesis comprises four chapters. In Chapter 1, the relevant literature on HCPs' experiences during the COVID-19 pandemic, including psychological and occupational outcomes, is reviewed and summarized. Chapters 2 and 3 are original, first-authored manuscripts prepared during my Master's degree. Chapter 2 was submitted for publication in the *European Journal of Psychotraumatology* and Chapter 3 is under review at the Canadian Public Health Agency's journal, *Health Promotion and Chronic Disease Prevention in Canada: Research, Practice and Policy*. Chapter 4 of this thesis provides a summary of the key findings of the research presented in the two preceding chapters, situating these works within the broader context of the literature and discussing key implications of the findings. The data presented in Chapters 2 and 3 were collected between February and June 2021 from a subset of participants in a broader investigation of HCPs' mental health and experiences during the COVID-19 pandemic led by Dr. Margaret McKinnon (Principal Investigator). The broader research project was designed by Dr. McKinnon, Dr. Randi McCabe, Dr. Ruth Lanius, Dr. Kim Ritchie, Dr. Andrea Brown, collaborators at the Atlas Centre for Veterans and Families, and a team of McMaster students, including myself, Mina Pichtikova and Yuanxin Xue. I conducted literature reviews, performed original data analysis, consulted with biostatisticians, wrote original drafts and collated author feedback for manuscript submission for each article presented in Chapters 2 and 3, respectively. I presented portions of these studies at various conferences, including the Canadian Psychological Association's 83rd Annual

Convention (2022) and the Canadian Society of Respiratory Therapists Annual
Conference (2021, 2022).

Chapter 1: Introduction

The COVID-19 pandemic has profoundly impacted healthcare systems across the globe, consequently burdening healthcare providers (HCPs), especially in the wake of the pandemic as they sacrificed their lives on the frontlines to protect communities (Evans, 2021; Morganstein & Flynn, 2021). Shortages in personal protective equipment (PPE), potentially life-saving resources and staff during the pandemic response have compacted upon distressing and potentially traumatic exposures for HCPs, such as witnessing patients die alone due to rigid no-visitor policies, initial fears of contracting and transmitting the coronavirus to loved ones before vaccines were available, experiencing a lack of support from organizations, and enduring stigma, harassment, discrimination and abuse at the hands of the public (Billings et al., 2021; Donkers et al., 2021; Lake et al., 2022; Miljeteig et al., 2021; Norman et al., 2021; Riedel et al., 2022; Smallwood et al., 2021; Xue et al., 2022). Due to these conditions, HCPs are at risk for a host of deleterious psychological outcomes related to their service, such as depression, anxiety, Post-Traumatic Stress Disorder (PTSD), burnout, moral distress and moral injury (Di Tella et al., 2020; Li et al., 2021; Norman et al., 2021; Riedel et al., 2022; Saragih et al., 2021; Shaukat et al., 2020; Shreffler et al., 2020; Yáñez et al., 2020). Alongside a growing global body of literature on the harmful psychological outcomes that HCPs have endured throughout the pandemic is rising concern over position and profession departure among HCPs (Al-Mansour, 2021; Falatah, 2021; Hou et al., 2021; Labrague & de los Santos, 2021; Tabur et al., 2022; Yáñez et al., 2020; Yang et al., 2021; Zhang et al., 2022). Despite the urgent need to address HCPs’ mental health sequelae and intention to resign

over the pandemic period, research in this area is largely limited to select HCP groups (e.g., nurses and physicians), consequently neglecting the experience of other vital HCPs, including respiratory therapists (RTs). To equip and retain RTs as they traverse pandemic-related adverse experiences and outcomes alongside their colleagues, there is an urgent need to better understand the psychological and occupational impacts that the COVID-19 pandemic has had on RTs specifically. Indeed, RTs are HCPs who are frequently exposed to potentially traumatic exposures, such as caring for critically ill patients of all ages and removing mechanical ventilation that at times results in death (Canadian Society for Respiratory Therapists, n.d.; Mahan et al., 2019). Furthermore, RTs’ working conditions are high risk in the pandemic context given their critical role providing cardiopulmonary care at the bedside of patients suffering from the respiratory illness caused by the coronavirus involving close contact with COVID-19 patients, heightening risk for infection (Maffoni et al., 2021). Accordingly, the purpose of this Master’s thesis was to answer, in part, the research question: what are the psychological and occupational impacts associated with COVID-19 pandemic service for Canadian RTs?

Trauma Exposure and Adverse Outcomes in Healthcare Occupations

HCPs have been broadly defined as “individuals who actively engage in the protection and the improvement of health and society” (World Health Organization, 2006 as cited in Riedel et al., 2022, pg. 1). HCPs are professionals commonly placed in stressful and traumatic situations given the nature of their occupations caring for citizens’ health and safety. For example, many HCPs have experience caring for patients suffering from acute

or chronic illness, motor vehicle accidents, gunshot wounds or in the aftermath of natural disasters (Morganstein & Flynn, 2021). A large body of literature demonstrates that HCPs are at high risk for adverse mental health impacts given, in part, to such exposures. Indeed, in an investigation of retrospective physical and psychological outcomes after trauma among HCPs, social service workers and trading company employees, HCPs reported a higher degree of exposure to workplace violence and the greatest levels of stress, anxiety and depression when compared to other professionals in the study (Magnavita et al., 2021). The following adverse psychological outcomes have consistently been established as relevant concerns among HCPs in the course of their work, with many studies exclusively focusing on physicians and nurses: burnout (Ding et al., 2014; Montgomery et al., 2019; Reith, 2018), anxiety (Ding et al., 2014; Serrano-Ripoll et al., 2020; Stelnicki et al., 2021; Stelnicki & Carleton, 2021), depression (Letvak et al., 2012; Serrano-Ripoll et al., 2020; Stelnicki et al., 2021), PTSD (Sendler et al., 2016; Serrano-Ripoll et al., 2020; Stelnicki et al., 2021; Stelnicki & Carleton, 2021) and suicide (Dutheil et al., 2019; Hawton et al., 2011; Serrano-Ripoll et al., 2020). In a Canadian study, for example, nurses reported widespread exposure to potentially psychologically traumatic events, including human suffering, life-threatening illness and physical assault (Stelnicki et al., 2021). These exposures increased the odds of positive screens for PTSD, Major Depressive Disorder, Generalized Anxiety Disorder and Panic Disorder (Stelnicki et al., 2021)

HCPs’ Experiences During the COVID-19 Pandemic

Although many HCPs have ample experience working in stressful and traumatic situations, it has been suggested that the COVID-19 pandemic may be unique in its impact on HCPs given its “threat... scope, magnitude and duration” (Morganstein & Flynn, 2021, pg. 482). Indeed, Morganstein and Flynn (2021) highlighted the atypicality of the COVID-19 pandemic given its shocking start with a vast degree of uncertainty about transmission of the virus, chronic illness and high mortality rates, lack of cure and high risk of infection to HCPs and their families, which combined, posed barriers for planning, response and hope for recovery at the outset of the pandemic. Furthermore, outside of their occupational roles, HCPs, along with their communities, have been burdened by the pandemic in their personal lives, with many individuals facing financial crises and stress from navigating home and family responsibilities (Shreffler et al., 2020). Notably, however, Billings et al. (2021), in a systematic review and meta-synthesis, argued that HCPs’ experiences during the COVID-19 pandemic may indeed not be unprecedented when compared to prior disease outbreaks. Here, concern over physical safety, inadequate PPE, scarce resources, inconsistent information, long work hours, high workloads and strained relationships were found to be common experiences for HCPs during the COVID-19 pandemic similar to other epidemics/pandemics [e.g., Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), Ebola]. Although the compacting layers of stressful events both within HCPs’ professional and personal lives may be similar to experiences endured in past disease outbreaks, it is important to acknowledge the novelty of the COVID-19 pandemic given

its global spread and worldwide economic impact (Morganstein & Flynn, 2021). Here, the global nature of COVID-19 pandemic did not allow for unimpacted countries to help others, as may have been the case with other epidemics/pandemics which were more localized.

HCPs have reported immense stress over physical safety, especially at the outset of the COVID-19 pandemic when PPE and resources were scant (Billings et al., 2021). Ethical and moral stressors (i.e., events that conflict with one’s moral values), both those that existed prior to the pandemic and those which arose in the COVID-19 context for HCPs, have also garnered global attention (Ducharlet et al., 2021; Riedel et al., 2022; Xue et al., 2022). In a scoping review on the potentially morally injurious or distressing experiences (PMIDEs) HCPs and public safety personnel faced during the COVID-19 pandemic, Xue et al. (2022), reported six broad categories of events delineating the circumstances of these exposures, including i) risk for contracting or transmitting the coronavirus, ii) inability to work on the frontlines, iii) provision of sub-optimal care, iv) care prioritization and resource allocation, v) perceived lack of support and unfair treatment by organizations, and vi) stigma, discrimination and abuse (Xue et al., 2022). Similarly, Riedel et al., (2022) conducted a scoping review of moral stressors (i.e., events that violate one’s moral values) for HCPs throughout the COVID-19 pandemic and synthesized exposures into three categories: patient care, interpersonal relationships and organizations. Patient-care-related moral stressors included witnessing inadequate care, having to isolate patients, feeling as though one was abandoning colleagues when infected, using PPE that hindered the facilitation of relationships and enforcing visitor

restrictions, especially for dying patients (Billings et al., 2021; Liu et al., 2022; Riedel et al., 2022; Silverman et al., 2021; Smallwood et al., 2021). Interpersonal moral stressors included changing teams, working with colleagues who lacked expertise in critical care, conflicting priorities on treatment plans between physicians and nurses and conflicts with patients’ families regarding the use of scarce resources (Kok et al., 2021; Liu et al., 2022; Riedel et al., 2022; Silverman et al., 2021). Organizational moral stressors included the distribution of scarce resources, lack of finances compromising care, time and staff, inadequate PPE, unsafe working conditions, lack of support from management and being treated as replaceable (Donkers et al., 2021; French et al., 2021; Kok et al., 2021; Kreh et al., 2021; Lake et al., 2022; Miljeteig et al., 2021; Riedel et al., 2022; Silverman et al., 2021; Smallwood et al., 2021; Zerach & Levi-Belz, 2021). Altogether, the extant literature demonstrates that HCPs have endured a broad range of distressing and potentially traumatic exposures associated with their occupation during the COVID-19 pandemic, rightfully raising concern for the health and wellbeing of HCPs globally (Shreffler et al., 2020).

Adverse Psychological Outcomes Associated with COVID-19 Pandemic Service

Research from previous epidemics and pandemics (e.g., SARS, MERS, Ebola) reveals deleterious impacts to HCPs’ mental health, including high rates of stress, depression, anxiety and post-traumatic stress symptoms (PTSS; (Alsubaie et al., 2019; Bai et al., 2004; Liu et al., 2012; Lung et al., 2009; Wu et al., 2009). Critically, some evidence suggests that burnout and symptoms of anxiety, depression and PTSD remained elevated even two years after the initial outbreak of SARS among HCPs who treated SARS

patients (Lancee et al., 2008). In light of this history, it is expected that HCPs, like those in the wake of past outbreaks, may face adverse psychological outcomes both during and after the current pandemic period. Here, it will be imperative to understand how HCPs are impacted during the COVID-19 pandemic in order to establish adequate supports to equip HCPs with the necessary resources to manage the expected adverse psychological outcomes.

Reports of adverse psychological outcomes among HCPs during the COVID-19 pandemic are alarming, yet consistent with the picture presented from past disease outbreaks. In a review of physical and mental health outcomes for HCPs during the COVID-19 pandemic, fever, cough, skin damage and high levels of depression, anxiety, insomnia and distress were commonly reported (Shaukat et al., 2020). Marvaldi et al.’s (2021) systematic review and meta-analysis revealed high prevalence rates of symptoms of anxiety, depression, post-traumatic stress and sleep disorders across 70 studies of mental health problems faced by HCPs during the pandemic. It appears that female HCPs and nurses, along with those working on the frontlines, may have experienced worse outcomes than their counterparts (Shaukat et al., 2020). Relatedly, d’Ettorre et al.’s (2021) systematic review on PTSS during the COVID-19 pandemic demonstrated that young HCPs with a lack of training and poor social support were at greater risk for PTSS than their counterparts. Notably, across the literature, HCPs appear to be more greatly affected than the community population during the pandemic, where HCPs directly working with COVID-19 patients are still further disproportionately affected than their

colleagues who do not work with COVID-19 patients (da Silva & Neto, 2021; Huang & Zhao, 2020).

Moral distress and moral injury have also been reported among HCPs worldwide. Moral distress has been defined as the psychological response to situations in which a HCP is prevented, whether by internal or external constraints, from acting in ways that align with their knowledge of the ethically appropriate course of action for a given situation (Epstein et al., 2019). Similarly, moral injury has been defined as the psychological response to events in which an individual transgresses their moral values either by acts of commission or omission (i.e., acting or failing to act) or when an individual witnesses someone else violate their deeply held moral values by acts of commission or omission (Litz et al., 2009; Litz & Kerig, 2019). As the relation and distinction between moral distress and moral injury remains poorly understood, it is possible that these concepts refer to the same phenomena born out of separate bodies of literature, where moral distress originated as a concept in the nursing literature (Jameton, 1993) while moral injury emerged simultaneously in the military literature (Shay, 1995), yet more research is needed to determine this relation. Some posit that the events which give rise to moral distress and injury may overlap (Riedel et al., 2022; Xue et al., 2022), but the degree of impact from exposure may distinguish these concepts, where moral distress, characterized by anger, grief and hopelessness (Burston & Tuckett, 2012; Riedel et al., 2022), may impact individuals less holistically than moral injury, which is associated with a shattered sense of identity, PTSD and suicidality in addition to anxiety, depression and incapacitating feelings of guilt, shame, anger and betrayal (Čartolovni et

al., 2021; Litz et al., 2009; Litz & Kerig, 2019; Riedel et al., 2022). Indeed, Litz & Kerig’s (2019) heuristic continuum model of moral stressors and outcomes delineates the discrepancy between moral distress and moral injury as outcomes differing in the extent to which these phenomena are deleterious in psychological, spiritual and social impairment. Nevertheless, exposure to moral stressors during the COVID-19 pandemic, as discussed above, has been associated with anxiety, fear, guilt, frustration, shame, loss of confidence, exhaustion, PTSD, burnout, anger and helplessness among HCPs (Kreh et al., 2021; Riedel et al., 2022; Xue et al., 2022; Zerach & Levi-Belz, 2021). For example, in one study, almost half of the physicians surveyed in April 2020 reported high exposure to PMIEs, which was positively related to self-reported degree of physical and emotional impact ratings (Maftai & Holman, 2021).

Across the literature of psychological outcomes among HCPs during the COVID-19 pandemic, high rates of adverse psychological symptoms are consistently reported across the globe. Critically, as the pandemic persists, bringing rapid changes and new stressors for HCPs with each wave, it is expected that HCPs’ will continue to be affected. As such, there is an urgent need for rapid implementation of supports for HCPs to ward against the deleterious outcomes associated with pandemic service.

Intention to Resign Among HCPs During the COVID-19 Pandemic

Occupational impacts, namely job dissatisfaction and intention to resign, have increasingly been reported in relation to the psychological outcomes and events endured during the COVID-19 pandemic among HCPs. Notably, a substantial proportion of research conducted here is specific to nurses (e.g., Falatah, 2021; Labrague & de los

Santos, 2021; Petrișor et al., 2021; Sheppard et al., 2022). For example, moral distress related to safety and quality of patient care was associated with intention to resign among nurses in the United States during the summer of 2020 (Sheppard et al., 2022). Critically, 38% of the 107 nurses surveyed reported considering leaving their current position (Sheppard et al., 2022). Relatedly, 27% of 79 Romanian intensive care unit (ICU) nurses surveyed between October 2020 and February 2021 reported considering leaving their position (Petrișor et al., 2021). Here, system-related sources of moral distress (i.e., stressors pertaining to the organizational impacts to patient care, such as administrative pressure to reduce costs or caring for more patients than is safe; Epstein et al., 2019) distinguished between those considering and not considering leaving their position during the pandemic (Petrișor et al., 2021). Similar reports of intention to resign related to psychological impacts during the pandemic have been reported in the Philippines (Labrague & de los Santos, 2021), Saudi Arabia (Al-Mansour, 2021), China (Hou et al., 2021), Bolivia (Zhang et al., 2022), Egypt (Abd-Ellatif et al., 2021), Turkey (Tabur et al., 2022) and Peru (Yáñez et al., 2020). Fronda and Labrague (2022) found that in addition to 26% of nurses considering leaving their positions during the pandemic, 21% reported considering leaving the profession entirely. In a review of the impact that the COVID-19 pandemic has had on nurses’ intention to resign, Falatah et al. (2021) reported that intention to resign appears to have increased among nurses since the inception of the COVID-19 pandemic. Here, the threat of position departure among HCPs during the pandemic related to distress and other negative psychological impacts demands immediate attention. This picture of adverse psychological outcomes related to intention

to resign during the COVID-19 pandemic should not, however, come as a surprise, given a long-standing body of literature demonstrating a relation between moral distress and intention to leave, both one’s position and profession (for a complete review, please see Burston & Tuckett, 2012).

Altogether, the extant literature on HCPs’ experiences during the COVID-19 pandemic demonstrates that these vital workers have endured incredible challenges throughout the COVID-19 pandemic, threatening the health and wellbeing of the healthcare workforce and, by consequence the continuity of the healthcare system. A key limitation to the research, especially research conducted in the early stages (2020-2021) of the pandemic, is the absence of a diverse representation of HCPs experiences based on various professional disciplines, including respiratory therapists (RTs). Despite this neglect, there is ample reason to believe that RTs have been similarly affected by their service during the COVID-19 as their HCP colleagues. It is imperative to understand the unique experiences of RTs, along with the psychological and occupational outcomes they face, in order to equip RTs to carry out their jobs well.

Respiratory Therapists

RTs are HCPs with expertise in the cardiopulmonary system (Canadian Society of Respiratory Therapists, n.d.). RTs assess, diagnose, treat, manage and educate patients of all ages with acute and chronic cardiopulmonary illnesses, such as chronic bronchitis, congestive heart failure and emphysema (Canadian Society of Respiratory Therapists, n.d.). RTs work collaboratively in groups and, as experts in mechanical ventilation and airway management, they often provide invasive care in critical situations, including

being core members of rapid response, code and trauma teams (Mahan, 2019). Here, RTs are commonly involved in termination of patient care or other end-of-life experiences for patients of all ages and are thus frequently exposed to death and dying (Brown-Saltzman et al., 2010; Collins et al., 2015; Mahan, 2019; Rocker et al., 2005). Indeed, such exposures to critical illness, death and dying meet criterion A for PTSD (American Psychiatric Association, 2013) and increase risk for secondary traumatic stress (Burr et al., 2020).

Despite broad exposure to potentially traumatic events in their profession, RTs’ mental health and experiences are scarcely researched (Mahan, 2019), especially when compared to other HCPs, such as nurses and physicians, with whom RTs work closely. Indeed, prior to the COVID-19 pandemic, much of the paucity of literature on RTs was not focused on their mental health and experiences, but rather on their critical thinking skills (Goodfellow, 2001), training and delivery of smoking cessation programs (Goodfellow, 2001; Jordan et al., 2011) and patient care delivery (Shelledy et al., 2009; Wong et al., 2014). Critically, the few studies that have considered RTs’ mental health have pointed to burnout, death anxiety, moral distress and PTSD as relevant concerns among RTs (Brown-Saltzman et al., 2010; Burr et al., 2020; Collins et al., 2015; Dryden-Palmer et al., 2020; Fumis et al., 2017; Larson et al., 2017; Schwenzer & Wang, 2006). For example, Brown-Saltzman and colleagues (2010) developed an interdisciplinary program on end-of-life care for RTs given a lack of training for these professionals who often treat critically ill and dying patients. Here, the majority of RTs surveyed reported recent end-of-life patient encounters and approximately one-third of participants reported

distress related to the withdrawal of treatment (Brown-Saltzman et al., 2010).

Furthermore, Collins et al., (2015) investigated the use of a program to aid RT students in dealing with death anxiety (i.e., “the thoughts, fears and emotions about that final event of living that we experience under more normal conditions of life” pg. 1) when caring for patients at end-of-life and called for future research on this concept among RTs given the lack of knowledge on how RTs deal with high exposure to end-of-life situations.

Schwenzer and Wang (2006) sought to understand the relation between moral distress, occupational dissatisfaction and turnover among RTs. This investigation revealed that, among 115 RTs surveyed, moral distress was experienced in relation to many areas of practice, especially disagreement with patients’ decision makers and providing futile care (Schwenzer & Wang, 2006). Furthermore, moral distress related to unsafe staffing was associated with job dissatisfaction and turnover among the RTs in this study (Schwenzer & Wang, 2006). Relatedly, some research suggests that RTs experience moral distress to the same degree as their physician and nurses’ counterparts in pediatric and neonatal ICUs (Larson et al., 2017) and in some cases, elevated moral distress alongside nurses, exceeding the degree of moral distress endured by physicians (Larson et al., 2017). In a study on secondary traumatic stress (i.e., “the natural, consequent behaviours and emotions resulting from knowledge about a traumatizing event experienced by a significant other,” Burr et al., 2020, pg. 1019) among RTs, Burr et al., (2020) found that approximately 36% of their sample of 201 American RTs screened positively for likely PTSD.

Given the pre-pandemic risk for adverse psychological outcomes due to the nature of the RT profession (Brown-Saltzman et al., 2010; Burr et al., 2020; Collins et al., 2015; Dryden-Palmer et al., 2020; Fumis et al., 2017; Larson et al., 2017; Schwenzer & Wang, 2006), combined with the widespread impact the COVID-19 pandemic has had on healthcare systems globally (Morganstein & Flynn, 2021) and the critical role that RTs play in caring for COVID-19 patients (Maffoni et al., 2021; Sawadkar & Nayak, 2020), there is ample reason to suspect that RTs may experience negative psychological and occupational impacts from pandemic service alongside their HCP colleagues. To date, however, relatively few studies have specifically investigated RTs’ mental health and experiences during the pandemic period. While RTs may be recognized more so now than in pre-pandemic literature, they are often lumped in with other HCPs, rendering their unique experiences and needs overlooked. The few studies that have exclusively considered RTs during the COVID-19 pandemic corroborate concerns for RTs’ mental health and wellbeing (Miller et al., 2021; Omar et al., 2022; Rajan et al., 2020; Roberts et al., 2020). For example, Miller et al. (2021) reported that 72% of their sample of 221 RTs experienced burnout, commonly driven by poor leadership, high workloads and staffing issues. Rajan et al. (2020) investigated RTs’ knowledge, confidence and perception of their role during the COVID-19 in India, reporting that virtually all RTs surveyed (N=86) reported a “negative psychological impact” of their pandemic service. Importantly, both of these investigations, while contributing to the need for knowledge on RTs’ unique experience during the pandemic, utilized author-generated survey items rather than using psychometrically validated questionnaires (Miller et al., 2021; Rajan et al., 2020). To

meaningfully understand RTs’ unique experiences during the COVID-19 pandemic and compare their experiences to their colleagues in other healthcare disciplines, it will be essential to utilize validated indices of psychological impact moving forward. Burnout has additionally been identified as a psychological impact that RTs face during the pandemic (Omar et al., 2022; Roberts et al., 2020), including RT students practicing in adult acute care (McHenry et al., 2022). Collectively, these studies would suggest that RTs face critical impacts to their psychological health during the COVID-19 pandemic. Despite some studies on HCPs during the pandemic including RTs as an occupational group (Alenazi et al., 2020; Ness et al., 2021; Prasad et al., 2021; Sharma et al., 2021), further investigation is needed to fully understand the scope of RTs unique experiences during the pandemic, especially in the Canadian context.

Summary

Taken together, the literature documents the widespread and varied impacts that COVID-19 pandemic service has had on HCPs, including both psychological and occupational outcomes. There is a critical knowledge gap in the literature, however, regarding the experiences of RTs. With ample reason to suspect that RTs are similarly affected by pandemic service as their HCP colleagues, it is essential to understand the psychological and occupational experiences that RTs face during the COVID-19 in order to supply RTs with adequate mental health supports. In the absence of such support, the safety and wellbeing of our RTs is at risk, which will have direct impact on patient care and healthcare delivery. Accordingly, the purpose of this Master’s thesis is to understand the psychological and occupational impacts of COVID-19 pandemic service among

Canadian RTs. As a note to the reader, there is some overlap in the content of the literature reviews and methods of the following two research papers given that the studies were conducted on the same group of participants.

Overview of the Presented Work

The research presented in Chapters 2 and 3 of this thesis are based on quantitative survey data collected from Canadian RTs between February and June of 2021, roughly corresponding to the second wave of the COVID-19 pandemic in Ontario, Canada. These data were drawn from a broader database of quantitative data gathered from a broad range of HCPs (e.g., nurses, physicians, social workers, personal support workers, occupational therapist) during the COVID-19 pandemic. In Chapter 2 of this thesis, we aimed to describe the psychological and functional profile of Canadian RTs and make comparisons between those working on and off designated COVID-19 units. Chapter 3 of this thesis presents an investigation of RTs’ consideration of position departure due to moral distress. Together, these studies address the paucity of knowledge of RTs mental health and consideration of position departure during the COVID-19 pandemic.

Chapter 2: Study 1

Characterizing the Mental Health and Functioning of Canadian Respiratory Therapists During the COVID-19 Pandemic

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Abstract

INTRODUCTION: Throughout the COVID-19 pandemic, healthcare professionals (HCPs) have appeared at increased risk for a host of negative mental health outcomes [e.g., depression, anxiety, post-traumatic stress disorder (PTSD), moral distress] and their deleterious impacts on functioning. Despite this knowledge, and the presence of high levels of stress and trauma among this occupational group pre-pandemic, little is known about the mental health and functioning of specific professional groups beyond nurses and physicians, including respiratory therapists (RTs), over the course of the pandemic. Accordingly, the purpose of the present study was to characterize the mental health and functioning of Canadian RTs during the COVID-19 pandemic.

METHODS: Between February and June 2021, Canadian RTs completed an online survey, including basic demographic information (e.g., age, sex, gender, marital status) and psychometrically validated measures of depression, anxiety, stress, PTSD, moral distress and functional impairment.

RESULTS: Two hundred and eighteen (N=218) RTs participated in this study. Approximately half of the sample screened positive for clinically relevant symptoms of depression (52%), anxiety (51%) and stress (54%) and one in three (33%) screened positively for likely PTSD. Moral distress was also prevalent among the sample ($M=133.8$, $SD=74.4$), being higher among RTs working on COVID-19 units as compared to those who were not ($p < .05$). All symptoms correlated positively with functional impairment (p 's $< .05$), with RTs reporting difficulties in functioning for an average of 9 days over the past month.

CONCLUSION: Moral distress and symptoms of depression, anxiety, stress and PTSD were prevalent among RTs and were associated with deleterious functional impacts throughout February to June 2021. These results raise concerns regarding the long-term impacts of pandemic service on RTs and point toward the need for adequate prevention, early detection and intervention efforts to support the mental health and functioning of RTs, both in Canada and globally.

Keywords: Respiratory Therapists; COVID-19; Mental Health; PTSD; Healthcare

HIGHLIGHTS:

- Research on RTs’ mental health prior to and during the COVID-19 pandemic is scant, especially in comparison to other HCPs
- RTs in the present study reported experiencing moral distress and clinically significant symptoms of depression, anxiety and PTSD, with associated functional impairment during the second wave of the COVID-19 pandemic
- One in three RTs screened positively for likely PTSD on the PCL-5

- There is an urgent need to provide RTs with adequate mental health supports and to understand the long-term impacts of pandemic service among RT

Characterizing the Mental Health and Functioning of Canadian Respiratory Therapists During the COVID-19 Pandemic

Introduction

The COVID-19 pandemic has exacerbated workplace stressors and potentially traumatic circumstances in healthcare settings across the globe, placing respiratory therapists (RTs) and other healthcare professionals (HCPs) at heightened risk for a host of negative psychological outcomes, including depression, anxiety, stress, post-traumatic stress disorder (PTSD) and moral distress (Benfante et al., 2020; Cai et al., 2020; Chew et al., 2020; Donkers et al., 2021; Shanafelt et al., 2020). Critically, research on RTs’ mental health and experiences during the pandemic is lacking, where the majority of investigations concerning the mental health of HCPs have focused primarily on other frontline workers (e.g., physicians and nurses; Di Tella et al., 2020; Kang et al., 2020; Lu et al., 2020; Mosheva et al., 2021; Xiao et al., 2020). In order to provide RTs with adequate, evidence-informed supports and resources necessary to ward against the anticipated negative outcomes associated with their service during the pandemic, there is an urgent need to characterize the psychological wellbeing and functioning of this population. Accordingly, the purpose of the present study was to characterize the mental health and functioning of RTs who worked during the COVID-19 pandemic in Canada.

RTs are HCPs who specialize in cardiopulmonary (heart and lung) health. RTs work collaboratively and alongside many other HCPs, such as nurses, physicians, physiotherapists and occupational therapists. RTs assess, diagnose, treat, manage and educate patients of all ages with both acute and chronic cardiopulmonary illnesses (e.g., chronic bronchitis, congestive heart failure, emphysema; Canadian Society of Respiratory

Therapists, n.d.). With a variety of specialized skills, such as expertise in mechanical ventilation and airway management (Canadian Society of Respiratory Therapists, n.d.; Mahan, 2019), RTs often provide intensive and invasive care in complicated and critical situations (e.g., motor vehicle accidents, newborn emergencies; Canadian Society of Respiratory Therapists, n.d.). RTs work in a variety of settings, including (but not limited to) patients’ homes, community clinics, outpatient clinics, general wards, neonatal nurseries, emergency departments, operating rooms and intensive care units (Canadian Society of Respiratory Therapists, n.d.).

Existing research on HCPs’ experiences during the pandemic highlights the impact that COVID-19 has had on multiple domains of HCPs’ wellbeing (Billings et al., 2021). HCPs have reported fear for personal and family safety, concerns surrounding patient mortality and shortages in personal protective equipment as key stressors during the pandemic (Cai et al., 2020; Hall, 2020; Shanafelt et al., 2020). Overall, research points toward elevated symptoms of depression, anxiety, stress, PTSD and moral distress among HCPs throughout the COVID-19 pandemic (Chew et al., 2020; Di Tella et al., 2020; Donkers et al., 2021; Du et al., 2020; Huang & Zhao, 2020; Kang et al., 2020; Lai et al., 2020; Miljeteig et al., 2021; Vizheh et al., 2020). For example, in a study including 1257 HCPs who worked during the first wave of the pandemic in China, Lai et al. (2020) found that approximately half of participants reported symptoms of depression and anxiety, a third reported symptoms of insomnia and almost three-quarters reported symptoms of distress. Critically, working on designated COVID-19 units appears to have a heightened impact on HCPs’ mental health. For example, in a sample of 145 HCPs in

Italy, participants who worked on designated COVID-19 units reported greater levels of depression and PTSD symptoms compared to HCPs in other units (Di Tella et al., 2020).

Although existing research has identified several areas that the COVID-19 pandemic has impacted for HCPs, this research is largely limited to the experiences of physicians and nurses (e.g., Di Tella et al., 2020; Kang et al., 2020; Lu et al., 2020; Mosheva et al., 2021; Xiao et al., 2020). There is abundant reason to suspect, however, that RTs are similarly affected by COVID-19-related workplace stressors and exposure to potentially traumatic events. Even prior to the COVID-19 pandemic, empirical evidence indicates that death anxiety, moral distress and PTSD may be relevant concerns among RTs in hospital settings given their frequent exposure to death and dying at the bedside of patients (Brown-Saltzman et al., 2010; Burr et al., 2020; Collins et al., 2015; Schwenzer & Wang, 2006). Moreover, as professionals providing care to critically ill patients and carrying out potentially distressing responsibilities, such as removing mechanical ventilation resulting in patient death, RTs appear to be at an elevated risk for PTSD (American Psychiatric Association, 2013; Burr et al., 2020; Mahan, 2019). Here, it is probable that these mental health impacts have been exacerbated during the COVID-19 pandemic. Specifically, as frontline HCPs caring for critically ill COVID-19 patients, RTs’ exposure to potentially traumatic events has likely increased significantly during the COVID-19 pandemic. For example, in a letter to the editor, Sawadkar and Nayak (2020) described how RTs in India spent approximately 4 to 10 hours per day caring for COVID-19 patients alone at the outset of India’s third wave, playing a crucial role in

bedside management of critically ill patients with high acuity need and high risk for medically invasive, even painful procedures and death.

A small number of studies have exclusively investigated the wellbeing of RTs during the COVID-19 pandemic and have indicated that RTs may experience negative psychological outcomes similar to those of other HCPs. For example, Miller et al. (2021) reported high levels of burnout among their sample of 3010 RTs. Whereas inadequate staffing, frequent exposure to the coronavirus and inability to complete assigned work appeared related to burnout, high-quality leadership was a protective factor against burnout (Miller et al., 2021). Rajan et al. (2021) found that RTs reported a “negative psychological impact” related to working on the frontlines of the pandemic, with a high level of concern over bringing the coronavirus home to family as a specific factor related to this impact (Rajan et al., 2021). Finally, in an investigation of anxiety among HCPs during the pandemic in Saudi Arabia, Alenazi et al. (2020) reported that individuals with the highest levels of anxiety were most likely to be nurses, workers in radiology and RTs.

Given the relative paucity of literature surrounding the wellbeing of RTs during the COVID-19 pandemic and prior research indicating that RTs are confronted with existing stressors and high levels of trauma exposure, there is an urgent need to characterize this population over the pandemic period. This knowledge will be central to efforts to provide adequate prevention, early detection and intervention support to RTs in Canada and beyond. Accordingly, the objective of the present study was to characterize the mental health and functioning of Canadian RTs during the COVID-19 pandemic. To our knowledge, this is the first study of its kind.

Methods

Procedure

This study is a part of a broader, multiple-methods investigation of Canadian HCPs’ mental health during the COVID-19 pandemic and was approved by the Hamilton Integrated Research Ethics Board (#12667). Eligibility criteria for the present study required that participants be at least 18 years of age and have contributed to patient care during the COVID-19 pandemic in Canada as either a registered, graduate or student RT. Participants were recruited via an email sent from the Canadian Society for Respiratory Therapists (CSRT; representing approximately 4875 RTs in Canada), posters shared from consenting hospitals across Canada, conference presentations and social media (i.e., Facebook and Twitter) advertisements. Interested participants accessed the survey between February and June 2021 (corresponding roughly to the second wave of the pandemic in Ontario, Canada) via Research Electronic Data Capture (REDCap) software: a secure, cloud-based data collection service (Harris et al., 2009, 2019). Participants read an information letter about the study and provided electronic informed consent if they wished to participate. The survey took approximately 30-45 minutes to complete. Upon completion of the survey, participants had the opportunity to be entered in a draw to win a \$25.00 (CAD) gift card.

Measures

Participants were asked to provide basic sociodemographic and occupational information, including age, sex, gender identity, sexual orientation, marital status, current province/territory of residence, ethnicity, years of education, level of RT (i.e., registered, graduate or student), years practicing as an RT, occupational role, occupational setting,

patient population, if they worked on a COVID-19 unit, number of occupational sites and combined household income after tax. The following scales were used as clinical assessment instruments: the Depression Anxiety Stress Scale 21 (DASS-21; Lovibond & Lovibond, 1995), PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013), Measure of Moral Distress Healthcare Professional (MMD-HP; Epstein et al., 2019) and World Health Organization Disability Assessment Scale (WHODAS 2.0; World Health Organization, 2010). Scale definitions are summarized in Table 1.

Data Preparation

Three-hundred and four (N=304) survey data entries from RTs were received between February and June 2021 for this study. The response rate of approximately 6.2% (estimated based on CSRT recruitment reach), though low, is not surprising given the short time span of data collection during a critical point during the pandemic (i.e., the height of the second wave of the COVID-19 pandemic in Ontario). We posit that this response rate reflects the experiences of RTs at this point in time where work demands, stress and potentially traumatic exposures resulted in a lack of motivation or ability to participate in survey research, especially involving personal details of mental health and history.

After removing data entries from RTs who either did not provide consent, consented but did not complete any part of the survey, or consented and completed the demographics but not at least one scale of interest, 218 RTs were included in data analysis. Patterns of missing data were assessed via the *nanian* package available on R software (Tierney, 2019) to elucidate any meaningful differences between RTs who

completed the demographics only and dropped out of the study compared to RTs who completed the demographics in addition to at least one scale of interest to this study (see Supplementary Materials). Little’s MCAR test (Little, 1988) was used to assess missingness in the final dataset, revealing no pattern of missingness between questionnaires ($\chi^2=3144, p=0.955$). A pattern of missingness was, however, observed within the MMD-HP survey ($\chi^2=912, p=0.0001$). The mice package on R software (van Buuren & Groothuis-Oudshoorn, 2011) was used for multiple imputation to handle missing data. Multiple imputation is a sophisticated statistical method for addressing missing quantitative data, yielding accurate and unbiased estimates of statistical parameters (Rubin, 1987; van Ginkel et al., 2020). Only items that contributed to a scale’s total score were imputed. Demographic data and text box data (e.g., write-in WHODAS items about the number of days of impairment) were not imputed. The original and imputed datasets were compared before analysis revealing that the summary statistics did not change after imputation.

Data Analysis

Data analysis was conducted on R software (R Core Team, 2021). To characterize RTs’ mental health and functioning, descriptive statistics (i.e., means and standard deviations) were run. Based on literature indicating that HCPs on COVID-19 units endorsed negative psychological outcomes more so than their counterparts who did not work on a COVID-19 unit (Di Tella et al., 2020; Said & El-Shafei, 2021), a series of Wilcoxon tests were conducted to assess for differences in DASS-21, PCL-5, MMD-HP and WHODAS scores between those working and not working on a COVID-19 unit. The non-parametric test

(Wilcoxon) was used to compare groups given deviations from normality for all variables of interest. To understand the association between psychological and functional impacts, a series of bivariate correlation analyses were conducted between WHODAS total scores and DASS-21, PCL-5 and MMDH-HP scores, respectively. All statistical analyses were conducted using SPSS with a significance level of $p = .05$.

Results

Sample

Two hundred and eighteen (N=218) RTs were included in data analysis. Most participants were registered RTs (93.8%; 6.2% graduate, student and recently retired RTs). Almost three quarters (71.1%) of the participants reported working on a designated COVID-19 unit. Sociodemographic information, along with additional occupational information, is provided in Tables 2 and 3, respectively. Variable levels with 0 responses are not shown; variable levels were collapsed where counts were less than 5 to protect anonymity.

Depression, Anxiety and Stress Symptoms

Depression and stress scores each ranged from 0 to 42. Anxiety scores ranged from 0 to 40. The average depression score was 12.0 ($SD=9.0$). The average anxiety score was 9.0 ($SD=7.0$). The average stress score was 16.0 ($SD=9.0$). The average depression, anxiety and stress scores in this sample each corresponded to mild symptom endorsement.

According to predefined severity cut-offs (Table 1), approximately half of the sample screened positively for clinically relevant symptoms of depression (52%), anxiety (51%) and stress (54%) symptoms. Further, 18%, 20% and 16% of the sample scored in the

severe to extremely severe severity levels for depression, anxiety and stress, respectively. Depression, anxiety and stress scores did not significantly differ between those on and off COVID-19 units (p 's $>.05$).

PTSD Symptoms

PCL-5 total scores ranged from 0 to 74. The average PCL-5 score was 23.0 ($SD=16.0$). One third (33%) of the participants scored at least 33 or greater on the PCL-5, indicative of a likely diagnosis of PTSD (Table 1). PCL-5 scores did not differ between individuals working on and off designated COVID-19 units ($p > .05$).

Moral Distress

MMD-HP total scores ranged from 6 to 375. The average MMD-HP score was 137.0 ($SD=78.0$). MMD-HP total scores significantly differed between RTs working on and off designated COVID-19 units (Figure 1). Probing this difference further revealed that RTs working on designated COVID-19 units reported significantly greater patient-related sources of moral distress than their counterparts who were not working on designated COVID-19 units (Table 4).

Functional Impairment

The average WHODAS score was 11.0 ($SD=5.0$), with scores ranging from 6 to 26. On average, participants ($n=178$) reported functional difficulties present for 9 days ($SD=9.3$) in the past 30 days. In the past 30 days, participants ($n=178$) were totally unable to carry out their usual activities or work because of a health condition for an average of 1.5 days ($SD=4.1$). On average, the sample ($n=178$) reported 4.1 days ($SD=6.2$) where they had to cut back or reduce usual activities or work due to any health condition (excluding days

where they were totally unable to carry out usual responsibilities). WHODAS scores did not significantly differ between those working and not working on a COVID-19 unit ($p >.05$).

WHODAS scores were positively, significantly correlated with all DASS-21 scores, PCL-5 and MMD-HP scores (p 's $< .001$), such that greater endorsement of these psychological symptoms was associated with a greater endorsement of functional impairment (Table 5).

Discussion

The purpose of the present study was to characterize the mental health and functioning of RTs who worked during the COVID-19 pandemic in Canada. Results of this investigation revealed that a substantial proportion of RTs in Canada reported moral distress and clinically relevant symptoms of depression, anxiety, stress and PTSD associated with functional impairment between February and June of 2021. These findings are consistent with recent reports on holistic impacts to other HCPs during the pandemic (Demartini et al., 2020; Di Tella et al., 2020; Hennein et al., 2021; Latimer, 2021; Lenzo et al., 2021; Pappa et al., 2020; Plouffe et al., 2021; Wilbiks et al., 2021) and demonstrate the urgent need for adequate supports and resources for RTs.

The present study is the first to investigate both the psychological and functional impacts of working during the COVID-19 pandemic among RTs. The paucity of literature surrounding RTs' experiences during COVID-19 is in keeping with the limited studies investigating RTs' mental health prior to the pandemic. For example, among peer-reviewed articles on RTs prior to COVID-19, the majority are not mental-health-related,

covering instead topics such as tobacco/smoking cessation training (Gordon & Mahabee-Gittens, 2011; Jordan et al., 2011), critical thinking skills (Goodfellow, 2001) and patient care provided by RTs (Shelledy et al., 2009; Wong et al., 2014). Moreover, empirical research related to RTs’ mental health prior to the COVID-19 pandemic is limited, yet points to the need to better understand RTs’ experiences given frequent exposure to potentially traumatic events, including providing end-of-life care and in some cases withdrawing life support (Brown-Saltzman et al., 2010; Mahan, 2019; Rocker et al., 2005). Critically, exposure to death ranks as a Criterion A feature requisite of DSM-5 conferred diagnosis of PTSD (American Psychiatric Association, 2013) and such exposures have likely only increased during the COVID-19 pandemic with increases in critically ill COVID-19 patients. Indeed, pre-pandemic literature, though scant, demonstrates the relevance of death anxiety (Collins et al., 2015), end-of-life care (Brown-Saltzman et al., 2010; Mahan, 2019), moral distress (Schwenzer & Wang, 2006) and secondary traumatic stress or PTSD (Burr et al., 2020) among RTs. The present findings add to the literature highlighting the unique impacts of RT service and extend the body of knowledge into the COVID-19 pandemic context.

Almost half of the RTs in the present study reported clinically relevant symptoms of depression, anxiety and stress, with 18%, 20% and 16% of the sample scoring within the severe to extremely severe range of these symptoms, respectively. These findings are consistent and, in some cases elevated, in comparison to reports among HCPs in Singapore, India (Chew et al., 2020), Italy (Lenzo et al., 2021), Canada (Wilbiks et al., 2021) and the United States (Hennein et al., 2021). For example, Chew et al. (2020)

reported that 10.6%, 15.7% and 5.2% of their 906 HCPs in both Singapore and India screened positively for depression, anxiety and stress symptoms, respectively. Wilbiks et al. (2021) reported an average depression score corresponding to mild symptom severity in a sample of 86 Canadian HCPs, with approximately 75% of participants in need of clinical follow-up. Relatedly, in a study of 1092 HCPs in the United States, 15.6% of the 170 HCPs surveyed screened positively for probable Generalized Anxiety Disorder and 13.9% (n=152) screened positively for major depression (Hennein et al., 2021).

Discrepancies between the present findings and those reported among other HCPs may be related to different geographical locations and associated sociocultural contexts of these studies, differences in the period of data collection, where the present findings were gathered early 2021 in Canada and the others (Chew et al., 2020; Lenzo et al., 2021) were conducted early-to-mid 2020 outside of Canada and the use of different screening tools (Hennein et al., 2021; Wilbiks et al., 2021).

One third of the RTs in the present study scored above a 33-point cut-off score, indicative of a likely diagnosis of PTSD. This shocking finding is, however, comparable to pandemic literature on HCPs experiences, where Di Tella et al. (2020) reported 26.2% of their sample met the PTSD cut-off. Similarly, Hennein et al. (2021) found that 22.8% of their sample of 1092 HCPs in the United States presented with probable PTSD. Interestingly, 3.8% of the 371 HCPs in a study in China reported symptom scores consistent with a likely diagnosis of PTSD (Yin et al., 2020). Here, it is unclear whether differences in healthcare settings, cultural differences in reporting of mental health symptoms, or as pointed out by the authors, a low number of participants from the

frontline, contributed to this difference relative to other settings. Nevertheless, 1 in 3 Canadian RTs surveyed in the present study were in need of clinical follow up for PTSD diagnosis. Interestingly, Foster et al. (2020) collaborated with the Respiratory Therapist Society of Ontario to administer a survey before the COVID-19 pandemic to RTs in Ontario using the PCL-5 (Weathers et al., 2013) to assess for PTSD symptoms. Although not scientifically peer-reviewed, results published in the Society’s provincial newsletter revealed that approximately 1 in 3 of the RTs scored above the 33-point cut-off for likely PTSD. Of those meeting this criterion, the majority (40.5%) were registered RTs with 11 to 19 years of experience and, critically, almost 10% were student RTs (Foster et al., 2020). These survey results are consistent with those reported by Burr et al., (2020), who investigated secondary traumatic stress among RTs, finding that approximately one-third of the 201 RTs surveyed screened positively for PTSD. In the present investigation, the 33% of RTs who scored above the cut-off for likely PTSD were mostly registered RTs, aged 30 to 39 years old, with 0 to 5 years of experience and currently working on a COVID-19 unit. Notably, the present study included a lesser proportion of student RTs than did Foster et al.’s (2020) survey, yet reiterates the notion that a younger, less experienced workforce demonstrates significant PTSD symptom endorsement. Here, it is notable that other HCPs, specifically nurses, are included in presumptive legislation surrounding PTSD in some Canadian provinces. For example, in Canada’s largest province, Ontario, Bill 163, “Supporting Ontario’s First Responders Act (PTSD)” led to a section amendment of the 1997 Workplace Safety Insurance Act (WSIA) in 2018 to include a statutory presumption of work-relatedness for PTSD among “other designated

workers” in addition to first responders, where employment is assumed to be the cause of PTSD unless there is evidence to indicate otherwise (WSIB, 2018). This policy allows eligible individuals to access benefits and treatment for PTSD and was amended in 2018 to include nurses who provide direct patient care (WSIB, 2018). Registered RTs, however, are not included in this legislation. Taken together, data from the present study corroborates past evidence of PTSD symptoms among RTs (Burr et al., 2019; Foster et al., 2020) and points toward the necessity of further research and consideration of RTs as designated workers entitled to inclusion in legislative efforts across Canada surrounding presumptive diagnosis of PTSD.

Moral distress scores reported by our sample of RTs are comparable to that of hospital nurses on COVID-19 units in the United States (Latimer, 2021) and Canadian HCPs (Plouffe et al., 2021) during the pandemic period. Notably, RTs in our study working directly on COVID-19 units reported higher levels of moral distress than their counterparts not working on these units. Specifically, RTs on COVID-19 units reported significantly greater patient-related moral distress (e.g., following family’s insistence to continue aggressive treatment despite believing it to be futile and prolong patient suffering; Epstein et al., 2019) than those not working on COVID-19 units. This finding is perhaps unsurprising given reports among Canadian HCPs of high rates of exposure to death and dying and the involvement of RTs in invasive care procedures (at times perceived as futile) during the pandemic (Ritchie et al., Under Review). Critically, in a 2006 investigation of the use of a moral distress scale for nurses among RTs, Schwenzer & Wang (2006) found that RTs experienced a range of morally distressing situations in

their practice, including care that was not in the patient’s best interest (e.g., disagreements with a patient’s family and providing futile care), unsafe staffing and participating in deception. Here, the perception of unsafe staffing predicted job dissatisfaction and turnover. As such, the types of morally distressing situations RTs experience during COVID-19 may not be new, but rather may be heightened with additional COVID-19-related stressors. Further research is needed to understand the potential unique role that the pandemic has had on RTs experiences, above and beyond existing stressors in the profession. Nevertheless, future research must continue to monitor the mental health and functioning of RTs working on COVID-19 units over the pandemic period as the impacts of such morally distressing exposures may develop as the pandemic persists, perhaps resulting in the Epstein and Hamric’s (2009) “*crescendo effect*” of compacting moral distress over time and subsequent deleterious psychological outcomes.

Heightened endorsement of depression, anxiety, stress, PTSD symptoms and moral distress were significantly associated with a higher level of functional impairment among RTs in the present study. While limited research on the functional impacts HCPs have experienced during COVID-19 is available, the present findings are consistent with Shrestha et al.’s (2020) recent investigation of hospital-based HCPs in Nepal, where depression and anxiety scores correlated positively with functional impairment along with reports of an association between negative psychological impacts and insomnia among HCPs during the pandemic (Lai et al., 2020; Pappa et al., 2020). Understanding functional impacts in addition to psychological impacts associated with service during the

COVID-19 pandemic will provide a more holistic picture of the impact of pandemic service on HCPs, including RTs, that will be critical for the development of supports and resources.

Aside from moral distress, mental health and functioning reports did not differ between RTs working on and off COVID-19 units in the present study. Interestingly, in an investigation of burnout and resilience among RTs during the pandemic, Miller et al. (Miller et al., 2021b) reported that, despite 73% of the sample (N=221) reporting burnout, the prevalence of burnout did not differ significantly between those working and not working in COVID-19 hotspots. With some research suggesting that HCPs working on COVID-19 units may endure more severe psychological impacts during the pandemic (Di Tella et al., 2020; Said & El-Shafei, 2021) it will be imperative to continue monitoring RTs who worked on COVID-19 units or in COVID-19 hotspots throughout and after the pandemic period to further understand the potentially unique impact of working on COVID-19 units.

As the pandemic remains ongoing, the psychological and functional impacts of healthcare service are likely to persist among RTs and other HCPs. Importantly, the WSIA’s presumptive legislation in Ontario only considers PTSD and does not acknowledge other deleterious impacts associated with healthcare service, such as depression, anxiety, stress and moral distress, as demonstrated in this study. Here, it is critical to ensure that RTs, alongside their healthcare colleagues, receive adequate mental health supports, including targeted prevention, early intervention and treatment efforts as they work on the frontlines of the COVID-19 pandemic. This call has been echoed in

media reports across Canada, which have pointed towards the devastating impact of pandemic healthcare service among HCPs and, by extension, their families. It will be critical for provincial and federal governments to ensure RTs and other HCPs are supported during and well beyond the COVID-19 pandemic.

Limitations

Despite its novel contributions, the present study is not without limitations. An inherent limitation to this study is its cross-sectional design. The results of the present study provide a snapshot of RTs’ mental health and functioning early 2021 (corresponding to the second wave of the pandemic in Ontario). Without comprehensive knowledge on RTs’ mental health at other time points in the pandemic and before the pandemic, the contextualization of these findings is limited. Follow-up studies with Canadian RTs are urgently needed to understand the long-term mental health and functional impacts of COVID-19 healthcare service in this profession. Here, it is possible that PTSD symptoms may increase over the course of the pandemic as fatigue, burnout and exposure patient suffering (a frequent source of moral distress for RTs and other HCPs during the pandemic; Ritchie et al., Under Review) increases, heightening risk. Thus, RTs and other HCPs may show delayed-onset PTSD and other mental health difficulties following this period of acute crisis. Additionally, the present study did not control for history of mental illness. As such, it is not clear to what extent the symptoms of depression, anxiety, stress and PTSD reported by our sample of RTs were present prior to the onset of the pandemic. Finally, the present study is limited by its response rate, which may introduce a potentially biased sample. Despite the present findings aligning with the extant literature,

replication of the present study is warranted with a more representative sample of Canadian RTs.

Conclusion

The present study illustrates that symptoms of depression, anxiety, stress, PTSD and moral distress were prevalent among RTs in Canada between February and June 2021 and, critically, were associated with functional impairment. As the pandemic persists, RTs will continue to face novel stressful and potentially traumatic circumstances, thus having the potential to further elevate existing symptoms and associated functional impacts. Here, it will be imperative to ensure that RTs, alongside other HCPs, have access to prevention, early intervention and long-term treatments aimed at stabilizing the mental health and well-being of this critical healthcare workforce that has given vital service at enormous personal cost during the COVID-19 pandemic.

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Data Availability: The data used in this study come from the McKinnon Trauma and Recovery Research Unit at McMaster University. All interested researchers may apply for access to these data through online application subject to review by the Data Access Committee, ethics approval, and signing of a data sharing agreement. Data are provided

only once a data sharing agreement is in place between McMaster University (the custodian of the data) and the researchers’ institution. For more information about data access please contact <https://www.thetraumaandrecoverylab.com/contact>.

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Tables

Table 1

Scale Definitions of Clinical Assessment for Mental Health and Functioning

Questionnaire	Health Concepts (Domains) Measured	No. of Items	Evaluation (Cut-Off)
Depression Anxiety Stress Scale (DASS-21, Lovibond & Lovibond, 1995)	<p>The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia.</p> <p>The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect.</p> <p>The stress scale assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable / over-reactive and impatient.</p>	21	<p>Scores for each component were calculated by summing the appropriate 7 items per construct and multiplying the sum by 2.</p> <p>Cut-off scores greater than 9, 7 and 14 were used to indicate clinically relevant symptoms of depression, anxiety and stress³⁰</p>
The PTSD Checklist for DSM-5 (PCL-5, Weathers et al., 2013)	PCL-5 assesses the presence and severity of PTSD symptoms.	20	<p>A total score was calculated by summing the ratings of the 20 items, where greater scores indicate a greater presence and severity of PTSD symptoms.</p> <p>A cut-off score of 33 was used to define participants with a likely diagnosis of PTSD as suggested by the National Center for PTSD in the United States³²</p>
Measure of Moral Distress - Healthcare Professionals (MMD-HP, Epstein et al. 2019)	MMD-HP measures the frequency and intensity of moral distress experienced by healthcare professionals at three levels: patient, system and team.	27	A total score was calculated by summing the product of the frequency and distress ratings for each item, where greater scores moral distress.
World Health Organization Disability Assessment Schedule 2.0 (WHODAS, World Health Organization, 2010)	The WHODAS-2.0 is a 7-domain disability assessment instrument based on the conceptual framework of the International Classification of Functioning, Disability, and Health (ICF) with 7 domain-specific scores. Only WHODAS 2.0 core questions and difficulty effect questions are included in this study.	12	Simple scoring was utilized whereby the 12 items were summed. Greater scores indicate greater functional impairment.

Table 2*Participant Sociodemographic Characteristics*

Variable	% (N=218)
Age	
20 to 29	24.3%
30 to 39	33.9%
40 to 49	23.9%
50+	18.0%
Sex /Gender Identity	
Female	84.9%
Male	14.7%
Sex Orientation	
Heterosexual or straight	87.6%
Other**	<5%
Marital Status	
Legally Married, Common Law, or Domestic Partnership	68.8%
Single, Never Married	23.4%
Separated, Divorced or Widowed	7.3%
Ethnicity*	
Caribbean	0.5%
East Asian	4.6%
First Nations	3.2%
Latin American	1.4%
Middle Eastern	0.9%
South Asian	1.4%
Southeast Asian	1.4%
European	87.6%
Other	4.6%
Province/Territory	
Ontario	35.3%
Alberta	19.7%
British Columbia	17.4%
Quebec**	<5%
Other province and territories**	<5%
Education	
College diploma (community or technical)	39%
University degree (e.g., Bachelors, Masters, PhD)	50%
Some higher education **	<5%
Income	
\$100,000 and over	50.5%
\$80,000 - \$99,000	19.8%
\$60,000-\$79,000	11%
\$40,000-\$59,000**	<5%
Less than \$39,000**	<5%

*Note: Participants were permitted to select multiple options. **The confidential cells are suppressed (Brackstone, 2002).

Table 3

Participant Occupational Characteristics

Variable	% (N=218)
Occupational Setting*	
Hospital	87.2%
Acute	85.8%
<i>Acute Care Units</i>	82.6%
<i>Chronic Care Units</i>	33%
<i>Outpatient Clinics</i>	18.8%
<i>Anesthesia Assistant</i>	7.3%
<i>Rehabilitation</i>	5%
Community	15.6%
<i>Respiratory equipment vendor/Home O2 vendor</i>	6.9%
<i>Primary Care/Long Term/Provincial Home Care</i>	8.8%
Years Practiced	
Student**	<5%
0 to 5 Years	25.2%
6 to 10 Years	17.4%
11 to 15 Years	17.0%
16 to 20 Years	12.8%
21 to 25 Years	11.5%
26 to 30	6.4%
Over 30 Years	6.0%
Role	
Staff therapist	80.3%
Educator	16.1%
Senior therapist/leadership	10.1%
Management/Consultant/Sale	5.5%
Student**	<5%
Unit	
Covid-19	71.1%
Patient Populations*	
Adult Care	96.8%
Pediatric	53.7%
Neonatal	50.5%
Employment Status*	
Full-Time	68.3%
Part-Time	19.3%
Casual	8.3%
Self-Employed or Unemployed**	<5%

*Note: Participants were permitted to select multiple options. **The confidential cells are suppressed (Brackstone, 2002).

Table 4

Mean and Standard Deviation of Moral Distress Scores by COVID-19 Unit

Unit	Total MMD-HP	Patient MMD-HP	Team MMD-HP	System MMD-HP
Non-COVID-19 (n=63)	119.1 (70.6)	32.5 (20.2)	51.7 (38.3)	34.9 (25.4)
COVID-19 (n=155)	144.1 (80.1)	45.7 (22.7)	57.7 (41.1)	40.7 (25.9)

Table 5

Bivariate Correlations Between Negative Psychological Impacts and Functioning

Measure	1	2	3	4	5	6	7	8	9
1 WHODAS	-								
2 DASS-21 Depression	.536**	-							
3 DASS-21 Anxiety	.481**	.601**	-						
4 DASS-21 Stress	.468**	.740**	.642**	-					
5 PCL-5	.505**	.663**	.648**	.669**	-				
6 MMD-HP	.306 **	.369**	.465**	.432**	.570**	-			
7 MMD-HP Patient	.248**	.274**	.303**	.349**	.426**	.784 **	-		
8 MMD-HP Team	.327**	.365**	.496**	.407**	.573**	.936**	.655**	-	
9 MMD-HP System	.259**	.270**	.359**	.358**	.437**	.840**	.482**	.695**	-

**Pearson’s Correlation is significant at the $p < .001$ level (two-tailed)

Figures

Figure 1

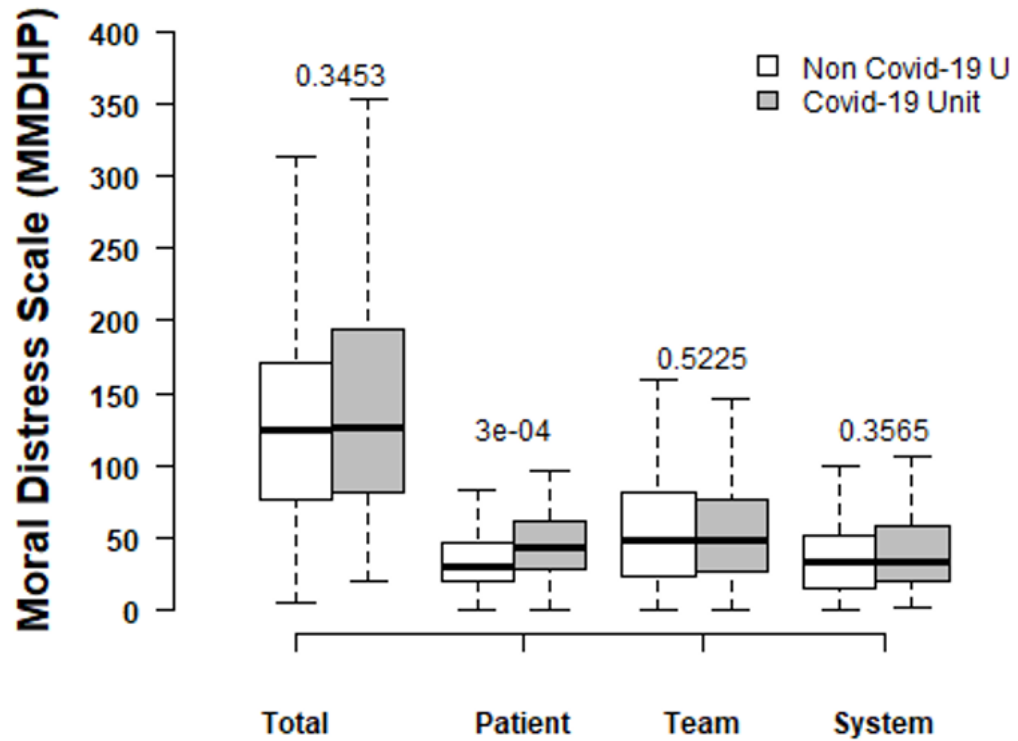


Figure 1. Differences in moral distress scale scores between RTs working on Non-Covid-19 Unit vs. Covid-19 Unit. When probing the significant difference between the total moral distress scores of these groups, analyses revealed a significant difference specifically in patient level sources of moral distress, such that those on COVID-19 units report greater moral distress at the patient level in comparison to their counterparts who did not work on a designated COVID-19 unit.

Supplementary Material: Patterns of Missing Data

Survey design and page/question features can lead to non-response (i.e., missing data) or break-off (i.e., termination of participation) from participants for a variety of reasons.

Patterns of survey participation were analyzed to assess missing data and identify potential relationships. No direct link was observed between these elements and the participants’ co-operation decision.

We obtained the Table S1 Respiratory Therapists’ Survey Participation based on Peytchev’s framework (Peytchev, 2009).

Table S1

Respiratory Therapists’ Survey Participation

Survey Participation	Missingness (Within Individuals)	Missingness (Between Individuals)
Unit Non-Response	27.7%	-
Breakoff	7.3%	-
Item Non-Response		
<i>DASS-21</i>	7.8%	4.6%
<i>PCL-5</i>	5.9%	3.2%
<i>MMDHP</i>	7.3%	0.0%
<i>WHODAS</i>	11.0%	7.3%

Probing patterns of missing data revealed that 27.7% of the RTs started the demographic questions but did not proceed to the next pages of the survey. Of those who proceeded past the demographic questionnaire, 7.3% broke-off from participating in the survey at some point. Within the individual level, the scales’ non-responsiveness as well as between individual non-responsiveness was examined is reported in the table above. Here, for example, 11% of the participants who started to respond to the WHODAS (responding to 1 to 3 items) choose to skip through the rest of the WHODAS and

submitted the questionnaire by leaving the items blank. 7.3% of the participants did not pursue the WHODAS questionnaire at all. After removing data entries from RTs who either did not provide consent, consented but did not complete any part of the survey, or consented and completed the demographics but did not complete at least one of the scales of interest, 218 RTs were included in data analysis.

Respondent characteristics, survey design, and page/question features may all be worthy of subsequent analysis of the behavioural path. We further investigated the sociodemographic and occupational profile of the 84 RTs (27.7%) who made a decision to start the survey, but not proceed to complete at least the demographics and one survey. We compared the characteristics of these RTs to the 218 RTs participant included in the study (Tables S2 and S3). Participants with university degrees were more likely to proceed with the questionnaire. Regardless of a participant’s decision drop the survey, the majority of both pathways’ respondents were likely to be younger, females with European ancestry, located in Ontario with over \$80,000 annual household income.

From a GBA+ perspective, females were highly likely to have marital status of Legally Married, Common Law, or Domestic Partnership. Less than five percent of the RT participants claimed to have First Nations/Inuit/Metis ancestry.

Table S2*Sociodemographic Characteristics Stratified by Survey Completion Status*

Variable	Unit Non-Response % (n=84)	Unit Response % (n=218)	p-value
Age			
20 to 29	32.1%	24.3%	0.216
30 to 39	29.8%	33.9%	0.577
40 to 49	23.8%	23.9%	1.000
50+	14.3%	18.0%	0.644
Sex /Gender Identity*			
Female	86.9%	84.9%	0.788
Male	13.1%	14.7%	0.866
Sex Orientation			
Heterosexual or straight	75%	87.6%	<u>0.012</u>
Other	7.2%	<5%	0.028
Marital Status			
Legally Married, Common Law, or Domestic Partnership	65.5%	68.8%	0.676
Single, Never Married	27.4%	23.4%	0.567
Separated, Divorced or Widowed	6.0%	7.3%	0.863
Population Group**			
European	70.2%	87.6%	0.001
Other population groups	<5%	<5%	<u>0.025</u>
Province/Territory			
Ontario	41.7%	35.3%	0.373
Alberta	16.7%	19.7%	0.657
British Columbia	11.9%	17.4%	0.317
Quebec	9.5%	<5%	<u>0.014</u>
Other province and territories	<5%	<5%	0.446
Education			
College diploma (community or technical)	41.7%	39%	0.768
University degree (e.g., Bachelors, Masters, PhD)	39.3%	50%	0.123
Some higher education	19.0%	<5%	0.075
Income			
\$100,000 and over	50%	50.5%	1.000
\$80,000 - \$99,000	14.3%	19.8%	0.352
\$60,000-\$79,000	13.0%	11%	0.758
\$40,000-\$59,000	<5%	<5%	0.974
Less than \$39,000	<5%	<5%	0.308

*Note: The entire sample reported cis-gendered identity. Sex and gender are collapsed to reduce redundancy.

**Note: Participants were permitted to select multiple options.

Table S3

Occupational Characteristics Stratified by Survey Completion Status

Variable	Questionnaire Non-Response % (n=84)	Questionnaire Response % (n=218)	p-value
Occupational Setting*			
Hospital	77.4%	87.2%	0.055
Acute	76.2%	85.8%	0.068
Acute Care Units	69%	82.6%	<u>0.016</u>
Chronic Care Units	27.4%	33%	0.419
Outpatient Clinics	25.0%	18.8%	0.301
Anesthesia Assistant	10.7%	7.3%	0.471
Rehabilitation	<5%	5%	0.480
Community	20.2%	15.6%	0.428
Respiratory equipment vendor/Home O2 vendor	10.7%	6.9%	0.386
Primary Care/Long Term/Provincial Home Care	6.0%	8.8%	0.576
Years Practiced			
Student	8.3%	3.2%	0.111
0 to 5 Years	17.9%	25.2%	0.227
6 to 10 Years	21.4%	17.4%	0.525
11 to 15 Years	10.7%	17.0%	0.239
16 to 20 Years	20.2%	12.8%	0.151
21 to 25 Years	7.1%	11.5%	0.369
26 to 30	6%	6.4%	1.000
Over 30 Years	8.3%	6.0%	0.628
Role			
Staff therapist	75%	80.3%	0.396
Educator	13.1%	16.1%	0.644
Senior therapist/leadership	11.9%	10.1%	0.803
Management/Consultant/Sale	9.6%	5.5%	0.235
Student	7.1%	<5%	0.327
Unit			
Covid-19	59.5%	71.1%	0.073
Patient Populations*			
Adult Care	95.2%	96.8%	0.763
Pediatric	59.5%	53.7%	0.431
Neonatal	56%	50.5%	0.467
Employment Status*			
Full-Time	67.9%	68.3%	1.000
Part-Time	13.1%	19.3%	0.274
Casual	11.9%	8.3%	0.448
Self-Employed or Unemployed	<5%	<5%	1.000

*Note: Participants were permitted to select multiple options.

Furthermore, we conducted Little’s Missing Completely at Random (MCAR) test (Little, 1988) on the full final data pulled for this study to assess missingness. We obtained a high p-value close to 1, concluding that the data was missing completely at random and there was no pattern of missingness between the questionnaires. Overall observation of missingness was found as 2.7% which is well below 5%. However, the MCAR test captured a few patterns of missing data in the MMD-HP questionnaire (Figure S1) that were not at missing at random (p-value=0.0001). In this case, multiple imputation was determined as necessary needed to deal with missing data as recommended in (Jakobsen et al., 2017).

Figure S1

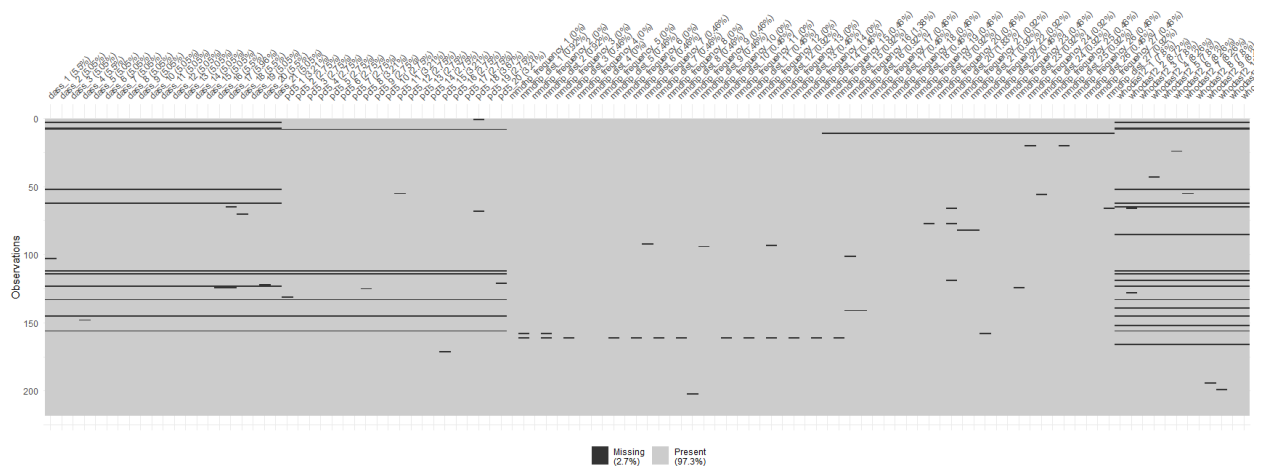


Figure S1: Patterns of missing data for the four scales included in this analysis (DASS-21, PCL-5, MMD-HP, WHODAS 2.0). Little’s MCAR test revealed that missingness for the DASS-21, PCL-5 and WHODAS 2.0 was MCAR, but this was not the case for the MMD-HP. Multiple imputation was used to address missingness for the MMD-HP.

Chapter 3: Study 2

Canadian respiratory therapists considering leaving their clinical position experience elevated symptoms of moral distress and mental illness during the COVID-19 pandemic

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Abstract

Introduction: Throughout the COVID-19 pandemic, respiratory therapists (RTs), have faced morally distressing situations, including working with limited resources and facilitating video calls for families of dying COVID-positive patients. Moral distress is associated with a host of negative psychological outcomes (e.g., depression, anxiety, burnout, PTSD symptoms) and has been linked to consideration of leaving a clinical position prior to and during the COVID-19 pandemic. It remains unclear, however, whether moral distress and its associated deleterious outcomes are associated with heightened consideration of leaving a clinical position among Canadian RTs during the COVID-19 pandemic.

Methods: Canadian RTs (N=213) completed a self-report, online survey between February and June 2021. Basic demographic information and responses on psychometrically-validated measures of moral distress, depression, anxiety, stress, PTSD, dissociation, functional impairment, resilience and adverse childhood experiences were collected.

Results: Approximately one in four RTs reported considering leaving their position. Higher levels of moral distress were associated with heightened symptoms of depression, anxiety, stress, PTSD, disengagement, emotional constriction, functional impairment, but lower resilience. As compared to RTs not considering leaving, RTs considering leaving their position reported higher levels of moral distress at the patient, team/unit, and systems levels and elevated symptoms of mental illness and functional impairment. Critically, over half (54.5%) of the RTs who were considering leaving screened positive for likely PTSD. Previous consideration of leaving a clinical position and having left a position in the past each significantly increased the odds of currently considering leaving one’s position, along with system-related moral distress and symptoms of PTSD, however, the contribution of PTSD symptoms and systems-level moral distress appeared small.

Conclusion: Compared to those not considering leaving clinical positions, Canadian RTs considering leaving described heightened levels of distress and elevated symptoms of mental illness, yet these individual-level factors appear unlikely to have been the primary factors underlying RTs’ consideration of leaving. Further research is urgently required to identify the systemic and organizational factors that may contribute to consideration of position departure among Canadian RTs.

Keywords: Respiratory Therapists; COVID-19; Turnover; Mental Health; PTSD, Healthcare

Highlights

- One in four Canadian respiratory therapists were considering leaving their position in the Spring of 2021
- Compared to RTs not considering leaving their positions, Canadian RTs who were considering leaving their clinical position early in the pandemic experienced elevated moral distress, symptoms of mental illness and functional impairment
- When controlling for other variables, previous consideration of leaving one’s position, having left a position in the past, system-level moral distress and PTSD symptoms significantly increased the odds of considering leaving; however, the contribution of system-level moral distress and PTSD symptoms were each small
- Long-standing organizational issues may play an additional role in consideration of position departure among Canadian respiratory therapists

Canadian respiratory therapists considering leaving their clinical position experience elevated symptoms of moral distress and mental illness during the COVID-19 pandemic

Introduction

Respiratory therapists (RTs), like other healthcare professionals (HCPs), have been confronted with morally distressing events throughout the COVID-19 pandemic, including working with scarce resources, being required to exclude family members from patient care and facilitating video calls between dying COVID-positive patients and their families at home.¹⁻⁴ Critically, moral distress is associated with a range of deleterious outcomes (e.g., burnout, depression, anxiety, PTSD symptoms, functional impairment) and intention to leave one’s position or profession among HCPs prior to and during the COVID-19 pandemic.^{1-3,5-8} Despite emerging knowledge of the psychological and functional impact the pandemic has had on RTs,⁸⁻¹⁰ and growing concern over attrition rates among HCPs globally,¹¹⁻¹⁴ little is known about Canadian RTs who have considered leaving their position during the pandemic. A nuanced understanding of RTs’ consideration of leaving during the pandemic will be vital for ensuring RTs’ wellbeing and the continuity of our public healthcare system. Accordingly, the purpose of the present study was to explore the impact of moral distress and its associated outcomes on RTs’ consideration of leaving a clinical position during the COVID-19 pandemic.

Respiratory Therapists

RTs are HCPs with expertise in cardiopulmonary (heart and lung) health.¹⁵ As HCPs who work in a variety of settings (e.g., home care, community clinics, outpatient clinics, emergency departments, operating rooms and intensive care units) and care for patients

of all ages,¹⁵ RTs have played a vital role at the forefront of the COVID-19 pandemic.^{4,10} Indeed, RTs have been at the bedside of COVID-19 patients since the outset of the pandemic, contributing to respiratory rehabilitation and physiotherapy (e.g., proning patients), caring for patients’ physical and emotional needs, and guiding patients through recovery when discharge from hospital appears possible.⁴

Moral Distress

Moral distress refers to a psychological experience that occurs when a HCP is constrained from acting in line with knowledge of the ethically appropriate course of action for a given situation, thus violating their core values and duties.^{16–19} Epstein and Hamric¹⁹ introduced the model of the *crescendo effect* which holds that ongoing instances of moral distress and unresolved past moral distress (i.e., moral residue) compact over time to negatively impact individuals and organizations. Whereas at the individual level, moral distress is associated with depression, anxiety, emotional constriction or detachment, guilt, grief and hopelessness, at the organizational level, moral distress is related to staff shortages, poor organizational culture and HCPs leaving their position or profession^{20–23} (see Burston and Tuckett²² for a full review of outcomes associated with moral distress). Notably, moral distress may arise at various levels of healthcare, including at the patient care (e.g., performing futile treatments at a family’s request), unit/team (e.g., poor communication and bullying) and system levels (e.g., poor staffing, lack of adequate resources).¹⁸

Moral Distress During the COVID-19 Pandemic

HCPs appear at an elevated risk for moral distress during the COVID-19 pandemic as global reports suggest HCPs have felt prevented from acting in line with their values during the pandemic, resulting in moral distress²⁴ (for a review, please see Xue et al.²⁵). In an investigation of moral distress among over 7000 Australian HCPs between August and October 2020, Smallwood et al.¹ found that scarce resources, PPE limiting ability to care for patients, excluding patients’ family members, and fear of letting co-workers down should one be infected constituted morally distressing events for HCPs. In a related editorial discussing moral distress among nurses, Cacchione et al.³ identified individual factors (e.g., perceptions of nursing’s role during the pandemic, skill level, resources to provide care to family), institutional factors (e.g., PPE supply, ability to detect COVID-19, capacity for COVID-19-positive patients) and broader external factors (e.g., healthcare regulations, national policies) that likely contribute to nurses’ moral distress during COVID-19.

Pandemic-related research corroborates past evidence of the relation between moral distress and negative psychological outcomes and turnover intention among HCPs.^{1-3,5-7} For example, Petrisor et al.⁵ reported that moral distress distinguished between ICU nurses with and without depression and anxiety. Here, system-level sources of moral distress (e.g., feeling unable to provide adequate care due to staff and resource shortages) distinguished between those nurses intending and not intending to leave their position.⁵ In a related study among a sample of 129 registered nurses between July and August 2020, Sheppard et al.²⁶ reported that morally distressing issues related to patient

care quality and safety, as well as issues in the work environment, predicted intention to leave. Finally, during the early outset of the pandemic in spring of 2020, Norman et al.² found that COVID-19-related moral distress among frontline HCPs in New York City centred on family, infection, and work concerns and was, in turn, related to PTSD symptoms, burnout, functioning and interpersonal difficulties at work.

Notably, the majority of literature on HCPs’ experiences of moral distress, before and during the COVID-19 pandemic, is focussed on nursing.²⁷⁻²⁹ RTs are also direct care providers who commonly face what can be moral challenges and traumatic exposures, including performing and witnessing perceived futile care or being responsible for the removal of mechanical ventilation, resulting in patients’ death.^{30,31} Here, D’Alessandro et al.⁸ recently reported levels of moral distress among 218 Canadian RTs between February and June of 2021 that were comparable to that observed among other HCPs, including nurses, during the pandemic. In this study, moral distress was related to functional impairment, such that RTs with higher subjective levels of moral distress reported greater impairment in everyday functioning.⁸ Critically, D’Alessandro et al.’s⁸ investigation is the first to consider moral distress exclusively among Canadian RTs during the pandemic and is one of only a handful of studies speaking to the need for adequate mental health and wellbeing supports for RTs as the COVID-19 pandemic persists.

With knowledge of the toll pandemic service has exerted on RTs and their healthcare colleagues, and growing concern over attrition rates in healthcare,^{11-14,26} there is an urgent need to understand intention to leave due to moral distress and its associated outcomes among not only nurses and physicians, but also among RTs. Accordingly, the

aim of the present study was to characterize the impact of moral distress and its associated deleterious outcomes on RTs’ consideration of leaving a clinical position during the COVID-19 pandemic. To our knowledge, this is the first study of its kind.

Rationale & Hypotheses

Although patient-related events (e.g., enforcing no-visitor policies, performing perceived futile care)¹⁻³ are cited frequently as sources of moral distress among HCPs during the pandemic, Petrișor et al.⁵ found that system-level sources distinguished between ICU nurses intending and not intending to leave. An adequate understanding of RTs’ considerations of leaving a position during the pandemic requires consideration of the potentially unique roles of patient, unit/team and system level sources of moral distress. Accordingly, in the present study, the subscales of the Measure of Moral Distress – Healthcare Professional (MMD-HP)¹⁸ were investigated individually.

Pandemic research points towards a relation between moral distress, intention to leave and symptoms of depression, anxiety, stress, PTSD and functional impairment among HCPs.^{1,2,5,8,32} Moreover, a long-standing body of literature points towards peri- and post-traumatic dissociative symptomology as predictive of a more severe course of PTSD.³³ Despite pre-pandemic literature identifying a relation between moral distress and emotional dissonance or detachment,²² few studies have explored the relation between dissociation and moral distress. Accordingly, a wide swath of measures indexing depression, anxiety, stress, PTSD, functional impairment, disengagement and emotional constriction were included in the present study. Furthermore, adversity in childhood has

been associated with mental and physical problems in adulthood,^{34,35} rendering it important to consider the role of early life trauma on RTs experiences during the pandemic.

Emerging evidence suggests that resilience may be protective against moral distress among HCPs,^{36,37} yet at least one study has found that resilience is insufficient to buffer against moral distress among HCPs.³⁸ In a related study, Clark et al.³⁹ reported that resilience and moral distress, although not correlated, served as independent predictors of workplace engagement among emergency department nurses in the United States.

Resilience was measured in the present study to better understand its relation to moral distress and consideration of leaving one’s position in a pandemic context among RTs.

Little is known about sociodemographic variables that may serve as predictors of moral distress and consideration to leave among HCPs. Falatah⁴⁰ noted an increase in nurse turnover during the pandemic. Whereas predictors of pre-pandemic turnover included sociodemographic variables (e.g., age, sex, marital status, nationality), during the pandemic, predictors of turnover intention among nurses included age, work experience, caring for COVID-19 patients, working in COVID-19 divisions, fear of contracting the disease, stress and anxiety.⁴⁰ Accordingly, years practiced and COVID-19 unit status were included in our initial predictive modelling.

We hypothesized that RTs considering leaving their position would report higher levels of psychological and functional outcomes, as well as more exposure to adverse childhood experiences, than RTs not considering leaving their position, along with lower levels of resilience. We hypothesized these same variables would predict consideration to leave a position

Methods

Procedure

This study is a part of a broader investigation of Canadian HCPs’ experiences during the COVID-19 pandemic. This study was approved by the Hamilton Integrated Research Ethics Board (#12667). RTs from across Canada were recruited to participate in an online survey via multiple means, including social media, emails from the Canadian Society for Respiratory Therapists (representing over 4000 RTs) and a convenience sample of hospitals across Canada. Participants had to have contributed to patient care in Canada during the pandemic as either a registered RT, graduate RT or student RT. RTs accessed the survey on Research Electronic Data Capture (REDCap)^{41,42} software between February and June 2021.

Measures

Demographics

The survey included a demographic form indexing basic demographic (e.g., age, sex, gender, current province/territory of residence) and occupational information (e.g., years practicing, occupational setting).

Measure of Moral Distress – Healthcare Professional (MMD-HP)

The MMD-HP was used to evaluate moral distress.¹⁸ The MMD-HP is a 27-item self-report measure that accounts for both subjective frequency and distress of events that HCPs may experience. Participants rated their degree of agreement with 27 statements on 5-point scales assessing frequency of exposure to the event and level of distress associated with the event, where 0 represented “Never/none” and 4 represented “Very frequently/distressing”. Total scores were calculated by summing the product of the

frequency and distress ratings for each item. Greater scores indicated heightened exposure to the event and elevated levels of moral distress.

Participants were asked further about consideration to leave a clinical position due to moral distress, both in the past (“Have you ever left or considered leaving a clinical position due to moral distress?”) and currently (“Are you currently considering leaving your position due to moral distress?”).

Depression Anxiety Stress Scale 21 (DASS-21)

The DASS-21⁴³ was used to assess symptoms of depression, anxiety and stress.

Participants rated 21 items on a scale ranging from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much or most of the time”) with reference to the past week. The DASS-21 yields mutually exclusive scores for depression, anxiety and stress.⁴³

PTSD Checklist for DSM-5 (PCL-5)

The PCL-5⁴⁴ was used to measure the presence and severity of symptoms of PTSD.

Participants used a 5-point scale ranging from 0 (“Not at all”) to 4 (“Extremely”) to rate their degree of past-month agreement with 20 statements assessing symptoms consistent PTSD as indexed in the DSM-5.⁴⁵

Multiscale Dissociation Inventory (MDI)

The MDI⁴⁶ was used to measure features of dissociation. The MDI is a 30-item self-report measure yielding 6 scales of dissociative symptomology, including disengagement, depersonalization, derealization, emotional constriction, memory disturbance and identity dissociation. Participants rated their degree of past-month agreement with 30 items on a 5-point scale ranging from 1 (“Never”) to 5 (“Very Often”). Only the disengagement and

emotional constriction subscales of the MDI were used for the present study given the theorized relation of these subscales to RTs’ consideration of leaving their position.

World Health Organization Disability Assessment Schedule 2.0 (WHODAS)

The 12-item version of the WHODAS⁴⁷ served as a measure of functional impairment. The WHODAS captures health-related disability across six domains of functioning, including cognition, mobility, self-care, getting along, life activities and participation. Participants rated degree of impairment experienced over the past month for 12 statements using a scale ranging from 0 (“None”) to 4 (“Extreme or cannot do”). Simple scoring of the WHODAS was used for this study.⁴⁷

Brief Resilience Scale (BRS)

The BRS served as a brief measure of resilience (i.e., one’s ability to “bounce back” in the face of stressful events”).⁴⁸ Participants rated their degree of agreement with six items related to resilience on a 5-point scale ranging from 1 (“Strongly Disagree”) to 5 (“Strongly Agree”), such that higher scores indicated a higher degree of resilience.

Adverse Childhood Experiences Scale (ACES)

The ACES was used to assess exposure to childhood adversity.⁴⁹ The ACES is a 10 item self-report scale assessing exposure to common adverse life events, including physical, sexual, or emotional abuse, neglect, domestic violence, parental separation or divorce, substance abuse in the household, a mentally ill or incarcerated family member. Participants indicated if they experienced the events in childhood (Yes=1, No=0).⁴⁹

Data Preparation

Three-hundred and four (N=304) survey responses were received between February and June 2021. After removing incomplete entries, 213 RTs were included in the final data set for this manuscript. Missing data were addressed with multiple imputation^{50,51} using Statistical Package for Social Science (SPSS), version 27.0.⁵² Only items which contributed to a scale’s total score were imputed; demographic data and yes/no responses (e.g., “Are you considering leaving a clinical position due to moral distress?”) were not imputed.

Data Analysis

Descriptive statistics were examined to characterize the sample and were then compared between those considering and not considering leaving their clinical position via a series of Chi-squared or Fisher’s exact tests. A series of independent samples *t*-tests (with Holm-Bonferroni corrections and Cohen’s *d* for effect size) were conducted to compare psychological and functional measures between those considering and not considering leaving their position. To assess the relation between moral distress and theoretically relevant variables (i.e., depression, anxiety, stress, PTSD, dissociation, resilience, functional impairment) bivariate correlations were run with the MMD-HP total score. Finally, a binary logistic regression model was constructed and assessed to compare RTs considering leaving and those who were not.

Results

Sample

Two-hundred and thirteen (N=213) participants were included in analysis. 25.8% (n=55) of the sample reported that they were currently considering leaving their position due to moral distress. 42.3% (n=90) of the sample reported that they had considered leaving but did not leave their position due to moral distress in the past, while 13.1% (n=28) reported leaving a position in the past due to moral distress (Table 1).

Comparison of RTs Considering and Not Considering Leaving

Consideration to leave was not associated with demographic variables (p 's > .05). There was, however, a significant association between past and current consideration of leaving a position due to moral distress [$\chi^2(2)=50.59, p<001$, Cramer's $V = .49, p<.001$].

A series of two-tailed t -tests were conducted to compare MMD-HP, DASS-21, PCL-5, detachment, emotional constriction (MDI), BRS WHODAS and ACES scores between RTs considering and not considering leaving their position. Using Holm-Bonferroni corrections, all measures, except for ACES, significantly differed between those considering and not considering leaving. Those not considering leaving scored significantly higher on the BRS but significantly lower on the remaining measures in comparison to those considering leaving their position (Table 2). Importantly, power analysis revealed that power was insufficient to assay differences in ACES score between RTs considering and not considering leaving their position ($\beta=0.18$). Of note, 54.5% (n=30) of the 55 participants who indicated that they were currently considering leaving

their position due to moral distress scored above the 33-point cut-off on the PCL-5 indicative of likely PTSD.

Moral Distress and Associated Variables

Bivariate correlations were run to assess the relation between moral distress and its aforementioned theoretically associated outcomes. MMD-HP total scores were significantly positively correlated with all DASS-21 subscales, PCL-5 scores, disengagement and emotional constriction subscales of the MDI and WHODAS scores, but significantly negatively correlated with BRS scores. MMD-HP total scores were not significantly correlated with ACES (Table 3).

Consideration of Leaving

Simple Binary Logistic Regressions

Simple binary logistic regressions were conducted to predict consideration of leaving independently from the variables of interest and to determine variables to include in the final predictive model (Table 4). Sex, COVID-19 unit and years practiced did not significantly impact consideration to leave. Past consideration of leaving a position significantly increased the odds of endorsing current consideration to leave, such that those who had considered leaving their position in the past were almost 30 times as likely to consider leaving currently when compared to those who had not considered leaving in the past (OR=29.33, 95%CI= 8.64-99.55). Those who had left a position in the past due to moral distress were 12 times as likely to currently consider leaving their position in comparison to those who had never considered leaving (OR=12.27, 95%CI = 2.99-50.36). All three sources of moral distress and the psychological and functional variables

significantly independently increased the odds of intending to leave. Higher scores on the BRS significantly decreased the odds of considering leaving a position due to moral distress, (OR=.66, 95%CI=.45-.98). ACES did not significantly increase the odds of consideration to leave (OR=1.077, 95%CI=.936-1.241).

Multiple Binary Logistic Regression

A multiple binary logistic regression model was created to predict consideration to leave. Based on simple binary logistic regressions, sex, COVID-19 unit, years practiced and ACES were excluded from this model.

The model significantly predicted consideration of leaving [$X^2(13)=96.69, p <.001$] with 92.4% sensitivity and 65.5% specificity, yielding a classification of 85.4%.

Past consideration to leave, MMD-HP system-related sources, PCL-5 and DASS-21 anxiety scores significantly predicted current consideration to leave (Table 5).

Specifically, the odds of considering leaving one’s position were 15.88 (95%CI: 4.26 – 59.24) times greater for those who had considered leaving a position in the past compared to those who had never considered leaving a position in the past. The odds of considering leaving one’s position were 7.34 (1.49 – 36.19) times greater for those who had left a position in the past compared to those who had never considering leaving a position in the past due to moral distress. The odds of considering leaving one’s position were 1.04 (95%CI: 1.01 – 1.06) times greater for every one unit increase in system-related sources of moral distress. The odds of considering leaving one’s position were 1.05 (95%CI: 1.00 to 1.10) times greater for every one unit increase in PCL-5 scores. The odds of

considering leaving one’s position were 0.914(95%CI: .838-.998) times less for every one unit increase in DASS-21 anxiety scores.

Discussion

The purpose of the present study was to characterize the impact of moral distress and its associated outcomes on Canadian RTs’ consideration of leaving a clinical position during the COVID-19 pandemic. Approximately one in four RTs (25.8%) were considering leaving their position between February and June of 2021 and were characterized by heightened moral distress along all three levels of distress assayed (i.e., patient, team/unit, system) and elevated symptoms of PTSD, depression, anxiety, stress, dissociation (i.e., emotional constriction; emotional engagement) and functional impairment when compared to their counterparts not considering leaving. Critically, more than half of the RTs considering leaving scored above the cut-off on the PCL-5 indicative of likely PTSD. Moreover, RTs considering leaving their position reported diminished levels of resilience compared to those RTs not considering leaving. These data are alarming in suggesting the need for rapid implementation of preventative, early intervention and late-stage models of complex care to ward against the continuing deterioration of mental health and functioning of Canadian RTs, including those considering leaving this vital workforce. Notably, however, psychological and functional variables predicted initially to increase odds of consideration to leave a position instead contributed very little to the predictive model. Rather, past consideration to leave was the only variable to meaningfully increase the odds of current consideration to leave. Critically, these findings are consistent with those observed in investigations of other

HCPs’ experiences during the COVID-19 pandemic, thus yielding critical insights necessary to retaining a healthy workforce of Canadian RTs, and to ensuring the continuity of our healthcare system.

One in four RTs in the present study reported considering leaving their clinical position 12 to 16 months post-pandemic outset. This finding, although concerning, is consistent with rates reported among nurses at a similar time point during the pandemic.⁵³ For example, among nearly 700 frontline nurses in the Philippines assessed early 2021, 25.8% indicated their desire to leave their position,⁵³ while 26.6% of ICU nurses in Romania reported considering resigning between October 2020 and February 2021.⁵ Interestingly, Fronda and Labrauge⁵³ reported that whereas approximately one in four nurses in the Philippines reported considering leaving their position early 2021, one in five also reported considering leaving their profession entirely. Additional work will be required to determine the percentage of Canadian RTs not only considering leaving their position but also considering leaving their profession. Indeed, these data are required urgently to assess the extent to which the Canadian healthcare system will be further impacted by consideration to leave during the pandemic.

In the present sample of RTs, moral distress was associated with increased endorsement of negative psychological outcomes, including elevated symptoms of PTSD, depression, anxiety, stress, disengagement, emotional constriction and functional impairment. These associations are consistent with the extant literature surrounding moral distress and psychological outcomes among other HCPs, particularly nurses, during the pandemic.^{1,2,5,32} For example, in an investigation of the relation between moral

distress and organizational factors among HCPs during of the pandemic, Plouffe et al.³² found that greater endorsement of moral distress significantly predicted greater endorsement of depression, anxiety, PTSD and burnout. Moreover, moral distress was related to depression, anxiety, burnout and PTSD among HCPs in New York² and Romania.⁵

Although RTs who were considering leaving their position reported significantly greater psychological and functional impairment, only system-related moral distress and PTSD symptoms increased the odds of considering leaving one’s position. Critically, however, the contribution of system-related moral distress (OR=1.04) and PTSD symptoms (OR=1.05) to the overall model was very small. Instead, past consideration to leave a position increased the odds of current consideration to leave to a much greater degree, such that RTs who had considered leaving or had actually left a position in the past had 16- and 7-times greater odds, respectively, of currently considering leaving a position, when controlling for other predictors. Here, we posit that although RTs considering leaving their position may experience greater moral distress and elevated symptoms of mental illness, these symptoms may not be the only factors driving RTs’ consideration to leave. Rather, systemic, organizational issues, such as those captured by the system-level sources of moral distress (e.g., inadequate resources and staffing, limited bed capacity and pressure to reduce costs) may also play a part in RTs’ current consideration of leaving a position. This hypothesis receives some support from our finding that past consideration of leaving along with having left a position in the past both predicted RTs’ current consideration, thus pointing to ongoing, potentially

institutional, factors that may contribute to consideration to leave pre- and post-pandemic. We cannot, however, rule out that individual- and patient-level factors contribute to consideration to leave over time. These findings suggest additional research is needed to better understand RTs’ consideration to leave through study of not only individual-level factors, such as symptoms of mental illness but also through careful consideration of systemic and organizational factors. Moreover, Fronda and Labrague’s⁵³ investigation of nurses’ intention to leave during the pandemic found that social support and coping skills partially mediated the relation between fear of the coronavirus and intention to leave one’s position, suggesting that these factors may be utilized to reduce both fear of the coronavirus and intention to leave⁵³ (for a review of interpersonal and social interventions relevant to HCPs during the pandemic see D’Alessandro et al.⁵⁴). Here, a sustained effort will be required to better understand how social support, coping skills and organizational factors contribute to RTs’ consideration to leave during the pandemic period.

In the present study, sociodemographic variables failed to differentiate RTs who were and were not considering leaving a position. The present sample of Canadian RTs was, however, quite homogenous in that most participants were females reporting European ancestry with less than 15 years of experience working as an RT. Relatedly, adverse childhood experiences failed to distinguish between RTs considering and leaving their position, despite RTs considering leaving scoring higher than their counterparts, which may be related to low statistical power and a low scoring sample ($M=1.87$,

$SD=2.11$). Accordingly, additional research will be required to determine whether targeted retention programs are necessary to ward against RT attrition in Canada.

Morally distressing experiences in healthcare will persist as the pandemic continues, increasing risk of moral distress and by association, negative psychological outcomes and turnover intention. Indeed, data collection for the present study occurred over the second wave of the pandemic in Ontario, Canada, yet at the time of writing, Ontario is in the peak of its 6th wave. Epstein and Hamric¹⁹ theorized the *crescendo effect*, where moral distress increases over time as residual distress in the aftermath of distressing events compacts and gradually rises.¹⁹ Furthermore, in Litz and Kerig’s⁵⁵ heuristic continuum of moral stressors and outcomes, they posit that moral distress, although impairing, may elicit a less damaging response than moral injury. Moral injury has been defined as a psychological response to events in which one transgresses or witnesses a transgression of deeply held moral values and is associated with PTSD, depression, anxiety and suicidal ideation or attempts.⁵⁶⁻⁵⁹ Accordingly, careful attention is necessary to determine whether the experience of “moral distress” can be distinguished from that associated with events considered morally injurious.

The potentially compacting nature of moral distress among RTs during the pandemic must be further acknowledged, along with the urgent need for adequate mental health and wellbeing supports, which may range along a stepped-care model progressing from preventative and early intervention efforts through to first- and second-line individualized therapeutic models. Such interventions, as described recently in the Moral Injury Guide prepared by the Centre of Excellence on PTSD⁶⁰ will also be necessary at

the team and institutional levels and may include organizations removing difficult ethical decisions from frontline workers, rotating staff between high and low stress roles, promoting a supportive culture and arranging rosters for shift workers. Furthermore, at the team level, open discussions about moral and ethical challenges, encouraging self-care and celebrating success may also prove critical in bolstering moral distress.⁶⁰ Here, it is predicted that such efforts will yield gains in institutional, team and individual mental health and wellbeing, as well as prove, in part, preventative against further RT and HCP turnover. In the absence of such targeted approaches, turnover consideration may increase among Canadian RTs over course of the pandemic, as observed in other countries.⁵³ Here, healthcare organizations and leaders are urged to encourage self-screening for signs of mental illness and deteriorating mental health (see, for example, Road Map to Mental Readiness Continuum⁶¹), as well as provide organizational support and the encouragement of formal assessments and treatment where needed (see D’Alessandro et al.⁵⁴ for a summary of organizational considerations to bolster against COVID-19-related moral injury in HCPs). Finally, adequate retention efforts that acknowledge RTs’ experiences with moral distress, and in some cases moral injury, during the pandemic are urgently needed from to ensure our vital RTs feel supported and able to continue providing care during and beyond the COVID-19 pandemic.

Limitations

Despite its novel contributions to the literature, the present study is not without limitations. Importantly, the MMD-HP was not altered for use during the pandemic time frame, but rather the original scale prompt was used asking participants to rate their

experience with each morally distressing item in general. As such, it is not clear whether reports of moral distress in the present study were specific to the pandemic context or representative of RTs’ careers broadly. Future research should consider asking participants about their experiences during the pandemic exclusively to better understand the effects of COVID-19-related moral distress on consideration of leaving and psychological outcomes. Relatedly, the present study did not control for past diagnosis of mental illness, thus rendering it unclear at present to what extent existing and past history of mental illness contributes to intention to leave among RTs during the COVID-19 pandemic. Future research should therefore consider the unique impact of pre-pandemic mental illness, as well as pre-pandemic systems issues, to better understand their potential role as risk factors in considering leaving one’s position.

Conclusion

The present findings reveal that one in four RTs sampled in Canada 12 to 16 months post-pandemic onset were considering leaving their position due to moral distress. These individuals reported significantly greater psychological and functional impacts than their counterparts who were not considering leaving their position. Although the sample of RTs considering leaving their position may be characterized by diminished mental health and wellbeing, the present findings suggests that more than individual level factors (often associated with self-and other blame) contribute to understanding RTs’ consideration to leave. Adequate mental health supports and further research into factors related to intention to leave are critical to ensuring RTs’ well-being and the continuity of our healthcare system as the pandemic persists.

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Tables**Table 1***Demographic Information Stratified By Consideration of Leaving a Position*

Variable	Considering Leaving (n=55)		Not Considering Leaving (n=158)	
	Frequency	Percentage	Frequency	Percentage
Sex & Gender*				
Female	48	87.3	134	84.8
Male	7	12.7	23	14.6
Missing	0	0	1	0.6
Age				
20 to 29	12	21.8	39	24.7
30 to 39	18	32.7	54	34.2
40 to 49	15	27.3	36	22.8
50 to 59	10	18.2	25	15.8
60 to 69	0	0	3	1.9
70 to 79	0	0	1	0.6
Population Group**				
African	0	0.0	0	0.0
Caribbean	0	0.0	1	0.6
East Asian	2	3.6	8	5.1
First Nations, Inuit, Metis	3	5.5	4	2.5
Latin American	0	0.0	3	1.9
Middle Eastern	1	1.8	1	0.6
Pacific Islander	0	0.0	0	0.0
South Asian	2	3.6	2	1.3
Southeast Asian	0	0.0	3	1.9
European	49	89.1	136	86.1
Other (e.g., Canadian, Caucasian)	2	3.6	7	4.4
Prefer not to answer	0	0.0	3	1.9

Marital Status	Legally Married, Common Law, or Domestic Partnership	39	70.9	107	67.7	
	Single, Never Married	12	21.8	38	24.1	
	Separated, Divorced or Widowed	4	7.3	12	7.6	
	Missing	0	0	1	0.6	
	Province/Territory					
	Alberta	7	12.7	35	22.2	
	British Columbia	12	21.8	24	15.2	
	Manitoba	3	5.5	7	4.4	
	New Brunswick	3	5.5	0	0	
	Newfoundland and Labrador	1	1.8	2	1.3	
	Northwest Territories	0	0.0	1	0.6	
	Nova Scotia	5	9.1	19	12.0	
	Nunavut	0	0.0	1	0.60	
	Ontario	20	36.4	56	35.4	
	Prince Edward Island	0	0.0	2	1.3	
	Quebec	2	3.6	3	1.9	
	Saskatchewan	2	3.6	8	5.1	
	Yukon	0	0.0	0	0.0	
Occupational Role**	Staff Therapist	44	80.0	131	83.4	
	Senior Therapist or Leadership Management	8	14.50	15	9.6	
	Educator	1	1.8	6	3.8	
	Consultant or Research	12	21.8	22	14.0	
	Sales	0	0	4	2.5	
	Student	0	0	3	1.9	
	Policy or Government	1	1.8	4	2.5	
	Other	0	0	1	0.6	
		Other	3	5.5	3	1.9
	Years Practiced	Student	1	1.8	3	1.9
0 to 5 Years		11	20.0	43	27.2	

	6 to 10 Years	10	18.2	28	17.7
	11 to 15 Years	8	14.5	28	17.7
	16 to 20 Years	10	18.2	19	12.0
	21 to 25 Years	5	9.1	19	12.0
	26 to 30	7	12.7	6	3.8
	Over 30 Years	3	5.5	11	7.0
	Missing	0	0.0	1	0.6
COVID-19 Unit					
	Yes	41	74.5	110	69.6
	No	14	25.5	48	30.4
Occupational Setting**					
	Hospital	53	96.4	134	85.4
	Community	7	10.9	26	16.6
	Student Rotations	0	0	3	1.9
	Other	1	1.8%	7	4.5
Patient Populations**					
	Adult Care	55	100	151	96.2
	Pediatric	29	52.7	82	52.2
	Neonatal	26	47.3	79	50.3
Employment Status**					
	Full-Time	38	69.1	116	74.8
	Part-Time	14	25.5	34	21.9
	Casual	5	9.1	13	8.4
	Self-Employed	1	1.8	2	1.3
	Unemployed	1	1.8	1	0.6

* All participants reported a cis-gendered identity. Sex and gender have been collapsed to remove redundancy.

** Participants were permitted to select multiple options.

Table 2*Comparing Outcome Variables Between RTs Considering and Not Considering Leaving*

	Not Considering Leaving (n=158)		Considering Leaving (n=55)		<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
MMD-HP Patient	37.46	20.48	54.24	24.76	-4.516	81.19	<.001	-0.775
MMD-HP Team/Unit	46.38	34.03	81.82	43.97	-5.44	77.71	<.001	-0.962
MMD-HP System	32.6	22.21	57.91	26.08	-6.95	211	<.001	-1.088
DASS Depression	10.61	7.91	16.18	10.82	-3.508	75.06	<.001	-0.637
DASS Anxiety	7.87	6.31	11.75	8.94	-2.966	73.59	0.004	-0.547
DASS Stress	14.57	7.61	20.8	9.61	-4.351	79.131	<.001	-0.76
PCL-5	18.22	13.26	33.98	17.97	-5.97	75.48	<.001	-1.079
MDI Disengagement	10.96	3.92	12.91	4.31	-3.094	211	.004	-0.484
MDI Emotional Constriction	8.37	3.6	10.44	4.9	-2.86	75.23	.005	-0.519
WHODAS	7.73	6.28	13.18	6.98	-5.38	211	<.001	-0.84
BRS	3.45	0.8	3.19	0.72	2.09	0.019	.030	0.327
ACES	1.78	2.14	2.13	2.02	-1.04	211	.300	-1.63

Table 3*Bivariate Correlations of Moral Distress and Theoretically Associated Outcomes*

	1	2	3	4	5	6	7	8	9	10
1 MMD-HP Total	-									
2 DASS21 - Depression	.380**	-								
3 DASS21 - Anxiety	.477**	.653**	-							
4 DASS21 - Stress	.422**	.740**	.653**	-						
5 PCL-5	.551**	.673**	.650**	.663**	-					
6 MDI Disengagement	.341**	.609**	.547**	.578**	.645**	-				
7 MDI Emotional Constriction	.308**	.599**	.502**	.451**	.548**	.572**	-			
8 WHODAS	.340**	.599**	.515**	.540**	.609**	.537**	.521**	-		
9 BRS	-.240**	-.432**	-.475**	-.383**	-.520**	-.434**	-.343**	-.429**	-	
10 ACES	.101	.168*	.082	.129	.166*	.179*	.149*	.285**	-1.20	-

*Significance at $p < .05$ ** Significance at $p < .001$

Table 4*Simple Binary Logistic Regressions Predicting Consideration to Leave Due to Moral Distress*

	B	S.E.	Wald	Sig.	Exp(B)	95%CI	
Sex	.163	.463	.124	.725	1.177	.475	2.918
COVID-19 Unit	.245	.355	.478	.489	1.278	.638	2.561
Years Practiced	.097	.082	1.414	.234	1.102	.939	1.294
Past Consideration to Leave (No, Ref)			30.470	<.001			
Past Consideration to Leave (Yes, 1)	3.379	.623	29.371	<.001	29.333	8.64	99.547
Past Consideration to Leave (Left, 2)	2.507	.721	12.104	<.001	12.267	2.988	50.358
MMD-HP Patient	.034	.008	19.964	<.001	1.035	1.019	1.050
MMD-HP Team	.022	.004	26.046	<.001	1.023	1.014	1.031
MMD-HP System	.041	.007	31.965	<.001	1.042	1.027	1.057
PCL-5	.064	.011	31.492	<.001	1.066	1.042	1.090
MDI Disengagement	.113	.038	8.784	.003	1.120	1.039	1.206
MDI Emotional Constriction	.118	.038	9.806	.002	1.126	1.045	1.212
DASS-21 Depression	.065	.018	13.896	<.001	1.068	1.032	1.105
DASS-21 Anxiety	.071	.022	10.681	.001	1.074	1.029	1.120
DASS-21 Stress	.089	.020	18.958	<.001	1.093	1.050	1.138
BRS	-.414	.201	4.234	.040	.661	.446	.981
WHODAS	.115	.025	21.903	<.001	1.122	1.069	1.177
ACES	.075	.072	1.074	.300	1.077	.936	1.241

Note: Years Practiced was an ordinal variable treated as continuous for the model.

Table 5*Multiple Binary Logistic Regression Predicting Consideration to Leave Due to Moral Distress*

	B	S.E.	Wald	Sig.	Exp(B)	95%CI	
Past Consideration to Leave (No, Ref)			17.215	<.001			
Past Consideration to Leave (Yes, 1)	2.765	.672	16.953	<.001	15.883	4.258	59.237
Past Consideration to Leave (Left, 2)	1.994	0.814	6.001	.014	7.342	1.490	36.185
MMD-HP Patient	.012	.011	1.145	.285	1.012	.990	1.034
MMD-HP Team	-.006	.009	.490	.484	.994	.977	1.011
MMD-HP System	.035	.012	8.088	.004	1.036	1.011	1.062
PCL-5	.049	.023	4.421	.036	1.050	1.003	1.100
MDI Disengagement	-.075	.076	.973	.324	.927	.799	1.077
MDI Emotional Constriction	.031	.067	.213	.644	1.032	.904	1.178
DASS-21 Depression	-.039	.039	1.020	.312	.961	.891	1.038
DASS-21 Anxiety	-.090	.044	4.065	.044	.914	.838	.998
DASS-21 Stress	.057	.042	1.840	.175	1.058	.975	1.149
BRS	-.030	.350	.007	.931	.970	.489	1.925
WHODAS	.070	.040	3.048	.081	1.072	.991	1.159

Chapter 4: Discussion and Summary

The research presented in this thesis adds critical knowledge to the gap on RTs’ experiences in the growing body of literature on the psychological and occupational impacts HCPs have endured throughout their service during the COVID-19 pandemic. Given the relative paucity of literature on RTs’ prior to and during the pandemic, the purpose of this thesis was to answer, in part, the research question: what are the psychological and occupational impacts associated with COVID-19 pandemic service for Canadian RTs? Findings from the two research studies presented here suggest that RTs have indeed been impacted both psychologically and occupationally during the COVID-19 pandemic, alongside their HCP colleagues, such as nurses and physicians, whom a large body of the extant literature has investigated.

In Chapter 2, we presented research aimed at characterizing the mental health and functioning of Canadian RTs during the Spring of 2021. Our results indicated that a substantial proportion of RTs surveyed experienced elevated symptoms of depression, anxiety, stress and moral distress. Critically, approximately one in three of the RTs surveyed likely would meet criteria for PTSD if given clinical follow-up. Functional impairment was associated with higher endorsement of adverse psychological symptoms (e.g., depression, anxiety, stress, moral distress, PTSD), suggesting holistic impacts of pandemic service to RTs’ wellbeing. Finally, comparing the mental health and functioning of RTs on and off COVID-19 units interestingly yielded no differences, except for patient-level moral distress. Though we might expect RTs on COVID-19 units to endorse a higher degree of symptoms of depression, anxiety, stress, PTSD and

functional impairment than RTs not working on COVID-19 units given potential added stress when caring for COVID-19 patients, this finding is consistent with recent work suggesting similar levels of burnout between RTs working in and out of COVID-19 hospitals (Miller et al., 2021). Moreover, higher endorsement of patient-level sources of moral distress, including providing perceived futile care, among RTs on COVID-19 units is consistent with knowledge of greater exposure to patient suffering and often death on these units. Our research findings raise concern over RTs’ mental health and wellbeing during the COVID-19 pandemic and demonstrate an urgency for adequate supports to be established for these vital workers. Reports of adverse psychological symptoms among the RTs in this investigation were consistent with knowledge of HCPs’ reports across the globe (mainly excluding RTs). Further, with a substantial proportion of the sample likely meeting criteria for PTSD and RTs reporting functional impairment for more than one week in the past month, the holistic impact of pandemic service among RTs demonstrates the necessity of adequate intervention. As discussed in Chapter 2, RTs are excluded from presumptive legislation for PTSD benefits in Ontario, despite nurses, whom RTs often work closely with, being included. Exclusion from presumptive legislation is just one example of the consequences of overlooking RTs’ experiences and needs for support prior to the pandemic. Healthcare organizations and leaders who wish to empower their employees to carry out their jobs well should take heed to this research and promptly seek to provide adequate prevention, early intervention and treatment resources for their RT staff who may be suffering from adverse psychological impacts during the COVID-19 pandemic. For example, organizations and leaders should consider recommendations

to care for staff, such as those put forward by the Atlas Institute for Veterans and Families (Phoenix Australia - Centre for Posttraumatic Mental Health & Canadian Centre of Excellence - PTSD, 2020), including: take responsibility for preparing staff for the potential adverse psychological outcomes associated with their work; establish peer support networks amongst staff; encourage self-assessments for psychological injury; and educate staff and encourage the use of informal and formal supports as needed, such as healthy coping strategies, employee assistance, or seeking chaplaincy (D’Alessandro et al., 2022). Furthermore, HCPs have voiced their desire for such support from leaders, asking their concerns and perspectives to be considered by leaders via tangible supports (Shanafelt et al., 2020). Without establishing adequate supports, the health and wellbeing of RTs and other HCPs will remain at risk.

In Chapter 3, we aimed to elucidate the relation between moral distress, its associated psychological outcomes, and consideration to leave one’s position among RTs during the COVID-19 pandemic (i.e., Spring of 2021). Shockingly, our investigation revealed that a quarter of the RTs surveyed were considering position departure and were characterized by elevated moral distress, adverse psychological symptoms (i.e., depression, anxiety, stress, PTSD, emotional constriction, detachment), functional impairment and lower resilience when compared to their counterparts who were not considering leaving. Notably, over half of the RTs who reported considering leaving their positions screened positively for likely PTSD diagnosis, yet PTSD and other psychological symptoms contributed very little to the predictive model of consideration of position departure. Rather, past consideration to leave was the key driving factor in

current consideration to leave in our analysis. This investigation yields novel insight into not only rates of Canadian RTs’ consideration of position departure early in 2021, but also gives insight into potential factors driving consideration to leave. We posit that our results point to the critical role of broader factors, as opposed to individual factors such as mental health and functioning, in consideration of position departure among RTs. Here, longstanding issues in healthcare that may have remained consistent from past consideration of leaving one’s position to current consideration may be important to explore. Echoing the call above for healthcare organizations and leaders to act now, these findings point to the potentially critical role of systemic healthcare issues, such as inadequate resources and staffing levels and limited capacity for patient care, which organizations may target in order to mitigate RTs’ consideration to leave their positions. Without immediate action of mental health supports and retention strategies for Canadian RTs, the continuity of our healthcare system remains threatened.

Taken together, the two studies presented in this thesis demonstrate the impact of COVID-19 pandemic service on Canadian RTs, both psychologically and occupationally. These findings are consistent with the extant literature on HCPs’ experiences during the COVID-19 pandemic, which indicate elevated adverse psychological symptoms and increased position departure consideration. Here, this thesis presents vital knowledge enhancing the widespread impact of pandemic service among RTs alongside their HCP colleagues and raises concern over RTs’ wellbeing and the continuation of healthcare systems that must be addressed with future research and action.

Limitations

Despite addressing a key gap in the literature regarding RTs’ experiences during the COVID-19 pandemic, the two research studies presented in this thesis are not without limitations. Conclusions of this thesis should be tempered appropriately in light of these limitations. The studies presented in this thesis were conducted on the same data set collected from Canadian RTs’ between February and June of 2021. Although a broad recruitment strategy was used (e.g., social media advertisements, newsletters from the CSRT, emails from healthcare organizations across Canada), the final samples presented in each study may be biased and not representative of the true population of Canadian RTs. For example, most participants in each study were from Ontario, Alberta and British Columbia, with only a few represented from other provinces and territories, such as Prince Edward Island, Quebec or the Yukon. Additionally, each sample was mainly composed of heterosexual, female-identifying individuals reporting European ancestry as their ethnicity. As such, this homogenous sample may not adequately represent the psychological and occupational experiences of Canadian RTs in the Spring of 2021. Relatedly, the waves of the COVID-19 pandemic varied greatly across Canada, both between and within provinces and territories. Here, the present studies are limited in their conclusions on the impact of pandemic service given that at the time of data collection RTs in Southern Ontario were in the midst of working during the second wave of the COVID-19 pandemic, while RTs in Northern Ontario and in other Canadian provinces and territories were not necessarily experiencing the same stress and working conditions as RTs in Southern Ontario. Collectively, limitations regarding the sample of participants and time point of data collection render the data presented in this thesis potentially

unrepresentative of Canadian RTs and may not be generalizable to the entire population of Canadian RTs. Future research should replicate the studies presented in this thesis perhaps on a province/territory basis and by comparing experiences of RTs across Canada according to wave of the pandemic rather than a single point in time.

The research presented in this thesis is also limited in its inability to comment on the unique impacts of COVID-19 pandemic service on psychological and occupational outcomes among RTs. The battery of questionnaires used to collect the data for the broader project from which the present studies were drawn did not account for prior mental health history or experiences. As such, it is unclear to what extent the psychological symptoms and consideration to leave presented in this thesis were directly related to working during the COVID-19 pandemic as opposed to events occurring prior to the pandemic or in one’s personal life, including early life trauma. Future research should account for prior mental health and personal history to better understand the unique impacts of pandemic service among RTs.

Finally, as discussed in Chapter 3, the investigation of RTs’ consideration of position departure is limited in its conclusions by not considering factors external to RTs, such as the role of the organization. As demonstrate in the results and discussion of Chapter 3, psychological symptoms did not fully explain consideration of position departure. Future research must consider other, systemic issues, which may present as key driving factors of position departure as well as key targets for intervention in order to retain RTs moving forward.

Future Directions

Findings of the research presented in this thesis yield critical insights into the adverse psychological outcomes and occupational impacts of COVID-19 pandemic service on Canadian RTs. By demonstrating that RTs have indeed been impacted during the pandemic alongside their colleagues despite being overlooked in the literature, this thesis points toward essential future research considerations and can inform the development of prevention and intervention strategies.

A key finding of this thesis research is the elevated rates of psychological symptoms, including substantial proportions of likely PTSD among RT participants. Notably, these results were garnered through quantitative surveys between February and June of 2021, in the midst of the second wave of the pandemic in Ontario, Canada. In a review of frontline workers’ experiences during COVID-19 and other pandemics (e.g., SARS, MERS, Ebola), Billings et al. (2021) noted that the impact of ethical dilemmas, such as allocating scarce resources, continued to affect HCPs even after the pandemic period. Furthermore, HCPs tended to realize the adverse psychological impacts of their service once the crisis had come to a close (Billings et al., 2021). Relatedly, theoretical models of moral distress contend that repeated exposures to morally distressing events may compact upon one another, resulting in heightened distress (Epstein & Hamric, 2009) and, in some cases, moral injury (Riedel et al., 2022). Here, it will be of the utmost importance to continue to monitor RTs alongside their colleagues throughout and after the current pandemic period. Research on the long-term mental health impacts of COVID-19 pandemic service among RTs and other HCPs will be critical to the

development of appropriate intervention in the aftermath of this pandemic as well as prevention and early intervention strategies for subsequent outbreaks.

Relatedly, RTs’ consideration of position departure must be monitored throughout the pandemic period. In a review of factors related to nurse turnover before and during the COVID-19 pandemic, Falatah (2021) noted an increase in nurse turnover throughout the pandemic. Ongoing interviews with RTs and other HCPs in our research group throughout the pandemic revealed that RTs perceived dire staffing shortages in Canada even prior to the COVID-19 pandemic. Our healthcare system cannot withstand the threat of an even greater loss of RTs across the country. As such, research on RTs consideration to leave, and especially the factors related to position departure, will continue to be essential as the pandemic persists. Here, qualitative interviews or focus groups may prove the most useful in understanding from RTs themselves their needs and perspectives of issues related to turnover consideration.

To fully understand the impact of the pandemic on RTs, the perspectives of student RTs must also be considered. Research among nursing students during the pandemic reveals that many reported stress (Aslan & Pekince, 2021), anxiety (Savitsky et al., 2020) and career turnover (Lin et al., 2021) throughout the pandemic. Notably, in one study, almost half of the 1020 nursing students surveyed reported thinking often about no longer pursuing nursing (Lin et al., 2021). Here, the widespread occupational impacts of the COVID-19 pandemic on HCPs are clear, with not only seasoned HCPs considering position and profession resignation (Falatah, 2021; Fronda & Labrague, 2022; Petrișor et al., 2021), but also students rethinking their career paths. Future research must address

student RTs’ perspectives on their intended profession in order to fully understand the impact of the pandemic on RTs and to established tailored retention programs, including at the educational level.

As the research in this thesis considered exclusively *outcomes* of pandemic service, future research should consider RTs’ experiences with stressful, potentially traumatic, or morally distressing/injurious *events* during the COVID-19 pandemic. Understanding the types of situations endured may provide insight into targetable situations to mitigate adverse psychological and occupational impacts to RTs. For example, pre-COVID-19 pandemic research revealed interpersonal conflict between nurses and physicians, management and colleagues as a profoundly stressful event for many Canadian nurses (D’Alessandro et al., In prep). Interpersonal conflict is a targetable source of stress, unlike exposure to death and dying that is common in the nursing profession (D’Alessandro et al., In prep). By investigating sources of stress, distress and trauma for RTs during the COVID-19 pandemic, practical organizational changes may be identified and implemented to contribute to preventative action and ward against adverse outcomes to RTs.

Conclusion

The overarching purpose of this thesis was to understand the psychological and occupational impacts associated with pandemic service among Canadian RTs. The results presented in Chapter 2 demonstrate that RTs experienced elevated adverse psychological symptoms associated with functional impairment during the second wave of the COVID-19 pandemic in Ontario. These findings demonstrate holistic impacts to RTs wellbeing

and raise concern over the potential long-term impact of pandemic service among this population. The results presented in Chapter 3 demonstrate that a substantial proportion of Canadian RTs were considering leaving their positions due to moral distress in the Spring of 2021. Findings from this investigation revealed that, despite reporting elevated symptoms of mental illness and impairment compared to those not considering leaving, RTs who were considering leaving their positions may have done so for reasons other than their mental health. Here, our findings demonstrate the need for urgent systemic action to support RTs’ wellbeing and to establish adequate retention programs for this vital workforce. Overall, the research presented in this thesis demonstrates that Canadian RTs have indeed been impacted both psychologically and occupationally during the COVID-19 pandemic alongside their HCP colleagues, despite a relative paucity of literature exploring their experiences. Findings from this thesis should be used to develop adequate prevention, early detection and treatment strategies for RTs during and beyond the COVID-19 pandemic.

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