



A qualitative descriptive study of the impact of the COVID-19 pandemic on staff in a Canadian intensive care unit

Une étude qualitative descriptive de l'impact de la pandémie de COVID-19 sur le personnel d'une unité de soins intensifs canadienne

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Abstract

Purpose We sought to explore the lived experiences of a professionally diverse sample of healthcare workers (HCWs) in a single intensive care unit (ICU) serving a large and generalizable Canadian population. We aimed to understand how working during the COVID-19 pandemic affected their professional and personal lives, including their perceptions of institutional support, to inform interventions to ameliorate impacts of the COVID-19 and future pandemics.

Methods In this qualitative descriptive study, 23 ICU HCWs, identified using convenience purposive sampling, took part in individual semistructured interviews between July and November 2020, shortly after the first wave of the pandemic in Ontario. We used inductive thematic analysis to identify major themes.

Results We identified five major themes related to the COVID-19 pandemic: 1) communication and informational needs (e.g., challenges communicating policy changes); 2) adjusting to restricted visitation (e.g., spending less time interacting with patients); 3) staffing and workplace supports (e.g., importance of positive team dynamics); 4) permeability of professional and personal lives (e.g., balancing shift work and childcare); and 5) a dynamic COVID-19 landscape (e.g., coping with constant change).

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The COVID-19 pandemic contributed to HCWs in the ICU experiencing varied negative repercussions on their work environment, including staffing and institutional support, which carried into their personal lives.

Conclusion Healthcare workers in the ICU perceived that the COVID-19 pandemic had negative repercussions on their work environment, including staffing and institutional support, as well as their professional and personal lives. Understanding both the negative and positive experiences of all ICU HCWs working during the COVID-19 pandemic is critical to future pandemic preparedness. Their perspectives will help to inform the development of mental health and wellbeing interventions to support staff during the COVID-19 pandemic and beyond.

Résumé

Objectif Nous avons cherché à explorer les expériences vécues par un échantillon varié de travailleurs de la santé (TS) dans une seule unité de soins intensifs (USI) desservant une population canadienne vaste et généralisable. Notre objectif était de comprendre comment le travail pendant la pandémie de COVID-19 a affecté leur vie professionnelle et personnelle, y compris leurs perceptions du soutien institutionnel, afin d'éclairer les interventions visant à atténuer les impacts de la COVID-19 et des pandémies futures.

Méthode Dans cette étude qualitative descriptive, 23 travailleurs de la santé en soins intensifs, identifiés à l'aide d'un échantillonnage raisonné de commodité, ont participé à des entrevues individuelles semi-structurées entre juillet et novembre 2020, peu après la première vague de la pandémie en Ontario. Nous avons utilisé l'analyse thématique inductive pour identifier les principaux thèmes.

Résultats Nous avons cerné cinq grands thèmes liés à la pandémie de COVID-19 : 1) les besoins en matière de communication et d'information (p. ex., les difficultés à communiquer les changements de politiques); 2) l'adaptation aux visites restreintes (p. ex., le fait de passer moins de temps à interagir avec les patients); 3) le soutien à la dotation en personnel et au milieu de travail (p. ex., l'importance d'une dynamique d'équipe positive); 4) la perméabilité de la vie professionnelle et personnelle

(p. ex., l'équilibre entre le travail en quarts et la garde des enfants); et 5) le paysage dynamique de la COVID-19 (p. ex., l'adaptation à des changements constants). La pandémie de COVID-19 a contribué à ce que les travailleurs de la santé de l'USI subissent divers impacts négatifs sur leur environnement de travail, y compris sur la dotation en personnel et le soutien institutionnel, qui se sont répercutés sur leur vie personnelle.

Conclusion Les travailleurs de la santé de l'USI ont perçu que la pandémie de COVID-19 avait eu des repercussions négatives sur leur environnement de travail, y compris sur la dotation en personnel et le soutien institutionnel, ainsi que sur leur vie professionnelle et personnelle. Il est essentiel de comprendre les expériences négatives et positives de tous les travailleurs de la santé des soins intensifs travaillant pendant la pandémie de COVID-19 pour bien se préparer aux pandémies futures. Leurs points de vue aideront à l'élaboration d'interventions en santé mentale et en bien-être pour soutenir le personnel pendant la pandémie de COVID-19 et au-delà.

Keywords COVID-19 · ICU · qualitative · healthcare workers

Working in an intensive care unit (ICU) is fast-paced and stressful because of high patient acuity, ethical complexities, and intense workloads.¹ A recent rapid review of psychological symptoms in physicians across several clinical specialties reported varying degrees of anxiety, stress, and depression during seven infectious disease outbreaks.² Moreover, current research shows that healthcare workers (HCWs)—those in technical, clinical (e.g., physicians, registered nurses, pharmacists, respiratory therapists, physiotherapists) and support roles (e.g., clerks, porters, sanitation)—in ICUs are at elevated risk of poor health outcomes (e.g., compassion fatigue, burnout) during public health emergencies.^{3–9} Many HCWs in Canadian ICUs have recounted traumatic events that occurred during the 2003 Severe Acute Respiratory Syndrome (SARS) epidemic.^{7,10–12} In less than one month, the COVID-19 outbreak surpassed that of SARS (an epidemic that occurred over a nine-month period) in regard to the total number of reported cases¹³ and broad population restrictions.^{14–18} The rapidly growing body of evidence spanning the COVID-19 pandemic highlights ongoing mental health impacts on HCWs,^{3,4,19–22} including high levels of distress and collective trauma.^{23–26} The severity of mental health impacts was moderated by increasing case numbers and the associated restrictions enacted to limit virus transmission.²⁷ Intensive care units in particular had to adapt to real or threatened resource shortages (e.g.,

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personal protective equipment [PPE], hospital beds, and HCWs²⁸) and continual policy changes (e.g., limits on visitation²⁹).

Developing a deeper understanding of the impacts of pandemics on the work and personal lives of HCWs in ICUs is essential to helping healthcare systems navigate health crises, mitigate disastrous long-term implications, and plan for future health threats.^{10,30} The purpose of this study was to explore the lived experiences and perspectives of a professionally diverse sample of HCWs in a single ICU serving a large and generalizable Canadian population. We aimed to describe their perceptions of their work environment and institutional support, and how their personal and professional lives have been affected by their occupation during the COVID-19 pandemic.

Methods

Study design

We conducted a qualitative descriptive study that used semistructured interviews and adhered to the Consolidated Criteria for Reporting Qualitative Research checklist³¹ (Electronic Supplementary Material [ESM] eTable 1). The institutional research ethics board of each investigator approved the study (Sinai Health System Research Ethics Board [REB 20-0089, approved April 2020]; Dalhousie University Research Ethics Board [#2020-5172, approved May 2020]; and University of Calgary Conjoint Health Research Ethics Board [#20-0745, approved June 2020]). Participants provided written informed consent at the time of recruitment and oral consent to participate at the time of the interview.

Participant selection

Participants were recruited from a 16-bed ICU in a single hospital serving a metropolitan area of approximately three million residents in Ontario, Canada. Participants were eligible if they were English-speaking adults (≥ 18 yr), able to provide informed consent, and worked as a HCW in the study ICU during the COVID-19 pandemic. To recruit participants within the same wave of the pandemic, we aimed to interview three to five participants comprising five common groups of HCWs at our institution for a total target of 15 to 25 participants, which included 1) allied staff (AS) (e.g., pharmacists, physiotherapists, porters, clerical, environmental service); 2) physicians in training (residents and clinical fellows, MD-Ts); 3) staff physicians (MDs); 4) registered nurses (RNs); and 5) respiratory therapists (RTs). These targets were set to balance

recruitment feasibility with data saturation (the point at which no new themes were found during iterative analysis).

Two study research nurses (J. K., C. E. N.) began recruitment on 5 June 2020, approximately six weeks after the first peak of infections in Ontario.³² They randomly approached eligible HCWs in-person in the ICU between 8:00 a.m. and 5:00 p.m. Monday to Friday until data saturation was reached (23 June 2020). A member of the research team (S. S.) was able to obtain consent from and enroll 26 of the 31 HCWs (83%) approached. Another researcher (C. D.) not affiliated with the study ICU emailed consenting individuals to schedule an interview date and time; nonresponders were sent one email reminder approximately one week after the initial email. No additional follow-up was conducted.

Data collection

The primary investigators with expertise in qualitative methods (J. P. L., S. Me.) developed a single guide to conduct 15-min interviews. Content for the interview guide was identified based on the results of two cross-national questionnaires deployed in parallel by our research group surveying COVID-19 effects on hospital HCWs in Ontario²⁶ and ICU HCWs across Canada.³³ Interview questions were open-ended and focused on eliciting participant perspectives, experiences, and perceived impacts of working in the ICU during the COVID-19 pandemic. Topics included 1) protocol changes; 2) availability of and training on PPE; 3) personal and professional supports; 4) career reflections; and 5) lessons learned. We piloted the guide with two ICU RNs who were not located at the study site and were not members of the investigative team. We revised the guide (ESM eTable 2) after each pilot interview to improve conversational flow. Three women researchers (C. D., L. K., S. Mi.) trained in qualitative methods conducted the interviews via Zoom audio or telephone, based on participant preference. Researchers recorded participant demographics (age, sex, marital status, children, professional role, years in role, clinical speciality) at the end of each interview. The interviews were audio-recorded and transcribed verbatim by a third-party transcription service (Rev.com, San Francisco, CA, USA). One researcher (C. D.) assigned a unique identifier and deidentified each participant transcript to maintain confidentiality. Three participants accepted the opportunity to member check their interview transcript to ascertain that transcription of their interview was accurate. All participants received a CAD 25 Visa prepaid gift card.

Data analysis

Three researchers (A. D., S. Mi., C. D.) performed data analysis using NVivo 12 (QSR International, Burlington, VT, USA). Applying Braun and Clarke's approach to inductive thematic analysis,³⁴ two researchers (A. D., S. Mi.) independently reviewed a sampling of data to formulate provisional codes and categories or themes. They then came together to compare and refine codes with oversight from the third researcher (C. D.). The initial researchers (A. D., S. Mi.) independently applied codes to a small sample of complete transcripts ($n = 5$). The researchers' coding was compared and discussed with the primary investigator with qualitative expertise (J. P. L.) to create a first draft of the codebook (ESM eTable 3). The researchers (A. D., S. Mi.) then analyzed five additional transcripts using both open coding (applying meaningful descriptors to the data) and axial coding (creating connections between codes), iteratively refining the codebook until all relevant ideas were included. The complete data set was then coded in duplicate (A. D., S. Mi.). Three researchers (A. D., S. Mi., C. D.) met weekly to discuss findings, including reoccurring themes, salient quotes, and connections to previous research. They assessed that no additional interviews were required to produce added information.

Results

Participants

We interviewed 23 of the 26 (88%) consenting participants between 7 July 2020 and 26 November 2020; three did not respond to our request to schedule an interview. Participant interviews lasted a median [interquartile range (IQR)] of 14 [10–17] min. Participants included five AS, five RNs, five MDs, four RTs, and four MD-Ts (Table 1). The median [IQR] age of participants was 38 [35–47] yr; about half (12/23, 53%) were female and one-third (7/23, 36%) had been in their current professional role for less than five years, albeit all RNs interviewed had worked as a nurse for over a decade. Most participants (10/17, 59%; missing data $n = 6$) had worked during a previous infectious disease outbreak (e.g., SARS, Influenza A virus H1N1), the greatest proportion within the AS HCW group (4/5, 80%).

Thematic analysis

We identified five themes that captured the perspectives and experiences of ICU HCWs participating in our study: 1) communications and informational needs; 2) adjusting to restricted visitation; 3) staffing and workplace supports; 4) permeability of professional and personal lives; and 5)

dynamic COVID-19 landscape. Illustrative quotations are provided in text and listed in Table 2.

Communications and informational needs

Participants shared their need to receive clear and consistent communication from hospital leadership regarding changes to visitation policies and provision of patient care. One RT (P-15) applauded their department for exceeding their informational needs, particularly as it pertained to screening and wider hospital policies. Nevertheless, this experience was not necessarily common across specialties and roles. One AS (P-19) stated that they were not consulted, hypothesizing that this was because they were not medical professionals. Participants repeatedly described that both the absence of information and contradicting information were a source of burnout and stress. One RT (P-12) articulated how stressful it was to be expected to remember all of the ever-changing policies and procedures. There was consensus that this pressure could be overwhelming at times.

Adjusting to restricted visitation

All participants acknowledged the negative impact of visitor restrictions on ICU patients and their families. Physicians were most vocal about challenges resulting from physical distancing restrictions with the families of their critically ill patients. Most physicians endorsed feeling guilty about limiting the time they spent in the patient's room (MD, P-17). All HCWs commented that restricted visitation policies had unintended negative consequences on family caregivers, such as grief over their inadequate presence, and sparse involvement in the provision of care. One MD (P-01) shared how the healthcare team worked to communicate with family members, and the importance of providing regular updates to relatives who felt isolated from their loved one because of restricted visitation policies. Physicians shared their distress related "*to deny[ing] families the right of a visit to their dying loved one*" (MD, P-06), and that families were often forced to rely on technology. Physicians also described their attempts to connect patients with their families in their last moments, and their experiences with complicated grief surrounding end-of-life care (MD, P-17).

Staffing and workplace supports

All HCWs shared their perspectives on their emotional distress while working in an ICU during the COVID-19 pandemic. One AS (P-10) recalled feeling displaced and unwelcomed, encompassing a lack of belonging and hospitality. The same AS (P-10) described feeling

Table 1 Participant characteristics

Characteristic	Total N = 23	RNs n = 5	RTs n = 4	MD-Ts n = 4	MDs n = 5	AS n = 5
Age category (yr), n/total N (%) ¹						
20–29	1/22 (5%)	0	1	0	0	0
30–39	12/22 (54%)	2	4	3	2	1
40–49	7/22 (32%)	1	0	1	2	3
50–59	1/22 (5%)	1	0	0	0	0
60 +	1/22 (5%)	0	0	0	1	0
Median [IQR]	38 [35–47]	43 [37–53]	33 [28–37]	36 [33–36]	42 [39–48]	48 [44–48]
Sex, n/total N (%)						
Female	12/23 (52%)	3	4	2	1	2
Years in current role, n/total N (%) ²						
≤ 4	7/19 (37%)	0	2	2	2	1
5–10	4/19 (21%)	0	1	0	0	3
11–15	4/19 (21%)	1	1	0	1	1
16–20	3/19 (16%)	3	0	0	0	0
> 20	1/19 (5%)	1	0	0	0	0
Median [IQR]	7 [4–15]	17 [17–20]	7 [3–11]	-	4 [3–10]	5 [5–7]
Others in household, n/total N (%) ³						
Yes	19/22 (86%)	5/5 (100%)	4/4 (100%)	2/4 (50%)	5/5 (100%)	3/5 (60%)
Previously worked during an ID outbreak, n/total N (%) ⁴						
Yes	10/17 (59%)	3/5 (60%)	1/4 (25%)	-	2/5 (40%)	4/5 (80%)

¹ Missing data: n = 1 (1 RN)

² Missing data: n = 4 (2 MDs, 2 MD-Ts)

³ Missing data: n = 1 (1 MD-T)

⁴ Missing data: n = 6 (4 MD-Ts, 2 MDs)

AS = allied staff; ID = infectious disease; MD-T = medical doctor in training; MD = medical doctor; RN = registered nurse; RT = respiratory therapist

unsupported when requests for feedback were not answered. While most participants relied on colleagues as sources of support (RT, P–12), some felt unsupported by colleagues in their work caring for critically ill patients. They described struggling to find people to deploy to the ICU as backup (MD, P–01), and the reluctance of some coworkers to cover their clinical areas because of fears of catching the virus (AS, P–14).

In contrast, some participants described successful efforts by management to ensure adequate staffing and workplace support (RN, P–20). One RT also described how the decision to up-staff their department provided additional support, ensuring enough time given to each patient (RT, P–16). Participants also remarked that access to psychological therapy and open discussions regarding mental health helped to alleviate distress and enhanced perceptions on the value that was placed on their occupational wellbeing (MD, P–05).

Permeability of professional and personal lives

Participants shared that the COVID-19 pandemic blurred the boundaries between their professional and personal lives, with boundaries being rapidly effaced. The safety of family and friends was of utmost concern and participants in our study reduced chances of exposure at all costs (RN, P–20). Reconciling responsibility and risk was difficult for all and one MD described how challenging this was for families, explaining how his loved ones grappled with a desire to be supportive of his professional work while also being unwilling to risk his personal safety (MD, P–06). The COVID-19 pandemic was especially burdensome to HCW families with young children at home, forcing parents to juggle full-time childcare with work responsibilities. This was not only difficult logistically but also challenged family dynamics; for example, as one parent's work was prioritized over the other's (MD-T, P–04). Many HCWs

Table 2 Lived experiences and perspectives of HCWs in a single ICU during the COVID-19 pandemic

Theme	Quotation
<i>Communications and informational needs</i>	<p>The hospital itself sent a lot of and continues to send a lot of communication as to the large-scale hospital policies with regards to visitors and screening upon entrance and that sort of thing. And for my department specifically, our manager has been amazing about just keeping us up to date on everything. (RT, P-15)</p> <p>From an [allied staff] perspective, we weren't really spoken to about anything. I guess maybe because we're not medical professionals. There was nothing. (AS, P-19)</p> <p>To put the burden on us to remember everything, plus remember 10 additional things that are brand new, I think that's the stress. And even though each one of the things is easy to remember, when you're putting 10 things together and trying to remember all of them, plus worrying about other things, I think it gets overwhelming at times. (RT, P-12)</p>
<i>Adjusting to restricted visitation</i>	<p>Not being able to go into the room or at least avoiding going into the room means that you're not communicating enough. There was this kind of distance between the team and the patient that we normally don't have. (MD, P-17)</p> <p>It was a weird feeling because it challenged how we communicate with patients and families because the families wouldn't be present. We always made it a priority, like make sure we call every patient's family every day to give them an update because they all felt like they were really isolated from their family member who was in the ICU. (MD, P-01)</p> <p>I was exposed to communicating decisions around withdrawal of ECMO, which is one of the therapies, the last therapy that we have as a choice.</p> <p>Withdrawing that means that the patient dies probably sometimes in a matter of minutes. This was really difficult because this was done via Zoom, and the family saw the patient die through an iPad. (MD, P-17)</p>
<i>Staffing and workplace support</i>	<p>Because we don't belong to nursing stations, we are not able to go into the nursing station lounge because they look at us like weird, what are you doing here? We feel like we're being rejected. But we have been working from day one, and we haven't got that type of emotional support or hospitality. We don't feel supported. That's the bottom line. (AS, P-10)</p> <p>I think that our management, they are not available, because whatever issues we have right now are not important. At least that's the feeling. We try to get feedback. They're never available, there are other things at hand. (AS, P-10)</p> <p>We really worked as a unit. Because we knew that if one of us got sick, that there's a potential that a lot of us would have probably gotten sick. (RT, P- 12)</p> <p>We were trying to get other people and they had no interest because they didn't want to expose themselves to put their families at risk. Come on, we're not asking you to do something we're not willing to do. (MD, P-01)</p> <p>I saw people who didn't want to cover my clinical area because one, they were afraid or they were fearful, or they didn't have the knowledge and they didn't want to get the knowledge. (AS, P-14)</p> <p>We had good resources available. They increased staffing. So, we always had extra staff to help. (RN, P-20)</p> <p>For a few months during the peak of it, we up-staffed our department a bit, and so that also allowed us to feel a bit of extra support, especially when things did get busier and when we were a bit more strained, to kind of be able to see all the patients and give enough time to each one. (RT, P-16)</p> <p>I felt it was really important having early available psychiatry or psychological therapy, which our nursing staff did to provide support for anyone at any time. So, it was an open invitation. You didn't have to use it, but at least it was available, so if you would reach out. We had lots of discussions about wellness and things like that. (MD, P-05)</p>
<i>Permeability of professional and personal lives</i>	<p>I was changing in the hospital...and I didn't talk when I [went] back home, I didn't talk to anyone, I first showered, put my clothes in the laundry...hand sanitizers and all that. (RN, P-20)</p> <p>That was very stressful also for my family because they were worried. I mean, they support me in my desire to serve society as a physician, but they're not really willing to put me on the line to do that, they don't like that. (MD, P-06)</p> <p>When school shut down, day care shut down, and my husband had to look after our child full time. That is not what he's meant to do. That created a lot of tension. (MD-T, P-04)</p> <p>Friends, depending on what's going on in their life personally, sometimes reached out. Kind of like what happened with SARS, they were like, oh, you work in a COVID unit, we're staying away from you. (RN, P-21)</p> <p>People outside of medicine were like, oh, we're so proud and you're such a hero and all this. And honestly, I didn't think I was doing anything different, so it made me feel uncomfortable, I found those statements were unfounded. (MD, P-01)</p>

Table 2 continued

Theme	Quotation
<i>Dynamic COVID-19 landscape</i>	I mean, we are not heroes like all the propaganda say. I don't like that. I don't think we're heroes. (MD-T, P-03)
	At the beginning, the stress was the unknown because a lot of the people were getting infected, and we didn't know whether it's airborne or droplets and the information was changing every single day. (RN, P-22)
	Using public transit and seeing people who weren't wearing masks and people not following the rules, I thought about, do I still want to work in a hospital after this? (AS, P-19)
	Once we started having patients in the ICU, I think anxiety reduced quite a lot because I could understand how we would implement all of this, how the day would look, how we would care for these patients. But I think then the concern turned to, how could we actually do what we would usually do for these patients, with all these additional challenges surrounding patient care, wearing PPE, and how best to wear it, when to wear it. (MD-T, P-17)
	Definitely it was very stressful to work. When we didn't have too much information, it was extremely stressful, but right now I think we are more relaxed, we just calm down a little bit with the new signs. (RN, P-23)
I just wore a simple face mask yesterday, but now I'm being told to wear an N95. Does that mean I was at risk yesterday, or is that just a policy, or is it a supply issue? (MD-T, P-02)	
You never got a chance to be comfortable with anything and you were constantly questioning if you were doing the right process. (AS, P-14)	

AS = allied staff; ECMO = extracorporeal membrane oxygenation; HCW = healthcare worker; ICU = intensive care unit; MD = medical doctor; MD-T = medical doctor – trainee; RN = registered nurse; RT = respiratory therapist

also described stigma they experienced from friends outside of the ICU. Some participants described feeling like their friends were avoiding them, contributing to a sense of isolation (RN, P-21). An additional experience felt collectively among HCWs was unease with being depicted as a healthcare hero. They discussed feeling like the title was “unfounded” (MD, P-01), describing the hero-narrative as “propaganda” (MD-T, P-03).

A dynamic COVID-19 landscape

Healthcare workers working in the ICU during the COVID-19 pandemic perceived their experiences as complex and highly stressful. One RN (P-22) remembered feeling anxiety before the pandemic was declared because HCWs were faced with many unknowns regarding transmission. An AS (P-19) described their distress at witnessing public citizens disregarding health guidelines, articulating how this made them question their desire to work in a hospital. Participants shared their experiences with having to process continually changing policies while providing patient care, explaining that anxiety levels dropped somewhat after having patients in the ICU as they were able to visualize what care was needed, eliminating a fear of the unknown (MD-T, P-17).

Nevertheless, it was difficult to establish a routine in the ICU as policies and procedures were constantly evolving (AS, P-14). Some found the changing policies distressing

not only for the patient's safety but also their own (MD-T, P-02). Overall, most HCWs agreed the pandemic noticeably affected their roles, but several commented that they felt more comfortable as time went on (RN, P-23).

Discussion

We conducted a semistructured interview-based study to explore perspectives of HCWs in one ICU on the impact of the COVID-19 pandemic on their work environment, institutional support, and their professional and personal lives. Our findings indicate that practices to control the spread of SARS-CoV-2 changed the provision of care in the ICU, which transformed the way HCWs contributed to the care of critically ill patients. Across professions, HCWs highlighted increased collegiality and teamwork that enhanced respect and mutual support, which may have helped protect against stress related to the increasingly blurred boundaries between their personal and professional lives. Restricted visitation policies in the ICU led to complex situations that had communication and emotional consequences for HCWs, for example, when restricting family members from visiting their loved ones. The unintended negative outcomes of the COVID-19 pandemic on some HCWs hinged on the notion that, despite significant cooperation among colleagues, some

HCWs felt excluded by other members of the ICU care team.

Adequate social support promotes wellbeing and prevents burnout,^{9,35} and social support networks in the workplace enhance mental capacity, particularly in the face of traumatic experiences.³⁶ Our data align with those of earlier reports, showing that all HCWs in the ICU require a safe and supportive workplace to provide quality patient care^{37,38} because of the uncontrollable nature of acute and critical illness.³⁹ Dedicated efforts to enhance the culture and collegiality of the ICU environment, including formal psychological support^{40–43} during the COVID-19 pandemic and beyond, may build mental resiliency and safeguard against fatigue and burnout in ICU HCWs.⁴⁴

Providing support to family members of ICU patients is central to the practice of critical care medicine,^{45,46} and has been more challenging in the COVID-19 pandemic.^{38,47} While some institutions banned visitors altogether, the restricted visitation policies enacted in our institution in response to the COVID-19 pandemic were similar to mandated policies at other Canadian^{48,49} and American^{50,51} institutions. They often required families of patients to choose who would visit their loved one and who would stay behind,^{44,52} increasing distress among families and challenging HCWs to effectively communicate critical information to loved ones.⁵² Intensive care unit visitation restrictions placed an overwhelming mental health toll on HCWs,^{35,38} who grappled with fatigue while comforting dying, often isolated patients, navigating unfamiliar virtual modalities, and caring for their own colleagues who fell ill.^{6,53} Previous work found that insomnia, anxiety, depression, post-traumatic stress disorder, and burnout were prevalent among HCWs in ICUs throughout the pandemic.^{38,54,55} Transformative change in the ICU may include establishing care principles to ease the emotional burden of ICU HCWs during times of restricted visitation.⁵⁶ Our findings will complement research on the impact of the COVID-19 pandemic on patients and families and will help to inform HCWs and organizations about how to better care for patients, with attention to promoting patient- and family-centered care.^{6,57}

The COVID-19 pandemic necessitated reengineering the workplace environment, which affected not only the provision of services but also the general culture of the ICU.⁵⁸ Most research to date has reported on short-term impacts of the COVID-19 pandemic on HCWs, and has rarely included the perspectives of a professionally diverse sample of HCWs (i.e., including nonclinical staff). Longer-term consequences of the pandemic are unknown.^{39,59–61} Additional communication for HCWs in ICUs that emphasizes transparency, respect, humanization, and dignity⁶² might come in the form of long-term support plans delivered by ICU policy liaison teams to help

facilitate communication between HCWs and patients' families.^{63–66} As well, policy liaison teams for HCWs and psychologists available for mental health support may help to ameliorate the impact on ICU HCWs during the COVID-19 pandemic and beyond.^{29,67} Past research has also highlighted the value of providing training courses along with sufficient PPE to help reduce anxiety around viral transmission felt by HCWs concerned about infecting their loved ones.^{38,57} Digital transformation for bridging gaps in connection,⁵² particularly regarding the emergence of remote monitoring technologies,⁵⁶ is an attractive area for future research. Widespread adoption of things like telemedicine⁶⁸ and the use of artificial intelligence as a diagnostic tool⁶⁹ would help make healthcare more accessible to Canadians.

Our study has several strengths including an interview guide codesigned with a PhD researcher and clinician and pilot tested with critical care nurses. We sampled participants across a variety of occupations and conducted interviews individually. This allowed HCWs time and space to share their perspectives and offer important insights on the challenges and psychological burden they experienced.

There are limitations to consider when interpreting the findings of our study. First, the study sample was dependent on the availability of frontline HCWs in the ICU during the pandemic. This might have resulted in selection bias toward individuals with more time and perhaps better mental health. Second, we only sent one reminder as we were cautious to not overburden individuals already under increased personal and professional strain. For these reasons, it is possible that important perspectives were missed. Third, this was a single-center qualitative study with 23 HCWs; although the statistical generalizability (whether the results from a representative sample of participants can be applied to a wider population or different contexts of these findings) of our findings is limited,⁷⁰ alignment with earlier research^{3,26} suggests good transferability (the extent to which results can be applicable in other contexts/ situations/times/ populations).⁷¹ Finally, our small sampling frame was not diverse enough to explore the role of sociocultural factors (e.g., gender, ethnicity) or additional professional factors (e.g., work experience) in ICU HCW's experiences. The extensive damage inflicted by historical pandemics on society, the economy, and health was due to characteristics of the pathogen and lack of public health resources at the time. These risks are not comparable with those posed by the COVID-19 pandemic; these risks arise not from the pathogen, but rather from indirect effects of control measures on health and core societal activities.

Conclusion

Healthcare workers in the ICU perceived that the COVID-19 pandemic had negative repercussions on their work environment, including staffing and institutional support, as well as their professional and personal lives. Continually changing institutional policies meant that ICU HCWs had to care for critically ill patients while understanding and adapting to policies that changed the way they contributed to the care of critically ill patients. Further research with larger and more diverse samples of ICU HCWs is required to validate these findings.

Author contributions Sangeeta Mehta and Jeanna Parsons Leigh conceived of the study. All authors contributed to the study design. Sara J. Mizen, Alexandra Dodd, and Chloe de Groot conducted the analyses. Sara J. Mizen, Stephana Julia Moss, Rebecca Brundin-Mather, and Jeanna Parsons Leigh prepared the initial manuscript draft. All authors substantively revised the manuscript.

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