

RESEARCH ARTICLE

Psychological distress, depression symptoms and fatigue among Quebec nursing staff during the COVID-19 pandemic: A cross-sectional study

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Funding information

This study was funded by the Quebec Network on Nursing Intervention Research (RRISIQ—Réseau de recherche portant sur les interventions en sciences infirmières du Québec).

Abstract

Aim: To describe the state of health of Quebec nursing staff during the pandemic according to their exposure to COVID-19, work-related characteristics and sociodemographic factors (gender, generational age group). State of health was captured essentially by assessing psychological distress, depression symptoms and fatigue.

Design and methods: A large-scale cross-sectional study was conducted with 1,708 nurses and licenced practical nurses in Quebec (87% women, mean age of 41 ± 11 years). The survey included several questionnaires and validated health-related scales (psychological distress, depression symptoms and fatigue). The STROBE guidelines were followed in reporting the study's findings.

Results: Results showed that the prevalence of psychological distress and depression symptoms was moderate to severe. Women, generation Xers and Yers, nurses who cared for COVID-19 patients and those with a colleague who was infected with COVID-19 at work scored higher for fatigue, psychological distress and depression.

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KEYWORDS

COVID-19, cross-sectional study, depression, fatigue, nurses, psychological distress

1 | INTRODUCTION

During an epidemic or pandemic, healthcare workers (HCWs), and particularly nursing staff, in contact with infected and potentially infected people are at high risk for physical and mental health problems. In a rapid systematic review of 50 studies, Cabarkapa et al. (2020) found that the psychological implications for HCWs were variable but that several studies nevertheless demonstrated an increased risk for stress-related disorders, depression and anxiety. In a rapid systematic review and meta-analysis of 117 studies, 18 of which focussed on nurses specifically, examining the impact of viral epidemic outbreaks and pandemics (e.g., COVID-19, SARS and Ebola) on the mental health of HCWs, Serrano-Ripoll et al. (2020) reported pooled prevalence estimates of 40% for acute stress disorder, 30% for anxiety, 28% for burnout, 24% for depression and 13% for post-traumatic stress disorder. Female gender and working in a high-risk environment (i.e. caring for infected patients) were factors associated with the likelihood of developing mental health problems. In their literature review of 36 studies, Brandford and Reed (2016) confirmed a troublingly high prevalence of depression symptoms in the nursing population. Their results suggested that a variety of factors predicted this depression: female Registered Nurse (RN), younger age, fewer years of work experience as RN and work setting.

2 | BACKGROUND

At present, the majority of studies examining the repercussions of the COVID-19 pandemic on the mental health of HCW, and particularly nurses, have been conducted in China (De Kock et al., 2021; Pappa et al., 2020). In the rapid review by De Kock et al. (2021), where 18 of the 24 studies examined were carried out in China, results indicated that the pandemic had a considerable impact on the psychological well-being of HCWs and that nurses were at higher risk for adverse mental health consequences. In their systematic review, where all but one of the 13 studies considered were carried out in China, Pappa et al. (2020) found that the pooled prevalence of anxiety and depression, respectively, was 23.2% ($n = 12$ studies) and 22.8% ($n = 10$ studies) and that anxiety and depression were more prevalent among women than men. Moreover, a subgroup analysis showed that nursing staff experienced more psychological distress and anxiety than physicians did.

To date, studies conducted with nursing cohorts in China (Kang et al., 2020; Lai et al., 2020; Nie et al., 2020; Zhang et al., 2021), the Philippines (Labrague & Santos, 2020) and Turkey (Yörük & Güler, 2021) have revealed high levels of anxiety, psychological distress, depression and insomnia. This raises the question of why so much distress among nurses in particular. According to Pappa

et al. (2020), certain conditions might explain this above and beyond female gender. Working or being in close contact with patients and their loved ones meant that nursing staff were exposed to a higher risk for transmission, grief and death (Pappa et al., 2020; Serrano-Ripoll et al., 2020). Zhang et al. (2021) added that how nursing work was organized, also, contributed to this state of affairs by forcing nurses to work overtime, depriving them of sufficient rest (sleep) and failing to provide essential medical protective equipment in some care settings (World Health Organization, 2020).

The results of studies (Comfort et al., 2021; Havaei et al., 2021; Smith et al., 2020) and surveys (Registered Practical Nurses Association of Ontario, 2021; Statistics Canada, 2021) carried out in North America have indicated also that the health of HCWs, including nurses, was weakened. In a cross-sectional correlational study conducted in British Columbia, Canada, Havaei et al. (2021) examined the impact of COVID-19 workplace conditions on mental health outcomes in a sample of 3,676 nurses and found the following prevalence rates: post-traumatic stress disorder 47%, anxiety 38%, depression 41% and high emotional exhaustion 60%. Binnie et al. (2021) reported high distress levels among HCWs (64.5%) in intensive care units (exposed to patients with COVID-19) affiliated with more than 30 Canadian institutions (78.1% of the sample was recruited in Ontario and 7.7% in Quebec). They noted that distress was more frequent among nurses (75.7%) than physicians (49.4%) and was higher among females (64.9%) than males (47.6%). As the majority of COVID-19 cases and deaths have occurred in the Canadian provinces of Quebec and Ontario (Public Health Agency of Canada, 2020), it is essential to grasp the impact of this outbreak on the health of nursing staff and to understand the immediate repercussions on their mental health in order to quickly implement measures to counter these deleterious effects. To our knowledge, there has been no study carried out with nursing staff in Quebec. Poor psychological health among nurses can also have a negative impact on how they perform at work (Li et al., 2017). Furthermore, HCWs, including nurses, with sleep disorders and anxiety and depression symptoms have been found to be at higher risk for adverse safety outcomes such as motor vehicle crashes (MVC), near-miss MVCs, exposure to potentially hazardous materials at work and medical errors (Weaver et al., 2020).

Against this background, we undertook a study to describe the state of health of nursing staff in Quebec, Canada, during the COVID-19 pandemic. As nurses and licenced practical nurses (LPN) are part of nursing staff in Quebec, both were included in the study. We sought to answer the following question: Did various dimensions (e.g., psychological distress, depression and fatigue) of the state of health of nursing staff vary by exposure to COVID environments, work-related characteristics (acute care and long-term care) and sociodemographic variables (gender and age)?

3 | METHODS

The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines (von Elm et al., 2014) were followed in reporting on this large-scale cross-sectional study (Appendix S1). This study was part of a larger cross-sectional survey. The methods used are summarized below but have been presented in greater detail elsewhere (Gélinas et al., 2021).

3.1 | Design and sample

Nursing staff in the province of Quebec were eligible to take part in the study if they were registered members of the College of Nurses of Quebec or the College of Licensed Practical Nurses of Quebec and if they had consented to be contacted for research projects. These two professional organizations randomly selected about 25% to 30% of their eligible members. This amounted to some 15,000 RN and LPN. Power analysis was run on the G*Power software version 3.1. Ratios from 0.15 to 1 were considered given that the groups compared were not all of equal size. Samples of 752 to 1,652 participants were required to perform *t* tests with an alpha of 0.01 with Bonferroni correction to account for multiple tests (0.05/5), a power of 80% and an effect size of 0.25. A minimum of 228 participants was required for ANOVAs ($\alpha = 0.01$, 80% power, 0.25 effect size) with three independent groups.

3.2 | Context of study

The study data were collected from 22 July to 16 November 2020. In Canada, the first wave of the pandemic lasted from mid-March to late June 2020 and the second began in early September and was ongoing in February 2021 (Canadian Public Health Association, 2021). As at early May 2021, more than 1.2 million people had been infected with COVID-19 and close to 25,000 had died from it in Canada (Public Health Agency of Canada, 2021).

3.3 | Ethics

Ethics approval was obtained for this study from the Medical/Biomedical Research Ethics Committee of the *Centre intégré universitaire de santé et services sociaux (CIUSSS) du Centre-Ouest-Montréal* to conduct this study (2021-2451).

3.4 | Procedure

Invitations were emailed by the research team or the professional organization (i.e. College of Licensed Practical Nurses of Québec) to nursing staff. The invitations included a link to an information and consent form that nurses had to complete before moving on to

complete an anonymous survey on the Qualtrics [Provo, UT, USA. July 2020] secure cloud-based data capture platform. Participants had the choice of completing the survey in French or English. Two reminder emails were sent out at 2-week intervals.

3.5 | Instruments

The survey comprised questionnaires covering sociodemographic and work-related characteristics, exposure to COVID-19 and self-perceived health, as well as validated health-related scales for measuring psychological distress, depression symptoms and fatigue.

3.5.1 | Sociodemographic and work-related characteristics

The sociodemographic characteristics considered were gender, age and generation membership. Generation membership was determined by year of birth: baby-boom (1946–1963), X (1964–1980) and Y (1981–2000). Work-related data included professional role (Registered Nurse or licenced practical nurse), years of work experience in current setting and in profession, work area and healthcare setting (acute care, long-term care or other).

3.5.2 | Exposure to COVID-19

Seven two-choice questions covered the following: perceived preparedness to offer safe care during pandemic (0 = poorly to very poorly prepared or 1 = well to very well prepared), cared for COVID-19 patients or not (yes/no), cared for patients who died from COVID-19 (yes/no), involved in a COVID-19 initiative (e.g., direct patient care, screening, administration; yes/no), infected with COVID-19 (yes/no), member of team infected with COVID-19 at work (yes/no) and sense of being overwhelmed by situation at work (0 = not yet affected/under control or 1 = overwhelmed). These questions were developed by professional organization and the research team.

3.5.3 | Self-perceived health

There was one general question in this regard: How would you rate your current health status compared with your health status before the pandemic? Five possible answers ranged from “greatly improved” to “greatly deteriorated.”

3.5.4 | Psychological distress

The K6 psychological distress questionnaire was used. Its six items are rated on a five-point descriptive scale ranging from 0 (*none of the time*) to 4 (*all of the time*) (Kessler et al., 2002). A total score is

obtained by tallying the ratings on the items, which makes for a possible score range of 0–24. A cut-off score of 13 or higher indicates non-specific serious psychological distress. The scale discriminates between community cases and non-cases of DSM-IV disorders. The instrument's internal consistency was found to be good in our study sample (Cronbach alpha coefficient of 0.88 and 0.87 for the English and French versions respectively).

3.5.5 | Depression symptoms

The nine-item Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001) is rated on a four-point descriptive scale from 0 (*not at all*) to 3 (*nearly every day*), yielding a possible total score of 0–27. It is used as a depression screening tool. A score of 0–4 indicates absence of or minimal symptoms; 5–9, mild symptoms; 10–14, moderate symptoms; and ≥ 15 , severe symptoms. Criteria validity and internal validity (with two different patient populations produced Cronbach alphas of 0.86 and 0.89) have been established. The internal consistency of the English and French versions of the PHQ-9 was found to be good in our study sample (Cronbach alpha coefficient of 0.88 and 0.89 respectively).

3.5.6 | Fatigue

The Occupational Fatigue Exhaustion Recovery Scale (OFER; Winwood et al., 2005) was used to measure fatigue. It is a 15-item self-report scale comprising three subscales: chronic fatigue (items 1–5), acute fatigue (items 6–10) and inter-shift recovery (items 11–15). This last subscale can be considered as a measure of persistent fatigue between shifts. The items are rated on a seven-point Likert scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*). As instructed by the instrument's creators, items 9, 10, 12 and 14 were re-coded. For each subscale, a score was computed using the following formula: sum of the 5 items/30 \times 100. The score could range from 0 to 100, with higher scores indicating greater fatigue. The instrument has demonstrated good construct validity (convergent and discriminant) and high internal reliability across subscales (>0.84) (Winwood et al., 2005). In our study, the internal consistency of the three subscales as assessed by the Cronbach alpha coefficient ranged from 0.82 to 0.91 for the French version and from 0.83 to 0.89 for the English version.

3.6 | Data analysis

IBM SPSS Statistics version 24 was used for data analysis. Descriptive statistics were computed for all variables—frequencies, means and standard deviations (SD), and medians and interquartile ranges (IQR)—depending on the level of measurement of the variable. All the health-related variables (i.e. psychological distress, depression symptoms and fatigue) were normally distributed with

skewness and kurtosis indices less than ± 2 (Kim, 2013). Health-related variables were compared against other variables (i.e. sociodemographic, work-related and COVID-19 exposure) using *t* tests for two independent groups and using ANOVA for three groups. There were less than 3% missing data for each study variable; missing data were not replaced.

4 | FINDINGS

4.1 | Sample characteristics

Our sample was composed of 1,708 participants, which translated into a participation rate of about 11%. Most of the participants were women (87%). Mean age of the sample was 41 ± 11 years. The mean years of professional experience was 14 ± 10 years. Sample characteristics and descriptive results for the variables are presented in Table 1.

4.2 | Variables related to nursing staff's health and exposure to COVID-19

Of the sample, 20% experienced serious psychological distress and 27% reported moderate-to-severe depression symptoms. Moderate levels of chronic, acute and persistent fatigue were reported as well. Whereas 55% of the nursing staff mentioned that their state of health had not changed during the pandemic, 40% reported that it had deteriorated.

Nursing staff was distributed across three care settings: acute care, long-term care and others (e.g., community care, mental health and public health). Almost half of the participants reported that they had cared for COVID-19 patients, of which 60% had cared for patients who died from the disease. Also, 81.2% of the nursing staff had been involved in a COVID-19 initiative (e.g., screening, nursing care, administrative duties), 11.8% reported having contracted COVID-19, and 49.7% reported that a member of their team had been infected at work. Finally, 30.6% of the nursing staff felt that they were not adequately prepared to provide safe care during the pandemic and 43.1% felt overwhelmed at work.

4.3 | Nursing staff's health by exposure to COVID-19

Nursing staff who cared for COVID-19 patients scored higher for psychological distress, depression symptoms and fatigue than did those who did not care for these patients. Also, nursing staff who reported that a member of their team had been infected at work scored higher for psychological distress, depression symptoms and fatigue than did those who did not report such an experience. However, no significant difference emerged in terms of psychological distress, depression symptoms and fatigue with respect

TABLE 1 Sample characteristics (n = 1,708)

Variables		
Gender ^a	Woman, n (%)	1,487 (87.1)
	Man, n (%)	186 (10.9)
	Other or Prefer not to answer, n (%)	33 (2.0)
Age	mean (SD); median (IQR)	41.10 (10.82); 40 (33–49)
Generation ^b	Y, n (%)	804 (47.3%)
	X, n (%)	746 (43.9%)
	Baby boomers, n (%)	149 (8.8%)
Professional role	LPN, n (%)	916 (53.6)
	RN, n (%)	792 (46.4)
Years of professional experience ^c	mean (SD); median (IQR)	14.01 (10.27); 12 (6–18)
Years of experience in current setting ^d	mean (SD); median (IQR)	9.14 (8.24); 7 (3–13)
Healthcare setting	Acute care, n (%)	511 (29.9)
	Long-term care, n (%)	561 (32.8)
	Other, ^e n (%)	636 (37.2)
Provided care to COVID-19 patients	Yes, n (%)	782 (45.9)
Provided care to COVID-19 patients who died ^f	Yes, n (%)	468 (59.9)
Psychological distress (total score) ^{g,h}	mean (SD); median (IQR)	8.14 (5.06); 8 (4–12)
Psychological distress (categories) ^g	Non-specific serious psychological distress, n (%)	1,358 (80)
	Serious psychological distress, n (%)	339 (20)
Depression symptoms (total score) ^{i,j}	mean (SD); median (IQR)	6.56 (5.62); 5 (2–10)
Depression symptoms (categories) ⁱ	Absence of or minimal symptoms, n (%)	732 (43.6)
	Mild symptoms, n (%)	502 (29.8)
	Moderate symptoms, n (%)	278 (16.5)
	Severe symptoms, n (%)	172 (10.2)
Chronic fatigue score ^{k,l}	mean (SD); median (IQR)	52.56 (28.52); 56.67 (30–76.67)
Acute fatigue score ^{l,m}	mean (SD); median (IQR)	59.19 (24.08); 60 (43.33–76.67)
Persistent fatigue score ^{l,n}	mean (SD); median (IQR)	51.96 (22.86); 53.33 (36.67–66.67)
Health status perception (total score) ^{o,p}	mean (SD); median (IQR)	3.41 (0.71); 3 (3–4)
Health status perception (categories) ^o	Greatly improved/improved, n (%)	77 (4.5)
	Has remained the same, n (%)	936 (54.9)
	Deteriorated/Greatly deteriorated, n (%)	691 (40.6)

Abbreviations: IQR, Interquartile range; LPN, licenced practical nurses; RN, Registered Nurses; SD, Standard deviation.

^aMissing data, n = 2.

^bMissing data, n = 9.

^cMissing data, n = 20.

^dMissing data, n = 25.

^eOther settings included community care, mental health and public health.

^fAmong those who provided care to COVID-19 patients (n = 782).

^gMissing data, n = 11.

^hPossible score range: 0–24.

ⁱMissing data, n = 21.

^jPossible score range: 0–27.

^kMissing data, n = 12.

^lPossible score range: 0–100.

^mMissing data, n = 14.

ⁿMissing data, n = 22.

^oMissing data, n = 4.

^pPossible score range: 1–5.

to having cared for patients who died from COVID-19, having contracted COVID-19 or having been involved in a COVID-19 initiative.

The results showed that nursing staff who felt poorly prepared to offer safe care during the pandemic scored higher for psychological distress, depression symptoms and fatigue than did those who felt well prepared. Nursing staff who felt overwhelmed at work scored higher for psychological distress, depression symptoms and fatigue than did those who reported not being affected yet or being in control. Table 2 presents these results.

4.4 | Nursing staff's health by work-related characteristics and sociodemographic variables

Regarding nursing staff's health, significant differences emerged for fatigue and its three subscales according to work setting. Nursing staff who worked in acute care and in long-term care scored higher for fatigue than did those who worked in other settings such as community care, mental health and public health. There was no significant difference between nursing staff working in acute care and those working in long-term care. Also, licenced practical nurses reported greater persistent fatigue than did Registered Nurses.

Regarding age, significant differences were noted between nursing staff in the baby-boom generation (born in 1946–1963), generation X (born in 1964–1980) and generation Y (born in 1981–2000) on all of the psychological variables. Baby boomers felt less fatigue (on all three subscales) than Xers and Yers did. Also, baby boomers scored lower than Xers and Yers did for psychological distress and depression symptoms. Moreover, Yers scored higher than Xers did for psychological distress and depression symptoms.

As for gender, women scored higher than men did for acute fatigue, depression and psychological distress (see Tables 3 and 4).

5 | DISCUSSION AND RECOMMENDATIONS

Our study shed light on a few aspects of the state of health of nursing staff in Quebec during the COVID-19 pandemic, more specifically in terms of psychological distress, depression symptoms and fatigue. Most of our nursing cohort was exposed to COVID-19. Our results show that the prevalence of psychological distress and of depression symptoms was moderate to severe. Nursing staff who scored higher for fatigue, psychological distress and depression symptoms were women, generation Xers or Yers, those who cared for COVID-19 patients, those with a colleague who had been infected with COVID-19 at work and those who felt poorly prepared to offer safe care to persons with COVID-19. Also, nursing staff who felt overwhelmed at work scored higher for fatigue and depression symptoms, but not psychological distress. Finally, working in acute care or long-term care was associated with higher scores for acute, chronic and persistent fatigue.

In general, the psychological distress and depression scores obtained in our sample are comparable to those reported in other studies of HCWs, particularly nurses. Clearly, exposure to the pandemic places HCWs at risk. In this regard, the Canadian survey by Smith et al. (2020) found a high prevalence of anxiety (55%) and depression symptoms (42% with the PHQ-2) in a sample of 5,988 Canadian HCWs during the COVID-19 pandemic.

In our study, 27% of the nursing staff reported a moderate-to-high level of depression symptoms, as measured with the PHQ-9. This is comparable to the rate (28.6%) reported by Kang et al. (2020) among 994 HCWs in Wuhan, the vast majority of which were nurses ($n = 811$). In their survey of 3,363 nurses in British Columbia, Havaei et al. (2021) reported a much higher rate of depression symptoms (41%). However, the study by Lai et al. (2020) with 764 nurses in China and the other by Hong et al. (2021) with 4,692 nurses in 42 government-designated COVID-19 hospitals during the outbreak observed lower rates of depression symptoms, respectively, 15.5% and 9.4%. Hong et al. (2021) explained that HCWs in Wuhan experienced more distress and heavier workloads than did those in other regions. Our study showed that 20% of nursing staff experienced psychological distress. Furthermore, 40% of the nursing staff in our study perceived that their general state of health had deteriorated during the pandemic, compared with 30% in the study by Kang et al. (2020). In other words, similar levels of depression symptoms and self-perceived health deterioration were found in our sample and in the Wuhan sample. Elsewhere in the world, Simonetti et al. (2021) noted a high prevalence of moderate anxiety (33.2%), sleep disturbances (71.4%) and low self-efficacy (50.6%) in a cohort of 1,005 nurses working in different types of hospital wards in Italy.

In addition, the nursing staff in our sample who cared for COVID patients scored higher for psychological distress, depression symptoms and fatigue. Lai et al. (2020), too, noted that HCWs who cared for persons with or suspected of having COVID-19 were more likely to experience depression symptoms. In their study, 522 participants (41.5%) were frontline HCWs directly involved in diagnosing, treating or caring for COVID-19 patients. These results are similar to those of Sagherian et al. (2020) who noted that "nurses who cared for COVID-19 patients had significantly scored worse on almost all measures than their co-workers."

Other variables also related to COVID-19 exposure had an influence on caregivers' well-being. The results of our study revealed higher levels of psychological distress, depression symptoms and fatigue among nursing staff who felt ill prepared for and overwhelmed by the situation and who had a team member infected with COVID at work. Contrary to the findings reported by Firew et al. (2020) in their study involving 2,040 HCWs, the participants in our study who contracted COVID-19 did not have higher levels of psychological distress or depression symptoms than those who were not infected. However, in the Lake et al. (2021) study, what caused the most distress in nurses during the COVID-19 pandemic was risk of transmission to family members. In their study carried out with 263 frontline nurses, Nie et al. (2020) reported that effective precautionary measures were negatively associated with psychological distress. In a

TABLE 2 Mean differences in nursing staff's health by four variables: provided care to patients with COVID-19, team member infected with COVID-19, perceived preparedness to offer safe care, sense of being overwhelmed (independent sample t test)

Variables	Provided care to patients with COVID-19 ^a			Team member infected with COVID-19 during work ^{b,c}			Perceived preparedness to offer safe care ^d			Sense of being overwhelmed by situation ^e		
	n	Mean (SD)	t	n	Mean (SD)	t	n	Mean (SD)	t	n	Mean (SD)	t
Psychological distress score	Yes	775	8.48 (5.12)	Yes	838	8.55 (5.10)	Yes	517	10.17 (5.13)	Yes	963	6.69 (4.68)
	No	919	7.86 (4.99)	No	826	7.70 (5.01)	No	1,175	7.26 (4.76)	No	725	10.08 (4.91)
Depression symptoms score	Yes	774	7.12 (5.82)	Yes	833	7.10 (5.69)	Yes	516	8.73 (5.95)	Yes	956	5.27 (5.20)
	No	911	6.10 (5.42)	No	822	6.02 (5.50)	No	1,168	5.60 (5.18)	No	724	8.25 (5.70)
Chronic fatigue score	Yes	780	56.06 (28.20)	Yes	842	56.11 (27.68)	Yes	516	64.28 (26.42)	Yes	961	43.14 (27.89)
	No	913	49.63 (28.43)	No	822	49.21 (28.94)	No	1,176	47.51 (27.85)	No	728	65.10 (24.16)
Acute fatigue score	Yes	778	61.63 (24.19)	Yes	840	61.41 (23.85)	Yes	517	66.35 (21.24)	Yes	958	53.29 (24.61)
	No	913	57.16 (23.77)	No	823	57.05 (24.17)	No	1,173	56.10 (24.83)	No	729	66.98 (20.86)
Persistent fatigue score	Yes	779	55.36 (23.40)	Yes	837	54.69 (22.76)	Yes	518	59.49 (21.79)	Yes	952	45.51 (22.16)
	No	905	49.01 (21.99)	No	818	49.13 (22.70)	No	1,165	48.63 (22.52)	No	728	60.41 (20.94)

Abbreviation: CI, confidence interval.

* $p < .01$; ** $p < .001$.

^aSince the start of the COVID-19 pandemic, have you provided care to people infected with COVID-19?

^bHas a member of your team been infected with COVID-19 in the course of their professional duties?

^c27 participants preferred not to answer and 7 had missing data.

^dWould you say that you are very well, somewhat well, somewhat poorly or very poorly prepared to offer safe health care to the population during the current COVID-19 pandemic?

^eSense of being overwhelmed by situation at work (0 = not yet affected/under control or 1 = overwhelmed).

TABLE 3 Mean differences in nursing staff's health by healthcare setting and generation (ANOVA)

Variables	Healthcare settings (n = 1,708)			Generation (n = 1,699)		
	n	Mean (SD)	F	n	Mean (SD)	F
Psychological distress			2.70 ^{ns}			37.78**
	Other	632	7.82 (5.11)	Y	802	8.96 (5.22)
	Long-term care	555	8.16 (5.08)	X	739	7.83 (4.74)
	Acute care	510	8.52 (4.97)	Boomers	147	5.23 (4.46)
Depression symptoms			1.22 ^{ns}			24.07**
	Other	628	6.34 (5.56)	Y	798	7.18 (5.67)
	Long-term care	555	6.85 (6.00)	X	735	6.46 (5.61)
	Acute care	504	6.51 (5.24)	Boomers	145	3.72 (4.35)
Chronic fatigue			9.63**			21.14**
	Other	631	48.69 (29.01)	Y	803	54.76 (27.83)
	Long-term care	554	55.50 (28.95)	X	741	52.94 (28.24)
	Acute care	511	54.14 (26.91)	Boomers	143	38.18 (29.76)
Acute fatigue			7.88**			20.11**
	Other	629	56.21 (25.22)	Y	800	60.57 (23.07)
	Long-term care	555	61.28 (23.64)	X	741	60.00 (24.15)
	Acute care	510	60.61 (22.76)	Boomers	144	47.18 (25.96)
Persistent fatigue			10.78**			18.60**
	Other	624	48.61 (23.74)	Y	800	52.91 (22.50)
	Long-term care	553	54.03 (22.25)	X	736	53.08 (22.29)
	Acute care	509	53.81 (21.96)	Boomers	141	40.87 (24.50)

^{ns} $p > .05$, * $p \leq .05$, ** $p \leq 0.01$.

TABLE 4 Mean differences in nursing staff's health by gender and professional role (independent sample t test)

Variables	Gender ^a (n = 1,673)			Professional role (n = 1,708)		
	n	Mean (SD)	t	n	Mean (SD)	t
Psychological distress			1.95 [*]			-0.02 ^{ns}
	Woman	1,477	8.22 (5.10)	RN	789	8.14 (5.02)
	Man	186	7.45 (4.78)	LPN	908	8.15 (5.11)
Depression symptoms			2.06 [*]			-0.85 ^{ns}
	Woman	1,469	6.63 (5.65)	RN	784	6.43 (5.41)
	Man	183	5.73 (5.28)	LPN	903	6.67 (5.79)
Chronic fatigue			1.88 ^{ns}			-0.71 ^{ns}
	Woman	1,476	52.89 (28.58)	RN	787	52.02 (28.12)
	Man	186	48.73 (27.10)	LPN	909	53.01 (28.87)
Acute fatigue			3.42**			-0.25 ^{ns}
	Woman	1,474	59.78 (24.05)	RN	785	59.04 (24.98)
	Man	185	53.39 (23.68)	LPN	909	59.33 (23.28)
Persistent fatigue			1.04 ^{ns}			-3.03**
	Woman	1,469	51.98 (22.89)	RN	785	50.16 (23.77)
	Man	182	50.13 (22.15)	LPN	901	53.53 (21.93)

Abbreviation: CI, confidence interval.

^{ns} $p > .05$, * $p \leq .05$, ** $p \leq .01$.

^aThe analyses were performed on participants who reported identifying as woman or man.

survey conducted 13–26 months after the SARS outbreak in Canada, Maunder et al. (2006) reported that perceived adequacy of training and support had a protective effect on the psychological health of HCWs. Recently, a study by Smith et al. (2020) showed perceived non-adequacy of personal protective equipment and workplace infection control procedures to be associated with higher levels of anxiety and depression symptoms. Also, Havaei et al. (2021) reported that negative assessments of organizational support and pandemic preparedness were associated with higher scores for depression and anxiety. Along these lines, Labrague et al. (2020) reported that perceived organizational support was associated with lower levels of COVID-related anxiety. These findings raise the question whether poor preparedness and support contributed to the distress experienced by our nursing staff sample.

Aside from psychological distress and depression symptoms, our study also examined fatigue and particularly fatigue between shifts, when nursing staff is supposed to recover in order to be able to perform properly when they return to work. It emerged from our study that nursing staff presented moderate-to-high levels of chronic, acute (end-of-shift) and persistent (inter-shift) fatigue. Our results correlate with those reported by Sagherian et al. (2020), who revealed in the context of the pandemic moderate-to-high chronic fatigue and high acute fatigue among 587 hospital nurses and nursing assistants in the United States. According to Winwood et al. (2005), poor inter-shift recovery tended towards chronic and persistent fatigue. Fatigue was more of an issue in acute care and in long-term care settings where nursing staff is more exposed to COVID-19. Few studies have examined this variable in the context of COVID-19 related care. Most studies have focussed on insomnia, which has been found to be prevalent among HCWs (Pappa et al., 2020). The consequences of work-related fatigue can be significant for productivity and even more so for individual well-being. It can also undermine quality of care and patient safety. Regarding care settings, Crowe et al. (2021) found that, in the early stages of the pandemic, nurses who worked in critical or acute care experienced mild-to-severe depression (57%), anxiety (67%) and stress-related symptoms (54%).

5.1 | Nursing staff's mental health pre-COVID-19

What should we make of the mental health of nursing staff? Is it possible that their mental health had already been undermined well before the pandemic and that the pandemic exacerbated the situation? Research conducted 1 year prior to the pandemic demonstrated that the mental health of nurses in Canada had indeed already been weakened. A study involving 4,267 Canadian nurses revealed a rate of depression symptoms (36% with the PHQ-9) just as high as we observed in our study (27%) (Stelnicki & Carleton, 2020). A recent pre-COVID study in British Columbia found that one-third of a sample of 5,500 nurses met the criteria for anxiety and depression and that half were above the cut-off point for post-traumatic stress disorder symptoms (Havaei et al., 2020).

According to the review by Brandford and Reed (2016), women are more likely than men to suffer from psychological distress and depression symptoms. The results of our study revealed that women experienced more acute fatigue, psychological distress and depression symptoms than men did. Men made up 11% of our nursing staff sample (men represented 11.5% of nursing personnel in Quebec in 2019–2020 (OIIQ, 2020)). According to Regenold and Vindrola-Padros (2021), the impact of the COVID-19 pandemic needs to be examined under a gender lens. Their findings demonstrated “that gender is significant when understanding the experiences of HCWs during COVID-19 as it illuminates ingrained inequalities and asymmetrical power relations, gendered organizational structures and norms, and individual gendered bodies that interact to shape experiences of healthcare workers” (p. 1).

In addition to gender, younger age and fewer years of work experience also contribute to depression symptoms (Brandford & Reed, 2016). The older generation of baby boomers (born 1946–1963) scored lower for psychological distress, depression symptoms and fatigue than did the younger generations of Xers (born 1964–1980) and Yers (born 1981–2000). Also, the youngest generation, the Yers 20–39 years old at time of study, experienced greater psychological distress and depression symptoms than did the generation of Xers before them. Other studies showed initial evidence that the negative psychological impact of COVID-19 pandemic hits young people harder than older (Henderson et al., 2020; Justo-Alonso et al., 2020). There are important generational differences in the prevalence of poorer mental health. It is markedly higher in those age 19, followed by those aged 30 and then those aged 50 and 62 years (Henderson et al., 2020). Moreover, in the context of the pandemic, having children could be a considerable source of stress and anxiety (Regenold & Vindrola-Padros, 2021). Not only do female nursing staff worry about possibly bringing COVID-19 home to their families but they must also balance work and family life, which is demanding. In fact, their caring responsibilities are twofold. Organizational strategy such as mentorship programme should be promoted to engage baby boomers as mentors to help the youngest generation to better cope with the negative psychological impacts of the COVID-19.

5.2 | Limitations

Though our participation rate of 11% may seem low, it was entirely expected and is comparable to the participation rate in the Havaei study (2021) conducted in British Columbia where participants received \$100 in compensation for their time. Also, as our study suffers from an obvious selection bias (only nurses who wanted to be contacted to participate in a research were invited to participate), our results cannot be generalized to the entire nursing population. Although the majority of the instruments that we used possess good psychometric properties, the fact that we used only a single item to measure self-perceived health means that our assessment of this dimension is far from comprehensive. Also, psychological distress

might have predated the pandemic for other reasons. Moreover, a single-time-point survey did not allow us to examine change over time during the pandemic. To date, the majority of cross-sectional studies have focussed on COVID's immediate impact. What will happen over the long term? Longitudinal studies will need to be undertaken to fill this gap as new variants emerge and the next wave begins to swell.

6 | CONCLUSION

Our results support the universality of the impact of the COVID-19 experience on nurses' mental health (The International Council of Nurses, 2021). Moreover, our findings brought to light an array of variables associated with a weakened state of mental health among nursing staff. However, these provide no more than a fragmented understanding of the phenomenon, given the complexity of the myriad of factors involved in mental health (Gray et al., 2019). Our findings do support an urgent need to mitigate harm among these HCWs, particularly nursing staff.

6.1 | Relevance for clinical practice: Mental health interventions for nursing staff

Given that one of the objectives of healthcare services is to provide high-quality care to patients with COVID-19, we should promote positive mental health among nursing staff. Interventions that have been implemented to address mental health issues in nursing staff during pandemics/epidemics can be categorized by type of support provided: informational, instrumental, organizational and emotional/psychological (Zaçe et al., 2021). Despite the lack of high-quality, well-designed studies demonstrating the effectiveness of interventions in supporting HCW mental health and resilience, a number of avenues show promise and merit further consideration (Pollock et al., 2020; Zaçe et al., 2021). These have been highlighted in the systematic review by Zaçe et al. (2021) that encompassed various HCWs including but not limited to nurses. It is worth summarizing the findings of three of the primary studies that they examined that had positive impacts on HCWs. First, a group-based intervention delivered by peers grounded in psycho-education and cognitive behavioural therapy during the Ebola epidemic in Africa had positive effects on staff stress, depression, anxiety, behavioural changes and relationship difficulties (Waterman et al., 2018). Second, a psychological information intervention implemented during the COVID-19 pandemic among nurses showed promising results regarding a positive impact on anxiety, insomnia and post-traumatic stress disorder symptoms (Cai et al., 2020). Third, a music therapy intervention using three play lists—breathing, energy and serenity—in the workplace during the COVID-19 pandemic demonstrated a positive impact on tiredness, sadness and worry among physicians and nurses (Giordano et al., 2020).

Finally, the case was made in a review involving HCWs (physicians and nurses were the main targets) for the necessity of coupling organization-level interventions with individual-level interventions to help mitigate the harm of mental health issues (Muller et al., 2020). Another systematic review found, among other things, that a systematized organizational response providing adequate leadership, staffing and policy helped nursing staff cope better with a pandemic (Fernandez et al., 2020). Elsewhere, two facilitators in particular were identified for implementing interventions to address the mental health issues of HCWs: effective mechanisms of communication, both formal (e.g., memos) and informal (e.g., social networks), and positive, safe and supportive learning environments for frontline HCWs (Pollock et al., 2020). Appendix 1 contains additional strategies to mitigate the negative psychological impacts of COVID-19 on HCWs.

ACKNOWLEDGEMENTS

We would like to thank the nurses who participated in this study for their immense contribution.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

JC, MLT and CG made substantial contributions to conception and design, acquisition of data, analysis and interpretation of data. JC drafted the whole manuscript, and CG and GR were involved in drafting the manuscript. All authors—JC, MA, MCC, JH, MLT, LL, GR and CG—revised critically the manuscript for important intellectual content, approved its final version and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

ETHICAL APPROVAL

Project 2021-2451 approved by the Medical/Biomedical Research Ethics Committee of the CIUSSS West-Central Montreal.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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How to cite this article: Côté, J., Aita, M., Chouinard, M.-C., Houle, J., Lavoie-Tremblay, M., Lessard, L., Rouleau, G., & Gélinas, C. (2022). Psychological distress, depression symptoms and fatigue among Quebec nursing staff during the COVID-19 pandemic: A cross-sectional study. *Nursing Open*, 9, 1744–1756. <https://doi.org/10.1002/nop2.1199>

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

APPENDIX 1

Strategies to mitigate negative psychological impacts of COVID-19 on HCWs

Anticipating and acknowledging the physical and emotional impact of COVID-19 on HCWs (Fernandez et al., 2020). Assessing risk of work-related stress symptoms including anxiety, depression, fear, and PTSD symptoms (d'Etterre et al., 2021) and providing means to prevent them.

Staff training in infection control, provision of adequate protective equipment, and clear, accurate COVID-19 guidelines and protocols disseminated to all staff could reduce psychosocial impacts (Ho et al., 2020). HCWs should be provided clear information about what they can do to protect themselves as a way of empowering them and restoring sense of control (Wu et al., 2020).

Building a continuum of HCWs support within the organization (Wu et al., 2020). Healthcare managers need to be proactive in deploying mechanisms (short- and long-term) to protect the mental well-being of staff and support them (Greenberg et al., 2020). Here are a few examples:

Reinforcing teams and providing regular contact to share about ongoing decisions and check on well-being for all staff (Greenberg et al., 2020).

Recognizing core symptom of trauma, such as avoidance (e.g., staff who are too busy to attend team discussions) (Greenberg et al., 2020).

More experienced managers should keep an active eye on more junior ones and ask them how they are doing (Greenberg et al., 2020).

Fostering support among colleagues by creating a peer support team to offer supportive resources, such as psychological first aid, potentially by tapping into existing employee assistance, chaplaincy or other wellness programmes, with triage, when needed, to higher levels of support (Wu et al., 2020).