


High levels of psychosocial distress among Australian frontline healthcare workers during the COVID-19 pandemic: a cross-sectional survey

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ABSTRACT

Background The coronavirus disease 2019 (COVID-19) pandemic has had a profound and prolonged impact on healthcare services and healthcare workers.

Aims The Australian COVID-19 Frontline Healthcare Workers Study aimed to investigate the severity and prevalence of mental health issues, as well as the social, workplace and financial disruptions experienced by Australian healthcare workers during the COVID-19 pandemic.

Methods A nationwide, voluntary, anonymous, single timepoint, online survey was conducted between 27 August and 23 October 2020. Individuals self-identifying as frontline healthcare workers in secondary or primary care were invited to participate. Participants were recruited through health organisations, professional associations or colleges, universities, government contacts and national media. Demographics, home and work situation, health and psychological well-being data were collected.

Results A total of 9518 survey responses were received; of the 9518 participants, 7846 (82.4%) participants reported complete data. With regard to age, 4110 (52.4%) participants were younger than 40 years; 6344 (80.9%) participants were women. Participants were nurses (n=3088, 39.4%), doctors (n=2436, 31.1%), allied health staff (n=1314, 16.7%) or in other roles (n=523, 6.7%). In addition, 1250 (15.9%) participants worked in primary care. Objectively measured mental health symptoms were common: mild to severe anxiety (n=4694, 59.8%), moderate to severe burnout (n=5458, 70.9%) and mild to severe depression (n=4495, 57.3%). Participants were highly resilient (mean (SD)=3.2 (0.66)). Predictors for worse outcomes on all scales included female gender; younger age; pre-existing psychiatric condition; experiencing relationship problems; nursing, allied health or other roles; frontline area; being worried about being blamed by colleagues and working with patients with COVID-19.

Conclusions The COVID-19 pandemic is associated with significant mental health symptoms in frontline healthcare workers. Crisis preparedness together with policies and practices addressing psychological well-being are needed.

KEY MESSAGES

THE KNOWN

- ⇒ Healthcare workers experience unique workplace demands and stressors in their day-to-day roles and therefore are at increased risk of mental illness.
- ⇒ Crisis events represent an additional threat to mental health of healthcare workers.
- ⇒ Poor mental health of clinicians has wider repercussions for quality of care, patient safety, workforce retention and engagement.

THE NEW

- ⇒ The impacts of the COVID-19 pandemic were associated with significant symptoms of mental illness in Australian frontline healthcare workers in primary and secondary care.
- ⇒ Some healthcare worker groups were more vulnerable to psychological problems.
- ⇒ Health organisations and leaders need to be better prepared for crisis events such as pandemics, given the associated impacts observed in mental health of frontline healthcare workers. Additional psychological well-being services are needed to actively support healthcare workers.

INTRODUCTION

Healthcare workers (HCWs) experience unique workplace demands and stressors, with doctors and nurses particularly experiencing poor mental health and increased rates of occupational burnout, anxiety, depression and suicide than other occupations.^{1–4} Although less is known about other groups of clinicians, the findings of early studies are concerning.⁵ These issues have ramifications beyond the health of practitioners themselves, given that poor mental health of clinicians translates to adverse effects on overall

quality of care,⁶ patient safety, workforce retention and engagement.⁷

Crises, such as the current coronavirus disease 2019 (COVID-19) pandemic, represent a profound threat to mental health. HCWs, particularly those on the 'front-line' in hospitals and the community, have had to respond quickly to many challenges including heavy workloads, large volumes of new information, new work practices and roles, redeployment or job insecurity, social change and increased risks to their own lives and for family members. Evidence regarding the impacts of the severe acute respiratory syndrome (SARS) pandemic demonstrated that the mental health of many HCWs was adversely affected, with potentially long-lasting mental health effects.^{8,9} Studies from overseas during the current pandemic suggest high rates of anxiety, depression, stress and burnout in HCWs, with the prevalence rates of up to 57%.¹⁰⁻¹⁶ Before the onset of COVID-19, certain demographic and workplace factors have been associated with increased risk of psychosocial harm for HCWs, particularly female gender,² inexperience,¹⁷ excessive work hours,^{18,19} and certain frontline areas.^{20,21} Similarly, studies of the general public during COVID-19 reveal a disproportionate impact on women,^{22,23} young people^{22,24} and people with previous mental health diagnoses.^{24,25} It is therefore vital to comprehensively identify and act on the mental health needs of Australian frontline HCWs to minimise the far-reaching effects of crisis events. This article reports the first findings from the Australian COVID-19 Frontline Healthcare Workers Study, which was both initiated and led by frontline clinicians in partnership with academics. This study investigated the severity, prevalence and predictors of symptoms of mental illness, as well as the social, workplace and financial disruptions experienced by Australian HCWs during the COVID-19 pandemic.

METHODS

The second wave of the pandemic in Australia occurred predominantly in Melbourne, Victoria, between June and October 2020. Severe lockdown restrictions were instituted locally including (but not limited to) mandatory mask wearing; travel limited to 5 km from home; an evening curfew, 1-hour limit for outdoor exercise per day; limits on seeing extended family; working from home; home schooling; the closure of most shops, hospitality and entertainment venues; and closure of international and interstate borders.

Participants and study design

A nationwide, voluntary, anonymous, online survey was conducted between 27 August and 23 October 2020, concurrently with the second wave of the pandemic. Australian HCWs, comprising medical, nursing, allied health, medical laboratory, administrative and other support staff, who self-identified as frontline HCWs in secondary or primary and community care, were invited to participate. Participants did not need to have cared for people with COVID-19 to participate. Over 8 weeks, 9518 survey responses were received,

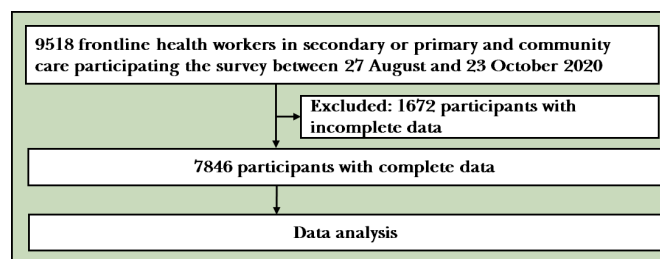


Figure 1 Flowchart of participant recruitment.

with complete data from 7846 (82.4%) participants reported in this article (figure 1).

Participants were recruited through multiple strategies. Information regarding the survey was emailed to chief executive officers and departmental directors of front-line areas (emergency medicine, critical care, respiratory medicine, general medicine, infectious diseases, palliative care and hospital aged care) of all public hospitals throughout Victoria, and to multiple hospitals around Australia. Hospital leaders were asked to share the survey information with colleagues. Thirty-six professional societies, colleges, universities, associations and government health department staff also disseminated the information about the survey across Australia. In addition, the study was promoted through 117 newspapers, 8 television and radio news items and 30 social media sites.

Data collection

Each participant completed the survey once, with no longitudinal data collected. Participants completed the online survey either directly or via a purpose-built website (<https://covid-19-frontline.com.au/>). Before commencing the survey, participants provided online consent to participate. Data were collected and managed using REDCap electronic data capture tools.²⁶

Information collected included demographics, home life details, professional background, work arrangements, the impact of the pandemic on employment and finances, organisational leadership, workplace change, exposure to COVID-19 and health and recreational habits (online supplemental file 1). Most questions were in a single-choice or multiple-choice format, with free text questions enabling more detailed answers. Five validated psychological measurement tools were completed to assess symptoms of mental illnesses: anxiety (Generalized Anxiety Disorder Scale-7 (GAD-7)),²⁷ depression (Patient Health Questionnaire-9 (PHQ-9)),²⁸ post-traumatic stress disorder (PTSD) (abbreviated Impact of Events Scale-6 (IES-6)),²⁹ and burnout (abbreviated Maslach Burnout Inventory (MBI)),³⁰ with subdomains of emotional exhaustion (EE), depersonalisation (DP) and personal accomplishment (PA)). Resilience was assessed using the abbreviated two-item Connor-Davidson Resilience Scale-2.³¹ Burnout on the MBI is indicated by higher scores on the EE and DP, and lower scores on the scale of PA. Cut-off scores for validated scales were as follows: depersonalisation: 0 to 3=low, 4 to 6=moderate, 7 to 18=high; emotional exhaustion: 0 to 6=low, 7 to 10=moderate, 11 to 18=high;

personal accomplishment: 0 to 12=high, 13 to 14=moderate, 15 to 18=low³²; IES is categorised as 0 to 9=none/minimal and >9=moderate-severe²⁹; GAD-7: 0 to 4=none/minimal, 5 to 9=mild, 10 to 14=moderate, 15 to 21=severe anxiety²⁷; PHQ-9: 0 to 4=none/minimal, 5 to 9=mild, 10 to 14=moderate, 15 to 19=moderately severe, 20 to 27=severe.²⁸ In addition, participants were asked to report if they subjectively believed they had experienced anxiety, depression, PTSD, burnout or other mental health issues in order to determine their insight into their mental health. Ethics approval was provided by the Royal Melbourne Hospital Human Research Ethics Committee (HREC/67074/MH2020).

Statistical methods and data analysis

A power calculation for general linear models was computed using RStudio.³³ With an expected medium to large effect size and a power of 0.95, and significance level of 0.05, a sample of 6348 participants was required. To account for missing or incomplete data, a minimum sample size of 7000 responses was chosen. Data analysis was performed using SPSS V.26.0 statistical software (IBM). Demographic and socioeconomic characteristics were reported descriptively. Predictors of mental illness symptoms were identified through univariable logistic regression then entered into a multivariable logistic regression model. Covariates examined in univariable analyses included age; gender; state; occupation; number of working years since graduation; living situation (living alone, living with children, living with elderly); frontline area; practice location; working with patients with COVID-19; anticipating working with patients with COVID-19; having received personal protective equipment (PPE) training; worry that their role will lead to COVID-19 transmission to family; worry regarding being blamed by colleagues, close friends or relatives infected with COVID-19; changed relationships with partner or friends or family or colleagues; changed household income; concerns regarding household income and pre-existing mental health diagnoses. For each mental illness scale, outcomes were merged into dichotomous categories (no or minimal symptoms vs moderate to severe symptoms) in the regression model. Associations between mental illness symptoms and predictor variables are presented as ORs with 95% CIs. Multicollinearity of predictor variables was examined using the variance inflation factor criterion. The Spearman coefficient (r) was calculated to evaluate the correlation between self-reported and objective evidence of mental illness symptoms. For all statistical tests, significance was indicated by $p \leq 0.05$.

RESULTS

Demographic characteristics and workplace environment

More than half ($n=4110$, 52.4%) of the participants were younger than 40 years, and 6344 (80.9%) were women (table 1). Most participants were nurses ($n=3088$, 39.4%), doctors ($n=2436$, 31.0%) or allied health staff ($n=1314$, 16.7%) with 523 participants working in other health

Table 1 Participants' characteristics

Characteristic	Frequency	%
Age (years) (n=7846)		
20–30	1860	23.7
31–40	2250	28.7
41–50	1738	22.2
>50	1998	25.5
Gender (n=7846)		
Male	1458	18.6
Female	6344	80.9
Non-binary	19	0.2
Prefer not to say	25	0.3
State (n=7846)		
Victoria	6685	85.2
New South Wales	472	6.0
Queensland	209	2.7
South Australia	203	2.6
Western Australia	137	1.7
Tasmania	81	1.0
Australian Capital Territory	35	0.4
Northern Territory	24	0.3
Occupation (n=7846)		
Nursing	3088	39.4
Medical	2436	31.0
Allied health	1314	16.7
Administrative staff	485	6.2
Other roles*	523	6.7
Number of working years since graduated (n=6637)		
0–5	1592	24.0
6–10	1377	20.7
11–15	943	14.2
≥15	2725	41.1
Number of people in the household (n=7846)		
Living alone (1 person)	1087	13.9
2	2492	31.8
3–4	3181	40.5
5–6	1024	13.1
≥7	62	0.8
Number of children <16 years at home (n=7846)		
0	5102	65.0
1–2	2253	28.7
3–4	482	6.1
≥5	9	0.1
Living with ≥1 elderly person/people at home (n=7846)	697	8.9
*Other roles=pharmacists: 185; clinical laboratory scientists or technicians: 176; paramedics: 95; support staff (including cleaning, security, facilities management personnel): 43; leadership role: 9; other role: 15.		

organisation roles including food services and security. The medical staff group comprised 389 general practitioners, 1221 senior medical staff, 745 junior medical staff and 81 students. More than one-quarter of participants ($n=2250$, 28.7%) had caring responsibilities at home, and 2133 (27.2%) participants had children who were being homeschooled.

Participants worked in primary care or community roles ($n=1250$, 15.9%), medical specialty areas ($n=1205$, 15.4%), emergency departments ($n=1146$, 14.6%), anaesthetics or surgical areas ($n=824$, 10.5%) or intensive care units ($n=745$, 9.5%) (table 2). More than three-quarters ($n=6158$, 78.5%) had been tested for COVID-19, 136 (1.7%) had been infected with COVID-19 and 77 (0.9%) had been previously quarantined because of unprotected exposure to COVID-19. Three-quarters ($n=4551$, 76.4%) were worried or very worried that their role could lead to them transmitting COVID-19 to their families, and almost two-thirds ($n=4949$, 63.1%) were worried about being blamed by colleagues for not taking adequate precautions if they contracted COVID-19.

Relationship changes and prevalence of mental illness symptoms

More than three-quarters of participants ($n=5994$, 76.4%) reported that the pandemic had affected their relationships with family, friends and colleagues, and nearly one-third had a close friend or relative who had been infected with COVID-19 either in Australia or overseas (table 2). Approximately one-third ($n=2389$, 30.4%) reported having a pre-existing mental illness diagnosed before the pandemic (table 3). Many participants subjectively believed they had experienced mental illness during the pandemic including anxiety ($n=4875$, 62.1%), burnout ($n=4575$, 58.3%) and depression ($n=2175$, 27.7%). Mental illness symptoms measured by objective scales demonstrated a similar or worse trend, with 4694 (59.8%) participants experiencing mild to severe anxiety, 5458 (70.9%) moderate to severe burnout (EE) and 4495 (57.3%) mild to severe depression. Participants had a high score for resilience with a mean (SD) of 3.21 (0.66) out of 4. There was correlation between subjective reporting and objective evidence of moderate to severe mental illness symptoms for anxiety ($r=0.346$, $p<0.001$), depression ($r=0.346$, $p<0.001$) and EE ($r=0.354$, $p<0.001$).

Predictors of poor mental health

In the multivariable regression model, independent, personal predictors for worse mental health on all measured outcomes (anxiety, depression, burnout and PTSD) included female gender, younger age, experiencing worsening of personal relationships and low resilience scores (table 4). In addition, independent, personal predictors for anxiety and PTSD included having previous mental health conditions, having a family member or friend infected with COVID-19 and concerns about household income. Depression was also associated with having previous mental health conditions and concerns

Table 2 Work environment and relationship changes during the pandemic

Characteristic	Frequency	%
Frontline area ($n=7846$)		
Primary care or community practitioner	1250	15.9
Medical specialty areas*	1205	15.4
Emergency department	1146	14.6
Anaesthetics, perioperative care or surgical areas	824	10.5
Intensive care unit	745	9.5
General medicine	644	8.2
Hospital aged care	536	6.8
Respiratory medicine	336	4.3
Palliative care	292	3.7
Infectious diseases	171	2.2
Paramedicine	99	1.3
Radiology	61	0.8
Hospital pharmacy	42	0.5
Pathology	31	0.4
Worked in multiple or other areas†	464	5.9
Location of practice ($n=7846$)		
Metropolitan	6373	81.2
Regional	1407	17.9
Remote	66	0.8
Currently working with people infected with COVID-19 ($n=7846$)		
Yes	3063	39.0
No	4783	61.0
Number of patients infected with COVID-19 cared for, mean (SD)	1.4 (0.43)	
Anticipating working with people infected with COVID-19 ($n=4775$)		
Yes	2891	60.5
No	1884	39.5
Received training on PPE during the pandemic ($n=7846$)		
Yes	5137	65.5
No	2709	34.5
Being worried that their roles will lead to them transmitting COVID-19 to family ($n=5954$)		
Not worried	729	12.2
Neutral	674	11.3
Worried or very worried	4551	76.4
Being worried about being blamed by colleagues if they contract COVID-19 ($n=7846$)		
Neutral	1275	16.3
Not worried	1622	20.7
Worried	4949	63.1
Experiencing close friends/relatives infected with COVID-19 in Australia or overseas ($n=7846$)		
Yes	2398	30.6

Continued

Table 2 Continued

Characteristic	Frequency	%
No	5448	69.4
Impact of COVID-19 on relationships (n=7846)		
<i>Closer or stronger relationship with</i>		
Partner	2266	28.9
Children/parents/family	2226	28.4
Friends	1054	13.4
Work colleagues	2533	32.3
<i>Worse relationship with</i>		
Partner	1000	12.7
Children/parents/family	1421	18.1
Friends	2221	28.3
Work colleagues	1116	14.2
<i>No effect on relationships</i>	1852	23.6
Change in household income due to COVID-19 (n=7846)		
Increased	820	10.5
Decreased	2415	30.8
No change	4611	58.8
Concerns or worries about household income since COVID-19 (n=7846)		
Yes	2416	30.8
No	5430	69.2

*Medical specialty areas included all medical specialties other than hospital aged care, general medicine, respiratory medicine, palliative care and infectious diseases. The latter were reported separately due to their potentially increased risk of exposure to COVID-19.

†This group included (but was not limited to) people working in leadership roles, clerical roles, support roles, food preparation, facilities maintenance, screening clinics and clinical scientists. COVID-19, coronavirus disease 2019; PPE, personal protective equipment.

about household income, whereas EE was also associated with previous mental health conditions. Independent, workplace predictors for worse mental health outcomes on all measured scales (anxiety, depression, burnout and PTSD) included having a nursing, allied health or other non-medical role, frontline area, working with patients infected with COVID-19 and being worried about being blamed by colleagues on contracting COVID-19 infection (table 5). There were no significant associations between other demographic, work environment, relationship or financial covariates and each mental illness score.

DISCUSSION

Main findings

To our knowledge, this is the largest, national, cross-sectional study examining psychosocial distress during the COVID-19 pandemic in Australia that has included all frontline healthcare occupations and areas. Despite participants receiving high scores on the validated

Table 3 Prevalence of mental health issues

Characteristic	Frequency	%
Pre-existing mental health condition diagnosed before the pandemic (n=7846)		
Yes	2389	30.4
No	5272	67.2
Prefer not to say	185	2.4
Self-reported mental health issues experienced since COVID-19 (n=7846)*		
Anxiety	4875	62.1
Burnout	4575	58.3
Depression	2175	27.7
PTSD	427	5.4
Other mental health issues	328	4.2
No mental health issues	1431	18.2
Mental health issues assessed by validated scales		
<i>Burnout DP</i> (n=7688)		
Low	4811	62.6
Moderate	1321	17.2
High	1556	20.2
<i>Burnout EE</i> (n=7701)		
Low	2243	29.1
Moderate	2079	27.0
High	3379	43.9
<i>Burnout PA</i> (n=7689)		
Low	2358	30.7
Moderate	1592	20.7
High	3739	48.6
<i>Anxiety—GAD-7</i> (n=7843)		
None/minimal	3149	40.2
Mild	2478	31.6
Moderate	1293	16.5
Severe	923	11.8
<i>Depression—PHQ-9</i> (n=7841)		
None/minimal	3321	42.5
Mild	2303	29.5
Moderate	1203	15.4
Moderately severe	620	7.9
Severe	369	4.7
<i>Impact of events/trauma—IES-6</i> (n=7796)		
None/minimal	4641	59.5
Moderate-severe	3155	40.5
	Mean (SD)	Range
Resilience—CD-RISC2 (n=7841)	3.21 (0.66)	0–4

Burnout DP: 0 to 3=low, 4 to 6=moderate, 7 to 18=high. Burnout EE: 0 to 6=low, 7 to 10=moderate, 11 to 18=high. Burnout PA: 0 to 12=high burnout, 13 to 14=moderate burnout, 15 to 18=low burnout. IES is categorised as 0 to 9=none/minimal and >9=moderate-severe. GAD-7: 0 to 4=none/minimal, 5 to 9=mild, 10 to 14=moderate, 15 to 21=severe anxiety. PHQ-9: 0 to 4=none/minimal, 5 to 9=mild, 10 to 14=moderate, 15 to 19=moderately severe, 20 to 27=severe.

*Multiple options could be chosen.

CD-RISC2, Connor-Davidson Resilience Scale-2; COVID-19, coronavirus disease 2019; DP, depersonalisation; EE, emotional exhaustion; GAD-7, Generalized Anxiety Disorder Scale-7; IES-6, Impact of Events Scale-6; PA, personal accomplishment; PHQ-9, Patient Health Questionnaire-9; PTSD, post-traumatic stress disorder.

resilience instrument, the majority experienced anxiety or depressive symptoms, or EE (burnout). This indicates that the protective effects of resilience are not sufficient

Table 4 Personal predictors of mental health outcomes (multivariable univariate analysis)

Predictor	Anxiety (GAD-7)		Depression (PHQ-9)		PTSD (IES-6)		Burnout DP		Burnout EE		Burnout PA	
	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value
Female	1.18 (1.01 to 1.38)	0.031	1.31 (1.12 to 1.55)	0.001	1.40 (1.22 to 1.60)	0.001	0.63 (0.54 to 0.72)	0.001	1.23 (1.07 to 1.41)	0.003	1.02 (0.89 to 1.16)	0.770
Age (years)												
20–30	1.93 (1.64 to 2.27)	0.001	1.55 (1.31 to 1.84)	0.001	1.72 (1.48 to 1.99)	0.001	2.72 (2.12 to 3.48)	0.001	2.29 (1.94 to 2.70)	0.001	0.82 (0.70 to 0.95)	0.012
31–40	1.31 (1.11 to 1.53)	0.001	1.12 (0.95 to 1.32)	0.163	1.19 (1.04 to 1.37)	0.010	1.69 (1.37 to 2.08)	0.001	1.39 (1.21 to 1.61)	0.001	0.76 (0.66 to 0.87)	0.001
41–50	1.21 (1.02 to 1.43)	0.028	1.23 (1.03 to 1.46)	0.019	1.03 (0.88 to 1.19)	0.680	1.36 (1.14 to 1.61)	0.001	1.32 (1.14 to 1.53)	0.001	0.90 (0.77 to 1.05)	0.183
Previous mental health condition	1.96 (1.74 to 2.20)	0.001	2.23 (1.98 to 2.50)	0.001	1.75 (1.57 to 1.95)	0.001	1.10 (0.98 to 1.24)	0.098	1.73 (1.53 to 1.96)	0.001	1.26 (1.13 to 1.41)	0.001
Experiencing family or friends infected with COVID-19	1.30 (1.15 to 1.46)	0.001	1.04 (0.92 to 1.18)	0.450	1.41 (1.26 to 1.57)	0.001	1.07 (0.96 to 1.20)	0.200	1.05 (0.93 to 1.18)	0.370	1.10 (0.98 to 1.23)	0.095
Experiencing worse relationships during the pandemic												
With partner	1.97 (1.96 to 2.29)	0.001	1.96 (1.45 to 1.98)	0.001	1.50 (1.29 to 1.74)	0.001	1.37 (1.16 to 1.60)	0.001	1.57 (1.31 to 1.89)	0.001	N/A	-
With family	1.74 (1.51 to 2.00)	0.001	1.56 (1.35 to 1.80)	0.001	1.58 (1.38 to 1.81)	0.001	1.29 (1.11 to 1.49)	0.001	1.52 (1.29 to 1.80)	0.001	N/A	-
With friends	1.38 (1.22 to 1.57)	0.001	1.32 (1.16 to 1.51)	0.001	1.51 (1.35 to 1.70)	0.001	1.36 (1.20 to 1.54)	0.001	1.74 (1.52 to 2.00)	0.001	N/A	-
With colleagues	1.77 (1.52 to 2.06)	0.001	1.45 (1.24 to 1.70)	0.001	1.50 (1.30 to 1.73)	0.001	N/A	-	N/A	-	N/A	-
Concerns about income	1.96 (1.50 to 1.89)	0.001	1.29 (1.14 to 1.45)	0.001	1.56 (1.41 to 1.74)	0.001	N/A	-	N/A	-	N/A	-
Resilience	0.62 (0.57 to 0.67)	0.000	0.76 (0.70 to 0.83)	0.001	0.76 (0.70 to 0.82)	0.001	0.74 (0.68 to 0.80)	0.001	0.63 (0.55 to 0.65)	0.001	1.82 (1.68 to 1.97)	0.001
N/A=variable not included for that mental scale in the model because no relationship was observed in the univariate model.												
Reference categories for each variable were as follows: gender=male; age=older than 50 years; pre-existing mental health conditions=negative response; experiencing family or friends infected with COVID-19=negative response; experiencing altered relationships with partner/family/friends/colleagues=no change; concerns about income=negative response.												
Lower OR for personal accomplishment indicates poorer outcomes.												
COVID-19, coronavirus disease; DP, depersonalisation; EE, emotional exhaustion; IES-6, Impact of Events Scale-6; PA, personal accomplishment; PHQ-9, Patient Health Questionnaire-9; PTSD, post-traumatic stress disorder.												

Table 5 Workplace predictors of mental health outcomes (multivariable univariate analysis)

Predictor	Anxiety (GAD-7)		Depression (PHQ-9)		PTSD (IES-6)		Burnout DP		Burnout EE		Burnout PA	
	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value
Occupation												
Nursing	1.79 (1.55 to 2.07)	0.001	1.92 (1.65 to 2.23)	0.001	1.28 (1.12 to 1.45)	0.001	0.84 (0.74 to 0.96)	0.013	1.22 (1.07 to 1.39)	0.003	0.73 (0.64 to 0.83)	0.001
Allied health	1.25 (1.04 to 1.50)	0.013	1.48 (1.22 to 1.79)	0.001	1.20 (1.02 to 1.41)	0.022	0.57 (0.48 to 0.68)	0.001	1.16 (0.98 to 1.38)	0.081	1.13 (0.95 to 1.34)	0.150
Other roles	1.83 (1.51 to 2.22)	0.001	1.95 (1.59 to 2.38)	0.001	1.29 (1.08 to 1.53)	0.004	1.13 (0.85 to 1.49)	0.380	0.89 (0.74 to 1.07)	0.233	0.43 (0.36 to 0.51)	0.001
Frontline area												
ICU	0.87 (0.70 to 1.10)	0.260	0.73 (0.58 to 0.93)	0.010	N/A	-	0.70 (0.57 to 0.87)	0.001	0.83 (0.67 to 1.03)	0.100	1.08 (0.88 to 1.33)	0.450
Anaesthetics and surgery	1.18 (0.94 to 1.48)	0.140	0.85 (0.67 to 1.08)	0.190	N/A	-	0.73 (0.59 to 0.91)	0.005	1.14 (0.91 to 1.43)	0.220	0.85 (0.69 to 1.05)	0.140
Medical specialty areas	1.13 (0.95 to 1.35)	0.150	0.89 (0.74 to 1.06)	0.200	N/A	-	0.67 (0.57 to 0.80)	0.001	1.19 (1.00 to 1.41)	0.047	1.18 (1.00 to 1.39)	0.040
Primary care, community and residential aged care	0.96 (0.77 to 1.20)	0.760	0.82 (0.66 to 1.03)	0.580	N/A	-	0.62 (0.49 to 0.78)	0.001	1.53 (1.24 to 1.89)	0.001	1.35 (1.10 to 1.66)	0.003
Other*	1.11 (0.87 to 1.42)	0.380	0.85 (0.66 to 1.03)	0.098	N/A	-	0.64 (0.49 to 0.84)	0.001	1.31 (1.03 to 1.66)	0.027	0.89 (0.71 to 1.11)	0.300
Currently working with patients with COVID-19	1.21 (1.05 to 1.39)	0.006	1.19 (1.03 to 1.37)	0.015	1.27 (1.12 to 1.44)	0.001	1.25 (1.09 to 1.42)	0.001	1.20 (1.05 to 1.37)	0.007	0.80 (0.71 to 0.92)	0.001
Received PPE training	0.91 (0.80 to 1.05)	0.210	0.96 (0.83 to 1.10)	0.580	1.04 (0.92 to 1.17)	0.490	0.98 (0.85 to 1.12)	0.790	1.10 (0.97 to 1.25)	0.122	1.27 (1.12 to 1.43)	0.001
Being worried that colleagues will blame them	1.68 (1.42 to 1.97)	0.001	1.44 (1.22 to 1.71)	0.001	1.82 (1.58 to 2.11)	0.001	1.39 (1.19 to 1.62)	0.001	1.57 (1.36 to 1.81)	0.001	1.02 (0.89 to 1.18)	0.700
<p>N/A=variablenot included for that mental scale in the model because no relationship was observed in the univariate model.</p> <p>Reference categories for each variable were as follows: occupation=medical staff; frontline area=emergency department; currently working with patients with COVID-19=negative response; received PPE training=negative response; being worried about being blamed=disagreed. Resilience was a continuous variable (scores 0-4).</p> <p>Lower OR for personal accomplishment indicates poorer outcomes.</p> <p>*Other for frontline area included people working in paramedicine, radiology, pharmacy, pathology and clinical laboratories, or other areas.</p> <p>COVID-19, coronavirus disease 2019; DP, depersonalisation; EE, emotional exhaustion; GAD-7, Generalized Anxiety Disorder Scale-7; ICU, intensive care unit; IES-6, Impact of Events Scale-6; PA, personal accomplishment; PHQ-9, Patient Health Questionnaire-9; PPE, personal protective equipment; PTSD, post-traumatic stress disorder.</p>												

to prevent psychological harm during the pandemic. A significant proportion also experienced PTSD symptoms. Although less than half of the participants worked with patients with COVID-19 and very few had been infected with COVID-19 or quarantined, many experienced disruptions to family life, altered social relationships and financial worries. Our findings are consistent with those reported in international studies: high mental health burden on frontline workers during COVID-19^{10 11 15} and SARS pandemics.³⁴ Fears of transmitting COVID-19 infection to family and of being blamed by colleagues for not taking adequate precautions if they did contract COVID-19 were extremely common. Personal, social and workplace predictors for mental illness symptoms have been identified.

Around the world, a growing number of largely country-specific, single timepoint, cross-sectional surveys have identified that mental health problems are common in HCWs during the COVID-19 pandemic. Prevalence estimates are as follows: 33% to 59% for anxiety, 30% to 62% for depression, 41% to 51% for burnout and approximately 57% for acute distress or PTSD.^{10 11 13–15 35} The upper limits of these prevalence estimates are strikingly similar to our own findings. However, moderate to severe burnout (EE) was much more prevalent in our study (70.9%), which may be explained by the later timing of our study, by which time Australian HCWs had endured many months of social and workplace disruptions, and lockdown restrictions.

By contrast, two separate, small (n=320 and n=668), single-site, single timepoint surveys of HCWs undertaken in Melbourne from April to May 2020 and from May to June 2020 both identified a lower prevalence of adverse mental health outcomes.^{36 37} Their findings may again be partly explained by the earlier timing of the studies in the first wave and the lack of power in those studies due to smaller size of the samples. Comparing our data to international data, the high prevalence of symptoms of poor mental health in our study is interesting given the comparatively low case load of COVID-19 in Australia. One explanation is that anticipation and fear of a catastrophic crisis leading to high death rates of patients and HCWs (as Australian HCWs saw occurring overseas) contributed to adverse psychological outcomes.¹⁴ This concept of psychological distress being related to anticipated, perceived risk is important and highlights the critical importance of crisis preparedness, good government and organisational leadership and consistent clear communication. In addition, the pervasive media coverage regarding COVID-19 along with the many restrictions enacted in local lockdowns may have contributed to poor mental health in Australian frontline workers.

Similar to our findings, studies from overseas have found that predictors of poor mental health in HCWs during the pandemic include female gender, less years of work experience (which in our study correlated with younger age), pre-existing psychological illnesses, working in a nursing role and working in certain frontline areas.^{10–13 15 16 35 38 39}

Many of these groups are at heightened risk of psychosocial harm during non-pandemic times, and it is possible that crises such as COVID-19 exacerbate harm in pre-existing vulnerable groups.⁴⁰ Importantly, unlike previous small local and international studies, the large sample size in our study enabled us to demonstrate that female gender and working in nursing or allied health roles are independent predictors of poor mental health. The relationship between nursing and poorer mental health may be explained by the heightened risk of COVID-19 exposure from prolonged and frequent contact with patients. Moreover, nursing and allied health professionals generally have less choice regarding their daily work environments.^{11–13 16} Reduced finances were not associated with a nursing role and therefore did not explain the association.

The relationship between gender and adverse mental illness outcomes is intriguing, given that this relationship was identified even during the SARS pandemic.³⁴ One possible explanation is that men and women have different coping styles,⁴¹ with men having greater odds of reporting DP in this study. In addition, a British study identified that women have had to bear greater responsibilities (on average, an extra 11.2 hours of unpaid work per week) than men as primary carers for dependents during the pandemic.⁴² General population data from the Australian Bureau of Statistics report similar findings, with women three times more likely than men to perform the majority of caregiving tasks and twice as likely to undertake the majority of unpaid domestic work.⁴³ In our study, having young or old dependents was not a predictor of poor mental health. However, we did not specifically enquire about the number of additional unpaid hours undertaken in the home for domestic or caregiving tasks during the pandemic. As there was no difference in resilience scores between men and women, this gender difference requires further exploration. The lack of a relationship between PPE training and poor mental health in our study may relate to the majority of frontline staff receiving training and the relatively low rates of COVID-19 infection in Australia compared with other countries.

Limitations

The large sample size in our study enabled detailed examination of independent predictors of poor mental health. Most participants in our study were women, which is consistent with data from both the Australian Institute of Health and Welfare and the Australian Health Practitioner Regulation Agency demonstrating that 75% of the Australian health workforce is female.^{44–46} Because of the very broad survey dissemination strategy, calculation of a response rate was not possible. Selection bias and response bias may have led to overestimation or underestimation of psychological distress and rates of pre-existing mental health illness. Similarly, in line with other international surveys exploring the psychosocial effects of the COVID-19 pandemic on healthcare workers, we were not able to confirm clinical diagnoses of mental illness with

the symptoms measured by the validated psychological scales. Nevertheless, these scales are validated and the only feasible option for measuring mental health symptoms in a large-scale survey such as this.

Because of the spontaneous and unexpected nature of the COVID-19 pandemic, no baseline data regarding mental health symptoms in non-pandemic times had previously been collected from a large cohort of Australian HCWs. Therefore, it is not possible to demonstrate a change in the prevalence estimates of mental health symptoms in this study. Nevertheless, the prevalence estimates in this study are much higher than those reported in earlier studies in non-pandemic times.^{2 47–49} Notably, the case load of COVID-19 in Australia at the time of survey closure was low relative to international settings, with 27484 cases recorded.⁵⁰ The prevalence of mental health impacts arising in the Australian context is indicative of harm related to the prolonged stress of a pandemic, even with relatively few cases. Participant responses were measured at a single timepoint, not longitudinally, to avoid excessively burdening the frontline healthcare workers during the pandemic. However, given the ongoing nature of the pandemic, we believe that longitudinal research is urgently required to better understand any persisting psychosocial effects of the pandemic on HCWs and any ramifications for patient safety and workforce retention. Similar prospective studies sampling Italian HCWs during the first and second waves of COVID-19 have reported growing prevalence of mental health issues as the pandemic continues, and it is likely that similar trends exist in Australia.⁵¹ Furthermore, research is required to examine the acceptability, uptake and effectiveness of any new interventions introduced to support the well-being of HCWs.

Implications

Although many factors, including lockdown restrictions, social disconnection and media coverage, likely have contributed to the high prevalence of mental health symptoms in frontline healthcare workers in this study, occupational factors cannot be ignored. Indeed, occupational factors (related to workloads, training, PPE, organisational leadership, communication and policies) must be actively considered because they represent important opportunities to intervene and prevent mental health issues. Both better crisis preparedness and new psychological support services for HCWs are needed. Importantly, such services should not just be short-term ‘fixes’ to address the current pandemic-related issues, but instead should provide long-term support given the high prevalence of pre-existing mental health diagnoses. These supports must be accessible and acceptable to HCWs. Although resilience was identified as a protective factor in this study, the overall resilience level of HCWs was already high, and as such, approaches that aim to build resilience are likely to have limited efficacy in this cohort. Furthermore, it is vital that health leaders in the government, secondary care and the community

recognise that certain groups of HCWs are more vulnerable to mental health problems and therefore require additional targeted support interventions. Crucially important are organisational policies and practices that address burnout (and contributing factors such as information overload), given its extremely high prevalence and the risk it poses to workforce retention.⁷

The health workforce is an indispensable asset. Yet crises such as the COVID-19 pandemic are associated with significant mental health symptoms in frontline HCWs, with potentially wide repercussions for individuals, patients and the workforce. Crisis preparedness, along with long-term, evidence-based policies and practices that focus on preventing and actively addressing psychological well-being, is needed to protect, maintain and ‘future-proof’ the health workforce.

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Confidential

Page 1

Future Proofing Frontline Healthcare Workers in Times of Pandemic and Other Crises

Explanatory Statement

You are invited to take part in this study. Please read this statement before deciding whether or not to participate in this research. If you would like further information regarding any aspect of this project, you are encouraged to visit our website: <https://www.covid-19-frontline.com.au>

What does the research involve?

The aim of the study is to explore the social, work and mental health effects experienced by frontline health workers during the COVID-19 pandemic and beyond. We aim to examine factors that promote good mental health and risk factors that contribute to poorer mental health.

Participating in this study will involve completing an online questionnaire, which has been piloted and shown to take approximately 15-20 minutes. These questions will include information about you and your work, what you do to stay healthy, and the impact the COVID-19 pandemic has had on your health and wellbeing, your social situation, and your work.

Why were you chosen for this research?

You have been invited to participate in this study because you are a 'frontline health worker'. In this study frontline health workers are defined as medical, nursing, or allied health professionals, clinical scientists/physiologists/technicians, healthcare students or clerical staff working in hospitals, primary care, the community, private practice or paramedicine.

You have been invited via your Head of Department/Director of Training/manager, your professional association, a colleague or friend, or by advertisement of this study.

You do NOT need to have worked with patients with COVID-19 to take part. We would like to hear from both people who have and who have not worked with people with COVID-19.

Consenting to participate in this project and withdrawing from the research

Participation in this study is voluntary. It is your decision whether to participate. If at any stage, you feel uncomfortable or you feel the questions are too personal, you may stop completing the survey and close it. As this study is an anonymous survey once you submit any answers withdrawal of data will not be possible.

Possible benefits and risks to participate

There are unlikely to be any immediate direct benefits from participating in the study, other than reflecting on your current mental health and wellbeing. Participating in this study will provide data that will help us understand the supports that frontline healthcare workers need and want when confronted with a crisis situation like COVID-19. This information is important for supporting health workers during futures crises.

We do not anticipate that there are immediate risks to you; but we acknowledge that reflecting on the impact of COVID-19 may arouse feelings of disquiet or distress. If this is the case, we encourage you to seek support and we have provided advice and links on our website and at the conclusion of the survey.

Confidentiality

The survey is anonymous and confidential. At no point in the study will we be asking your name, date of birth or address. Your survey results will not be considered individually, instead the results from all the participants will be combined for analysis to provide overall trends when data are presented

Storage of Data

05.09.2020 10:07

projectredcap.org

Data will be collected through a Melbourne Health account on REDcap, which is password protected. 2 It will only be accessible by the researchers involved in the study. Data will be kept for 5 years and then destroyed via deletion of electronic files when no longer needed.

Results

Once the study is complete, a summary of the findings will be posted on our website. Interim analyses (after 2 months) of our research will also be made available on the study website.

Complaints

Should you have any concerns or complaints about the conduct of the project, you are welcome to contact the Manager, Melbourne Health Human Research Ethics Committee, Ph: 03 93428530; or email: research@mh.org.au

CONSENT

☐ I have read the explanatory statement. I am a health care worker. I am over 18 years of age and I agree to participate.

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PART A - Demographics and Home Life

Survey Progress

How old are you?

- ☐ 20-30
☐ 31-40
☐ 41-50
☐ 50-64
☐ 65-70
☐ 71+

What is your gender?

- ☐ Male
☐ Female
☐ Non-binary
☐ Prefer not to say

How many people, including yourself live in your household?

How many people aged 65 years or older live in your house?

How many children (under 16 years) live in your house?

Since the COVID-19 pandemic started, have you had to actively manage home schooling responsibilities?

- ☐ Yes
☐ No
☐ Not Applicable

Do you have any caring responsibilities (such as for children, older adults or others) that have impacted your ability to work during the pandemic?

- ☐ Yes
☐ No
☐ Not Applicable

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PART B - Professional Background and Work Arrangements

Survey Progress

Which state do you work in?

- ☐ South Australia
- ☐ Victoria
- ☐ ACT
- ☐ New South Wales
- ☐ Northern Territory
- ☐ Queensland
- ☐ Tasmania
- ☐ Western Australia

Please tick your places of work (select all that apply)?

- ☐ Public hospital
- ☐ Private hospital
- ☐ Other
- ☐ Community

If other, please specify

Where is the main location of your clinical work?

- ☐ Metropolitan area
- ☐ Regional area
- ☐ Remote area

What is your profession or work background?

- ☐ Senior Medical Staff
- ☐ General Practitioner
- ☐ Junior Medical Staff
- ☐ Nursing
- ☐ Allied Health
- ☐ Clinical Scientist/Physiologist/Technician
- ☐ Student - Medical, Nursing, Allied Health
- ☐ Clerical or Administrative Staff
- ☐ Paramedic
- ☐ Other

Please specify Allied Health profession

- ☐ Physiotherapist
- ☐ Occupational Therapist
- ☐ Speech Pathologist
- ☐ Social Worker
- ☐ Psychologist
- ☐ Technician
- ☐ Medical Scientist
- ☐ Other

If other, please specify

If other, please specify

How many years have you worked in your profession since graduation?

- ☐ 0-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ More than 15 years

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How many years have you worked in your current role?	<input type="radio"/> 0-5 years <input type="radio"/> 6-10 years <input type="radio"/> 11-15 years <input type="radio"/> More than 15 years
What health course are you studying?	<input type="radio"/> Allied Health <input type="radio"/> Applied Medical Science <input type="radio"/> Medicine <input type="radio"/> Nursing <input type="radio"/> Paramedicine
As a student what year are you in for your healthcare course?	<input type="radio"/> 1st Year <input type="radio"/> 2nd Year <input type="radio"/> 3rd Year <input type="radio"/> 4th Year or more
Which frontline area do you work with? If you work on an inpatient ward, please select the department below that is most associated with your ward.	<input type="radio"/> Emergency Department <input type="radio"/> Intensive Care Unit <input type="radio"/> Respiratory Medicine <input type="radio"/> General Medicine <input type="radio"/> Infectious Diseases <input type="radio"/> Other Medical Specialty Area <input type="radio"/> Surgical Specialty Area <input type="radio"/> Anaesthetics /Perioperative Care <input type="radio"/> Hospital Aged Care <input type="radio"/> Palliative Care <input type="radio"/> Primary Care or Community <input type="radio"/> Paramedic <input type="radio"/> Other
If other, please specify	_____
Do you CURRENTLY work in direct contact with COVID-19 patients?	<input type="radio"/> Yes <input type="radio"/> No
Do you ANTICIPATE that you may have to work in direct contact with COVID-19 patients if numbers increase in your state?	<input type="radio"/> Yes <input type="radio"/> No
Have you received training to care for patients with COVID-19? (please select all that apply)	<input type="checkbox"/> Yes - regarding caring for patients with COVID-19 <input type="checkbox"/> Yes - regarding the use of personal protective equipment (PPE) <input type="checkbox"/> Yes - other <input type="checkbox"/> No
If other, please specify	_____
	<div> <div>very unconfident 1</div> <div>2</div> <div>3</div> <div>neutral 4</div> <div>5</div> <div>6</div> <div>very confident 7</div> <div>N/A</div> </div>
How confident do you feel to care for patients with COVID-19	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>

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How confident do you feel using PPE when coming into contact with patients with COVID-19

Do you feel you need more training related to COVID-19 or using PPE?

Yes

No

not worried at all 1

2

3

neutral 4

5

6

very worried 7

How worried are you about the possibility of your role leading to transmission of COVID-19 to your family?

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PART C - Work and Finances: Impact of COVID-19 Pandemic

Survey Progress

We would like to know if your working arrangements have changed due to the COVID-19 pandemic:

BEFORE the COVID-19 pandemic what was your employment status?

☐ Full time
☐ Part time
☐ Casual
☐ Other

If other, please specify

CURRENTLY what is your employment status?

☐ Full time
☐ Part time
☐ Casual
☐ Other

If other, please specify

Have your paid or unpaid hours spent working changed? This includes work carried out in the hospital or from home. Please select all that apply

☐ Increased paid hours
☐ Increased unpaid hours
☐ Decreased hours (paid or unpaid)
☐ No change

Have you been redeployed to a new area of work (i.e. change in the department you work in)?

☐ Yes
☐ No

	very unconfident 1	2	3	neutral 4	5	6	very confident 7
How confident do you feel working in your new area?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Has your role at work changed?

☐ Yes
☐ No

	very unconfident 1	2	3	neutral 4	5	6	very confident 7
How confident do you feel working in your new role?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Has your household income altered due to COVID-19?

☐ Increased
☐ Decreased
☐ No change

As a result of COVID-19 do you have concerns or worries about your household income?

☐ Yes
☐ No

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PART D - Exposure to COVID-19

Survey Progress

In the last week, please estimate how many patients with CONFIRMED COVID-19 you have encountered

- ☐ None
- ☐ 1-5
- ☐ 6-10
- ☐ 11-20
- ☐ 21-50
- ☐ 51-100
- ☐ >100
- ☐ Don't know

In the last week, please estimate how many patients with SUSPECTED COVID-19 you have encountered?

- ☐ None
- ☐ 1-5
- ☐ 6-10
- ☐ 11-20
- ☐ 21-50
- ☐ 51-100
- ☐ >100
- ☐ Don't know

Have you ever been tested for COVID-19?

- ☐ Yes
- ☐ No

How many COVID-19 tests have you had since the pandemic started?

Have you ever had a positive test for COVID-19?

- ☐ Yes
- ☐ No
- ☐ Prefer not to say
- ☐ Result not known yet

Have you ever been quarantined (i.e. furloughed) due to significant exposure to someone with COVID-19?

- ☐ Yes
- ☐ No

Do you have close friends or relatives (in Australia or overseas) who have contracted COVID-19?

- ☐ Yes
- ☐ No

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Survey Progress**How true do you believe the following statements are:**

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
The community is worried that health workers will spread the virus to others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The community is generally appreciative of health workers during this time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I contract COVID-19, colleagues will question whether I took sufficient precautions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Has the COVID-19 pandemic had an impact on your relationships with family, friends and work colleagues? (please select all that apply)

- ☐ I have a closer or stronger relationship with my partner
- ☐ I have a closer or stronger relationship with my children/parents/family
- ☐ I have a closer or stronger relationship with my friends
- ☐ I have a closer or stronger relationship with my work colleagues
- ☐ I have a worse relationship with my partner
- ☐ I have a worse relationship with my children/parents/family
- ☐ I have a worse relationship with my friends
- ☐ I have a worse relationship with my work colleagues
- ☐ No effect on relationships

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PART E - Relaxing and Staying Healthy

Survey Progress

Generally do you consider that your physical health is:

- ☐ Excellent
☐ Good
☐ Fair
☐ Poor

Do you have underlying health conditions that you believe increase your risk of becoming unwell with COVID-19?

- ☐ Yes
☐ No

Do you use digital apps to track your PHYSICAL health activities (e.g. exercise, diet, other health measures)?

- ☐ Yes
☐ No

PRIOR to the COVID-19 pandemic have you ever been diagnosed with depression, anxiety, or another mental health condition?

- ☐ Yes
☐ No
☐ Prefer not to say

SINCE the COVID-19 pandemic started, do you believe that you have experienced any of the following? (please select all that apply)

- ☐ Anxiety
☐ Burn out
☐ Depression
☐ Post-traumatic stress disorder
☐ Other mental health problem
☐ None of the above
☐ Prefer not to say

Since the COVID-19 pandemic started, what activities have you undertaken to manage any possible MENTAL HEALTH issues such as stress, anxiety or depression? (please select all that apply)

- ☐ Maintained exercise
☐ Increased exercise
☐ Yoga, meditation or similar
☐ Maintained or increased social interaction with family and friends
☐ Used an app (e.g. Smiling mind, Headspace or other)
☐ Increased alcohol use
☐ Other strategy
☐ None of the above

If other, please specify

If you have used or are currently using an App for stress or to support mental health, which app did you use?

Was the App useful?

- ☐ Yes
☐ No
☐ Not Applicable

Are you still using the App?

- ☐ Yes
☐ No
☐ Not Applicable

Since the COVID-19 pandemic started, have you sought help from any of the following sources for stress, anxiety, depression or another mental health issue? (please select all that apply)

- ☐ Doctor or psychologist
☐ Employee support program at my place of work
☐ Professional support program outside of work
☐ None of the above
☐ Other

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Please specify

What do you think would help you most in dealing with stress, anxieties, and other mental health issues (including burnout) related to the COVID-19 pandemic?

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PART F - My healthcare organisation and organisational changes during COVID-19

Survey Progress

Please answer these questions for the healthcare organisation where you mainly work

The communications I have received so far about workplace changes due to COVID-19 have been useful and timely

- ☐ Strongly agree
 - ☐ Somewhat agree
 - ☐ Neither agree nor disagree
 - ☐ Somewhat disagree
 - ☐ Strongly disagree
-

How well has your healthcare organisation supported your wellbeing and mental health during the COVID-19 pandemic? For example providing new resources e.g. Apps, telephone support lines etc

- ☐ Very well supported
 - ☐ Somewhat supported
 - ☐ Neither supported or unsupported
 - ☐ Somewhat unsupported
 - ☐ Very unsupported
-

What did you find to be the main challenges that you faced during the COVID-19 pandemic?

What strategies might be helpful to assist frontline healthcare workers during future crisis events like pandemics, disasters etc?

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Survey Progress**The following questions ask about the provision of health care during the COVID-19 pandemic:**

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I am worried that some patients will not receive the care they need due to scarcity of resources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having to wear PPE means that I cannot properly provide the care to patients with suspected or confirmed COVID-19.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I have to go into quarantine, I am letting down my co-workers who are already overworked and stressed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Excluding close family from the bedside of patients with COVID-19 goes against my values as a healthcare worker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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PART G - Measuring wellbeing, resilience, and coping

Survey Progress

The next section asks about your feelings, thoughts, and responses to the COVID-19 pandemic using well validated scales.

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Survey Progress

The next 2 questions consider resilience
(Connor-Davidson Resilience Scale- the CD-RISC-2)

	Not true at all	Rarely true	Sometimes true	Often true	True nearly all the time
I am able to adapt when changes occur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to bounce back after illness, injury, or other hardships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Survey Progress

Over the past TWO WEEKS, how often you have been bothered by the following?
(Generalized Anxiety Disorder - GAD-7)

	Not at all	Several days	More than half the days	Nearly every day
Feeling nervous, anxious, or on edge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not being able to stop or control worrying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worrying too much about different things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble relaxing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being so restless that it is hard to sit still	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming easily annoyed or irritable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling afraid as if something awful might happen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Survey Progress

Over the past TWO WEEKS, how often you have been bothered by the following?
(Patient Health Questionnaire - PHQ-9)

	Not at all	Several days	More than half the days	Nearly every day
Little interest or pleasure in doing things?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling down, depressed, or hopeless?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble falling or staying asleep, or sleeping too much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling tired or having little energy?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor appetite or overeating?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling bad about yourself - or that you are a failure or have let yourself or your family down?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble concentrating on things, such as reading the newspaper or watching television?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Moving or speaking so slowly that other people could have noticed? Or been so fidgety or restless that you have been moving a lot more than usual?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoughts that you would be better off dead, or thoughts of hurting yourself in some way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Survey Progress**Over the last TWO weeks, how has the COVID-19 pandemic impacted your everyday thinking?
(Impact of Event Scale - IES-6)**

	Not at all	A little bit	Moderately	Quite a bit	Extremely
I thought about it when I didn't mean to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other things kept making me think about it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was aware that I still had a lot of feelings about it, but I didn't deal with them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tried not to think about it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt watchful or on guard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had trouble concentrating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Survey Progress

For each statement, mark the box that most accurately reflects your response:
(Abbreviated Maslach Burnout Inventory)

	Every day	A few times a week	Once a week	A few times a month	Once a month or less	A few times a year	Never
I deal very effectively with the problems of my patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel I treat some patients as if they were impersonal objects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel emotionally drained from my work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel fatigued when I get up in the morning and have to face another day on the job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've become more callous towards people since I took this job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel I'm positively influencing other people's lives through my work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working with people all day is really a strain for me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't really care what happens to some patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel exhilarated after working closely with my patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Survey Progress

Is there is anything else that you would like to tell us about the impact of the COVID-19 pandemic or regarding supports that you feel are useful for well-being?
