




# BMJ Open Psychological impacts of COVID-19 on Vietnamese health workers over the prolonged restricted COVID-19 responses: a cross-sectional study

Bach Tran <sup>1,2</sup>, Minh Trong Nguyen,<sup>2</sup> Pascal Auquier,<sup>1</sup> Laurent Boyer,<sup>1</sup> Guillaume Fond,<sup>1</sup> Giang Thu Vu,<sup>3</sup> Thao Phuong Hoang,<sup>4</sup> Phuong Thu Ho,<sup>4</sup> Tu Huu Nguyen,<sup>5</sup> Carl A Latkin,<sup>6</sup> Cyrus SH Ho,<sup>7</sup> Roger C M Ho <sup>7,8</sup>, Melvyn W B Zhang <sup>9</sup>

**To cite:** Tran B, Nguyen MT, Auquier P, *et al*. Psychological impacts of COVID-19 on Vietnamese health workers over the prolonged restricted COVID-19 responses: a cross-sectional study. *BMJ Open* 2023;**13**:e069239. doi:10.1136/bmjopen-2022-069239

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2022-069239>).

BT and MTN contributed equally.

BT and MTN are joint first authors.

Received 14 October 2022  
Accepted 13 July 2023



© Author(s) (or their employer(s)) 2023. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

For numbered affiliations see end of article.

## Correspondence to

Professor Bach Tran;  
[tranamu2022@gmail.com](mailto:tranamu2022@gmail.com)

## ABSTRACT

**Objective** We assessed the psychological impact posed by COVID-19 and its associated factors on the healthcare workforce nationwide during the peak of Vietnam's fourth outbreak.

**Design** A cross-sectional study.

**Setting** Our study was conducted in 61 provinces of Vietnam.

**Methods** A total of 2814 healthcare professionals in 61/63 provinces of Vietnam. An online questionnaire using Patient Health Questionnaire-9 (PHQ-9), Perceived Stress Scale-4 (PSS-4) and Generalised Anxiety Disorder-7 (GAD-7) scales was distributed randomly to a subgroup of 503 respondents.

**Primary and secondary outcome measures** To determine the impact of COVID-19 on the psychological of health workers, we conducted analyses to test a primary hypothesis related to participants based on three main scales including PHQ-9, PSS-4 and GAD-7 scales.

**Results** Nearly half (49.7%) of healthcare workers experienced mild depression symptoms, 34.0% underwent moderate anxiety symptoms and 49.3% reported high-stress levels. Respondents who had a monthly income below 5 million VND (~US\$212) and had more than 3 days of duty per week had a higher score on the anxiety scales. Compared with medical doctors, nurses/midwives had lower PHQ-9 (Coef=-2.53; 95% CI=-3.71 to -1.36) and GAD-7 scores (Coef=-2.36; 95% CI=-3.56L to -1.16). Increased workload and work time was the harmful factor that increase the PHQ-9, GAD-7 or PSS-4 scores. More than half (53.9%) of respondents stated no demand for mental healthcare services.

**Conclusions** Health workers who gained less financial rewards are reported to have higher levels of mental distress than others, implying the need for a raise in basic salary as well as compensation and encouragement schemes. To tackle hesitancy in seeking mental help, integrating online mental health therapy with e-health consultations via social media can be strategically implemented to augment service delivery, and simultaneously enhance the standard of mental health services.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The main strength of our study is the size of the survey sample: the data were collected from healthcare workers in all three regions, within all age groups and work environments.
- ⇒ We also investigated associated factors and were able to identify correlations between items.
- ⇒ The questionnaire was self-report, recall and other biases may cause certain answers to be underestimated or overestimated.
- ⇒ The informed sample selection of the snowball sampling method, which was not representative, may have resulted in a greater number of responses from certain health institutions than others.
- ⇒ The data are sufficient to indicate the severity of mental burdens that healthcare workers were experiencing and provide valuable insights for policy development.

## INTRODUCTION

The global COVID-19 pandemic has exerted immense pressure on healthcare systems worldwide, resulting in an overwhelming surge of cases and fatalities.<sup>1</sup> During such an unprecedented health crisis, the role of healthcare workers (HCWs) has become more important than ever. Due to appalling working conditions and rigorous schedules, front-line HCWs consistently experienced severe burnout, sleep disorders and even depression.<sup>2,3</sup> The lack of care and protective equipment as well as long detachment from family and society also added to the extreme mental burden of HCWs.<sup>4</sup> Therefore, many tools had been used among HCWs in order to evaluate their psychological health and the most common are PHQ-9 (Patient Health Questionnaire-9), GAD-7 (Generalised Anxiety Disorder-7) and PSS-4 (Perceived Stress Scale-4).



As the COVID-19 pandemic has become one of the most severe health crises in human history, it is extremely important to assess the impact of COVID-19 over time. Vietnam has experienced four waves of COVID-19, and the fourth wave is considered to have had the worst impact on Vietnam.<sup>5</sup> However, in the fourth wave, the Vietnamese government advocated focusing on both fighting the epidemic and developing a strategy to cope with the socioeconomic consequences of COVID-19.<sup>6</sup> This inadvertently has a great impact on health workers, and front-line groups against the COVID-19 pandemic. In the last week of November alone, a total of 115 826 new cases and more than 1000 deaths were recorded across the country.<sup>7</sup> Strict response measures were adopted, including total lockdown, compulsory quarantine camps, and daily COVID-19 testing,<sup>8</sup> all of which put extra burdens on the already heavy workload of HCWs. In 2021, while other countries have considered and implemented the first steps of the self-quarantine and self-treatment model for mild-to-asymptomatic patients, Vietnam still required hospital admission or quarantine camps for most cases and relied heavily on HCWs to provide daily care, assistance and COVID-19 testing to each and every individual.<sup>9</sup> These response strategies have taken their toll on the healthcare system, as indicated by the overload on the healthcare system in 2021.<sup>10</sup> Untreated and amplified distress through months of relentless work posed dangerous psychological threats to HCW. Understanding the problems that HCW were facing is vital for improving working quality, pandemic control and long-term development of the healthcare workforce.

Much research has been conducted on the mental burden of HCWs during COVID-19 around the world. The most common problems experienced by HCWs were anxiety, uncertainty, insomnia and severe traumatic stress.<sup>11</sup> In Vietnam, while there is a wealth of literature on the psychological impacts of COVID-19 (eg, the research taken place during the Nationwide Partial Lockdown in Vietnam in April 2020 using The Impact of Events Scale-Revised to assess the impact of COVID-19 on HCWs through online surveys<sup>12</sup> or a cross-sectional study conducted from April 22 May 2022 to 12 May 2020 about the Psychological Stress Risk Factors, Concerns and Mental Health Support among HCWs in Vietnam during the COVID-19 outbreak,<sup>13</sup> most studies were carried out during previous outbreaks in 2020 and therefore is not representative of the full scope of the fourth outbreak beginning in April 2021 and its devastating impacts on mental health. In addition, most previous evaluation models have not been able to take into consideration non-clinical factors such as disparities in ability of doctors, lack of cooperation or low adaptability of doctors and nurses when operating in a new facility. Our study aims to describe the impact of the COVID-19 pandemic on the psychological health of health workers and to analyse the factors contributing to their mental burden.

## METHODS

### Study design and sampling method

We conducted an online cross-sectional survey from October 2021 to November 2021 to comply with social distancing rules under the considered peak of the 4th outbreak in 61/63 provinces in Vietnam. The link to the survey was created on SurveyMonkey, a simple, cost-effective and entirely online survey design platform. The national survey was performed on three groups including HCWs, medical students and the general population. For the HCWs group, we focused on four topics of interest: (1) quality of Life and sleep quality, (2) burn-out, (3) work motivation and retention and (4) psychological impacts of COVID-19.

In this target group, we included HCWs with the following criteria: (1) aged 20 and older, (2) agreed to participate in the study, (3) worked at medical facilities in Vietnam in the last 6 months and (4) could access the survey link and complete the questionnaire. The data were collected using the snowball sampling approach. At the end of the data collection duration, a total of 2814 HCWs were from 61/63 provinces in Vietnam. This subsample of 'psychological impacts of COVID-19 on Vietnamese health workers over the prolonged restricted COVID responses' involved 510 respondents who were randomly assigned to this set of survey questions. There were 503 participants who completed the survey, hence, the completion rate was 98.6%.

### Measurements

After conducting a systematic review of the psychological impacts of COVID-19 on Vietnamese health workers as well as drawing on experiences from previous research to identify the most important variables to include in the survey instrument. In this stage, we involve not only people in the research team but researchers working in the field to provide suggestions to ensure the survey content could be practical and easily administered, provide readily interpretable results and minimised respondent burden. The Vietnamese questionnaire was first tested on 15 members of the Vietnam young physicians Association's staff to check the valid and reliable measure of the constructs stated in the study objectives. The questionnaire was then modified, the above test data will be removed and the final questionnaire version took around 30 min to complete. We sent the questionnaire link via email to a small group of 20 participants from each region of Vietnam (Northern, Central and Southern) who worked in types of health facilities (general hospitals, specialised hospitals, central clinics and commune health stations) as the core group. After completing the survey, they were invited to introduce more acquaintances and colleagues to participate in the survey. All data were encrypted and only used for research purposes.

Vietnam Young Doctors Association is an organisation with the participation of more than 82 000 doctors from 20 to 45 years old in 63/63 provinces and cities in Vietnam.<sup>14</sup> This target group is Vietnam's core healthcare workforce.

With many volunteer activities for public health, reaching people in the most difficult remote areas, the Vietnam Young Doctors Association plays an important role in people's healthcare. Activities can be mentioned such as supporting front-line doctors in the fight against COVID-19; research to promote import and distribution of vaccines; research in treatment and testing; building an early warning system; organise training programmes on COVID-19 prevention and control.<sup>14</sup> After the COVID-19 period, the Vietnam Young Physicians Association organised a post-COVID-19 healthcare programme for more than 17 000 people across the country.<sup>15</sup> As those directly involved in the prevention of the COVID-19 pandemic, the Vietnam Young Physicians Association plays a particularly important role during the COVID-19 pandemic with a series of patient care activities before, during and after the COVID-19 pandemic. Therefore, the selection of HCWs by the Vietnam Young Physicians Association will provide the most comprehensive picture of the psychological impacts of COVID-19 on Vietnamese health workers over the prolonged restricted COVID responses.

The questionnaire was designed to measure the following constructs: (1) general and socioeconomic status,<sup>16 17</sup> (2) occupational characteristics<sup>16 18</sup> and (3) depression, anxiety and stress severity.<sup>19-21</sup>

### Outcome variables

#### Patient Health Questionnaire

Nine questions were adapted from the PHQ-9 and assessed the severity of depression. On a four-point Likert scale (0=not at all, 1=several days, 2=more than half the days, 3=nearly every day), participants were asked about the frequency of problems encountered in the past 2 weeks. The total score ranged from 0 to 27, and levels of depression were determined based on the total score (0-4: none/minimal; 5-9: mild; 10-14: moderate; 15-19: moderately severe; 20-27).<sup>19</sup> The PHQ-9 scale has been validated and used in many studies in Vietnam.<sup>22 23</sup> In this study, we used PHQ-9 validated version with the Alpha coefficient of the questionnaire was 0.91.

#### Generalised Anxiety Disorder-7

A short questionnaire was designed to ascertain the participants' anxiety severity. The respondent's scores ranged from 0 to 3, similar to the PHQ9. The total score of 7 questions ranged from 0 to 21, and levels of anxiety were determined based on the total score: normal (0-4 points), mild anxiety (5-9 points), moderate anxiety (10-14 points) and severe anxiety (15-21 points).<sup>20</sup> The GAD-7 scale has been validated and used in many studies in Vietnam.<sup>24 25</sup> In this study, we used GAD-7 validated version with the alpha coefficient of the questionnaire was 0.94.

#### Perceived Stress Scale-4

Participants are required to complete four questions about stress status.<sup>21</sup> For questions 1 and 4, answers were scored from 0 to 4 (0=never, 1=almost never,

2=sometimes, 3=fairly often, 4=very often). Questions 2 and 3 were scored in reverse (4=never, 3=almost never, 2=sometimes, 1=fairly often, 0=very often). The total score ranged from 0 to 16, higher numbers indicated higher stress levels. Participants were categorised into two groups based on their total PSS-4 score (low stress: PSS score<6; excessive stress: PSS-4 score≥6). The PSS-4 scale was used in previous study in Vietnam.<sup>26</sup> The questionnaire's alpha coefficient was 0.60.

We used two questions to measure the need for support and improve mental health and willingness to give psychological counselling, as follows:

**Do you have a demand to use spiritual support services for medical staff during the COVID-19 period? If yes, what service?**

There is no need.

Knowledge about mental health.

Skills to deal with anxiety and depression problems.

Skills to help others cope with mental problems.

**Do you willing to give psychological counselling to colleagues during the COVID-19 pandemic?**

Yes.

No.

### Covariate

#### Individual characteristics

Participants reported their sociodemographic details including age, gender, education, area, region, marital status, the main income per month and monthly household income per capita.

Occupation characteristics during COVID-19 period comprised the following questions: type of workplace (general hospital, specialised/private hospital, Centers for Disease Control and Prevention (CDC)/medical centre/public health station, university hospital and other), level of the workplace (central line, province/city line, district line and other), specialty (medical doctor, nurse/midwife, technician/administrative staff and other), contract status (civil servant, indefinite-term labour contract and other), work experience (<5 years, 5-10 years and >10 years), working seniority (<5 years, 5-10 years and >10 years), number of duties per week (none, 1 day, 2 days and 3 days and above), working time (<8 hours, 8 hours, 9-10 hours, 11-12 hours and >12 hours), having part-time jobs (none, 1, 2 and more), the period of participating in the fight against the COVID-19 pandemic (none, 1-3 months, 3-12 months, >12 months), increase in workload due to COVID-19 (no increase, increase <20%, increase 20%-50%, increase >50%), increase in working time due to COVID-19 (no increase, increase <20%, increase 20%-50%, increase >50%).

Participants reported the resource to support mental health during the COVID-19 pandemic, including no support needed, social media/internet, friends, family, exercise, yoga, video game, reading psychological support material, writing a diary/blog, meditation, doctor/psychologist).



## Statistical analysis

For data management and analysis, Stata software (V.15.1) was used. Continuous variables were presented as mean and SD, while categorical variables were presented as frequencies with percentages. Missing data were managed using the listwise deletion method.

In terms of mental health, this study used multivariate Tobit regression to identify factors associated with depression, anxiety and stress in HCWs. The predictors variable included demographic variables and occupational characteristics variables. To identify factors related to the chance of requiring mental healthcare and participating in mental support, multiple logistic regression was employed. Stepwise forward techniques were employed to create reduced models, with a significance level of  $p < 0.2$  as the inclusion threshold. Statistical significance was set at  $p < 0.05$ .

In online supplemental appendix, we presented the mental health characteristics regarding socioeconomic status (online supplemental appendix 1), occupation characteristics (online supplemental appendix 2) and mental healthcare (online supplemental appendix 3). The percentage of severity levels of depression, stress and anxiety by subgroup was calculated using Tabout (Stata package).<sup>27</sup> The  $\chi^2$  test was performed to determine the difference in stress, anxiety and depression levels between the subgroups.

Participation was completely voluntary, respondents who were under 18 must have the consent of their parent or guardian to participate in this study. Collected data were saved in a secured system and only served the study purposes.

## Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

## RESULTS

### Demographic characteristics of participants

The demographic and socioeconomic characteristics of respondents are highlighted in [table 1](#). More than half of the participants were females (53.3%), aged 31–40 (51.5%). Most participants lived in cities (61.8%) and have married (70.9%). Participants who had main income per month and monthly household income per capita was 5–19 million VND had the highest percentage with 55.9% and 41.5%, respectively.

### Occupation characteristics during COVID-19

[Table 2](#) provides the work characteristics. The majority of the respondents (53.8%) were medical doctors in general hospitals. Participants who were medical doctors, had civil servants, had work experience from 5 to 10 years, on duty 1 day per week had the highest prevalence with 53.8%, 68.6%, 38.3% and 37.3%, respectively. More than 40% of participants worked more than 8 hours per day.

**Table 1** Demographic characteristics of participants

Characteristics	n	%
<b>Total</b>	503	100.0
Age groups		
21–30	180	35.8
31–40	259	51.5
≥40	64	12.7
Gender		
Male	234	46.7
Female	267	53.3
Education		
Intermediate/college	78	15.5
Graduated	243	48.3
Postgraduated	182	36.2
Area		
City	311	61.8
Town	81	16.1
Rural, mountainous	111	22.1
Region		
Northern	288	57.5
Central	120	24.0
Southern	93	18.6
Marital status		
Single/divorced/widowed	146	29.1
Married	356	70.9
The main income per month		
Under 5 million VND	129	25.6
5–10 million VND	281	55.9
10 million VND or above	93	18.5
Monthly household income per capita		
Under 5 million VND	186	37.1
5–10 million VND	208	41.5
10 million VND or above	107	21.4

More than 50% of participants reported an increase in workload and working time.

[Table 3](#) reports the access to mental healthcare of respondents. More than half (53.3%) of the participants received assistance and improved their health through social media and the internet. Only a small proportion (4%) could access help from psychologists. The majority of participants willing to give psychological counseling to their colleagues (90.5%).

### Mental health characteristics

[Table 4](#) reports the severity of three mental problems as scored by their measurement scales. The percentage of health workers suffering from depression, anxiety, and high stress accounts for a high rate with 67.6%, 43.5%,

**Table 2** Occupation characteristics during COVID-19 pandemic of respondents

Characteristics	n	%
Type of workplace		
General hospital	215	42.9
Specialised/private hospital	85	17.0
Centers for Disease Control and Prevention (CDC)/medical centre/public health station	123	24.6
University hospital	35	7.0
Other	43	8.6
Level of workplace		
Central line	108	21.5
Province/city line	181	36.1
District line	151	30.1
Others	62	12.4
Specialty		
Medical doctor	270	53.8
Nurse/midwife	107	21.3
Technician/administrative staff	61	12.2
Others	64	12.7
Contract status		
Civil servant	343	68.6
Indefinite-term labour contract	80	16.0
Others	77	15.4
Work experience		
Under 5 years	136	27.1
5 years to under 10 years	192	38.3
Above 10 years	173	34.5
Working seniority		
Under 5 years	188	37.5
5 years to under 10 years	169	33.7
Above 10 years	145	28.9
No of duties per week		
None	107	21.3
1 day	187	37.3
2 days	90	17.9
3 days and above	118	23.5
Working time		
Under 8 hours	63	12.5
8 hours	230	45.7
9–10 hours	108	21.5
11–12 hours	53	10.5
Above 12 hours	49	9.7
Part-time job		
None	398	79.3
1	90	17.9
2 and more	14	2.8

Continued

**Table 2** Continued

Characteristics	n	%
The period of participating in the fight against the COVID-19 pandemic		
None	107	21.3
1–3 months	187	37.3
3–12 months	90	17.9
Above 12 months	118	23.5
Increase in workload		
No increase	206	41.1
Less than 20% increase	101	20.2
Increase from 20% to less than 50%	121	24.2
Increase by 50% or more	73	14.6
Increase in working time		
No increase	229	45.7
Less than 20% increase	118	23.6
Increase from 20% to less than 50%	94	18.8
Increase by 50% or more	60	12.0

and 49.3%, respectively. The mean score of PHQ-9, GAD-7 and PSS-4 was  $7.1 \pm 5.1$ ,  $4.5 \pm 4.3$  and  $6.7 \pm 2.3$ , respectively.

Online supplemental appendix 1 reveals that participants aged 31–40 years old had a higher prevalence of depression, anxiety and stress than those aged 21–30 and  $\geq 40$  years old. Respondents who had main income per month under 5 million VND had a higher prevalence of depression, anxiety and stress than those who had more than 5 million VND.

Online supplemental appendix 2 presents mental health characteristics regarding occupation characteristics during COVID-19 pandemic. Compared with people whose workload did not increase, participants who had increased workloads and working time had a higher prevalence of depression and anxiety.

Online supplemental appendix 3 illustrates the mental health characteristics regarding mental healthcare.

### Multivariate regression to identify factors related to mental health, the need for support and the availability of mental health counselling

**Table 5** examines factors associated with depression, anxiety and stress. Female HCWs had PHQ-9, GAD-7 and PSS-4 scores 1.53, 0.97 and 0.33 times higher, respectively, than males. Respondents who had a monthly income per month of more than 5 million VND have lower PHQ-9, GAD-7 and PSS-4 scores than those who had <5 million VND. Compare to medical doctors, nurses/midwives had lower PHQ-9 (Coef= $-2.53$ ; 95% CI= $-3.71$  to  $-1.36$ ) and GAD-7 scores (Coef= $-2.36$ ; 95% CI= $-3.56$  to  $-1.16$ ). Participants who participated in the fight against

**Table 3** Characteristics of mental healthcare assessment

Characteristics	n	%
Mental health support		
No support needed	33	6.6
Social media/internet	268	53.3
Friends	256	50.9
Family	250	49.7
Colleagues	216	42.9
Exercise/yoga	184	36.6
Video game	92	18.3
Read psychological support material	53	10.5
Write a diary/blog	28	5.6
Meditation	21	4.2
Doctor/psychologist	20	4.0
Demand for mental healthcare services		
There is no need	271	53.9
Knowledge about mental health	124	24.7
Skills to deal with anxiety and depression problems	141	28.0
Skills to help others cope with mental problems	101	20.1
Willingness to give psychological counselling to colleagues		
Yes	455	90.5
No	48	9.5

the COVID-19 pandemic for 1–3 months had higher PHQ-9 (Coef=1.95; 95% CI=0.66 to 3.23) and GAD-7 (Coef=1.48; 95% CI=0.22 to 2.74) scores than those who did not participate. Increased workload and work time was the harmful factor that increase the PHQ-9, GAD-7 or PSS-4 scores. Exercise/Yoga was a positive method to help improve mental health that decreased both PHQ-9 (Coef=-1.41; 95% CI=-2.33 to -0.50), GAD-7 (Coef=-1.30; 95% CI=-2.23 to -0.38) and PSS-4 (Coef=-0.41; 95% CI=-0.81 to -0.01) scores.

**Table 6** reports factors that influence the need for mental health services and the willingness to provide mental health counselling to coworkers. The participant who had postgraduate education (OR=0.29; 95% CI=0.11 to 0.74), more than 10 years of experience (OR=0.22; 95% CI=0.08 to 0.57) was likely to not need support and improve mental health. Meanwhile, respondents who had a main income per month of 10 million VND or above, participated in the fight against the COVID-19 pandemic, and longer work experience was more likely to be willing to give psychological counselling to colleagues than others.

**Table 4** Severity score of depression, anxiety, stress

Characteristic	n	%
Total	503	100.0
Depression severity		
None (PHQ9 score: 0–4)	159	32.4
Mild (PHQ9 score: 5–9)	244	49.7
Moderate (PHQ9 score: 10–14)	45	9.2
Moderately severe (PHQ9 score: 15–19)	27	5.5
Severe (PHQ9 score: 20–27)	16	3.3
Anxiety severity		
Normal	284	56.5
Mild anxiety	171	34.0
Moderate anxiety	29	5.8
Severe anxiety	19	3.8
Stress severity		
Low stress (PSS<8)	255	50.7
High stress (PSS≥8)	248	49.3
	Mean	SD
PHQ-9 score (range: 0–27)	7.1	5.1
GAD-7 score (range: 0–21)	4.5	4.3
PSS-4 (range: 0–16)	6.7	2.3
GAD-7, Generalised Anxiety Disorder-7; PHQ-9, Patient Health Questionnaire-9; PSS, Perceived Stress Scale.		

## DISCUSSION

This study investigated the influences of COVID-19 on the psychological health of health workers in Vietnam. As it is already well evident that a higher workload leads to higher levels of mental disorders, it is important that we look into factors associated with psychological impacts to develop timely interventions.

Our study revealed that the rate of HCWs experiencing anxiety in our study is lower than in a US study, especially for moderate and severe anxiety.<sup>28</sup> The USA has been greatly impacted by the pandemic, with a substantial number of cases and fatalities. However, HCWs had a higher severity of depression and anxiety than in previous studies in Vietnam.<sup>25 29</sup> In Vietnam, the fourth wave of COVID-19 saw a surge in daily cases, hospitalisations and deaths. This increase may have caused HCWs to experience psychological distress and trauma-related symptoms, potentially leading to depression and anxiety. Additionally, inadequate support structures and resources for HCWs during this wave may have exacerbated their mental health issues. As a result, the fourth wave highlights the need for emotional support and resources for HCWs to address the psychological impact of the pandemic on their mental health. Our results indicated participants had longer working hours and more days of duty: 28% had to work for more than three extra days of duty, and 14.2% worked for more than 12 hours per day. Health workers with less job

**Table 5** Multivariate Tobit regression to identify factors associated with depression, anxiety and stress among health professionals

Characteristic	PHQ-9 score		GAD-7 score		PSS-4 score	
	Coef.	95% CI	Coef.	95% CI	Coef.	95% CI
Demographic information						
Gender (vs male)						
Female	1.53***	0.60 to 2.47	0.97**	0.04 to 1.90	0.33	-0.07 to 0.72
Age groups (vs 21–30)						
31–40	-0.04	-1.06 to 0.98			-0.37	-0.80 to 0.07
41 years and above	-2.10**	-3.71 to -0.48			-0.90**	-1.58 to -0.21
Area (vs city)						
Countryside					0.31	-0.29 to 0.91
Others					-0.32	-0.88 to 0.23
Region (vs Northern)						
Central	-0.59	-1.73 to 0.56				
Southern	0.84	-0.42 to 2.10				
The main income per month (vs under 5 million VND)						
5–10 million VND	-2.06***	-3.13 to -0.99	-1.34**	-2.46 to -0.23	-0.52**	-1.00 to -0.03
10 million VND or above	-2.16***	-3.56 to -0.76	-1.74**	-3.31 to -0.18	-1.18***	-1.88 to -0.47
Monthly household income per capita (vs under 5 million VND)						
5–10 million VND	1.67***	0.57 to 2.78	1.68***	0.56 to 2.80	0.16	-0.34 to 0.66
10 million VND or above	0.57	-0.54 to 1.68	0.63	-0.50 to 1.75	0.44*	-0.06 to 0.94
Occupational characteristics						
Type of workplace (vs general hospital)						
Specialised/private hospital			-0.96	-2.21 to 0.29		
Centers for Disease Control and Prevention (CDC)/medical centre/public health station			-0.79	-1.98 to 0.41		

Continued



Table 5 Continued

Characteristic	PHQ-9 score		GAD-7 score		PSS-4 score	
	Coef.	95% CI	Coef.	95% CI	Coef.	95% CI
University hospital			0.30	-1.89 to 2.49		
Other			-3.54***	-5.31 to -1.76		
Level of the workplace (vs central line)						
Province/city line					-0.42	-0.94 to 0.10
District line					-0.57*	-1.19 to 0.05
Others					0.07	-0.65 to 0.78
Specialty (vs medical doctor)						
Nurse/midwife	-2.53***	-3.71 to -1.36	-2.36***	-3.56 to -1.16		
Technician/administrative staff	0.24	-1.23 to 1.71	0.37	-1.07 to 1.82		
Others	-1.45**	-2.88 to -0.02	-0.97	-2.65 to 0.72		
Work experience (vs under 5 years)						
5 years to under 10 years			-0.08	-1.23 to 1.07		
Above 10 years			-0.99	-2.32 to 0.33		
No of duties per week (vs none)						
1 day	0.49	-0.84 to 1.81	0.56	-0.77 to 1.89		
2 days	0.73	-0.55 to 2.01	0.08	-1.23 to 1.40		
3 days and above	2.53***	1.11 to 3.95	1.54**	0.07 to 3.00		
The period of participating in the fight against the COVID-19 pandemic (vs none)						
1-3 months	1.95***	0.66 to 3.23	1.48**	0.22 to 2.74		
3-12 months	1.33*	-0.17 to 2.83	1.16	-0.33 to 2.64		
Above 12 months	0.73	-0.73 to 2.19	0.94	-0.57 to 2.44		
Contract status (vs civil servant)						
Indefinite-term labour contract	-0.04	-1.28 to 1.20	0.06	-1.19 to 1.31		

Continued



Table 5 Continued

Characteristic	PHQ-9 score		GAD-7 score		PSS-4 score	
	Coef.	95% CI	Coef.	95% CI	Coef.	95% CI
Others	1.32*	-0.08 to 2.72	1.52**	0.09 to 2.94		
Working time (vs under 8 hours)						
8 hours			1.44**	0.01 to 2.87	0.91***	0.31 to 1.52
9–10 hours			1.28	-0.44 to 2.99	0.87**	0.14 to 1.60
11–12 hours			2.21**	0.20 to 4.21	0.81*	-0.06 to 1.68
Above 12 hours			2.33**	0.16 to 4.50	1.28***	0.35 to 2.22
Increase in workload (vs no increase)						
Less than 20% increase	-0.53	-1.76 to 0.70	-0.93	-2.64 to 0.77		
Increase from 20% to less than 50%	1.61***	0.43 to 2.80	1.30	-0.46 to 3.06		
Increase by 50% or more	3.62***	2.11 to 5.13	1.62	-0.57 to 3.81		
Increase in working time (no increase)						
Less than 20% increase			0.50	-1.13 to 2.13	0.19	-0.31 to 0.68
Increase from 20% to less than 50%			0.30	-1.70 to 2.30	0.59*	-0.01 to 1.20
Increase by 50% or more			1.58	-0.82 to 3.98	1.01**	0.24 to 1.77
Methods to help improve mental health (yes vs no)						
Doctor/psychologist			1.45	-0.72 to 3.61		
Read psychological support material	1.34*	-0.09 to 2.77				
Family					-0.45**	-0.88 to -0.03
Friends			0.56	-0.35 to 1.47		
Colleagues					-0.36	-0.36
Social media/internet	1.04**	0.15 to 1.93	0.63	-0.28 to 1.54	-0.34*	-0.74 to 0.06
Exercise/yoga	-1.41***	-2.33 to -0.50	-1.30***	-2.23 to -0.38	-0.41**	-0.81 to -0.01

Continued



**Table 5** Continued

Characteristic	PHQ-9 score		GAD-7 score		PSS-4 score	
	Coef.	95% CI	Coef.	95% CI	Coef.	95% CI
*p<0.05, **p<0.01, ***p<0.001.						
GAD-7; Generalised Anxiety Disorder-7; PHQ-9; Patient Health Questionnaire-9; PSS-4, Perceived Stress Scale-4.						

experience and who have recently joined the fight against the COVID-19 pandemic all scored higher on depression, anxiety and stress, according to our findings. Shanafelt *et al's* research also discovered that HCWs who were younger, had more direct patient contacts, were involved in COVID-19 patient care and experienced COVID-19 exposure had higher anxiety rates during the pandemic.<sup>30</sup> This demonstrates that those with extensive experience in the field and in epidemic prevention and control are better equipped to deal with the outbreak. Long working hours, high workloads, exposure to death and dying, and making difficult decisions regarding patient treatment are just a few of the many stressors that HCWs face on a daily basis. High workloads and extended working hours can cause physical and mental tiredness, which raises the possibility of burnout and depression. Exposure to death and dying can be extremely difficult for some people since it can cause them to experience grief, anxiety and post-traumatic stress disorder. Making challenging decisions about patient care can also be emotionally taxing and cause feelings of guilt or self-doubt. Therefore, healthcare firms must understand how these stressors affect their staff members and take action to resolve them. This could entail offering workload reduction and work-life balance techniques into practice. Besides, health workers who gained higher main income per month tended to have lower mental distress, meaning a higher level of mental distress came with financial rewards. Indeed, despite serving as the most important occupation during the pandemic, HCWs received no or very little bonus for overtime worked.<sup>31</sup> At the lowest point in the Vietnam 2021 economic collapse, the salary of HCWs was cut in half or left overdue for months in many institutions.<sup>32 33</sup> The lack of encouragement and constant overwork led to a toxic working environment that threatened the quality of care and development of the healthcare workforce. In Vietnam, the salary of doctors is higher than that of nurses and other professionals (according to the basic salary coefficient of Vietnam). However, doctors' salaries are still low, making it difficult for them to make ends meet. Measuring the impact of wages on mental health healthcare workers is essential. In the last 3 months, 400 HCWs in Ho Chi Minh City and hundreds of others in other cities of Vietnam have quit their job due to low pay rates and unbearable workload.<sup>34 35</sup> As a result, the Vietnam healthcare workforce, which is already short on human resources, became even more overwhelmed. To avoid negative scenarios similar to Vietnam 2021, financial encouragement has been used in many other countries to enhance work satisfaction and improve the quality of their workforce, such as Singapore's 14% salary increase for nurses or Poland's 20% salary bonus for front-line workers.<sup>36 37</sup> Therefore, an important implication for Vietnam at this time is to raise the basic salary of HCWs and provide more generous compensations for their overtime work.

There is no doubt that policy-makers need to make urgent efforts to alleviate pressure on healthcare staff. However, it is also important that institutions are

**Table 6** Multivariate logistics regression to identify factors associated with the need for support and availability of mental health counselling

Characteristic	Need support and improve mental health		Willingness to give psychological counselling to colleagues	
	OR	95% CI	OR	95% CI
General information				
Gender (vs male)				
Female	1.65	0.88 to 3.10	1.75*	0.90 to 3.39
Age groups (vs 21–30)				
31–40			0.45*	0.19 to 1.08
Education (intermediate/college)				
Graduated	0.84	0.33 to 2.11		
Postgraduated	0.29***	0.11 to 0.74		
Area (vs city)				
Town			3.19*	0.92 to 11.11
Rural, mountainous			1.13	0.52 to 2.50
Region (Northern)				
Central			1.73	0.65 to 4.59
Southern			0.47*	0.20 to 1.14
The main income per month (vs under 5 million VND)				
5–10 million VND			0.92	0.42 to 1.99
10 million VND or above			4.04**	1.27 to 12.88
Occupational characteristics				
The period of participating in the fight against the COVID-19 pandemic (vs none)				
1–3 months			4.14***	1.78 to 9.62
3–12 months			4.43***	1.60 to 12.25
Above 12 months			4.38***	1.51 to 12.73
Work experience (under 5 years)				
5 years to under 10 years	0.53	0.21 to 1.35	2.62**	1.09 to 6.31
Above 10 years	0.22***	0.08 to 0.57	6.54***	1.82 to 23.47
Contract status (vs civil servant)				
Indefinite-term labour contract	0.43**	0.19 to 0.99		
Others	0.50	0.20 to 1.28		
Increase in working time (vs no increase)				
Less than 20% increase	0.35*	0.10 to 1.21		
Increase from 20% to less than 50%	0.12**	0.02 to 0.81		
Increase by 50% or more	3.57	0.30 to 41.86		
Support service needs (Ref: no)				
Knowledge about mental health (yes)	3.99**	1.39 to 11.45		
Skills to deal with anxiety and depression problems (yes)	7.27***	2.00 to 26.44		
Skills to help others cope with mental problems (yes)	2.44	0.75 to 7.96		

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001.

concerned more about the mental well-being of their staff, and healthcare professionals are also encouraged to care more about their mental health. According to our survey, more than half (53.9%) of HCWs stated no demand for mental healthcare services. The hesitancy for seeking mental healthcare may stem from a busy

schedule, unawareness or underestimation of mental health problems or the inaccessibility of existing mental services. Therefore, the first step towards improving the psychological well-being of HCWs should be to raise awareness and adapt mental services to fit into their hectic schedules. An ideal solution for policy-makers is

using social media and other online platforms. During COVID-19, social media have become increasingly popular as a platform for raising pandemic awareness and providing self-care information. Our data also indicated that social media and the internet were the leading sources of mental healthcare: more than half of respondents in all categories have used online platforms to relax and access information about mental health. This form of healthcare has, in a sense, replaced conventional therapy sessions with psychologists and doctors as it is readily accessible, and convenient and does not involve any risk of COVID-19 infection. Given the harsh, uncertain work hours of COVID-19 front-line workers, mental health interventions in Vietnam should be developed as online resources such as prerecorded therapy sessions or mindfulness blogs that can be accessed by any time. Mental healthcare content on Instagram, Facebook and Twitter is considered an effective form of public awareness-raising and is widely encouraged in many countries.<sup>38 39</sup> These platforms are used by several mental health organisations and specialists to disseminate knowledge, offer assistance and advertise mental health services. In addition, online mental health therapy and e-health consultations are also convenient services for HCWs, especially in countries with limited access to traditional mental health services or where face-to-face sessions may be difficult or inconvenient.<sup>40 41</sup> Many mental health issues, such as anxiety and depression, have been successfully treated using teletherapy and other online mental health services.<sup>41</sup> The connotation here is that integrating online mental health therapy with e-health consultations via social media can be strategically implemented to augment service delivery, and simultaneously enhance the standard of mental health services, catering to not only healthcare providers but also the general population.

### Strengths and limitations

The main strength of our study is the size of the survey sample: the data were collected from HCWs in all three regions, within all age groups and work environments. Furthermore, besides the assessment of psychological impacts, we also investigated associated factors and were able to identify correlations between items. Our study has some limitations. First, the questionnaire was self-report. Recall and other biases may cause certain answers to be underestimated or overestimated. Second, the informed sample selection of the snowball sampling method, which was not representative, may have resulted in a greater number of responses from certain health institutions than others. Nevertheless, our data are sufficient to indicate the severity of mental burdens that HCWs were experiencing and provide valuable insights for policy development.

### CONCLUSIONS

Health workers who gained less financial rewards are reported to have higher levels of mental distress than

others, implying the need for a raise in basic salary as well as compensation and encouragement schemes. To tackle hesitancy in seeking mental help, integrating online mental health therapy with e-health consultations via social media can be strategically implemented to augment service delivery, and simultaneously enhance the standard of mental health services, catering to not only healthcare providers but also the general population.

### Author affiliations

<sup>1</sup>EA 3279, CEReSS, Research Centre on Health Services and Quality of Life, Aix-Marseille Université, Marseille, France

<sup>2</sup>Institute for Preventive Medicine and Public Health, Hanoi Medical University, Hanoi, Viet Nam

<sup>3</sup>National Centre for Youth Substance Use Research, The University of Queensland, Brisbane, Queensland, Australia

<sup>4</sup>Action Aid Vietnam, Hanoi, Viet Nam

<sup>5</sup>Vietnam Young Physicians' Association, Hanoi, Viet Nam

<sup>6</sup>Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland, USA

<sup>7</sup>Department of Psychological Medicine, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

<sup>8</sup>Institute for Health Innovation and Technology (iHealthtech), National University of Singapore, Singapore

<sup>9</sup>Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore

**Acknowledgements** BT is the PI of the research project which is managed by Youth Research Institute as a ministerial-level research project implemented by Vietnam Young Physician Association. The project was supported by Action Aid Vietnam, Gia Lam Urban Development And Investment Company Limited, Vingroup, and supported by Vingroup Innovation Foundation (VINIF) (Grant No. VINIF.2020.COVID-19.DA03). The authors would like to acknowledge ActionAid Vietnam, Youth Research Institute and Vietnam Young Physician Association for financial support. MTN is a master student of the project.

**Contributors** BT: guarantor, conceptualisation, resources, supervision, writing—review and editing, MTN: writing—original draft, writing—review and editing, PA: supervision, writing—review and editing, LB: supervision, writing—review and editing, GF: supervision, writing—review and editing, GTV: methodology, investigation, writing—review and editing, TPH: supervision, resources, PTH: supervision, resources, THN: resources, methodology, data collection, CL: supervision, methodology, writing—review and editing, CSHH: supervision, methodology, writing—review and editing, RCMH: supervision, methodology, writing—review and editing, MWBZ: supervision, methodology, writing—original draft, writing—review and editing.

**Funding** This study is supported by Actionaid Vietnam, Vingroup Innovation Foundation (VINIF) (Grant No. VINIF.2020.COVID-19.DA03). The article process charge of this paper is supported by the NUS Department of Psychological Medicine (R-177-000-100-001/R-177-000-003-001/ R177000702733), NUS iHealthtech Other Operating Expenses (R-722-000-004-731).

**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Consent obtained directly from patient(s).

**Ethics approval** The study was approved by the scientific committee of the Youth Research Institute (Code: ĐT.KXĐTĐN 22-11). All procedures performed in studies involving human participants were by the ethical standards of the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** All data relevant to the study are included in the article or uploaded as online supplemental information.

**Supplemental material** This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content



includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

#### ORCID iDs

Bach Tran <http://orcid.org/0000-0001-9510-6753>

Roger C M Ho <http://orcid.org/0000-0001-9629-4493>

Melvyn W B Zhang <http://orcid.org/0000-0001-8385-2345>

#### REFERENCES

- WHO. Weekly operational update on COVID-19. 2021.
- Dzau VJ, Kirch DG, Nasca TJ. To care is human—collectively confronting the clinician-burnout crisis. *N Engl J Med* 2018;378:312–4.
- Lu DW, Dresden S, McCloskey C, et al. Impact of burnout on self-reported patient care among emergency physicians. *West J Emerg Med* 2015;16:996–1001.
- Lai J, Ma S, Wang Y, et al. Factors associated with mental health outcomes among health care workers exposed to Coronavirus disease 2019. *JAMA Netw Open* 2020;3:e203976.
- Fourth wave of COVID-19 in Việt Nam longer and much more serious than previous ones: health Minister. 2021. Available: <https://vietnamnews.vn/society/994206/fourth-wave-of-covid-19-in-vietnam-longer-and-much-more-serious-than-previous-ones-health-minister.html>
- Le T-AT, Vodden K, Wu J, et al. Policy responses to the COVID-19 pandemic in Vietnam. *Int J Environ Res Public Health* 2021;18:559.
- WHO. COVID-19 in Viet Nam situation; 2021, Report 70.
- Nguyen TV, Tran QD, Phan LT, et al. In the interest of public safety: rapid response to the COVID-19 epidemic in Vietnam. *BMJ Glob Health* 2021;6:e004100.
- Van Nguyen Q, Cao DA, Nghiem SH. Spread of COVID-19 and policy responses in Vietnam: an overview. *Int J Infect Dis* 2021;103:157–61.
- Onishi T. Vietnam's Ho Chi Minh city faces medical collapse as COVID surges. In: *Nikkei Asia*. 2021.
- Chong M-Y, Wang W-C, Hsieh W-C, et al. Psychological impact of severe acute respiratory syndrome on health workers in a tertiary hospital. *Br J Psychiatry* 2004;185:127–33.
- Nguyen TT, Le XTT, Nguyen NTT, et al. Psychosocial impacts of COVID-19 on Healthcare workers during the nationwide partial Lockdown in Vietnam in April 2020. *Front Psychiatry* 2021;12:562337.
- Nguyen PTL, Nguyen TBL, Pham AG, et al. Psychological stress risk factors, concerns and mental health support among health care workers in Vietnam during the Coronavirus disease 2019 (COVID-19) outbreak. *Front Public Health* 2021;9:628341.
- Vietnam Young Physicians Association. RESPONSE TO COVID-19 Vietnam young physicians Association: Vietnam young physicians Association. Available: <http://thaythuocre.vn/>
- Minh H. Research on post-COVID-19 status for young working age people Vietnam government electronic newspaper:: 2022. Available: <https://baochinhphu.vn/nghien-cuu-tinh-trang-hau-covid-19-doi-voi-nguoi-trong-do-tuoi-lao-dong-tre-102220609160808323.htm>
- Dang AK, Le XTT, Le HT, et al. Evidence of COVID-19 impacts on occupations during the first Vietnamese national Lockdown. *Ann Glob Health* 2020;86:112.
- Alharthi MH, Alshomrani AT, Bazaid K, et al. Factors affecting the psychological well-being of health care workers during the COVID-19 crisis. *Psychol Res Behav Manag* 2022;15:1931–42.
- Wang X-L, Liu M-X, Peng S, et al. Impact of the COVID-19 pandemic on career intention amongst undergraduate medical students: a single-centre cross-sectional study conducted in Hubei province. *BMC Med Educ* 2022;22:154.
- Test review: patient health Questionnaire–9 (PHQ-9). *Rehabilitation Counseling Bulletin* 2014;57:246–8.
- Spitzer RL, Kroenke K, Williams JBW, et al. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med* 2006;166:1092–7.
- Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav* 1983;24:385–96.
- Nguyen N, An P, Tien N. Reliability and validity of Vietnamese version of patient health questionnaire 9 items (PHQ-9) among UMP medical. *Freshmen* 2022:901–23.
- Vu LG, Le LK, Dam AVT, et al. Factor structures of patient health Questionnaire-9 instruments in exploring depressive symptoms of suburban population. *Front Psychiatry* 2022;13:838747.
- Mughal AY, Stockton MA, Bui Q, et al. Validation of screening tools for common mental health disorders in the methadone maintenance population in Hanoi, Vietnam. *BMC Psychiatry* 2021;21:488.
- Quang LN, Kien NT, Anh PN, et al. The level of expression of anxiety and depression in clinical health care workers during the COVID-19 outbreak in 2 hospitals in Hanoi. *Health Serv Insights* 2021;14:11786329211033245.
- Nguyen Thanh Trung DDN. Degree of Stress among staffs at University of social sciences and Humanities, Hanoi. *Vietnam Journal of Preventive Medicine* 2015:75.
- Watson I. TABOUT: STATA Module to export publication quality cross-tabulations. 2004.
- Biber J, Ranes B, Lawrence S, et al. Mental health impact on Healthcare workers due to the COVID-19 pandemic: a U.S. cross-sectional survey study. *J Patient Rep Outcomes* 2022;6:63.
- Hoang N-A, Van Hoang N, Quach H-L, et al. Assessing the mental effects of COVID-19-related work on depression among community health workers in Vietnam. *Hum Resour Health* 2022;20:64.
- Shanafelt T, Ripp J, Trockel M. Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *JAMA* 2020;323:2133–4.
- Thai TT, Le TAT, Truong LTT, et al. Care for the Carers: an evaluation of job satisfaction of community Healthcare workers in charge of infectious disease prevention and control in Vietnam. *Risk Manag Healthc Policy* 2021;14:2831–9.
- News TT. In Vietnam, doctors, nurses raise banners to demand 8-month unpaid salaries; 2022.
- Quynh T. Unkind cut: medics fighting COVID-19 report drop in wages: Vnexpress; 2021.
- News V. Hundreds of health workers in HCM city quit due to low pay; 2022. Vietnam news
- Snell G. Overworked and underpaid, Vietnam's medical staff reflect on COVID-19: globe Southeast Asia; 2021.
- Baker J. Salary increase of up to 14% for nurses in public Healthcare sector; 2021. Channel news Asia
- Williams GA, Scarpetti G, Bezzina A, et al. How are countries supporting their health workers during COVID-19? *Eurohealth (Lond)* 2020;26:58–62.
- Tsoy D, Tirasawasdichai T, Ivanovich Kurpayanidi K. Role of social media in shaping public risk perception during COVID-19 pandemic: a theoretical review. *IJMSBA* 2021;7:35–41.
- Saud M, Mashud M, Ida R. Usage of social media during the pandemic: seeking support and awareness about COVID-19 through social media platforms. *J Public Affairs* 2020;20:e02417.
- Liu S, Yang L, Zhang C, et al. Online mental health services in China during the COVID-19 outbreak. *Lancet Psychiatry* 2020;7:e17–8.
- Ngcobo-Sithole M. Challenges and opportunities in the provision of mental health care services during the COVID-19 pandemic and beyond. *Lessons from COVID-19* 2022:241–62.