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The Psychological Impact of the COVID-19 Pandemic on Healthcare Staff in High Acuity Areas, and the Impact of Mitigation Strategies

Marilyn Hui Xin Ng[1], Shivani Manohara[1] , Anthony TB Wong[2], Louis Xiang Long Ng[1], Joyce SC Ng[2]

[1]Department of Anaesthesia and Surgical Intensive Care, Changi General Hospital, Singapore
[2]Department of TRaCS, Changi General Hospital, Singapore
Email: manohara.shivani@singhealth.com.sg

Abstract

The COVID-19 pandemic has been more than a global health crisis. Social problems such as depression, anxiety and fear of the future are common feelings amongst people, including healthcare staff. We conducted a survey of our frontline staff in a Singapore Public Hospital to evaluate stress, moral distress in hypothetical scenarios when resource triaging is needed and the perception of mitigation strategies implemented during the first spike in cases seen in Singapore in May 2020. Our study shows that, during the earlier part of the COVID-19 pandemic, frontline staff stress was mostly at moderate levels. Many measures and policies were implemented in Singapore to deal with COVID-19, of which, frontline staff felt that clear communication of the policies and guidelines from the government and from the hospital administration were most helpful. A follow up study to assess how staff stress levels have progressed and how their opinions have changed after more than 2 years of working in the pandemic will be ideal in guiding our future healthcare strategies.

Keywords

Pandemic, COVID-19, Healthcare Workers, Stress, Burnout, Moral Distress, Resource Triaging

1. Introduction

Working in high acuity areas such as the Emergency Department (ED) (Estryn-Behar et al., 2011) and the Intensive Care Unit (ICU) (Van Mol et al., 2015) has traditionally been associated with high staff levels of stress and burnout.

When the COVID-19 pandemic hit, our frontline workers were subject to additional stress from the overwhelming workload, increased risk of contraction of a deadly infection, depletion of personal protection equipment, widespread media coverage, depletion of pharmacological supplies, and feelings of being inadequately supported (Lai et al., 2020). Frontline healthcare workers were also found to be at higher risk for psychological morbidity compared to those who were not engaged in direct care of suspected or confirmed COVID-19 cases (Lai et al., 2020).

COVID-19 infection numbers hit a peak in Singapore in May 2020, and the government implemented a "Circuit Breaker" (https://www.channelnewsasia.com/singapore/covid-19-circuit-breaker-chronicles-charting-evolution-645586), essentially a country-wide lockdown, in hopes of controlling the spread of disease and to avoid further straining our healthcare system.

We decided to survey our frontline staff working in the Emergency Department (ED), Intensive Care Units (ICU) and the Infectious Disease Isolation Unit (with level 2 and level 3 ICU capability) during this period to determine staff stress levels and to evaluate the impact of mitigation strategies on staff morale.

Understanding the extent of the psychological impact of the pandemic, as well as the possible protective mitigating factors, will be useful in focusing healthcare resources on effective measures to provide psychological support to our healthcare workers as the global pandemic continues.

2. Methods

This study was exempted from review by the SingHealth Institutional Review Board.

We sent an invitation via email, WhatsApp™ messaging system and Short Messaging System (SMS) to the doctors and nurses working in the ED, ICUs and Infectious Disease Isolation Unit managing COVID-19 patients (potential or confirmed) in our 1000-bed general hospital, to fill in an online anonymous survey. We had 55 responses, 24 doctors (43%) and 31 nurses (56%).

To evaluate stress, we used the Perceived Stress Scale (PSS) (Cohen et al., 1983), a simple, widely used self-report measure with 10 questions assessing "the degree to which situations in one's life are appraised as stressful") (Cohen et al., 1983). Individual scores on the PSS can range from 0 - 40, with higher scores indicating higher levels of perceived stress. Scores from 0-13 would indicate low stress; 14 - 26 moderate stress and 27 - 40 high perceived stress. It has been shown to have strong factorial validity in measuring perceived stress across various populations and languages and maintains consistent test-retest reliability (Bastianon et al., 2020).

To evaluate respondents' perceived impact of various mitigation strategies, we adapted a questionnaire used by Sim SS and Huak CY on the psychological impact of the SARS outbreak (Sim & Huak, 2004). Questions were focused on whether respondents felt that their situation was beyond their control and what

their feelings were in the last month. In each case, respondents are asked how often they felt a certain way on a 5 point scale (0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often).

As part of this questionnaire, respondents were asked to rank how important factors such as personal values and national policies were in guiding difficult decisions in managing patients, and about strategies that helped them cope with the stresses of working in a pandemic.

The survey was divided into 4 parts: personal demographics; impact of the pandemic on self; national, institutional and social strategies impact on mitigating psychological stress; and their readiness, and what may help mitigate the moral distress of triaging patients given limited medical resources in the event that the healthcare system gets overwhelmed.

Descriptive statistics of respondent characteristics and outcomes of interest were tabulated.

3. Results

A total of 55 doctors and nurses responded. 24 were doctors (43%) and 31 nurses (56%). 40 were females (73%) (Table 1).

Of note, 61.8% of our respondents had >7 years or working experience. This perhaps reflects the amount of experience required to work in areas such as the ICU.

Based on the PSS, 52 (94.5%) of our healthcare workers had moderate perceived stress, while only 1 (1.8%) had high stress.

As for changes in life priorities triggered by the pandemic, most stated that their own health (49/55, 89.1%), relationship with family (50/55, 90.9%), professional values (51/55, 92.7%) and organisational requirements (49/55, 89.1%) had become more important to them (Table 2).

When asked about the mitigation strategies that they felt helped them to cope with the demands of frontline work, most cited national policies such as clear communication of directives and disease information about COVID-19 by the government (83.6%) and emphasis on personal hygiene and social responsibilities (87.3%) as being important (Table 3).

Institutional policies such as clear communication of directives and disease information about COVID-19 (90.9%), precautionary measures taken at work such as clear-cut infection control policies (89.1%) and the availability of personal protective equipment (PPE) due to government stockpiles (87.3%) were also found to be helpful (Table 4).

Social support from family and colleagues were also found to be very important (92.7% and 87.3% respectively) (Table 5).

On the flip side, many felt that the Trace Together application (an application available for the cell phone or as a wireless dongle which the government used to trace contacts of infected patients; 50.9%), split team arrangements (41.8%) and the use of social media (43.6%) to be the least useful in supporting them in their

work.

We also asked respondents if they would be comfortable performing triage of critically ill patients for treatment and care in hypothetical setting when local resources run low (Table 6).

Perhaps unsurprisingly, those with more working experience were more comfortable with making a difficult decision in the proposed scenario.

Most respondents cited professional experience (94.5%), professional ethics and values (92.7%), and adequate planning and debriefing on the situation (92.7%) as being of the greatest help when faced with such decisions (Table 7).

Table 1. Characteristics of healthcare workers.

Healthcare Worker Characteristics		
		Number (percentage)
Gender	Male	15 (27%)
	Female	40 (73%)
Age	18 - 25	7 (12.7%)
	>25 - 35	21 (38.1%)
	>35 - 45	13 (23.6%)
	>45 - 55	9 (16.3%)
	>55	5 (9.1%)
Race	Chinese	31 (56.3%)
	Malay	10 (18.2%)
	Indian	7 (12.7%)
	Others	7 (12.7%)
Marital status	Single	20 (36.3%)
	Married	34 (61.8%)
	Divorced	1 (1.8%)
Religion	Christianity	28 (50.9%)
	Buddhism/Taoism	9 (16.3%)
	Islam	8 (14.5%)
	Hinduism	4 (7.3%)
	No religion	6 (10.9%)
Years of working experience	0 - 2 years	9 (16.3%)
	>2 - 7 years	12 (21.8%)
	>5 - 7 years	5 (9.1%)
	>7 years	34 (61.8%)

Table 2. Changes in priorities as a result of the pandemic.

Things that have become more important to me			
My health	Agree	49	89.1%
	Disagree	6	10.9%
My relationship with my family	Agree	50	90.9%
	Disagree	5	9.1%
My relationship with my friends	Agree	44	80.0%
	Disagree	11	20.0%
My relationship with my colleagues	Agree	39	70.9%
	Disagree	16	29.1%
My work	Agree	41	74.5%
	Disagree	14	25.5%
My spiritual beliefs	Agree	38	69.1%
	Disagree	17	30.9%
Personal values	Agree	36	65.5%
	Disagree	19	34.5%
Religious Faith	Agree	27	49.1%
	Disagree	28	50.9%
Professional values	Agree	51	92.7%
	Disagree	4	7.3%
Organisation's requirements	Agree	49	89.1%
	Disagree	6	10.9%
National/Institution Policies	Agree	46	83.6%
	Disagree	9	16.4%

Table 3. Mitigation strategies: national level.

Things that helped me to cope with the COVID-19 situation			
National Strategies			
		Total	Percent
Social Distancing	Agree	42	76.4%
	Disagree	13	23.6%
Temperature screening and declaration of travel history	Agree	37	67.3%
	Disagree	18	32.7%
Home Quarantine Order/Stay Home Notice/Leave of Absence	Agree	39	70.9%
	Disagree	16	29.1%
Border control	Agree	39	70.9%
	Disagree	16	29.1%
Free healthcare for residents, PR and long-term pass holders diagnosed with COVID-19	Agree	43	78.2%
	Disagree	12	21.8%
Implementation of Circuit Breaker initiatives	Agree	43	78.2%
	Disagree	12	21.8%

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National support budgets	Agree	42	76.4%
	Disagree	13	23.6%
Clear communication of directives and disease information about COVID-19 by government	Agree	46	83.6%
	Disagree	9	16.4%
Trace together app	Agree	27	49.1%
	Disagree	28	50.9%
Guaranteed essential supply chain	Agree	44	80.0%
	Disagree	11	20.0%
Penalties for breach of Infectious Disease Act	Agree	41	74.5%
	Disagree	14	25.5%
Emphasis on personal hygiene and social responsibilities	Agree	48	87.3%
	Disagree	7	12.7%
Temporary housing provided to returning residents and long-term pass holders while under quarantine/Stay Home orders	Agree	41	74.5%
	Disagree	15	27.3%

Table 4. Mitigation strategies: institution level.

Things that helped me to cope with the COVID-19 situation			
Institution Strategies			
		Total	Percent
Clear communication of directives and disease information about COVID-19 by institution	Agree	50	90.9%
	Disagree	5	9.1%
Precautionary measures taken at work including clear cut infection control policies	Agree	49	89.1%
	Disagree	6	10.9%
Being able to give feedback to hospital management	Agree	36	65.5%
	Disagree	19	34.5%
Support from hospital administration	Agree	40	72.7%
	Disagree	15	27.3%
Support from my supervisor/ manager/head of department	Agree	41	74.5%
	Disagree	14	25.5%
Being able to talk to someone about my concerns; peer support and staff counselling services (e.g. helpline and face-to-face support)	Agree	39	70.9%
	Disagree	16	29.1%
Care pack (from within the hospital)	Agree	35	63.6%
	Disagree	20	36.4%
Implementation of shift or split team arrangements	Agree	32	58.2%
	Disagree	23	41.8%
Clear protocols and directives to follow for COVID-19	Agree	45	81.8%
	Disagree	10	18.2%
Availability of PPE due to Government stockpile	Agree	48	87.3%
	Disagree	7	12.7%

Table 5. Mitigation strategies: social systems.

Things that helped me to cope with the COVID-19 situation			
Social Systems			
		Total	Percent
Social media support	Agree	31	56.4%
	Disagree	24	43.6%
Support from public e.g. discounts/freebies for healthcare workers	Agree	34	61.8%
	Disagree	21	38.2%
Support from my colleagues	Agree	48	87.3%
	Disagree	7	12.7%
Support from my family	Agree	51	92.7%
	Disagree	4	7.3%
My religious convictions	Agree	37	67.3%
	Disagree	18	32.7%

Table 6. Difficult decisions.

How comfortable would you be to carry out this decision?					
Experience (years)	0 - 2	>2 - 7	>7	Total	Percent
Agree	3	9	28	40	72.7%
Disagree	6	3	6	15	27.3%

Table 7. Factors that assist in difficult decisions during the pandemic.

What will assist you in making such a decision and reduce the level of psychological distress and conflict?						
	Experience (years)	0 - 2	>2 - 7	>7	Total	Percent
Guidance of clear national/institution policies	Agree	7	10	32	49	89.1%
	Disagree	2	2	2	6	10.9%
Professional experience	Agree	9	11	32	52	94.5%
	Disagree	0	1	2	3	5.5%
Professional values/ethics	Agree	8	11	32	51	92.7%
	Disagree	1	1	2	4	7.3%
Religious Faith	Agree	0	8	22	30	54.5%
	Disagree	9	4	12	25	45.5%
Psychological prepping through planning exercises	Agree	8	10	30	48	87.3%
	Disagree	1	2	4	7	12.7%
Adequate planning and debriefing on situation and process of triaging	Agree	8	11	32	51	92.7%
	Disagree	1	1	2	4	7.3%
Guidance by seniors	Agree	9	9	28	46	83.6%
	Disagree	0	3	6	9	16.4%
Non-involvement in decision process	Agree	4	3	22	29	52.7%
	Disagree	5	9	12	26	47.3%
Support from peers	Agree	8	8	28	44	80.0%
	Disagree	1	4	6	11	20.0%

4. Discussion

The COVID-19 pandemic introduced an additional source of stress for healthcare workers in medical disciplines already traditionally considered stressful (Estryn-Behar et al., 2011; Van Mol et al., 2015; Lai et al., 2020).

Frontline healthcare workers (HCWs) involved in the diagnosis and management of COVID-19 also reported physical and mental exhaustion from the ethical dilemmas and moral injuries for life-or-death decisions which had to be made fast, and without the support of optimal care protocols, the pain of losing patients and colleagues, and the risk of infection to themselves and their families (The Lancet, 2020; Søvold et al., 2021).

When an individual is exposed to levels of stress beyond his ability to cope over a prolonged period, burnout and numerous health-related concerns can occur (Koolhaas et al., 2011).

Burnout can directly impact the healthcare worker's own mental health, resulting in a high prevalence of anxiety, depression and sleep disorders (Marvaldi et al., 2021).

Burnout may also lead to the lowering of the quality of healthcare systems in terms of poor adherence to guidelines, poor communication, medical errors and worsened patient outcomes and safety (Salyers et al., 2017), hence measures that reduce or mitigate the stress faced by HCWs are of vital importance, not only in the ongoing fight against COVID-19, but also to ensure staff retention and performance.

Regular evaluation of staff stress levels and the efficacy of mitigation measures in controlling staff levels, as well as a hospital administration responsive to staff feedback are factors that will likely help in reducing staff burnout (Rieckert et al., 2021).

Our study shows that, during the earlier part of the COVID-19 pandemic in 2020, stress felt by frontline staff was mostly at moderate levels. This is good news and may reflect the relatively indolent course that the pandemic took in Singapore as a result of rapid government response, early lockdown, wide-spread testing and quarantine, and that the healthcare system was stressed but not overwhelmed. Clearly, some of the mitigation factors covered above have been effective. However, this may have changed since then as the pandemic drags into its third year, hence a follow up study is due.

As mentioned, numerous measures and policies were implemented in Singapore to deal with COVID-19. Not all were perceived by staff to be very helpful, but of note, frontline staff felt that clear communication of the policies and guidelines from the government and from the hospital administration was an important aid for dealing with what was then, an unknown virus.

The availability of adequate PPE was very much appreciated, even as other parts of the world faced shortages on equipment to protect the healthcare staff. Decisive precautionary measures taken at work, with national efforts taken to emphasise the importance of personal hygiene and social responsibility were initiatives which struck a chord with our HCWs even as they worked selflessly to

manage the sick while the majority of Singapore worked from home.

It was fortunate that despite the challenges due to surges of infection, Singapore avoided the situation of an overwhelmed healthcare system and the need to triage patients due to limited medical resources. However, when faced with the question of making a difficult decision on the ground for which national and hospital policies could not cater for, most staff felt that professional experience was of the most help.

Anja Rieckert et al. have put forth further suggestions on how to build and maintain the resilience of HCWs during the COVID-19 pandemic (and beyond), encompassing good communication at the organisational, environmental and individual levels, psychosocial support and treatment, monitoring the health status of HCWs, as well as optimising working conditions (Rieckert et al., 2021).

Our healthcare institution can work to further improve information dissemination to staff on workflows and pandemic policies, while bearing in mind that excessive updates can also be detrimental (Negative Social Consequences of the Information Glut). Social support is crucial and staff should be encouraged to maintain contact with friends and family. Hospital support groups should be set up to help those who wish to connect with other healthcare workers. Continuing to ensure adequate stockpiling of personal protective equipment remains important, with local manufacture of critical equipment such as masks remaining a priority, given the initial disruptions in supply lines (Best & Williams, 2021). Personal hygiene practices as well as emphasising personal responsibility should continue to be encouraged, both in the hospital amongst staff as well as in public.

Ongoing assessment of staff mental health, as well as ensuring adequate staff numbers so that each can have sufficient rest periods, will continue to be important, even as we look to exit this public health emergency.

Once the pandemic runs its course, each healthcare institution and, indeed, each government, should analyse its performance and invest in resources to prepare for the next one.

The main weakness of this study is the small respondent numbers and the nature of electronic survey system, with no in-person interview being conducted.

Although the response rate among our frontline HCWs in the three surveyed areas was only about 10% based on our hospital's approximate head count, we believe our study still yields important information which may assist in guiding future institutional and national policies on how to help frontliners cope with challenging work situations and to preserve the mental wellbeing of our healthcare workforce.

A follow up study to assess how stress levels of staff have progressed and how their opinions have changed after more than two years of working in the pandemic will be useful in guiding our future healthcare strategies.

5. Conclusion

It is heartening to see that stress levels in our respondents were moderate during

the first COVID-19 peak. However, this may have changed as the COVID-19 pandemic drags into its third year, so a reassessment is due. It is also clear that attempts for clear communication both at the national and institution level to staff are useful and appreciated.

Further studies would be useful to assess how staff felt about the available psychosocial support facilities, as well as policies for optimising work conditions.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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