Title: Experiences of the SARS-CoV-2 pandemic amongst Australian Healthcare workers: From stressors to protective factors

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Experiences of the SARS-CoV-2 pandemic amongst Australian healthcare workers: From stressors to protective factors.

Summary

Background
The SARS-CoV-2 pandemic has critically challenged healthcare systems globally. Examining the experiences of healthcare workers (HCWs) is important for optimising ongoing and future pandemic responses.

Objectives
In-depth exploration of Australian HCWs' experiences of the SARS-CoV-2 pandemic, with a focus on reported stressors vis-à-vis protective factors.

Methods
Individual interviews were performed with 63 HCWs in Australia. A range of professional streams and operational staff were included. Thematic analysis was performed.

Results
Thematic analysis identified *stressors* centred on paucity of, or changing, evidence, leading to absence of, or mistrust in, guidelines; unprecedented alterations to the autonomy and sense of control of clinicians; and, deficiencies in communication and support. Key *protective* factors included: the development of clear guidance from respected clinical leaders or recognised clinical bodies, interpersonal support, and strong teamwork, leadership, and a sense of organisational preparedness.

Conclusions
This study provides insights into the key organisational sources of emotional stress for HCWs within pandemic responses and describes experiences of protective factors. HCWs experiencing unprecedented uncertainty, fear, and rapid change, rely on clear communication, strong leadership, guidelines endorsed by recognised expert groups or individuals, and have increased reliance on interpersonal support. Structured strategies for leadership and communication at team, service group and organisational levels, provision of psychological support, and consideration of the potential negative effects of centralising control, would assist in ameliorating the extreme pressures of working within a pandemic environment.

Introduction
The SARS-CoV-2 pandemic has challenged healthcare systems globally, requiring enormous adaptation and resilience from both organisations and HCWs[1-4]. Uncertainty surrounding the pandemic, the virus, potential vaccines and treatments, and issues around provision of healthcare has critically challenged health systems. Change has been required at all levels, in the context of rapidly evolving evidence and priorities. Such rapid changes have had wide-ranging and dramatic effects on healthcare systems and workers, who are identified as a high-risk group for negative psychological impacts due to the SARS-CoV-2 pandemic[5]. Multiple publications identify a spectrum of psychological symptoms and emotions experienced by HCWs in outbreak contexts, including concerns about infection risk, stress, depression, anxiety, insomnia, and burnout[6-9].

In periods of rapid change, the resilience of systems, organisations, or people within these, can determine the success or failure of the adaptions of the system. What resilience is, with respect to health systems in relationship to the current pandemic, requires further examination. Resilience of healthcare systems has been the subject of increasing discussion in recent years,[6-8] with recognition of the need to build resilience in health systems, teams, and personal resilience in healthcare workers, and to enhance understanding of what this means in practice[10-13].

Organisational resilience:

Organisational resilience is an emerging field of knowledge[14]. Health system resilience is described as the ability to respond to shocks based on: preparedness for future events (e.g. pandemic planning), effective surveillance enabling early identification of the onset of the event and rapid response, managing impact across health system functions in terms of access and quality, and recovering and learning from the event[15]. Interestingly, characteristics of resilient organisational responses may be incongruent with reflexive human responses (such as the desire to increase control). Lloyd-Smith draws lessons from the Christchurch earthquake response for health systems faced with the SARS-CoV-2 pandemic[16], identifying a key characteristic of resilience (in the face of unanticipated events) as the ability of leadership to *loosen* control, thereby increasing capacity for organisational improvisation.

Individual resilience:

Individual resilience and organisational capacity to support resilience among healthcare workers is an important focus from the current pandemic. Useful resources for supporting resilience include positive psychological resources, positive social relations, and health organisational practices[17]. A scoping review focussing on current knowledge around building resilience in HCWs leading up to and during outbreak/pandemic situations[18] recommended pre-pandemic interventions including infection control and resilience training, and increasing perceptions of preparedness. Potential peri-pandemic interventions included effective rapid communication, psychological support, and interventions monitoring the health status of HCWs.

This study aimed to document experiences of the SARS-CoV-2 response within Australian hospitals. For this analysis we examined key sources of distress as described by HCWs, how they interact with organisational structures, resources and capacities in the context of pandemic-induced change, and what protective factors might be useful to increase resilience for ongoing and future pandemic responses.

Materials and methods

Clinical context

Individual semi-structured interviews were performed with healthcare workers across two metropolitan hospitals in New South Wales and Queensland, Australia. For the first 18 months of the pandemic, Australia had an elimination approach to SARS-CoV-2 with rapid introduction of hotel quarantine and suppression of community transmission. However, with the current increase in community transmission related to variant B.1.617.2 (delta), a move towards policies of control rather than elimination is underway. To the submission date, Australia has documented 147,275 cases of COVID-19 (2071 in Queensland and 71,734 in New South Wales).

Participant recruitment and data collection

After ethical approval was obtained at both sites [HREC details supplied post review], semi-structured interviews were conducted by two university-based social scientists (authors 2 and 3), with 63 healthcare workers working in two large tertiary hospitals in Australia (September 2020-March 2021). To obtain participation from a broad range of specialties, roles, and levels of experience, purposive sampling was undertaken. HCWs with experience of preparing for, overseeing, or delivering care for COVID-19 patients were invited to participate by investigators at the research sites. Emails were sent to directors of relevant units inviting their department to participate in the interviews. Recruitment was targeted to include a broad range of relevant specialties, including infectious diseases and infection control, emergency medicine, intensive care, anaesthetics, radiology, respiratory medicine, and public health, and a range of roles and seniority levels (see Table I).

The interview guide covered: perceptions and experiences of risk; personal and professional experiences of COVID-19 responses; and perceptions of responsibility across person, hospital, state and society (see

Interviews lasted 20-91 minutes, were digitally recorded and transcribed verbatim. Interviewing continued until data saturation was reached.

Data Analysis

Thematic analysis was driven by a framework approach, which included the following steps: (1) familiarisation; (2) identification of framework; (3) indexing (4); charting; (5) mapping and interpretation[20]. Independent data coding was conducted by Authors 2 and 3, and then cross-checked to facilitate development of themes (Authors 1, 2 and 3), moving towards an overall interpretation of the data. Analytic rigour was enhanced by searching for negative, atypical and conflicting cases in coding and theme development. Inter-rater reliability was ensured by integrating several research team members in the final analysis, including infection control practitioners and infectious diseases physicians.

Results

Thematic analysis identified stressors and potential protective factors, summarised in Figure I in terms of factors relating to organisational resilience and those relating to individual resilience.

Stressors
Autonomy/control
Participants identified multiple factors which increased their levels of distress including a strong focus on the reduction in clinician autonomy and perceptions of lack of control (including perceived lack of adequate guidance), and suboptimal organisational dynamics of communication and support. Participants reported uncertainty around clinical guidelines, including absence of provided guidance/guidelines, mistrust of guidance, and frustrations about applying guidelines generated at a higher level that were not perceived to be context-sensitive or feasible in practice. Rapid change and the perception that guidelines did not align well with the lived realities within individual systems was reported to confer anxiety, change fatigue and mistrust of guidelines.

Clinical decisions were described as deferred to higher levels than usual in organisations and states (for example, executive-led clinical decisions and state-wide mandates where local autonomy would usually prevail), resulting in substantial changes to the hierarchies of control within health systems.

> *I have found on a state level at least, that the organisation came in very early from a higher level, and I mean the chief health officer. It's been good and bad. It's taken away a lot of autonomy, and maybe this is part of the reason why I'm talking about redundancy of infectious disease as well, because our autonomy has been taken away, to some extent, in that we don't make individual decisions about what happens with patients, whether we decide to admit them or we don't. If the chief health officers think they need to be admitted, they just have to be admitted, even if they don't have COVID. [Infectious Diseases Doctor, Queensland]*

> *We were at the point where I said, "Well, I don't know, because I don't know how many beds we've got. I can't accept these people." So I had to call the executive, as we always did, to clarify movement of patients. And that was when, for me, [...] the executive started making decisions that were not appropriate and not listening to us and, yeah, becoming more difficult. That was the turning point for me. [Infectious Diseases Doctor, NSW]*

Participants also described a sense of decision-making paralysis around usual clinical decisions such as bed prioritisation. Decision-making by people in non-clinical management or political roles led to a sense of mistrust within health services. Decision-makers were perceived to lack specialist infection management expertise. Senior clinicians described their disagreement with, or powerlessness over, decisions made by executive response teams.

Challenges to communication: managerial support and acknowledgement of distress
Several participants reflected on the absence of explicit and in-person support from managerial or executive staff. Where present, this was highly valued, as participants reflected that under higher workloads and stress, recognition of their contribution was important.

> *But not one person from executive touched base with me to say, "Are you okay? Are you okay in yourself? How are you handling it, [name]?" Not one person did that from executive and I'm just thinking, "God, if I showed that type of lack of leadership to my team, I wouldn't have had a workforce that felt safe at all." I'm thinking, "Don't you realise that just a phone call to just go, 'How's today going down there? You've got four positive patients. Are you okay?'" It takes two seconds of your time to do that and it just didn't enter their head to do it. [Respiratory/Infectious Disease Senior Nurse, Queensland]*

> *For me, clearly I worked far too many hours, probably without realising the emotional turmoil of that. I guess I was really lucky that I have a very supportive husband at home and no young children. But, I guess, in leadership roles, maybe having a little bit more support as you're embarking into something as big as that. It's about maybe organisations recognising that the workload that might be taking place, fine to remunerate with overtime, but that's not going to save somebody's physical and mental wellbeing. [ICU Nurse Manager, Queensland]*

High levels of stress and substantial barriers to effective communication because of rapid changes to policy were described by managers, who struggled to communicate effectively to their staff. Managers reported long hours and working through nights altering guidelines to keep up with evolving recommendations and translate them into clinical practice:

> *It was quite stressful, not from a content point of view, but trying to support the staff. There were sometimes multiple changes in one day. And trying to be able to communicate those changes was a real challenge. And it got to the point where the staff were quite stressed. The leadership team were doing a fantastic job, but they had so many competing priorities that it was very difficult to communicate all of those changes to the staff. [Senior ICU Nurse, Queensland]*

Protective factors

Participants described factors which increased their resilience and ability to cope in the rapidly changing and highly charged SARS-CoV-2 environment. Three main factors were identified: (1) clear guidelines and processes endorsed by respected professional bodies; (2) interpersonal support; and (3) organisational confidence, supported by strong team relationships, clear and respected leadership, and perceived preparedness.

Clear and contextually appropriate guidelines
Many participants reflected that clear processes provided a feeling of safety within their work environment. Where clear guidance was produced, especially if endorsed by respected professional bodies and clinical leaders, staff reported an increased sense of safety, both personal (risk of acquiring infection) and professional (risk to patients and clinical practice). Contextualised communication styles were described by one participant as highly valued – that is, operationalising broader health system advice to clinical context, and communicating it well.

> *I think that realisation that the high-level advice needs to be operationalised to each clinical context, and maybe just that awareness that each clinical context needs an oversight to make sure that an action was put into place to make sure that that task was followed. So I felt, whilst in terms of leadership, if there was a clear understanding of how that area works, then the advice was just contextualised in conversation and it just instantly made sense to the staff…[gap in interview] …*

leadership needs to be really implemented, that walk the ground, understand the floor, understand what happens in the frontline, and consider how the advice could be then implemented at that point and make sure that it's done across the board. [Occupational Therapist, Queensland]

The defining point was the UK Resus Council. So the UK Resus Council brought out their first COVID-19 resuscitation guidelines. And, in essence, the first set of advanced life support guidelines that defined the layers of PPE in relation to the interventions. And really gave an empowerment in hospital to healthcare workers to sit there and go, "You know what? I'm not in the right PPE. I can call for help and I can stick a mask on someone. And if I've got a defibrillator, I can defibrillate them, but I can't start chest compressions and I can't start bag valve masking them." [Critical Care Clinical Nurse Consultant, Queensland]

Interpersonal support

Participants relied heavily on interpersonal support from team members, family and friends. Multiple participants reflected that they needed to talk through experiences with colleagues after stressful periods. The need for psychological support beyond line managers was raised (as the hierarchical nature of some line-managing relationships could inhibit openness) with one participant suggesting the need for a "safe third person" to hear concerns.

And when it all becomes very uncertain, it can be quite - I think not everybody has the confidence to raise all these things. Hence, having a sort of a safe third person on the sidelines to raise certain issues with, and then we can advocate for them if necessary or reassure them or put them in touch with the right people. [Senior Anaesthetist, Manager, NSW]

The increased sense of vulnerability (personal and professional) during the pandemic was raised by a number of participants, reflecting on their own and their colleagues' sense of insecurity and distress. Support from colleagues, family and friends, and in some circumstances formal debriefing processes, were described as helpful during periods of increased distress. A number of participants felt that formal psychological support services would have been beneficial.

But then what we did was go back to the respiratory ward the next day and had a second debrief, which was really sort of just a question and answer discussion, but in this critical incident debrief type format to listen to and address some of the concerns. Once we'd worked out where the concerns were and what the concerns were, we actually then took a big, big step back and it had a couple of talk through - It's what I call the talk-through, walk-through. [Critical Care Clinical Nurse Consultant, Queensland]

Probably what would have been helpful, I suppose, would have been maybe some kind of psychological support for the teams at the frontlines, some kind of regular debrief. All that became really hard, you see, because we couldn't meet in groups, that was the thing. [Respiratory/ Infectious Diseases Nurse Manager, Queensland]

Organisational confidence: Teamwork, leadership and preparedness

Participants identified that teams with good communication across multiple levels of the organisation generated a sense of solidarity and psychological/physical safety. Experienced staff with leadership skills were highly valued within the pandemic response. Where leadership was felt to be disingenuous, lacking in expertise or experience, and not receptive to the experiences of the frontline healthcare workers, participants reported feeling "less valued" and less safe.

What would make good leadership? I guess it'd be good if the people making decisions were affected by the decisions. Because it's all very well for someone to say, "Oh, that's fine. Just keep doing elective surgery." But then if you're not going to be the one who's then forced to look after sick people with no protective equipment. Yeah, so I guess making sure that people that are making decisions are the ones that are affected by them. [ICU doctor, Queensland]

Visibility of managers and executive on the frontlines was highly valued. Direct communication, verbally or in-person, from executive to clinical staff was described as desirable but often absent. Participants valued in-person communications either on the phone or face-to-face, perceiving these as more genuine expressions of concern or care than emails. Where present, such examples of visible leadership promoted feelings of safety and being valued. Where systems were perceived to have responded quickly and proactively to the pandemic and to be led by strong respected leadership, a sense of organisational preparedness and safety was described.

My boss was very [prepared], in the beginning, and now in retrospect, I can look back on her preparation of us and I am very, very grateful because by the time the first person with coronavirus hit our ward, we were ready for it. And we had felt, and I know I personally, maybe not everyone, but certainly through knowledge, knowledge had replaced fear. [Respiratory/Infectious Diseases Nurse, Queensland]

I think within ED, I must say our managers and our heads of department were incredibly supportive and they were incredibly present on the floor, which I think was really important for our staff to see that we're actually all in this, it's not we're just feeding you to the wolves. So I think that was really important as well. [Emergency Department Nurse, NSW]

Organisational units that were responsive to rapidly changing needs were highly valued. Participants reflected positively on the "enabling effects" of working in a pandemic response mode, such as increased responsiveness of systems and services (e.g. IT services) to introduce changes, committee decision-making, and executive engagement.

The only good thing about COVID, was that all those meetings and things, sort of disappeared for a while. We could actually get on with it. And it's the quickest. I have never seen IT people or people develop procedures and processes so quick in my life. [Infectious Diseases Doctor, Queensland]

Discussion

The SARS-CoV-2 pandemic has been an unprecedented health system and societal shock and its ripple effects are widespread and ongoing. The effects on healthcare workers have only begun to be understood and will continue to emerge over time[20]. It is clear that experiences amongst health service professionals have not been uniform (across place, person or context) and that some contexts have been able to adapt[21], whereas others have not. Placing an emphasis on key stressors and moderators of such dynamics, can assist in making sense of what has played out, and what may play out in the future.

In this study *stressors* were unified by the shadow of uncertainty, which has dominated both professional and community experiences of the pandemic[22,23]. Organisational dynamics within this study centre around responses to uncertainty; that is, substantial changes to hierarchical structures and decision-making authority; absence of, and then development and communication of, therapeutic guidelines; and importantly the provision (or lack) of support to increase tolerance to individual and organisational uncertainty during a time of rapid change. There was an increased need/desire for communication and support in the midst of this uncertainty, but meeting this need was challenging for managers due to the very nature of the rapidly changing evidence and policy environment. The pivot to prioritising executive authority over local clinical autonomy seemed, from this data, to exacerbate uncertainty and paralysis and reduce the perceived legitimacy of the governance arrangements[24] rather than producing the desired effect (more authoritative

decisions being made). Autonomy in choosing improvement strategies has been shown to foster a sense of ownership, intrinsic motivaction and performance in physicians[25]. During the pandemic response, where rapid improvements/adaptations were required, autonomy in developing adaptive strategies was described to be largely removed from fontline clinicians.

What *moderates shocks* and nurtures resilience within health systems, has been well documented elsewhere[26,27]. Barasa et al describe resilience in health services as underpinned by cognitive, behavioural and contextual capacities which determine the success or failure of the emergence of absorptive, adaptive and transformative strategies. These different elements can been seen in response to the pandemic response: the cognitive challenges that health services faced in developing appropriate responses to the pandemic (e.g. rapidly emerging and changing information providing challenges around guideline development); the behavioural challenges experienced in deploying appropriate policies in response (e.g. delaying care for patients until appropriate personal protective equipment was donned); and the contextual limitations (e.g. workforce challenges)[27]. HCWs facing uncertainty, rapid change and critically restructured priorities within the healthcare system, required support for increased anxiety and stress, and confidence that decisions were evidence-based, steered by experts, and morally sound. Their capacity to cope was supported by factors such as team cohesiveness, informal debriefing systems (i.e. capacity to talk), formalised and centralised feedback (i.e. sense of achievement and solidarity) and leaders who were perceived as visible, empathetic and in touch with 'on the ground' realities.

Our study suggests that the pandemic has had the effect of centralising rather than loosening control within Australian health systems, with government and central health organisations determining policy and procedures to a greater extent than previously. Centralised governance and control serve to maintain consistent communication/guidance across health services, and positions responsibility and accountability at appropriately high levels. However, centralising authority reduces autonomy to create flexible responses, disrupts established power dynamics and trust systems, and as a result may impair the ability of organisations to create a sense of shared ownership and understanding around policy and clinical guidelines. The rapid changes to guidance and policy (albeit necessary in the face of the evolving pandemic) brought with them an increased need for clear communication, leadership, team relationships and interpersonal support for HCWs trying to function within such a dynamic system change. Such capacities are difficult to create in a crisis; they must be built and maintained long-term. Health systems that fail to invest in these resources may find themselves unable to respond as effectively or rapidly as they need to in a crisis. Recognition of the resources needed to offset the stress and negative organisational outcomes associated with such changes is a useful outcome of examining this pandemic response.

Conclusions:
It is worth considering the internal impact of the enormous changes within healthcare organisations resulting from the SARS-CoV-2 pandemic, and how both positive and negative outcomes have occurred as a result. In times of uncertainty, tightening organisational control and policy is a natural response. However, inherent in the safety of our organisations are critical human factors which include the experience of stress, perceptions of safety and support, dynamics of trust and leadership. The consequences of rapidly changing an organisational structure alters all these factors, which can have unanticipated effects. Support structures can provide resilience during change, but within a dynamic pandemic response are not always prioritised.

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Transparency declaration

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Table I

Table I: Participants by site, role, and experience

	Total	NSW	Queensland	> 10 years' experience	Managerial role
Doctors	20	7	13	19	9
Nurses	23	6	17	15	5
Allied Health	9	4	5	5	2
Non-clinical[1]	8	4	4	3	1
Other[2]	3	2	1	2	0
Total	63	23	40	44	17

[1] includes administrative officers, cleaners etc

[2] includes ambulance staff, educators