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Impact of the COVID-19 pandemic on emergency department team dynamics and workforce sustainability in Australia. A qualitative study

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ABSTRACT

Introduction: The COVID-19 pandemic has challenged health care professionals and changed our approach to care delivery. The aim in this study was to explore nurses' experiences providing care in the ED during the COVID-19 pandemic in Australia and the impact of this on ED team functioning.

Methods: A qualitative explorative descriptive study was conducted using thematic analysis strategies. Participants comprised: Registered Nurses (n = 18) working in clinical roles in the Emergency Department and Leadership Registered Nurses (n = 6) within the organisation. One on one interviews (n = 21) and one focus group interview were conducted utilising semi-structured, conversational style, in-depth interviews between January 2022 and April 2022.

Results: Two major themes were identified that described the impact on ED team dynamics and longer-term impacts on the ED nursing workforce. The first major theme was: 'Changed Emergency Department team identity and dynamics' and included four sub-themes: *i) PPE is a barrier to team camaraderie; ii) outsiders versus insiders – ambivalence to PPE spotter role; iii) personal safety comes first in a pandemic; and iv) using PPE depersonalises the whole patient experience*. The second major theme was: 'This pandemic caught everyone off guard' and had three sub-themes. The associated sub-themes were: *i) People outside ED have no understanding of what it has been like; ii) COVID-19 is here to stay - Permanent changes to care delivery and nursing practice; and iii) tenacity of a true profession.*

Conclusions: Study findings illuminated the dynamics and functionality of ED nursing, encompassing the unique qualities of camaraderie, autonomy, resilience and tenacity.

1. Introduction

The SARS-CoV-2 (COVID-19) pandemic has had a profound effect upon health care provision and Health Care Workers (HCWs) internationally [1]. Throughout the pandemic a key concern has been appropriate use of Personal Protective Equipment (PPE) to minimise transmission within healthcare settings and prevent HCW exposure and infection [2–6]. Prior to the COVID-19 pandemic, research evaluating nurses' experiences with the use of PPE while working in acute frontline healthcare settings such as the Emergency department (ED) was limited [7].

The ED is an integral component in the response and management to public health emergencies such as an infectious disease outbreak [8–10]. The ED environment is a fast paced, time critical environment requiring well placed interprofessional working systems, practice-based training, enabling advanced team cognition and functioning [11]. As the primary portal of entry into the hospital, the ED represents a microcosm of the health care setting, where problems may manifest with the greatest potential for chaos and stress [10]. In the case of a public health emergency such as COVID-19, this resulted in extreme fluctuations in the volume of patient presentations [12–17]. Nurses working in the ED setting are also at higher risk of exposure to serious infectious diseases from presentation of undifferentiated patients [8,18]. Another risk to staff is an overcrowded, chaotic and inefficient ED, resulting in increased levels of stress, impeding staff performance, communication, and teamwork [19–23]. This may then decrease the quality of health

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care, adversely affecting patients and their health care outcomes [22,24]. Efficiency and teamwork are vital for the functionality of the ED, quality health outcomes and for staff and patient satisfaction.

At the outset of a pandemic of a novel pathogen, emergency services must plan for and respond to unknown fluctuations in ED demand and protect HCWs from exposure to the pathogen. Activation of the COVID-19 pandemic response plan necessitated a rapid overhaul of ED operations in preparation for a surge in the number of potentially infected individuals presenting to the ED [25]. Currently, there is limited research exploring emergency nurses' experiences providing care and working in PPE during the COVID-19 pandemic, and the impact this had on ED team functioning and care delivery. The aim of this study was to explore and describe nurses' experiences providing care in the ED during the COVID-19 pandemic in Australia and the impact of this on ED team functioning.

2. Methods

2.1. Study design

A qualitative exploratory descriptive (QED) design was selected as the most appropriate approach to explore and describe the nurses' experience providing care in the emergency department (ED) during the COVID-19 pandemic in Australia.

2.2. Study setting

This research project was conducted within the Emergency Department (ED) of a large private hospital in Melbourne, Australia. This ED caters for adult and paediatric patients, treating over 29,000 adults and children annually.

2.3. Study sample

Purposive sampling techniques were utilised to recruit 24 registered nurses, 18 clinical nurses and six nurses working in leadership roles. Inclusion Criteria were being employed in a clinical nursing role in the health service ED or a management or leadership within the organisation during the pandemic and providing written informed consent to study participation.

Sample size was guided by the concept of information power, where the greater the relevant information held for the study, the smaller the number of participants needed [26].

2.4. Data collection

Semi-structured one-on-one interviews and a single focus group were conducted using a conversational style using Zoom® teleconferencing software. Topics were explored in depth and with flexibility using open questions. Verbal consent was obtained as well as demographic data on commencement of each interview. Interviews were organised and conducted by the primary researcher (PD). This researcher was a female emergency nurse working in the study site emergency department and undertaking her Master of Advanced Nursing. The researcher conducting the interviews received initial training in qualitative interviewing techniques from the co-authors. Following initial supervision and approval by the senior researcher (SB). Each interview and the focus group were conducted over 30 to 60 min.

2.5. Thematic analysis

Data analysis for this study was undertaken using Braun and Clarkes' [27] six steps of thematic analysis: familiarising oneself with the data, line-by-line coding, generating themes or extracting patterns, reviewing themes, defining and naming themes, then writing it up for dissertation. This choice was justified as the most suitable way to organise, condense and interpret the collected qualitative data, elicit meaning and communicate findings [28]. With this six-step process in mind, recordings were transcribed and checked within 24 h of each interview. Interview transcripts were examined and organised into theme tables manually.

Data analysis occurred concurrently with data collection so that the researcher could generate an emerging understanding about the research question, which in turn informed both the sample size and the questions being asked [27,29]. The researchers were also mindful to immerse themselves in the data and apply a consistent and systematic approach to the analysis [30]. Themes were identified by using an inductive approach and staying true and close to the interview transcripts [31,32]. For example, two researchers (PD & AFH) reviewed each individual transcript independently and coded the transcripts and the codes were then reviewed to identify potential themes and sub-themes. The final thematic structure was agreed upon by discussion until consensus was reached between three researchers (PD, AFH & SB).

2.6. Ethical considerations

Ethical approval for this study was obtained from the health service prior to commencing the study (Number: EH2021-762) as well as the university (Number: 2021-430). Informed consent to participate was obtained prior to commencement of the interviews. Confidentiality and data security were also ensured through measures of de-identification of data with use of coded and encrypted transcripts as well as password protected storage of data.

3. Results

Two major themes were identified that described the impact of the COVID-19 pandemic on ED team dynamics and the longer-term impact on the ED nursing workforce: 1. '*Changed emergency department team identity and dynamics'* and 2. '*This pandemic caught everyone off guard'*.

3.1. Theme 1: Changed emergency department team identity and dynamics

One of the major themes identified was how the pandemic had changed Emergency Department team identity and interpersonal dynamics within the ED Team (Table 1). Four sub-themes were identified within this major theme: (i) *PPE is a barrier to team camaraderie; (ii) Outsiders versus Insiders - Ambivalence to PPE spotter role; (iii) Personal safety comes first in a pandemic; (iv) Using PPE depersonalises the whole patient experience.*

(i) 'PPE is a barrier to team camaraderie'

The first sub-theme that emerged related to the effect that wearing PPE had on ED team camaraderie. Participants commented that as they could no longer see their colleagues' facial expressions under the mask, this affected interpersonal communication and rapport between staff. For example:

> PPE […] has made team nursing harder due to the miscommunication, under communication, misinterpretation of communication, fatigue communication, abrupt communication, unheard communication between staff, patients and relatives […] you said it twice, or maybe three times, you are going to give up. (CRN3)
>
> And
>
> Having most of our faces covered now, we're having to be really be clear about communication and it's so much harder to create bonds […] Every now and then I'll see someone outside and then they won't have a mask on and I realised that I actually didn't know what they look like […] One of the best things about nursing is that

Table 1
Major Theme 1: Changed emergency department team identity and dynamics.

Sub-theme 1: *PPE is a barrier to team camaraderie*	
I really feel for the junior nurses, in the early stages of their career, that what they're definitely not getting is that team stuff from being with their colleagues; social things and just sitting in the room having those chats, those things are missing. (CRN 5)	There are leaders in the medical field and there are non-leaders. And the medical colleagues are short with the nursing staff [saying]:"Come on get someone who knows what they are doing". Well actually "You don't know what you are doing so that's why you want us. …there is no leadership". (CRN 10)
But then, always [wearing] N95, and always [wearing] full PPE… as a leader, it was very challenging for me to keep the team engaged. You know, looking after people's mental health and with all the lockdowns [we had in the area], that was a big challenge. (LRN3)	Also, with huge turnovers of staff, it's really interesting. You see them out on the floor in the N95 masks and their PPE and then you go into the tearoom and have lunch and you're like, Oh, that's what you look like. I didn't pick that's what your nose and mouth looked like, but it always…kind of shocked me. (CRN16)
Sub-theme 2: *Outsiders versus insiders - Ambivalence to PPE spotter role*	
Spotters' Advantages	**Spotters' Disadvantages**
We would do in-situ training […] we would bring out the PPE spotter role […] they were trained to actually obviously watch the donning and doffing, but also to make sure that the staff were fit checking their mask […] if they had to retrain someone during the donning and doffing procedures, the spotters were really dedicated trainers (LRN6)	Now it's more external PPE spotters coming in but who's training them? […] different departments had different interpretations of how they will utilise that spotter. (LRN6)
What the PPE spotter has helped with, is slow down, everyone's reaction to a safe manner, where we are minimizing unnecessary contact with the patient. But we're maximizing patient safety and worker safety at the front line as well. And the PPE spotter has helped in controlling how many people can go into the room and the effective donning and doffing of the PPE to ensure it's done in a safe manner. (CRN4)	You've got no idea what background they are from and what their capabilities are […] so that impacts upon time with patient care and teamwork. […] Some of them are good at what they do and are part of the team and help with [other] nursing related things including PPE and others [just] stand around. Three were sitting out the front of triage […] all I could see was 3 pairs of hands sitting there on their phones doing nothing […], It made me angry. (CRN3)
Sub theme 3: Personal safety comes first in a pandemic'	
Clinical ED nurses (CRNs)	**Leadership Nurses (LRN)**
Then the unwell patient goes into the isolation area […] if they deteriorate and needs more airway support […] the main aim is to limit the number of persons who look after the patient […] we don't need to rush things because it's all about protecting ourselves […] When you initiate intubation during pre-COVID years, everyone can just help and circulate and provide assistance during complicated procedures, but during COVID, you just limit the number of people around the patient…it's not a simple procedure. (CRN6).	We had to retrain our brains to say let's look after ourselves first before we go in there. That was so difficult […] because you press a code blue or buzzer whatever it is you jump in there, you start CPR, you do, and then we were taught "No" you have to wear all these HAZMAT suits and they're desaturating. Leave it. Put on your PPE, like spot each other, Okay are we ready? And then you go in. You have already lost a few minutes there, but we had no choice. (LRN3)
These factors (safety, traumas, AGPs) have affected patient outcomes, where we have to be appropriately donning our PPE prior to seeing the patient with our emergency resuscitation measures were delayed by a minimum of up to two minutes, which related to the poor patient outcomes. (CRN4)	Going to a Code Blue, you have to put on PPE first so that delays delivery of care. We are not very good at putting our safety first, so I think nurses found that difficult having to stop to put on PPE first and causing a delay in getting to the patient. (LRN5)
We are all trying to limit our interactions with the patient […] I don't think that's been a positive change for the patient […] I think it's necessary in terms of infection control […]. We are definitely prioritising infection control over patient care. (CRN5)	Things weren't as timely because […] staff had to take additional precautions than what they would have done having not had COVID […]. And I think the segregation […] the need to kind of keep people clear of each other, might have meant longer wait times for patients […]. We did get…a lot of patient complaints about having to wait, having to wear a mask. (LRN4)
Sub-theme 4: *Using PPE depersonalises the whole patient experience.*	
It increases the stress level…they [the patients] are more stressed…more anxious and therefore makes everything worse […] that just adds extra time and effort and you feel like you are going in circles. They can't see you because of the mask […] you end up yelling a bit more […] which means my voice then becomes tired and croaky. (CRN3)	…Especially a lot of our elderly patients, they will nod and smile at you and you think that they hear what you are saying, but actually they have no idea. Then you go to do something with them, and they are "Why are you doing that?" and you say "well I told you and you gave me consent to do that" but then they say "oh no I didn't, I didn't hear what you said" … (LRN5)

camaraderie with your colleagues. I think [PPE use] is a barrier to that. (CRN5)

(ii) 'Outsiders *versus* insiders – ambivalence to PPE spotter role'

The PPE spotter role was devised to be a 'second set of eyes' and to assist in protecting the HCW from risk of transmission of the SARS-CoV-2 virus [COVID-19]. The second sub-theme reflected emergency staff members' ambivalence about the use of PPE spotters in the ED during the COVID-19 pandemic. Initially, spotters were senior nurses employed by the hospital. However later in the pandemic, due to staff shortages, spotters were nursing assistants employed from outside the ED. Participants expressed some frustrations with this process as they perceived external staff were less able to contribute to ED care practices and had very little knowledge of the specific care environment. For example:

> We had senior nurses who were PPE spotters…I think that was the key to success […] So I think the challenge, there was perhaps that the PPE spotter role was being eroded somewhat […] not because that's what we wanted to happen but because of progression, time […] and a lack of senior nurses. (CRN2)
> And
> Initially we were, nurses were spotting each other so we were working in dynamic teams, it's the best way to do it. So we didn't have enough nurses, we wanted more staff, so we had the PPE spotters and we have had mixed results in terms of PPE spotting. (LRN1).

Participant's perceptions of the advantages and disadvantages of the PPE spotter role are shown in Table 1.

(iii) 'Personal safety comes first in a pandemic'

The third sub-theme identified related to maintaining staff safety as the first priority, when responding to a medical emergency. As with any medical emergency, HCWs are taught to 'check for Danger first' as per the universal DRSABCD algorithm in basic life support, or rather, don PPE first prior to attending to a medical emergency and risking transmission of the disease. Both clinical emergency nurses and leaders commented about how they had to retrain themselves to think about their own safety first when emergencies occurred in the ED. Participant views reflected the various challenges associated with the delivery of quality care and maintaining of IPC practices while wearing PPE in the ED setting (Table 2). Participants reflected that while delivery of comprehensive care is a priority, preventing transmission of SARS CoV-2 to staff was of critical importance. Participants believe that the additional steps required to maintain staff safety could however adversely impact on timely response to clinical deterioration. For example:

Table 2
Major Theme 2: 'This pandemic caught everyone off guard'.

Sub-theme 1: *'People outside ED have no understanding of what it has been like'*	
How draining it is and how physically exhausting. How much harder it makes it […] then on top of that we're busier, we are all doing more hours than we are supposed to at a time …when the job is harder. We're also having to do more […] and that's not great, it's not great for morale, you know. (CRN5)	No one came down to support us. We were just given cookies and doughnuts to say we have done a good job. So it was like, well why don't you come down her to see what it's like. They haven't physically come down to the ED. I've not seen upper management. (CRN 10)
i) Sub-theme 2: COVID-19 is here to stay - p*ermanent changes to care delivery and nursing practice'*	
Obviously, we've got a history of doing things differently, so this has been a big change for us. Whereas for the junior staff, this is all they have known. … I guess probably for those of us who are used to doing it differently, maybe there is more of a sense of loss. (CRN 5)	Yeah, I think the quality of the PPE has improved, the mask has improved. … The protocols are getting […] clearer. Nurses are adapting and prioritising. Routines [are established] how you do things quickly in a safe manner (CRN6)
In a good way we have become very conscious of the need for PPE and [to decrease] cross contamination. …We have all learned heaps, even the most experienced of us have learned heaps in that regard. (CRN9)	But in saying that I think we feel a lot safer in our practice so now we have N95s that fit. The yellow gowns are terrible because you just sweat for a whole shift. But I guess it, you kind of get used to it (CRN15)
If these young ones are coming in wearing PPE from day one, then they will take it as normal (CRN3)	You can make more individualized decisions about care [for example how frequently to patient vital signs]. You could do more from a distance…cluster the care and just do it nice and quickly. (CRN2)
I'm pretty sure from now on … People will think "hmm, I'm not well today, I'm not going to work"…instead of "oh, I've got a bit of a cold but I could still go into work"…(CRN1)	
Sub-theme 3: *Tenacity of a true profession'*	
I think it's getting better now, people are getting used to it and the more people are vaccinated, you get more confidence. You know, how to deal with things it's easier to be organized with the PPE…We overcame it [many of the challenges]…People are getting used to it now, they're getting better with the delivery of care, how to improvise. (CRN7)	[The ED staff] are more relaxed now… you can feel, you can tell. They know how to do things now, how to manage their PPE. If they don't need to be in with a patient and then they don't need to be in there. So, there is less stress now people are used to it now. It's become a routine. (CRN 6)
So it was really, staying ahead and knowing what the recommendation was that particular day, that particular week and then making sure that you informed the staff around you and more junior staff. (CRN2)	I think, from my experience, anyway, after having COVID, I'm not so scared of it [getting COVID19 infection] anymore. That's for sure… (CRN15)

Patient care and safety is an issue and deterioration of the patient […] When you are in the ED, you have to don and doff, it takes longer, you need more staff […] staying (in ED) for 24, 36, 48 hrs is normal now […] how would you feel not having a shower in 13 h […] not even being able to brush my teeth […] the basic nursing care is not being given to the patient and the nurses don't even think about it or they don't have time, PPE has impacted upon this very much for them. (CRN3).

(iv) 'Using PPE depersonalises the whole patient experience'

This sub-theme reflected participants' perceptions of how use of PPE impeded communication and interaction with patients and family members, resulting in depersonalisation of nursing care.

Major Theme 2: *This pandemic caught everyone off guard'*.

The second major theme reflects the long-lasting impact of the COVID-19 pandemic on Emergency Nursing practice (Table 2). Three sub-themes were identified: *(i) 'People outside ED have no understanding of what it has been like'; (ii) 'Permanent changes to care delivery and nursing practice'; and (iii) 'Tenacity of a true profession'*.

(i) 'People outside ED have no understanding of what it has been like';

The first sub-theme was '*People outside ED have not had any understanding of what it's been like', reflecting* participants' perception that working in the frontline setting of the ED during a pandemic involved an element of disconnect with the outside world. This sense of isolation was compounded by hospital policy to minimise unnecessary foot traffic within the ED. For example:

It's a 700-bed hospital so I didn't physically go to ED. No-one went to the ED that didn't need to be there. And because it was, you know, we kind of essentially locked it up because we didn't want people wandering in and out of the highest risk area. (LRN4)

Another aspect of this theme was the perception by clinical ED staff that the increased workload and challenges with PPE were not acknowledged.

People outside of ED have not had any understanding of what it's been like for us […] I certainly don't think management understood the impact of it […] Surge allowance was important […] it's more money […] but the acknowledgement that actually, this is hard and we appreciate what you're doing […] And I think it just comes back to feeling valued in, when we were all working in an environment that none of us signed up for. (CRN5)

And

I think the main challenge […] is how this really affected our staff. A lot of people don't understand, until they have worn one, an N95 for a few hours, …[that] ED staff have not had any reprieve from this since 2020. There is no break. Probably a month or two, we were allowed to wear a surgical mask. But then, always N95, always full PPE and as a leader, it was very challenging for me too, to keep the team engaged. (LRN3)

(ii) 'COVID-19 is here to stay - Permanent changes to care delivery and nursing practice'

Participants also reflected on the impact this once in a life-time event was having on the nursing profession. For example, one nurse stated: "Oh my god, this has not happened, any of this sort of stuff has not happened in my whole nursing career […] it's a completely new ball game." (CRN1). Some participants commented on the social and professional consequences of the COVID-19 pandemic and in one instance, compared it to the long-term impact of the AIDS pandemic. For example:

I don't see us ever working without masks again…at least surgical masks, and that doesn't thrill me […]. There is always going to be that anxiety around the next thing and I don't think COVID is a long way from over […] Whereas for the junior staff, this is all they have known, […] this is the only way they have nursed really so it's been part of their learning. (CRN5)

And

I remember when AIDS first came out […] So out of that the whole concept of universal precautions, […] so you presume everybody has it until proven otherwise, which is what we should have always been doing […] And in some ways, this pandemic being a respiratory virus, is completely different as well, it's going to change our practice. (CRN1)

Some participants expressed concerns about the number of nurses leaving the profession, commenting "A lot of nurses are starting to

burnout. There is a large mass exodus of nursing staff, very highly skilled and highly trained nursing staff are leaving these high acuity areas which does compromise patient safety" (CRN4). The nurse leaders also expressed their concerns about the loss of experienced staff from the ED as a result of the pandemic:

> We have seen a huge amount of attrition with staff leaving ED. Having worked in PPE, it has played a huge role in that where a lot of staff are saying: "If this is what my working future is going to be like, I don't want it, I want out". Now that we are back to normal, we will see a big increase in mental illness with our staff, a lot more depression, anxiety, burnout, PTSD. I think ED will be one of the biggest areas showing that. I do worry about the impact of the pandemic on ED nursing staff and nurses going into ED as a career. (LRN5)

(iii) 'Tenacity of a true profession'

The third sub-theme captures the resilience of emergency nurses and the nursing profession. The participants in both the leadership and clinical group expressed views on how they adapted during the pandemic surges, adapting but providing high quality care. For example:

> We've got the basics sorted out so we know what, how to do things now in an organised manner. We've got better equipment, better masks and we've got everything that is required to keep yourself safe and for the delivery of care to be quicker. (CRN6)

Participants identified how working under strict conditions in the height of the pandemic had encouraged them to refine their emergency response processes and explore innovative use of technology, that had enhanced their practice.

> Delegation of roles that was very important […], so everyone had a very distinct role. Our communication initially was hampered by the fact that we didn't want to open and close the door in between the isolation rooms and then not have sufficient negative pressure. We came up with the idea of using the iPad, which has been brilliant because that [means we can] keep an eye on the patient and communicate with staff. Also [getting equipment for example], getting the monitor, put outside isolation room. […] We still use the iPad quite often, just to communicate with staff, it makes a huge difference instead of popping out your head every five minutes and exposing everyone. (CRN18)

Sustaining vigilant use of PPE was recognised as an ongoing challenge by participants, however greater acceptance of the need for ongoing use and attention to correct PPE use was evident in participants' comments:

> I think one of the biggest challenges with wearing PPE is, you know, it has been over two years now, [so] we become complacent. So, you know, […] how many times you are wearing a yellow gown and, 'oh I've got to get my pen out of my pocket' and breaching your PPE going in under your gown […]. But in saying that I think we feel a lot safer in our practice now we have N95s that fit. The yellow gowns are terrible cause you just sweat for a whole shift. But I guess it, you kind of get used to that and I think, from my experience, anyway, after having COVID, I'm not so scared of it anymore. (CRN15)

4. Discussion

The study's findings highlight the impact of the COVID-19 pandemic on ED functioning, team dynamics and provision of timely patient care. Study participants acknowledged that the COVID-19 pandemic was a once in a lifetime event that would have long-lasting impacts on the nursing profession. The ED staff adapted and followed requirements on the use of PPE, however there was the perception that a prioritisation of personal safety resulted in the compromising of patient centred care and depersonalisation of the patient experience. Despite the acknowledged impacts on team functioning, participants showed resilience and that team cohesion was maintained, as staff adapted and refined their roles to maintain ED functioning during the pandemic.

This was particularly evident when participants discussed the impact that PPE use had on team camaraderie. Camaraderie in the emergency department usually involves trust and friendship among people who spend a lot of time together. Such an environment cultivates effective teamwork, collaboration, adaptability, and resilience [33]. These elements are also essential to deliver safe patient centred care [34,35,36]. Participants reported that PPE had an impact on team camaraderie and situational awareness and affected care provision. In addition, PPE use could disrupt team building and familiarity, it is therefore possible that this may also have impacted on team members sense of psychological safety in the workplace. Hayirli et al's (2021) study also reported that increased PPE use was a barrier to teamwork. Scott [37], showed that camaraderie and humour in emergency department personnel was often a stress reducing mechanism, and the impact of this loss on ED team functioning, as a consequence of the pandemic, should be further evaluated.

Having reduced stress management processes [37] through loss of camaraderie, may also exacerbate pre-existing staffing and workplace pressures and may lead to individuals experiencing symptoms of burnout [38]. Evidence has found that nurses have a far greater risk of burnout than any other HCWs [39,40] and experiences delivering care during the COVID-19 pandemic has led nurses to have an increasingly negative view of the profession and this is contributing to nurses leaving the profession [41]. Globally, the COVID-19 pandemic has exacerbated pre-existing problems in nurse workforce sustainability [39,42]. Whether or not this is also an aspect found in the ED workforce would need to be investigated as it was not the focus in our study.

Another aspect that participants discussed was ambivalence towards the role of "PPE spotters". The introduction of an outsider's perspective may have further disrupted the team dynamics and contributed to the sense of loss of camaraderie [43]. McGarry and Nairn [44] reported that successful introduction of specialist nurse roles in the ED was facilitated by appointment of an individual known to the team who was considered trustworthy. In our study, when staff taking on the role of PPE spotters were known to the team, they were reported as being as integral to the pandemic response and were not considered an outsider. In the early stage of the pandemic, when fear and anxiety were prevalent and when the PPE spotter role was performed by senior permanent staff, the role was perceived more positively. In contrast, in the latter stages of the pandemic response during periods of heightened ED activity, the PPE spotter role was viewed less favourably. Some participants expressed the view that there was a greater need for 'runners' who could assist with providing equipment to staff working in isolation rooms and other tasks within the ED rather than using precious resources employing people to focus on good use of PPE. The perceived disconnect between the health organisation leadership team and the ED workforce might have further exacerbated criticism of non-ED staff working in the PPE spotter role. Improving communication between these teams would have provided the team in ED with the opportunity to request an adequate surge workforce [45], able to act as runners or PPE spotters depending on the needs identified in the ED at the time.

The COVID-19 pandemic brought to light pre-existing workforce problems, particularly the challenges associated with the recruitment and retention of critical care qualified ED and Intensive Care Unit (ICU) nurses [46,47]. The challenges associated with attracting and retaining a highly skilled workforce have been attributed to unsustainable working conditions (high workloads and stress levels) and a lack of organisational support and leadership [48]. The impact of the COVID-19 pandemic on HCWs has highlighted an urgent need for government policy makers and health care organisations to address these issues [48].

A key first step in this process is to develop a comprehensive understanding of ED team functionality and the impact of health care emergencies such as the pandemic on ED team dynamics and functionality.

5. Strengths and limitations

This study involved a large sample of ED nurses working in a large, private health service ED in Victoria, with in-depth semi-structured interviewing resulting in a rich and detailed source of qualitative data for analysis. Two RN groups (clinical and leadership) provided both a clinical ED perspective and a management perspective from the whole organisation in relation to the impact of the COVID-19 pandemic on ED care delivery and emergency nurses, ultimately providing a richer source of data. As evidenced by the demographic data, participants from both groups were included from a diverse range of roles, experiences, perceptions, and qualifications adding to the depth and meaning of findings. Inclusion of some casual nurse bank and agency clinical RNs allowed a broader clinical perspective that included both private and some public sector experiences.

As with any study, there were several limitations that should be acknowledged. Firstly, the study was conducted at the one site. A multi-site study would promote greater depth and transferability of findings. Secondly participants were nurses only, further investigation might include other HCWS e.g., medical doctors, nursing and medical students, paramedics to increase the generalisability of the study findings. Another limitation was that one of the researchers was an ED nurse working at the study site and that could have had an impact on the way staff responded. This limitation was addressed by involving the other researchers in the interpretation of the findings.

6. Implications for clinical practice

Participants expressed a strong sense of identity and autonomous thinking. The demands and nature of the ED require these characteristics for quick decision making, assertiveness and confidence in their own ability. The sense of teamwork and communication was expressed as being important to nursing staff, between themselves as well as with patients. This strong sense of culture, teamwork and dynamics needs support and development from upper management that is conducive to the requirements of the ED functionality. This will empower and strengthen the ability and cohesion of ED nursing staff.

Further, Improved communication (internal and external) to address the disconnect between ED and executive management as well as greater input into policies and procedures that affect ED work.

7. Conclusion

Working in the ED during the COVID-19 pandemic has had a long-lasting effect on frontline and leadership nurses. The autonomy, resilience, tenacity of emergency nurses and unique skillset they have needs to be supported and strengthened to ensure sustainability of this vital workforce. The COVID-19 pandemic has highlighted the importance of building psychological and physical resilience in nurses particularly regarding workforce preparation, education and training for future emergencies.

Ethical statement

The study was performed in accordance with the Declaration of Helsinki (WMA, 2013). Ethics approval to conduct the study was obtained by the hospital (EH2021-762) and the University (2021-430).

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CRediT authorship contribution statement

Penelope Dempster: Conceptualization, Data curation, Formal analysis. **Ana Hutchinson:** Formal analysis, Supervision. **Elizabeth Oldland:** Conceptualization, Supervision. **Stéphane L. Bouchoucha:** Conceptualization, Formal analysis, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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