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# Impact of COVID-19 and the hospital disaster response on nurses working in a Fijian emergency department

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#### ABSTRACT

Objective: This research examined the impact of the COVID-19 pandemic on Registered Nurses working in the Emergency Department (ED) of a major Fijian hospital. It explored the role of formal disaster response and highlighted lessons that can be learned for future disasters, especially in low-resource settings.

Methods: This exploratory qualitative study reports the perspectives of 16 Registered Nurses working in the ED during the 2021 COVID-19 outbreak.

Results: The implementation of disaster plans helped staff feel supported. Rapid deployment of tents provided much-needed extra space but increased challenges due to heat and shortages of human and material resources. High-volume mortality meant extended delays in adequately managing the deceased. Absence from family for patients and staff led to mental stress; this experience was ameliorated for nurses by support from the ED manager and clinical colleagues.

Conclusion: Planning and training are crucial prior to any disaster. In future, surge capacity and emergency response must be implemented by including clinicians in

planning and delivery. It is crucial that provision of extra space is matched with sufficient extra staff. Adequate and early management of dead bodies is also vital.

#### 1. Introduction

Despite years of planning in anticipation of a global pandemic, SARS-CoV-2 caught the world by surprise with health systems and personnel overwhelmed. Until the COVID-19 outbreak, much disaster preparedness had focused on building capacity in Emergency Medical Teams (EMTs) to enable effective rapid response to natural disaster situations and on providing education and training to promote human resource readiness [1]. The impact of the COVID-19 pandemic on health services caused immense social and psychological dislocation as well as the inevitable cost to human life. Clearly, increased pressure on limited hospital resources and inability to cope with rapid influx of patients results in increased death and injury [1]. Even in high-income countries, COVID-19 exposed unforeseen weaknesses in health systems and resources, leaving health services struggling to respond effectively to the overwhelming needs of this very sick group of patients. These challenges were intensified in less well-resourced countries with fewer medical and nursing personnel and limited material resources [2,3].

This paper explores the COVID response of a low-resource environment. It illustrates how deployment of disaster response training affected the work of nurses in one of Fiji's main hospitals and what lessons could be learned for future disaster planning and response.

The Republic of Fiji consists of over 330 volcanic islands in the South Pacific Ocean, with a population just over 900,000. Despite recognition as a low-income country [4], Fiji's Government provides universal health coverage as a fundamental right for all citizens. There are three divisional hospitals, 18 sub-divisional hospitals, 84 health centres and 98 nursing stations around the country. Two specialised hospitals and two private hospitals also deliver primary and specialist healthcare services. Fiji's health worker density ratios are 0.8 practising physicians and 2.9 nurses and midwives per 1000 people, below the World Health Organization (WHO) recommended minimum level required to meet essential population health needs (4.45 health workers per 1000 population) [1].

Fiji has experienced multiple disasters over recent years. Consequently, it has developed strong emergency preparedness and response workforce and systems, initially in partnership with the National Critical Care and Training Response Centre in Australia and the WHO EMT Initiative. Fiji leads the Pacific in delivering prehospital Major Incident Medical Management Support programs and had the first WHO-accredited EMT in the Pacific, trained to provide fixed and mobile facilities and personnel during national disasters. This invaluable

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preparedness training in health emergency response systems provided a sound basis for building an effective health response to the COVID-19 pandemic challenge.

Fiji's first case of COVID-19 was reported in March 2020, and successful mitigation strategies were established. By June 2020 Fiji was COVID-free. However, following a quarantine system failure in April 2021, COVID-19 again infected the community. By August, Fiji had the world's highest rate of COVID-19 infections per capita [5] totalling over 500 deaths [6]. Due to the rapid unexpected increase in COVID-19 cases, the public health infrastructure struggled to cope with the pandemic, without equipment and PPE [5,7].

Nurses make up the majority of Fiji's health workforce. Emergency nurses were at the forefront of COVID-19 response as most patients were admitted through Emergency Departments (ED), requiring rapidly enhanced skills and practices to manage overwhelming numbers of presenting patients. Because nurses are the first contact point for ED patients and are consistently with patients during admission, their experiences of the COVID-19 outbreak are vital to understanding it and to informing recommendations for future pandemics. To date, however, relatively little has been published about emergency nurses' experiences of the COVID-19 pandemic in Pacific Island countries [8–10].

This research therefore aimed to address this gap by examining the impact of the 2021 COVD-19 outbreak on nurses working in the ED of a major hospital in Fiji. It explores their personal experiences and their reflections on the capacity of their department to respond to this unprecedented disaster.

#### 3. Methods

#### 3.1. Research design

This qualitative study obtained data through focus groups and analysed them thematically. A qualitative design was appropriate to generate a deep understanding of the complex human experiences in a specific context [11,12]. It resulted in rich data to detail the intensity and complexity of pandemic impacts in this particular locality.

#### 3.2. Ethical considerations

The study was approved by the College Human Health Research Ethics Committee, Fiji Institute of Pacific Health Research at Fiji National University (CHHREC ID: 006.22).

#### 3.3. Participants

All permanently employed Registered Nurses (RNs) working in the ED during the COVID-19 outbreak in 2021 were invited to participate in a focus group. The ED Nursing Unit Manager (MS) provided initial information about the study as an oral in-service presentation. Notices were also placed throughout the ED. Each participant received a letter outlining the purpose and processes; a group information session was held to answer questions about the research. Study information emphasised that participation was voluntary and the results confidential.

#### 3.4. Data collection

Focus group discussions were conducted during July-August 2022, focussing on participants' feelings, sense of preparation and coping strategies, and their perspectives on what worked and what could be improved in future (Supplementary Material shows the topic questions for discussions).

An independent facilitator conducted the groups: a medical practitioner working in the hospital but not the ED. She therefore had no knowledge of what occurred in ED during the COVID outbreak but was familiar with the environment and able to ensure participants' comfort

during discussions. She was briefed by researchers prior to running the focus groups. A scribe kept contemporaneous notes which were then compared to recordings of each session. Sessions were recorded with participant permission. These were transcribed and cross-checked against the written documentation to ensure all information was accurately recorded. Groups ran between 1.5–2 h.

Three focus groups were conducted with 16 participants: two groups of six RNs who were permanent ED nurses (FGs 1,2) and one group (FG 3) consisting of four RNs seconded to ED as a surge workforce during the pandemic to help deal with increased demand.

#### 3.5. Data analysis

Focus group responses were thematically analysed using MAXQDA (VERBI Software, 2021) qualitative data analysis software. Thematic analysis can be "descriptive, explanatory, and/or critical in nature" [13] and enables researchers to explore the participants' reality using their own accounts. We used Braun and Clarke's approach [12] consisting of: data familiarisation, initial code generation, searching for themes, reviewing themes, and defining and naming themes. The codes and themes were reviewed and validated independently by the authors and all focus group participants.

Credibility was ensured through member checking [14]. All participants received transcripts of their group to ensure their views were accurately represented. They were invited to comment on the codes, themes and associated comments to ensure accurate analysis. No changes were suggested. Trustworthiness [14] was ensured by the targeted choice of participants and by providing relevant quotes and examples to enable readers to follow analytic decision-making. Authenticity was assured though using direct quotes and narratives to enable readers to understand participants' experiences.

#### 4. Results

Qualitative analysis developed five overarching themes: Capacity and adaptability; Staff support (positive and negative); Space; Systems and Challenges (personal, resources and risks to patients), discussed below. Table 1 provides a definition for each identified theme illustrated by example codes. Selected excerpts are included to illustrate perspectives typical of the data analysed within each theme.

#### 4.1. Capacity and adaptability

Initially, significant operational challenges were evident in preparing for and delivering care. Nurses were understandably scared and uncertain about how they would cope and how caring for patients with COVID-19 would affect them personally and professionally.

Initially it was very terrifying. For me this was like the first pandemic that I encountered... I was afraid that the number of... rising cases. It was really scary what type of cases will come, the condition of the patients and how will I deal with it (FG2)

However, nurses gained confidence from implementation of the disaster plan and associated preparation and education, as they became overwhelmed with patients.

But then I guess... because we acted earlier. We got IPC [infection prevention and control] in, we had the trainings done, we had to go through the PPE training... That gave us some encouragement, some grounds, I guess to say. You feel like 'I could protect myself'. (FG2)

#### 4.2. Staff support: positive

One particularly important support participants discussed was their departmental nurse manager. Each focus group highlighted his work in supporting nurses, providing continuous education and backing for the

**Table 1**Themes, descriptors and example codes.

THEME	DESCRIPTOR	EXEMPLAR CODES
Capacity and adaptability	Capacity to adjust to potential and real challenges, to recognise opportunities for change, or to respond effectively to consequences.	Preparation: Unprepared Preparation: Prepared Adapting care strategies Resilience
Staff support	Emotional and physical support provided to individuals and teams which created positive or negative results.	Supportive actions/qualities: Training / Zoom Support from family/friends Negative support: Staff shortages Deployed staff not used to ED, unfamiliar with routines
Space	Infrastructure: physical environment including size, quality of the patient care environment	Tents Patient care space Too hot to work in Working in PPE in un- airconditioned space
Challenges: risks to patients	Infection prevention and control, patient mix, lack of nurses, patients' isolation from family/friends, fear of dying	Separation from family Compromised patient care Working in PPE (limited time and communication) Only able to do the minimum Communication compromised Families frustrated Shortage of staff
Challenges: resources	Lack of equipment e.g. oxygen, medical consumables, equipment and pharmaceuticals	Resources Equipment insufficient Moving equipment between tents
Challenges: personal	Fear of infection, fear of the unknown, watching other staff get sick, absence from family, creating a team, creating a safe environment	Lack of support Stigma Fear of infection Fear of transmitting to family Risk of infection New disease Isolation and quarantine Personal impacts: hours, stressful, separation from family, tired, overwhelmed
Systems	Plans, processes and coordination. Standard Operating Procedures (SOP)	Communication with MoH Referral pathways (unclear, changing) Meals Systems not keeping up Dead body management Not involved in SOP development Internal SOPs kept changing

nurses on each shift, for example:

The other thing that worked, saved us, which is probably one of the most important ones, having a good manager. He actually kept us together and bonded. (FG1)

Support from colleagues and from medical staff was also crucial.

We hoped for the best and slowly, things changed. But I think [the team] that really helped us and we had a good bonding in our group. We ate together, we shared stories, we walked together. It was something like a family sort of. That was I think the best part of coming to work, because you know your friends are there while things are hard, but you can manage. Because your team is with you, one thing is good. (FG2) We had the doctors. The doctors were amazing. First time for me to see a doctor change the diaper. And I'm like, oh my gosh, they don't do this in the ward. (FG3)

#### 4.3. Staff support: negative

Participants reported a lack of support and information from the

Ministry of Health and local facility management. They felt excluded from decisions that impacted them and from discussions or policy development.

We felt completely shut out by the facility management and the Ministry of Health. They couldn't come cos [we were a] hot zone, but they made no attempt to talk to us at least via Zoom. (FG1)

They further felt unsupported when they received insufficient food. Because they were kept isolated from their families and the community, they were unable to shop for themselves.

For a few days, we weren't getting... breakfast and lunch, and dinner was not provided. It was supposed to be provided by the hospital... If all the shops were closed, where do you buy something? And we weren't allowed to go out... So you're stuck without eating, and then you come to work without eating, (FG1)

#### 4.4. Space

The Fiji Emergency Medical Assistance Team (FEMAT) moved quickly to set up surge capacity using four UNICEF multipurpose tents in the ED carpark. While the tents met urgent needs for extra space due to the rapid and drastic increase in numbers of critically ill patients and deaths, they were erected without discussion with operational clinical staff. Thus, there were insufficient human and material resources for these extra spaces, and operations were constantly reviewed and changed.

It was a very bad experience, with us working in tents with not enough resources (FG3)

The SOP [standard operating procedures]... changed almost every three or four days... We didn't make the agenda... but it didn't suit the work at all (FG1)

A primary concern was transporting patients between the ED and tents which were erected directly onto the gravel road surface, creating difficulty moving any equipment with wheels. Tents had no ramps, so nurses were required to lift patients on beds or wheelchairs between tents if they required acute care. There were also shortages of patient monitors, oxygen regulators, and flow meters. The tents had no piped oxygen, so nurses had to wheel oxygen cylinders weighing 85 kg for use throughout the shift as all COVID-19 patients required oxygen, but medical orderlies were rarely available.

The planning... If they had involved us, we would've given these ideas, or how to go about this. For example, [we had] trouble moving patients from one tent to another on the gravel... There could've been at least... a walkway or something. (FG2)

Shortages of staff and essential equipment in the tents heavily impacted the quality of care that nurses felt able to provide. This created anxiety, as nurses knew that the tent set-up was incapable of receiving, managing, and treating patients effectively. Staff were concerned about patient flow, care quality and the risks to themselves and their patients. Temperatures in the tents ranged between 29–32 degrees Celsius, unsuitable for staff in PPE managing patients and trying, at all costs, not to decontaminate their PPE which would have put them at significant risk of catching COVID.

Well one thing I feel I was not prepared for was looking after patients in that room [tent]. We had four tents outside and it was really difficult to look after because we had all sorts of patients — surgical, medical... these tents were really not well equipped... we had one washroom outside... the weather conditions were really bad; sometimes it would rain and sometimes the tents would get really hot and if you're working in PPE you won't be able to survive there, so you have to keep on coming out and changing... there were a lot of chances to breach your PPE while doing it. (FG2)

#### 4.5. Systems

Management of dead bodies was hugely problematic. Initially, deceased patients were segregated by their COVID status, and bodies could only go to the mortuary after being swabbed for a PCR test. Thus, deceased patients were kept for extended periods in hot, unairconditioned tents, that were unprotected from the sun, waiting 6–8 h for results.

I think there was another issue about getting the dead moved... some of them were lying there for six hours, some of them eight hours and some maybe two days (FG2)

During the outbreak peak, shortages of morgue attendants and vehicles for transporting COVID-positive bodies, and inadequate or non-existent SOPs meant that dead bodies accumulated in the ED for several hours.

Once I was looking after tent 4, I had like eight... and the tent was really hot like the smell... so sorry for the patient because it's so hot yeah and get that stench and I was trying to you know wrap one patient and my hand went in, like yeah very squishy... because they were DOA patients meaning if they are dead from home they will come here we swab them and we'll wait for their swab status... so they were just flooded...and then we had to wait... sometimes it exceeded 12 to 24 h they were still waiting (FG 2)

#### 4.6. Challenges: patient impact

The communal culture in Fiji means, under normal circumstances, that families are generally heavily involved in caring for patients in hospital. However, during COVID, family members were not allowed inside the hospital, causing significant stress to all involved.

But with that tent open environment, where you see all the people just lying there, no loved one beside them, and the nurses are the only ones, and the doctors there to help them, to care for them, and I think that's just the stark reality. (FG3)

#### 4.7. Challenges: resources

As well as limited numbers of nurses, other support services were unavailable, including orderlies to change cylinders and transport patients. Essential equipment such as monitors, intravenous infusion pumps and bed linen were sometimes unavailable. Periodic lack of beds meant patients had to wait in their cars for admission.

One monitor was used in like four tents. It was a portable monitor, right, with wheels so we go with patients and then pass it to another tent (FG2) And there is not enough screens, so we had to take screens from this tent to this tent and there's all gravel on the floor, on the ground. (FG1)

#### 4.8. Challenges: personal

Focus groups members all felt the separation from their families deeply, but they were also emotionally invested in patients who were also separated from loved ones, especially when they were dying.

The scary part was, when I went to the tent... I stood there, and then I felt scared and a bit emotional at the time, because they were relatives of someone, someone's father, someone's mother. We didn't know, so that was scary and a bit emotional (FG3)

It was a very big challenge for me. I was away from my family for six months, so I was like kind of missing everyone back home, was worried about them. (FG2)

Social stigma also impacted nurses' personal well-being, contributing to feelings of isolation.

The other thing I think it came with a stigma since you're working in the hospital you're likely to spread it to a lot of people... so we're really scared to go anywhere else because they would you know at the end of the day they could point out fingers that I had brought the disease from the hospital even though it was everywhere [in the] community. (FG2)

Despite these challenges, the ED nurses generally adapted well to additional pressures from the pandemic. They demonstrated exemplary resolve and clearly described what helped them cope: support from their manager, from each other, from their families, and from doctors, along with adequate preparation and sufficient PPE, consistent with research reported elsewhere (e.g. 10, 15). They also illustrated the adaptability of nurses common among those working in emergency settings under high pressure and in rapidly changing, uncertain environments.

In three days, we got used to it, then we were totally like completely grown up, nicely, everything there...and we had to do everything same way, so it was really scary at one time, and then later, it was okay (FG3)

One thing that really helped for us was, because being an ED nurse is like a plus point there. We see patients who critical, really, patients who really require a higher level of care... so with that type of experience, that's why it was good, like, easy. I wouldn't say easy. I mean, we were not that much scared to see those critically ill patients. (FG1)

#### 5. Discussion

The results were consistent with findings across several other studies of ED nurses in the Pacific and other regions [10,16]. Previous studies have identified similar themes: Capacity and adaptability [17]; Support [18,19]; Space (e.g. [15] regarding surge capacity); Systems [10,17]; and multiple Challenges [15,20,21]. We therefore focus on discussing results that were more specific to participants in this regional context and consider their implications for managing future major disasters and emergencies, especially in low-resource settings.

#### 5.1. Deployment of surge capacity

A large study documenting pandemic emergency care experiences from the Pacific region found that pre-existing infrastructure and equipment were insufficient to control the pandemic [15]. It recommended that investing in adequate infrastructure and appropriate equipment is crucial for effective response to future disasters. However, as illustrated here, despite access to surge infrastructure (tents), their rapid deployment was problematic. Further, deployment of extra staff to ED, while an exemplary implementation of the hospital disaster plan, was insufficient. This research has highlighted that building infrastructure and having adequate equipment are not on their own sufficient. Attention to staffing is critical, in terms of both numbers and preparation. Nurses participating in FG3 were deployed from other hospital areas as a surge workforce for ED and the frontline. Consequently, other areas were shorter of staff than usual.

In high-resource settings, interim facilities can be readily used and deployed, but adequate staffing and proper patient flow are crucial [22]. An Italian study recommended that surge capacity be used for less acutely ill patients [23]. In Fiji, such cases were managed at home or in community settings as there was no capacity in acute hospitals. In the UK, 15,000 extra beds were rapidly established in Nightingale Hospitals to respond to the expected COVID surge, but health services could not find sufficient health professionals to staff twice as many ICU beds in an already stretched health system and had no clear vision which patients would be admitted [24]. The sites were mothballed or repurposed shortly after being commissioned [25], highlighting the crucial importance of not putting infrastructure and buildings before identifying and preparing suitable people to staff them [24].

Similarly, our results reinforce the need for caution in recommending increased surge capacity without considering where extra staff would

come from, how they would be prepared and whether moving limited human resources from one health service area to another would sustainably provide the extra resourcing required. Training other health staff should be considered, for example, from local nursing schools and universities. Health professional educators are generally registered practitioners and could be readily prepared and deployed to look after less acutely ill patients, freeing key hospital staff for frontline work. Many low-resource countries have comparatively young retirement ages (55–60 years), and retired health workers may be willing to be retrained for deployment during crises. While initially in this pandemic, older people were shielded from any interaction, consideration should be given to where and how this potential cadre of knowledgeable workers could be deployed.

#### 5.2. Management of the deceased

Internationally, managing dead bodies during the COVID-19 pandemic proved an unprecedented challenge [26]. Available guidance from WHO [27] was resource-intensive and difficult to scale. Like care of living patients, dead body management during the outbreak suffered from lack of space for storage, staff for testing and autopsies, and supplies of PPE and testing equipment. The consequences are both practical and emotional. While the Fijian system attempted to scale morgue facilities rapidly, it was unable to prevent the impact on patients, their families and healthcare staff.

While understandable that systems became overwhelmed in unprecedented situations, important lessons can be learned for future disasters and emergencies: such as identification of suitable space, development of policies and procedures, and training and development of a surge workforce (not frontline healthcare staff) for rapid deployment in similar situations. For example, consideration should be given to identifying volunteers willing to manage the flow of deceased patients away from open wards. Occupational groups likely to be less active in a pandemic such as airline staff could, for example, be trained and deployed.

## 5.3. Support and communication from facility management and the Ministry of Health

Communication is always a major challenge in disaster response. While FEMAT's rapid response was commendable, there were insufficient discussions with the clinicians expected to carry out care. Engaging and integrating clinicians into policy and planning at all decisionmaking levels is crucial to good governance, especially during escalating crises [19]. ED nurses experienced lack of support, involvement and communication from senior management leaving them feeling undervalued and unappreciated. Key decisions about patient management, the use of tents and management of the deceased, while doubtless well intended, were made without consulting the clinicians expected to implement them. Further, nurses felt undervalued and unseen due to lack of meal provision by management. Transparent and well-structured communication both up- and down-wards is crucial to effective and timely response. Given pressures on senior decision-makers during the COVID-19 outbreak, a liaison role has potential to ensure that frontline clinicians feel supported and heard in decisions affecting care.

#### 5.4. Strengths and Limitations

This research provides insight about pandemic experiences and responses in one country in an under-resourced and under-researched region, adding to the scarce literature. It examined the impact on a self-selected sample of ED nurses in one major Fijian hospital during the COVID-19 outbreak; thus the findings may not be generalisable to other countries or settings. Despite a comprehensive recruitment strategy, nurses who had already left the ED following the pandemic may have been excluded from the pool of potential participants. In terms of

findings, nurses working in other hospitals may have had different experiences and despite our diligent analysis, other researchers using the same data may have identified different themes. This qualitative study provides a "rich, contextualised understanding" of a shared, unique human experience [28] in unprecedented circumstances.

#### 6. Conclusion

This paper has explored how nurses in a low-resource setting coped with the overwhelming influx of COVID-19 patients during a major outbreak. They generally adapted and coped well, despite long absences from family support. The rapid deployment of local disaster plans was commendable. However, certain areas could be improved in future disaster response.

Effective planning and management of staff surge capacity is critical; moving nurses from one health service area to another is not sustainable as it leaves the source site understaffed. Decision-makers should identify other cadres of health workers in the community who could be trained and deployed to support frontline clinicians. Improved liaison and communication flows, including clinicians wherever feasible in critical decisions is likely to make future responses more effective.

Management of the deceased remains challenging in any unprecedented and overwhelming event. Planning needs to consider how to address this problem in future, including training and developing a rapid response group of suitable community volunteers to bridge the gaps identified.

Healthcare workers have been hailed as heroes of the pandemic given their essential role in the continued functioning of society and caring for those with COVID-19 [15]. This research has demonstrated that ED nurses in Fiji stepped up and responded diligently and effectively to an unprecedented situation. It has identified ways to support frontline staff better respond to similar situations in future.

#### CRediT authorship contribution statement

Keshni Singh: Writing – review & editing, Writing – original draft, Project administration, Investigation, Conceptualization. Mamatuki Sosefo: Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Conceptualization. Antony Robinson: Writing – review & editing, Writing – original draft, Project administration, Methodology, Formal analysis, Data curation. Chris Rossiter: Writing – review & editing, Writing – original draft, Project administration. Di Brown: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

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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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