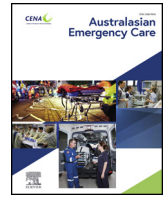




Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Research paper

Pre COVID-19 emergency department nurses' perspectives of the preparedness to safely manage influenza pandemics: A descriptive exploratory qualitative study

Jessica C.M. Lockett*, Katherine Nelson, Caz Hales

School of Nursing, Midwifery, and Health Practice, Victoria University of Wellington, Wellington, New Zealand



ARTICLE INFO

Article history:

Received 18 September 2020
Received in revised form 4 March 2021
Accepted 4 March 2021

Keywords:

Emergency nursing
Influenza
Human
Pandemics
Occupational health
Strategic planning

ABSTRACT

Background: Pandemics pose significant challenges to healthcare systems worldwide and emergency departments are a crucial component in any pandemic response. This study was designed to explore what New Zealand emergency nurses perceive as the major challenges to nursing care and staff safety during a pandemic, and to identify strategies nurses feel are important in mitigating these challenges.

Methods: A descriptive exploratory qualitative design using semi-structured interviews was conducted in March 2019. Participants were 16 triage nurses from two New Zealand emergency departments. Qualitative content and thematic data analysis techniques were used.

Results: Emergency nurses highlighted existing safety issues in their practice, and their concerns about how a pandemic might exacerbate these issues. These themes were identified as: safety of self and family, safety of patients, and safety of organisational systems. Nurses also shared their perspectives on how to mitigate these safety issues.

Conclusions: This study provides a detailed understanding of the concerns emergency nurses hold about working during pandemics. Similar fears for staff and patient safety have been voiced globally during the current COVID-19 pandemic, and it is crucial that emergency departments worldwide develop pandemic plans that address the safety concerns to which fear was attributed.

© 2021 College of Emergency Nursing Australasia. Published by Elsevier Ltd. All rights reserved.

1. Introduction

Increasing globalisation through travel and trade means many countries are vulnerable to the risks of pandemic disease, which not only covers a wide geographical area crossing international borders but also affects large numbers of people [1]. Pandemics place a considerable strain on healthcare systems, putting lives at risk and posing significant economic costs. Influenza is considered a high-risk pathogen for causing a global pandemic because it can infect animals, allowing more opportunities for the virus to mutate [2]. The most recent influenza pandemic occurred in 2009, where the H1N1 influenza virus infected between 11% and 21% of the global population and caused approximately 500,000 deaths and a rapid increase in emergency department (ED) service demand worldwide [3]. Other respiratory pathogens also pose a considerable risk, as seen with the current pandemic of the coronavirus disease COVID-

19, which has affected 217 countries and caused the deaths of more than 2 million people worldwide as of February 2021 [4].

Historically, New Zealand has focussed much of its pandemic planning on the management of influenza. Both local and national level plans exist for how health authorities would manage health and other essential services during an influenza pandemic. The national pandemic plan predicts that a moderate to severe influenza pandemic would put significant pressure on EDs, who would need to manage both unwell influenza patients and other acute emergencies. One specific strategy to manage the increased demand on ED services is the establishment of community-based assessment centres (CBACs), where lower-acuity patients with influenza-like illness (ILI), could be managed [5].

Emergency departments are high-risk areas for transmission of infectious disease due to the close proximity of undiagnosed patients to other patients and a lack of adequate infection control measures in place; often exacerbated by overcrowding [6]. ED staff have been shown to be at high risk for occupational exposure to infectious diseases during previous pandemics [7,8]. Thirty-one percent of staff who tested positive for COVID-19 antibodies across 13 hospitals in the United States worked in EDs; nurses were the

* Corresponding author at: 48A Bauchop Road, Waterloo, Lower Hutt 5011, New Zealand.

E-mail address: jcmlockett@gmail.com (J.C.M. Lockett).

What is known

- Emergency departments play a key role at the frontline of the health response to a pandemic.
- Staff working in emergency departments are at high risk for exposure to infectious disease during a pandemic.
- There is a lack of research into the perspectives of New Zealand emergency nurses around the impact a pandemic would have on their practice.

What this paper adds

- Fear is a significant factor that influences New Zealand emergency nurses' willingness to practice during a pandemic.
- Existing safety issues within the emergency department contribute to these fears.
- Emergency nurses experience a tension between personal responsibilities and their duty of care.
- Fear is manifested in a lack of trust in the current regional and national pandemic plans.
- The strategies emergency nurses feel are necessary to successfully manage a pandemic offer new insights for policymakers at regional and national level.

occupational cohort with the greatest prevalence of positive cases overall [9]. The increased risk to nurses has been linked to atypical disease presentations, inadequate environmental cleaning, and insufficient supplies of personal protective equipment (PPE) [7,9].

Previous international research exploring safety concerns of nurses caring for patients during pandemics has focused on issues of disease transmission to self and family, workload and staffing, and conflict between personal and professional obligations [10–12]. The triaging of influenza patients has been identified as problematic due to challenges in disease recognition, and staff's poor adherence to infection control principles [13,14]. Furthermore, triage practices can change during a pandemic, with emergency nurses triaging patients away from the ED to community services [15]. In such scenarios, nurses reported feeling underprepared due to ill-defined guidelines for triaging away, distressed at the inability to provide care to all patients, and expressed ethical concerns at how this would alter their perception of their role as a nurse [16].

Table 1
Interview guide.

Staff perceptions and concerns	<ol style="list-style-type: none"> 1. Tell me about how your Department manages seasonal influenza? <ol style="list-style-type: none"> a. How does your ED manage surges of presentations? 2. How do you think an influenza pandemic might alter the way you deliver nursing care in your ED? <ol style="list-style-type: none"> a. The Ministry of Health and District Health Boards (DHB) require EDs to continue managing their normal workload as well as manage the surge of influenza patients during a pandemic. How do you see this working in your ED? b. What strategies do you feel might be needed for your ED to manage the increased workload during a pandemic? c. Another part of the Ministry of Health's pandemic plan involved keeping unwell people in the community to be cared for at home by family members. If you had a sick family member, how do you think this would affect your family? 3. Tell me about how you decide when to call in sick to work? <ol style="list-style-type: none"> a. What are your feelings when calling in sick? b. How does workload in the ED impact on your decisions?
Presenteeism	<ol style="list-style-type: none"> 4. When do you decide to implement isolation precautions for a patient with influenza-like illness (ILI)? <ol style="list-style-type: none"> a. Are there any factors that influence this decision? 5. How do you manage patients that might have influenza at triage? <ol style="list-style-type: none"> a. The hospital requires patients presenting with ILI to be given a mask and segregated from non-ILI patients within the ED waiting room. How is this requirement met in your ED? b. A major part of the Ministry of Health and hospital plans for pandemic management requires ED nurses to triage lower-acuity ILI patients away from ED to GPs or community-based assessment centres. How do you feel about triaging patients away from ED during a pandemic?
Infection control	<ol style="list-style-type: none"> 6. There are many identified risks to caring for infectious patients. What are the specific risks in your ED when caring for influenza patients? <ol style="list-style-type: none"> a. How well are these risks managed?
Triage practices and principles	
Occupational exposure to infectious disease	

There is a paucity of Australasian specific research exploring ED nurses' perspectives on the impact an influenza pandemic would have on their role and workplace. The aim of this study was to explore the perspectives of New Zealand ED nurses on the provision of nursing care in ED during a pandemic, and to identify strategies they consider important for pandemic planning.

2. Methods

A descriptive exploratory qualitative design was employed to explore the perspectives of emergency department nurses in the management of patients during an influenza pandemic. The aim of the study was to describe the perspectives of emergency nurses about the impact a pandemic would have on themselves and their role when caring for patients presenting to the ED.

2.1. Participants and sampling

A convenience sample of triage-trained registered nurses working in two EDs within the lower North Island of New Zealand participated in the study. These EDs were chosen to reflect different levels of hospital services available across New Zealand, encompassing both secondary and tertiary-level facilities. An email and poster recruitment strategy was used, with emphasis placed on the voluntary nature of the study. Nurses who expressed interest were sent a participant information sheet and written consent was obtained before each interview. Convenience sampling was chosen to allow for face-to-face interviews without increasing cost and travel time for the researcher [17]. Ethics approval was granted by the Victoria University of Wellington Human Ethics Committee (HEC 0000027012). Following ethics approval, locality approval was granted from both study sites prior to participant recruitment.

2.2. Data collection and analysis

Interview questions were developed based on the literature review and the interview schedule (Table 1) piloted with a senior ED triage nurse. Six main open ended questions were used, with additional prompts and follow-up questions included depending on how comprehensively the participant answered the main question. A semi-structured approach to interviews was taken to allow participants to determine what knowledge they considered meaningful and raise issues the researcher may not have anticipated [17]. The audio-recorded interviews were conducted by the first author

in a mutually agreed location and ranged from 25 to 66 minutes in length. Interviews were conducted in March 2019 and transcribed verbatim, following which distinguishing participant features were removed and each transcript de-identified.

Content and thematic analysis were used for data analysis which was carried out using NVivo 12 coding software. Content analysis was initially undertaken to identify the main topics raised, especially with regard to the strategies highlighted. Categories were built up from the data, starting with specific words that were linked to create a general concept [18]. This method allowed the researchers to take into account the breadth of the data, rather than immediately focussing on selected extracts and overlooking those which offered a different view on the same subject matter. An inductive approach to thematic analysis was then undertaken, guided by Braun and Clarke's six phases, to understand the meaning of the topics raised and produce data-driven themes that avoided being guided by the researchers' analytical and theoretical preconceptions [19].

Lincoln and Guba's framework for establishing trustworthiness was adhered to throughout the study [20]. Credibility was maintained by audio-recording the interviews and transcribing these verbatim, with these transcriptions then thoroughly checked to ensure accuracy. Direct quotes from these transcripts are included in the results section. Rich descriptions of the study methods and the context from which the data was gathered are provided to promote transferability. A detailed audit trail was maintained to document decision-making during data collection and analysis. Analysis of the data was conducted by the primary author and verified by the second and third authors to ensure the findings were grounded within the participant's narrative. The use of an audit trail enhanced both confirmability and dependability of the study.

3. Results

Sixteen registered nurses participated in this study, 10 from site one and 6 from site two. Of the 16, 13 were female and 7 participants were the primary caregiver for dependent family members. Nine participants were in designated senior nurse roles, including Associate Charge Nurse Manager, Clinical Nurse Educator, Patient Flow Coordinator and Clinical Nurse Specialist. The participants' experience in emergency nursing ranged from 4 to 20 years, with a mean of 11 years, and their experience as a triage nurse ranged from 6 months to 20 years, with a mean of 9 years.

This study revealed that the everyday safety concerns ED nurses have when working in an overcrowded environment with infectious patients were exacerbated by the volumes of patients who would present during an influenza pandemic. This led to concerns that nurses would fail to balance personal, professional and organisation needs during a future pandemic. These concerns were established across three main themes: safety of self and family, safety of patients and safety of organisational systems. Finally, the different strategies and planning that participants identified as important to safely navigate a future pandemic are presented.

3.1. Safety of self and family

As undifferentiated patients journey through the ED system towards definitive diagnosis and management, it is the role of ED nurses to assess and care for them. This creates a risk of nurses being unknowingly exposed to an infectious disease; all 16 participants described situations where disease exposure had occurred in their everyday practice. The consequences of this exposure can be deadly, with two participants sharing their distress about a nursing colleague who contracted influenza during the 2009 H1N1 pandemic and subsequently died: "*She [colleague] was a known*

asthmatic and she got the flu from a patient and died. It was horrifying because it was someone I knew well, and she had a little baby and so it was not nice, it was a horrible, horrible thing" (Participant 10). This experience was the basis for heightened concern that the provision of healthcare during an influenza pandemic was a risk to their own personal safety: "*The major risk is that I'm going to get influenza and... influenza kills*" (Participant 1). ED nurses held even greater concerns for the safety of their families and the risk of spreading influenza to them: "*It's more about taking that stuff home to my family... like as nurses, we know the risks when we come to work and we do take some risk but when you do put that back onto someone's family then I don't think that's appropriate*" (Participant 12).

Nurses were conflicted as to whether they would continue to attend work during a pandemic due to fears for their personal safety: "*I don't know if I would continue working if it was becoming a health issue to myself*" (Participant 16). However, participants also discussed that presenteeism – continuing to work whilst unwell – was commonplace in their ED. Factors influencing the decision to continue to work included staffing: "*Knowing you're already short staffed you do consider whether you're sick enough to stay at home or not*" (Participant 1); guilt "*You feel like you're letting everyone else down*" (Participant 3); and limited paid sick leave: "*People do go to work when they are unwell because they don't have the sick days or they need the money*" (Participant 9). Nurses feared these issues would be compounded during a pandemic, especially the availability of sick leave. Some worried that they would run out of sick leave and would have to take unpaid leave if they became unwell, which could influence their decision to work through illness: "*the fact is that we [my family] would struggle financially if I had to take time [unpaid leave] off*" (Participant 11).

3.2. Safety of patients

Emergency nurses in this study described significant existing safety problems in EDs, centred around workload, staffing and resourcing constraints, and their concerns that these would increase exponentially during an influenza pandemic. They feared being unable to provide adequate nursing care, to mitigate the risks that patients in ED would face, and to prevent the spread of disease amongst patients.

Overcrowding was highlighted as a significant issue across both EDs, resulting in frequent instances of both the inability to provide all necessary patient care, and the provision of patient care in non-traditional treatment spaces, mainly ED corridors. Nurses described frequently being so time-poor they are unable to complete all nursing care tasks: "*I have had two high-dependency patients... I had another confused patient and two other patients, one of whom was in an isolation room so I just didn't see them... That was definitely a time where I was thinking 'this is not okay' because people's safety was being compromised, my registration was being compromised and this is not the care that they [patients] deserve*" (Participant 9). Additionally, patients were often placed in ED corridors due to space constraints in overcrowded EDs, resulting in incidents of patients being toileted in public, treatment delays and clinical deterioration being missed: "*I've seen patients having CPR [cardio-pulmonary resuscitation] in the corridor... I've seen patient's X-rayed when they've not been assessed and then been found to be heavily pregnant. I've seen patients who have not had vitals [signs recordings] for hours on end because the nurses have just been too busy*" (Participant 15).

All nurses expressed the belief that their workplaces would not manage the increase in patient numbers during a pandemic: "*We always just seem to cope but at the expense of so many other things so... if we're expected to manage a massive surge of patients with flu then somewhere along the line, something is going to break*" (Participant 8). This included concerns that EDs would have insufficient

nurses for patient care and shortages of essential life-saving equipment: “From a resource point of view I think the nurses would get saturated quite quickly and I think our resources would get saturated quite quickly” (Participant 15). Care rationing due to an imbalance in nurse to patient numbers was of particular concern: “It never makes you feel great having to not do something and it doesn’t make me feel like I’m providing the best care that I can for my patient...it definitely doesn’t make you feel good inside and it doesn’t kind of sit with my morals and my values and my ethics around nursing” (Participant 1).

Nurses feared EDs would be physically unable to accommodate the isolation requirements of every influenza patient, or that isolating influenza patients would come at the expense of other patients’ monitoring and care needs: “I think we would really struggle because if we have to isolate patients with the flu then that potentially would mean patients who need telemetry monitoring are in the corridor or, you know, the frail” (Participant 11). Furthermore, they feared that corridor patients were at high risk of contracting influenza from infected patients due to the lack of physical barriers to prevent disease spread. Additionally, emergency nurses would be required to continue to care for patients with injuries or illnesses unrelated to influenza, and they feared these patients would be vulnerable to contracting influenza, adding to their morbidity burden: “I just don’t think we’re going to prevent the other patients in the ED that are actually unwell, especially the elderly or the child with the fracture next door, from being exposed” (Participant 8).

The potential need to triage lower-acuity influenza patients away from the ED to a CBAC, as included in the national pandemic plan [5], was a contentious issue and a source of fear for all nurses in the study, who worried that they would not always recognise seriously ill or deteriorating patients: “We’re going to feel for their pulses and we’re going to assess what their breathing is like and they might look okay at that point in time but...what if the patient goes away and deteriorates and that ends up being on your head” (Participant 1). Some nurses recalled serious or sentinel events that involved their colleagues when patients had been triaged away from ED. Witness-

ing the subsequent investigations and questioning of these nurses’ practice contributed to a reluctance to engage with this triaging practice. Nurses with direct experience of making an incorrect decision at triage were unwilling to triage away during a pandemic; “I’d leave that decision up to someone else because I’ve been wrong in the past” (Participant 4).

3.3. Safety of organisational systems

Organisational factors, often considered to be outside of the direct control of nurses, have an impact on the safety of ED nurses and patients daily, and this lack of control would be exacerbated during an influenza pandemic. The nurses described the challenges that occur during influenza season each year. These included the difficulty of maintaining isolation precautions: “It can be pretty hideous...there would be a lot of people in isolation and then you can’t pull them out...so the bed flow of the department can get extremely difficult” (Participant 15); hospital bed-block “the hospital doesn’t run quick enough for us and there aren’t enough beds available for people who require isolation...we don’t have much space so we get bed-blocked so quickly” (Participant 6); and infection control requirements “Equipment isn’t always wiped down as well as it should be” (Participant 7).

All participants feared these issues would be exacerbated during a pandemic, and expressed a significant lack of confidence in the ability of both hospital and government pandemic plans to keep patients and staff safe. One senior nurse stated that their hospital had a record of making well-intentioned policies without providing the necessary resources for the policies to be fully implemented as planned: “They put all this stuff on us all the time and they never provide us with anything to kind of like make it work...I wouldn’t be surprised if there’s a hundred other things they’ve said that we should be doing that we’re just not able to do because they don’t meet the basic stuff that we need as a department” (Participant 8). Nurses described how their hospitals were often slow at updating organi-

Table 2
Key strategies ED Nurses propose to manage during a pandemic.

Category	
	<i>ED-level strategies</i>
Staffing	Increase nursing and medical staffing to meet increased patient volumes Use of overtime rates as incentive, including for non-fulltime staff Introduction of on-call nursing rosters Investment in casual nursing pool training and retention
Model of care	Focus on emergency interventions only Non-urgent cares to be completed once transferred to inpatient ward
Triage	Development of clear guidelines for the identification of lower-acuity patients who could be triaged away from ED to community-based care Greater input by medical staff into decisions regarding triaging patients away Use of point-of-care testing at triage to identify atypical presentations Increased physical distancing between patients and staff at triage and administration desks Separation of pandemic and non-pandemic patients within the ED waiting room Separation of pandemic and non-pandemic patients within the ED treatment area
Equipment	Robust supplies of PPE for staff Overhaul of ED cubicle decontamination procedures to improve cleaning turn-around times
	<i>Hospital-level strategies</i>
Prevention	Sending medical staff to Aged Residential Care facilities to assess and treat patients and avoid the need for transport to ED where possible Diversion of stable influenza patients away from ED to alternative clinical areas for assessment to limit disease transmission
Preparation	Expand existing ED physical footprint Increase inpatient admission bed capacity including isolation bed capacity Plan for rapid, temporary expansion of ED footprint into surrounding non-clinical areas
Response	Establish triggers to signal when ED needs an escalation of resources to manage patient influx e.g. hospital staff redeployment to ED
Welfare	Subsidised or free childcare on site
	<i>Government-level strategies</i>
Legislation	Legal protection for ED staff triaging patients away
Welfare	Increased sick leave entitlements Increased domestic leave entitlements for those with family dependents
Immunisation	Expansion of free influenza vaccination programme to family members of healthcare workers living in the same household Mandatory healthcare worker vaccination unless medically contraindicated
Public health	Clear, concise, practical public health advice on self-care to encourage lower-acuity patients to be managed at home by family
Community services	Subsidise primary health/general practice visits for the duration of the pandemic

sational plans, and by the time plans were finalised they were out of date. They argued that this meant their EDs were already left with a shortfall in resourcing to manage demand, with no ability to safely manage the increase in patient numbers that an influenza pandemic would create: “Every year the numbers are going up and up and up and so the staffing we have for those numbers is based on last year’s numbers and we’re only just catching up. . . we’re a few steps behind, so if a pandemic came we would be completely stretched and at capacity and pretty paralysed” (Participant 13). The lack of trust in pandemic plans also extended to government planning: “We’re not well-equipped at all. Well-equipped means that there’s an extra unit or area you can open which you can isolate in, well-equipped means there’s ante-chambers, well-equipped means. . . there’s aprons, gowns, masks aplenty so we won’t run out on day three” (Participant 5).

3.4. Strategy and planning

After reflecting on existing safety issues and their concerns about a future pandemic, ED nurses identified many strategies they would like to see implemented at ED, hospital and government level to mitigate the issues they highlighted. Table 2 summarises these strategies.

4. Discussion

Key findings of this study reveal that the threat of a pandemic exacerbates ED nurses existing safety concerns in everyday practice around caring for infectious patients. ED nurses expressed considerable and multifaceted fears around the potential negative impact on the health of nurses and their families; pandemic duty of care obligations; making ethically-challenging decisions around resource allocation; and lack of trust in the robustness of existing pandemic plans to manage workload and resourcing issues. However, despite the bleak outlook held by these nurses, they also held novel ideas for strategies that could be put in place to mitigate some of the identified issues.

Fear of becoming infected with influenza during a pandemic was common amongst the nurses in this study, but the fear of being a vector for disease and infecting family members was even more prominent. This is in line with previous pandemic research [12,21], and has also manifested during COVID-19, with nurses isolating themselves from their families by living separately to reduce the risks of disease transmission [22]. However, the decision to take sick leave when unwell was also influenced by concerns around the financial ramifications of exhausting limited sick leave entitlements. Researchers within the private sector found a correlation between the unavailability of paid sick leave and presenteeism, continuing to work whilst unwell [23]. If nurses fear they may exhaust their sick leave allowance during a pandemic, higher rates of presenteeism may occur, placing both nurses and patients at risk. The personal financial ramifications of exhausting sick leave or needing to cease work for health reasons directly related to the pandemic have not previously been explored in existing literature.

This study identified a tension between ED nurses’ concerns for their own personal safety, and their professional responsibility to patients. No guidance regarding duty of care obligations in New Zealand is included within the national pandemic plan [5]. The New Zealand Nurses’ Organisation (NZNO), the largest professional nursing body, acknowledges nurses may have competing priorities during a pandemic and states that it is the decision of each individual nurse as to how to manage their duty of care obligations [24]. The WHO mandates that healthcare workers are morally obligated to work during a pandemic provided organisations have taken action to minimise threats to the personal safety of staff [25]. Nurses lacked confidence in both their employers and the govern-

ment to uphold their safety during a pandemic. Issues around the supply of PPE to nursing staff during the COVID-19 pandemic in both Australia and New Zealand have warranted these concerns [26,27].

Of particular significance in this study was nurses’ concerns about the ethical and moral dilemma of being unable to provide all necessary patient care due to workload, staffing and time constraints. This is a recognised phenomenon in nursing known as care rationing [28]. However, there is a paucity of research on the effect a pandemic may have on the frequency of care rationing in the ED setting. The provision of substandard or missed care and the potential for serious adverse events was a real concern for all participants in this study. ED nurses described how care rationing resulted in a moral dilemma that negatively impacted on their professional nursing values. Care rationing has been reported by nurses overwhelmed by COVID-19 patients, with some patients missing out on vital medications [29].

This study further highlights the fear of potentially needing to triage lower-acuity patients away to CBACs during a pandemic to prevent EDs being overwhelmed. CBACs are designed to provide assessment, advice and essential medicines but do not provide ongoing observation of unwell patients and are not staffed by ED nurses [5]. The potential for patients to deteriorate after being triaged and diverted to a CBAC, and any associated disciplinary ramifications related to this possibility, were the fundamental concerns for nurses in this study. This is not without precedence, as New Zealand ED nurses have previously been censured by the nursing regulating agency for not recognising the severity of a patient’s condition at triage and causing undue harm [30]. The use of prescribed mass-casualty algorithms to support triage decision-making has been proposed as a means to mitigate individual accountability [31].

Finally, emergency nurses had a low level of confidence that existing local and national pandemic plans would adequately manage the influx of influenza patients and the subsequent risk to staff safety. This could have significant impact on workforce availability during a pandemic, as previous research has shown that workplace preparedness influences nurse willingness to attend work during a disaster [12]. Participants suggested multiple strategies that could be implemented across ED, hospital and government level that could mitigate some of the issues and concerns raised within the study. There was no priority order to the strategies suggested as this was not asked within the interview. However, given the current effects of the COVID-19 pandemic on acute care services, priority needs to be given to strategies that (i) focus on staffing and sick leave entitlements to reduce the existing culture of presenteeism; (ii) develop mass casualty-type triage guidelines for pandemic situations; (iii) ensure adequate PPE supplies for staff, and (iv) extend priority vaccination to the families of healthcare workers. In addition, the government needs to urgently develop comprehensive pandemic guidelines that better promote the safety of ED patients and staff. These need to include specific details about the prioritisation of finite health resources, including ED staff, hospital beds and vital equipment.

4.1. Limitations

Data collection was limited to two urban study sites in New Zealand, and this impacts upon the generalisability of the research, as other areas of New Zealand have different population demographics that could influence responses. All participants identified as New Zealand European, Australian or British European, so this research is limited in that there is no representation from Māori, Pacific or Asian ethnic nurses. As participation in this research was on a voluntary basis, there is a risk for self-selection bias, where nurses who hold a particular interest or view point in the research

topic are more likely to participate in the study. Given the various perspectives shared on many topics, if there was bias this was most likely minimal.

4.2. Recommendations

Despite the many everyday issues and future concerns expressed in this study, the emergency nurses provided their unique insight into strategies to successfully manage a future pandemic. Strategies raised by the nurses and from the analysis should be considered during future pandemic planning by hospitals, primary care organisations, emergency responders and the government to support nurses to manage both their personal and professional obligations during a pandemic, such as childcare or accommodation support. Guidance around challenging ethical issues should be incorporated into pandemic plans, as this will promote the mental wellbeing of staff working in difficult situations when they are expected to allocate scarce resources. To develop solutions to support nurses during pandemics, the nursing profession needs to be engaged in contributing their expertise to pandemic planning at all levels. Emergency nurses, with their unique insight into care rationing, overcrowding and infection control challenges, must be involved in specific planning around the management of acute patients requiring hospitalisation.

5. Conclusion

New Zealand emergency nurses hold significant fears for how an influenza pandemic would impact on patients, and on their families and themselves. The perceived inadequacy of existing pandemic plans at both local and national level is also a contributing factor. Many of the issues identified by the nurses in this study have been evident globally during the COVID-19 pandemic. Although the New Zealand healthcare system has not been tested to the same extent as other countries, the urgency of including emergency nurse perspectives in future pandemic planning cannot be overstated. Further research is necessary to determine if the concerns expressed in this study are unique to the New Zealand context, or reflected internationally. This is especially crucial as many countries, including Australia, are currently dealing with a second wave of COVID-19 infections and this research could help to improve the response in New Zealand and elsewhere [32].

The identification of various ED-specific ethical concerns that have not been considered or accounted for in existing influenza pandemic planning is a significant new finding to emerge from this research. Pandemic planning requires different considerations tailored to individual countries and their unique healthcare systems, and this research is the first that specifically highlights the perspectives of New Zealand emergency nurses. Their perspectives must be taken into consideration in future pandemic planning to mitigate the negative impact of the identified issues.

Funding

This paper was produced with no funding from any source.

Ethics

Ethics approval for this research was granted by the Victoria University of Wellington Human Ethics Committee (Approval number 0000027012). Following ethics approval, locality approval was granted from both study sites prior to participant recruitment. This research was carried out in accordance with the Declaration of Helsinki.

Conflict of interest

The authors declare no conflict of interests.

Acknowledgements

The authors would like to thank the emergency nurses who participated in this research. We also acknowledge all emergency nurses and their families who are nursing during the current COVID-19 pandemic.

References

- [1] Dicker RC, Coronado F, Koo D, Gibson Parrish R. Principles of epidemiology in public health practice: an introduction to applied epidemiology and biostatistics. 3rd ed. Atlanta: CDC; 2012, 1–72 pp.
- [2] World Health Organization. Influenza (avian and other zoonotic) [Internet]. [Place unknown]. WHO; 2018. Available from: [https://www.who.int/en/news-room/fact-sheets/detail/influenza-\(avian-and-other-zoonotic\)](https://www.who.int/en/news-room/fact-sheets/detail/influenza-(avian-and-other-zoonotic)) [updated 13 November 2018; cited 19 July 2020].
- [3] Centers for Disease Control and Prevention (CDC). 2009 H1N1 pandemic (H1N1pdm09 virus) [Internet]. Atlanta: CDC; 2019. Available from: <https://www.cdc.gov/flu/pandemic-resources/2009-h1n1-pandemic.html> [updated 11 June 2019; cited 12 July 2020].
- [4] World Health Organization. Weekly Operational Update on COVID-19 [Internet]. [Place unknown]. WHO; 2021. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports> [updated 01 February 2021; cited 02 February 2021].
- [5] Ministry of Health. New Zealand influenza pandemic plan: a framework for action [Internet]. Wellington: Ministry of Health; 2017. Available from: <https://www.health.govt.nz/your-health/healthy-living/emergency-management/pandemic-planning-and-response/influenza-pandemic-plan> [updated August 2017; cited 04 June 2020].
- [6] Rothman RE, Irvin CB, Moran GJ, Sauer L, Bradshaw YS, Fry RB, et al. Respiratory hygiene in the emergency department. *Ann Emerg Med* 2006;48(5):570–82.
- [7] Chen YC, Huang LM, Chan CC, Su CP, Chang SC, Chang YY, et al. SARS in hospital emergency room. *Emerg Infect Dis* 2004;10(5):782–8.
- [8] Sandoval C, Barrera A, Ferrès M, Cerda J, Retamal J, Garcia-Sastre A, et al. Infection in health personnel with high and low levels of exposure in a hospital setting during the H1N1 influenza a pandemic. *PLOS ONE* 2016;11(1):e0147271.
- [9] Self WH, Tenforde MW, Stubblefield WB, Feldstein LR, Steingrub JS, Shapiro NI, et al. Seroprevalence of SARS-CoV-2 among frontline health care personnel in a multistate hospital network – 13 academic medical centres, April–June 2020. *MMWR Morb Mortal Wkly Rep* 2020;69(35):1221–6.
- [10] Corley A, Hammond NE, Fraser JF. The experiences of health care workers employed in an Australian intensive care unit during the H1N1 influenza pandemic of 2009: a phenomenological study. *Int J Nurs Stud* 2010;47(5):577–85.
- [11] Lam KK, Hung SYM. Perceptions of emergency nurses during the human swine influenza outbreak: a qualitative study. *Int Emerg Nurs* 2013;21(4):240–6.
- [12] Arbon P, Ranse J, Cusack L, Considine J, Shaban RZ, Woodman RJ, et al. Exploring staff willingness to attend work in a disaster: a study of nurses employed in four Australian emergency departments. *Australas Emerg Nurs J* 2013;16(3):103–9.
- [13] Bonacchi M, Ciapetti M, Di Lascio G, Harmelin G, Sani G, Peris A. Atypical clinic presentation of pandemic influenza A successfully rescued by extracorporeal membrane oxygenation – our experience and review of the literature. *Interv Med Appl Sci* 2013;5(4):186–92.
- [14] Martel J, Bui-Xuan EF, Carreau AM, Carrier JD, Larkin E, Vlachos-Mayer H, et al. Respiratory hygiene in emergency departments: compliance, beliefs, and perceptions. *Am J Infect Control* 2013;41(1):14–8.
- [15] Ranse J, Lenson S, Luther M, Xiao L. H1N1 2009 influenza (human swine influenza): a descriptive study of the response of an influenza assessment clinic collaborating with an emergency department in Australia. *Australas Emerg Nurs J* 2010;13(3):46–52.
- [16] Rottman SJ, Shoaf KI, Schlesinger J, Klein Selski E, Perman J, Lamb K, et al. Pandemic influenza triage in the clinical setting. *Prehosp Disaster Med* 2010;25(2):99–104.
- [17] Liamputtong P. Qualitative research methods. 4th ed. Oxford: Oxford University Press; 2013.
- [18] Prior L. Content analysis. In: Leavy P, editor. *The Oxford handbook of qualitative research*. Oxford: Oxford University Press; 2014. p. 359–79.
- [19] Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2008;3(2):77–101.
- [20] Lincoln YS, Guba EG. *Naturalistic inquiry*. 1st ed. Thousand Oaks: Sage Publications; 1985.

- [21] McMullan C, Brown GD, O'Sullivan D. Preparing to respond: Irish nurses' perceptions of preparedness for an influenza pandemic. *Int Emerg Nurs* 2016;26(1):3–7.
- [22] Fichtel C, Kaufman S. Fearing COVID-19 spread to families, health care workers self-isolate at home [Internet]. [Place unknown]. NBC; 2020. Available from: <https://www.nbcnews.com/health/health-news/fearing-covid-19-spread-families-health-care-workers-self-isolate-n1171726> [updated 01 April 2020; cited 02 August 2020].
- [23] Asfaw A, Rosa R, Pana-Cryan R. Potential economic benefits of paid sick leave in reducing absenteeism related to the spread of influenza-like illness. *J Occup Environ Med* 2017;59(9):822–9.
- [24] New Zealand Nurses Organisation (NZNO). Guideline: obligations in a pandemic or disaster. Wellington: NZNO; 2016. Available from: <https://webcache.googleusercontent.com/search?q=cache:HKJ0gITmkEg:https://www.nzno.org.nz/LinkClick.aspx%3Ffileticket%3DvldcH9XdIDg%253D%26tabid%3D109%26portalid%3D0%26mid%3D4918+&cd=1&hl=en&ct=clnk&gl=nz> [updated 2020; cited 16 January 2020].
- [25] World Health Organisation. Ethical considerations in developing a public health response to pandemic influenza [Internet]. [Place unknown]. WHO; 2007. Available from: https://www.who.int/csr/resources/publications/WHO_CDS_EPR_GIP_2007_2c.pdf [updated 2007; cited 16 January 2020].
- [26] Australian Nursing and Midwifery Federation (ANMF). Nurses and midwives safety concerns amid COVID-19 pandemic [Internet]. Tasmania: ANMF; 2020. Available from: <https://anmftas.org.au/2020/03/anmf-media-release-nurses-and-midwives-safety-concerns-amid-covid-19-pandemic/> [updated 18 March 2020; cited 02 August 2020].
- [27] Radio New Zealand. Covid-19: health workers facing protective gear shortages call for urgency [Internet]. Wellington: NZNO; 2020. Available from: <https://www.rnz.co.nz/news/national/413803/covid-19-health-workers-facing-protective-gear-shortages-call-for-urgency> [updated 08 April 2020; cited 21 October 2020].
- [28] Higgs M, Fernandez R, Polis S, Manning V. Similarities and differences in nurse-reported care rationing between critical care, surgical and medical specialties. *J Patient Saf* 2020;16(3):e162–8.
- [29] Weiss C. Interview with Bronx emergency room nurse: "Some critical patients are not getting the medication and IV pumps they need" [Internet]. [Place unknown]. World Socialists Web Site; 2020. Available from: <https://www.wsws.org/en/articles/2020/04/11/bron-a11.html> [updated 11 April 2020; cited 02 August 2020].
- [30] Health Disability Commissioner (HDC). 12HDC01172 Triage assessment of patient with reported exposure to meningitis: delays in treatment [Internet]. Wellington: HDC; 2014. Available from: <https://www.hdc.org.nz/media/1708/12hdc01172.pdf> [updated 14 June 2014; cited 16 June 2020].
- [31] Greenacre M, Fleschner K. Distributive justice in disaster triage: utilitarianism competes with egalitarianism, autonomy, and the physician-patient relationship. *Univ West Ont Med J* 2017;86(1):35–7. Spring.
- [32] Department of Health and Human Services Victoria. Coronavirus (COVID-19) daily update [Internet]. Melbourne: Victoria State Government; 2020. Available from: <https://www.dhhs.vic.gov.au/coronavirus-covid-19-daily-update> [updated 09 September 2020; cited 09 September 2020].