

Journal of EMERGENCY NURSING

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THE PATH AHEAD AND THE PROMISE OF THE FUTURE



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It is an incredible honor to be the incoming 2022 ENA President and one I never dreamed would be a reality for me. Often, we don't see what may be possible in our future when we're busy standing in the moment. I'm here now as proof you can create your own path and do anything you desire.

Nearly twenty years ago, I started as a new nurse in the emergency department. Today, I'm the Chief Nursing Officer at the same hospital and about to embark on my year as the ENA President. While anything is possible, it takes grit. It takes persistence. It takes a true belief that something bigger, something better, is always out there if you seek it and work for it.

The last two years have tested us like no other time. We persist with the hope of brighter days and a drive to learn from this experience so that we are better educated, better prepared, and better equipped for the next challenge. To make that happen, and borrowing from my predecessors Mike Hastings and Ron Kraus, we must believe that each of us, as individuals, can make a difference and know that we can elevate ourselves and the people around us.

We have seen and dealt with so much during this pandemic. We are tired, we are all struggling with something, and we are all trying to figure out how to keep moving forward. The forward motion requires us to rekindle the

inner fire that drives emergency nurses to be the amazing people you all are. Moving forward means using that take-charge, get-it-done attitude that we all have and applying it to our own careers and lives. Most importantly, moving forward requires a little help, and our willingness to seek it out no matter the circumstances. We all know we can do these things ourselves, but that doesn't mean we have to.

ENA continues to be here to support you in many ways: advocating for a healthy nursing work environment, creating ENA University for your continuing education and skill development, and offering volunteer opportunities to help you grow within the organization. Your emergency nursing peers are also here. This community is built on shared experiences, deep bonds and colleagues who are like family. Use those around you and offer your support to others. We need one another, and our patients need us. ENA is uniquely positioned to help you build these connections.

We all know that 2022 will continue to bring new challenges, and plenty of old ones, to our profession. We should look to what is ahead and use the struggles we have endured over the last two years as motivation to plot a course. This should happen both individually and together, and reinforce what emergency nurses need to be successful, to amplify our voices about what's most important in health care, and to continually demonstrate how this community is the epitome of exceptional.

With that goal in mind, if we each push forward down the path toward our highest hopes and aspirations, the momentum of the emergency nursing community will build toward positive change. It starts for each of us today. Find your inner fire and prove to yourself that persistence pays off. Choose your journey and follow your dreams. Maybe you'll end up somewhere you never would have imagined, too.

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IS YOUR TRAUMA CENTER PEDIATRIC READY?



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If a 1-year-old child with a viral illness presents to a community emergency department in a remote or rural area, chances are that they will still receive appropriate care for their condition, even if that emergency department rarely cares for children. But what if that 1-year-old child has instead been critically injured in a motor vehicle crash? Will their needs be met? Will the team who typically cares for adults recognize altered mental status in the young, nonverbal child? Will the department have a pediatric intraosseous device to use to provide life-saving fluids or blood if intravenous access attempts are unsuccessful? Will the nurse who must draw up weight-based medications during resuscitation have access to the necessary tools to help prevent the medication errors that can be so easy to make in stressful, unexpected situations, especially when caring for patients who are much smaller than the patients typically treated?

The purpose of this editorial is to update readers regarding the results of some of the most recent data regarding the links between pediatric readiness and pediatric morbidity and mortality in United States emergency departments. A secondary goal is to introduce the readers to some

of the major resources and tools available thanks to the National Pediatric Readiness Project (NPRP). Taking advantage of these resources can not only improve an emergency department's readiness to care for ill and injured children, but can also help prepare an emergency department for regulatory and accreditation visits.¹

Linking Pediatric Readiness to Pediatric Outcomes: What the Data Tell Us

Being prepared for pediatric emergencies can be very challenging when you have very limited exposure to pediatric patients. Nevertheless, emergency departments and emergency professionals have both a professional and ethical duty to be prepared to deliver life- and limb-saving care to pediatric patients just as they do for adults.² The reality is that the vast majority of critically ill and injured children are initially brought to community emergency departments for stabilizing care rather than to a facility with pediatric specialization or expertise.³ This underscores the importance of having standardized national guidelines for pediatric preparedness. A study published in 2019 by Ames et al⁴ sought to link pediatric preparedness to outcomes. This study was based on the 2013 NPRP Assessment and examined outcomes for over 20 000 critically ill children who presented to 426 US hospitals. Results confirmed that after adjusting for age, chronic complex conditions, and illness severity, presentation to a hospital in the highest NPRP pediatric readiness quartile was associated with decreased odds of in-hospital mortality (adjusted odds ratio compared with the lowest quartile: 0.25; 95% confidence interval: 0.18-0.37; $P < .001$).

Injury remains the leading cause of death for children age 1 to 18 years, yet the initial care of most injured children also takes place in emergency departments primarily designed and equipped to treat adults.⁵ The results of recent studies have shown that even trauma centers are inconsistent in their level of readiness to care for children.^{6,7} For example, while the majority of trauma centers have a tool to use for precalculated pediatric drug dosing, many lack other important parameters such as recording pediatric weights in kilograms only and the presence of a quality improvement process that includes pediatric-specific metrics.⁶

A recently published study of injured children brought to 832 emergency departments in US trauma centers was the first to dig deeper and evaluate the association between

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pediatric readiness of emergency departments verified as trauma centers (as per the 2013 NPRP nationwide assessment), in-hospital mortality, and in-hospital complications.⁷ In the study of over 372 000 injured children, receiving initial care in an emergency department that had a pediatric readiness score within the highest quartile of readiness was associated with *42% lower odds of death*. The authors concluded that if all the children included in the study had been treated in emergency departments in the highest quartile of readiness, an additional 126 lives (95% confidence interval 97-154 lives) might have been saved in each of the 6 years for which data were collected.⁷ That is over *700 children's lives* that might have been saved if the trauma centers had all invested the time and resources required to better prepare for stabilizing pediatric emergency care! On the basis of the results of the 2013 NPRP national assessment survey, we learned that many US emergency departments were not adequately prepared to quickly stabilize critically ill or injured children.⁸ Now we also know that just because an emergency department is a verified trauma center doesn't mean that it is adequately prepared to stabilize critically ill and injured children. Not surprisingly, we've learned through our professional networks that leaders in several states are considering incorporating the NPRP assessment or significant NPRP criteria as they revise their trauma rules used for verification.

Even in the absence of pediatric specialists, general or mixed age emergency departments, including low patient volume departments in remote or rural areas, can help ensure more equitable care for ill and injured children by taking advantage of the many resources that have been created by the NPRP. Recommended measures include establishing a nurse and physician pediatric emergency care coordinator (PECC), being proactive in providing pediatric emergency nursing education, stocking specific, potentially life-saving pediatric equipment, and participating in pediatric-specific quality improvement initiatives.⁹ What role can emergency nurses play? Perhaps one of the most important ones. The presence of a PECC has been identified as the *single most important* factor that influences the readiness of any emergency department that cares for pediatric patients.¹⁰ The 2018 American Academy of Pediatrics Committee on Pediatric Emergency Medicine and Section on Surgery, American College of Emergency Physicians Pediatric Emergency Medicine Committee, and Emergency Nurses Association Pediatric Committee Joint Policy Statement, "Pediatric Readiness in the Emergency Department,"⁹ identified the presence of 2 PECCs, one a physician and one a nurse, as central to the readiness of any emergency department that cares for children. Guidance for the recommended qualifications and responsibilities of PECCs are included in

this joint statement. An Internet link for this Joint Statement can be found in the resource list for this article. Depending on an emergency department's pediatric volume, a PECC may not require a full-time equivalent and may even be shared through formal agreements with other emergency departments.

Navigating the NPRP Resources

In case you have not discovered them yet or, like me, you sometimes find all the acronyms associated with the NPRP a bit confusing, let me recommend 2 valuable, free resources available to all emergency departments. The NPRP ED checklist, a tool that can be used for improving your emergency department's pediatric preparedness, and the National Pediatric Readiness Quality Initiative platform (NPRQI) can be found at the corresponding Internet link in the reference list.^{1,11} See the [Box](#) for additional resources. The NPRQI was created with a focus on community and rural emergency departments. It represents the implementation arm of the NPRP and is designed to allow individual emergency departments, regardless of size, to participate in larger quality improvement initiatives with evidence-based pediatric-specific metrics. Emergency departments that participate in the NPRQI can enjoy many benefits, including the following:

- Assessment of current pediatric emergency care delivery and tracking performance over time
- Ability to assess performance across 28 standardized pediatric quality measures (system and clinical conditions)
- Benchmarking performance with similar hospitals
- Optimization of care on the basis of current available resources
- Annual reports to share with hospital/ED leadership regarding quality, patient safety, and risk mitigation
- Fulfilling requirements for Pediatric Medical Recognition in your state/territory
- Accreditation by state/regulatory agencies
- Value-based care reimbursement and reporting¹

A Shout Out for Pediatric Preparedness During the Pandemic

Being prepared for pediatric patients can be challenging, but it becomes an even greater challenge when faced with a global pandemic. I would like to give kudos to emergency departments such as the one at Boston Children's Hospital for their excellent work to meet the unique needs of their

pediatric patients **and** staff during the coronavirus disease 2019 (COVID-19) pandemic. The more prepared an emergency department is at usual or normal operational levels (if there is such a thing), the more prepared they will be when the unexpected occurs, whether that be a natural disaster, a school shooting, or a global pandemic. “Implementing a Novel Nursing Site Manager Role in the Pediatric Emergency Department for Patient and Staff Safety during the COVID-19 Pandemic,”¹² published in this current issue of the *Journal of Emergency Nursing* (JEN) described the way the Boston Children’s Hospital emergency department pivoted quickly at the onset of the pandemic to meet the specialized needs of their multidisciplinary staff during this time, while ultimately also benefiting their pediatric patients.

Many infants and young children will not tolerate a face mask and will touch everything in reach, regardless of whether they are sick or not. To put it mildly, young children rarely understand, care about, or cooperate with infection control, and during the pandemic, everyone, of every age, was suddenly a possible vector for COVID-19. Developmentally appropriate behavior as an infection control risk represented major challenges to emergency departments that cared for pediatric patients during the pandemic, when having patients wear masks and cleaning all surfaces well between patients became higher priorities for *all* patients (not just those on isolation) than in any other time in recent history. This emergency department, already well-prepared to care for pediatric patients in normal noncrisis operations, was able to focus their attention and resources on meeting the educational, safety-related, and psychosocial needs of their staff during this unique time. This is exceptional as many emergency departments were in full crisis mode, forgoing any quality improvement initiatives. Schmid and Downey’s¹² results demonstrated an instance wherein caring for staff was also doing what was best for patients. It ultimately resulted in more effective, patient-centered, and safe patient care during an unprecedented time in health care.

Closing Thoughts

Widely adopted standards for stroke and ST-segment elevation myocardial infarction care have decreased morbidity and mortality for those conditions, just as the development of trauma centers has significantly reduced preventable deaths caused by injury.⁸ Unfortunately, national standards do not exist for pediatric emergency care, and pediatric preparedness among US emergency departments is uneven as a result. Because injury is the leading cause of death for children aged 1 to 18 years, increasing the pediatric readiness

of our nation’s trauma centers can play a major role in the effort to improve the outcomes of injured pediatric patients. The infographic included within this editorial ([Appendix](#)), “Improve Your ED’s Readiness to Care for Children,” was developed by the Emergency Nurses Association to serve as a visual summarizing key points for emergency departments that seek to ensure that they are prepared for children regardless of how infrequently those children present for care and regardless of where they are located.

Resources

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Appendix

Improve Your ED's Readiness to Care for Children*

Equipment, Supplies, and Medications

Stock ED with appropriate-sized, easily accessible pediatric supplies and equipment for pediatric patients from newborn to adult ranges:


- Organize items logically
- Use a color-coded, weight-based, storage system
- Keep a fully stocked pediatric resuscitation cart readily accessible at all times



Competency in Pediatric Care

Ensure members of the healthcare team have the skills and knowledge to treat children of all ages and developmental stages:


- Periodically evaluate pediatric-specific competencies, including triage, medication administration, procedures, disaster preparedness, and handoff communication
- Use observation, written tests, and/or chart reviews
- Emergency Medicine or Pediatric Emergency Medicine board certification and pediatric emergency nursing certification is strongly encouraged.



Quality and Performance Improvement (QI/PI)

Implement a QI/PI plan that includes monitoring of outcomes-based pediatric-specific indicators.


- Integrate multidisciplinary QI/PI activities with:
 - prehospital agencies
 - inpatient pediatrics
 - trauma/injury prevention programs
 - pediatric critical care
- Use the Plan, Do, Study, Act method:
 - systematically review, identify, and mitigate variances in pediatric emergency care



Support Services for the ED

Ancillary services should have skills, equipment, and capability to provide care to pediatric patients:

- Radiology departments
 - develop protocols based on age and size of patients to reduce radiation exposure
- Clinical laboratories
 - facilitate testing for all ages of patients
 - ensure availability of microtechnology for small and limited samples
 - have transfer protocols for pediatric patients who exceed laboratory capabilities




Policies, Procedures and Protocols

Develop and implement age-specific policies, procedures, and protocols that also address children with special health care needs through:


- Local collaboration with regional pediatric centers
- Use of standard, evidence-based guidelines found on the EMSC Innovation and Improvement Center website: <https://emscimprovement.center/>

Educate staff on policies and monitor compliance.



Administration and Coordination for Care of Children


Identify Pediatric Emergency Care Coordinators (PECCs) to coordinate delivery and evaluation of pediatric care in the ED: An emergency physician and emergency nurse with demonstrated clinical competence and expertise in pediatric emergency care




Pediatric Patient and Medication Safety

Establish a culture of safety and educate staff in pediatric-specific safety considerations:

- weigh all patients in kilograms, ideally with scales locked in kilograms
- take full set of vital signs
- use weight-based dosing
- provide for cultural sensitivity, interpreter services, and family-centered care
- implement patient identification policies
- monitor/evaluate patient safety events





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* Based on the 2018 AAP/ACEP/ENA Joint Policy Statement, "Pediatric Readiness in the Emergency Department"

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COMMENTARY ON “REMOTE ADVANCE CARE PLANNING IN THE EMERGENCY DEPARTMENT DURING COVID-19 DISASTER: PROGRAM DEVELOPMENT AND INITIAL EVALUATION”

Authors: Jennifer Lynn White, MD, and Judd E. Hollander, MD, Philadelphia, PA

Novel applications of telehealth exploded during the pandemic.¹ From virtual acute care visits to virtual triage and home visits and telehealth via ambulances, synchronous and asynchronous telehealth etched a permanent place in the emergency care specialty.² In this edition of the *Journal of Emergency Nursing (JEN)*, Liberman et al³ explore a pragmatic telehealth program developed to take the heavy, bedside end-of-life discussion away from the front-line staff and offload it to a trained group of nurses via telehealth. A logic model describing the use of Remote Goals of Care Program (GOC) was developed and implemented.

The emergency department can be loud and crowded and lack the quiet privacy needed to have end-of-life discussions with patients and families. During the COVID-19 pandemic, when visitation policies were restricted, many end-of-life discussions took place via remote platforms.⁴ Patients were often scared, alone, and dying of COVID-19 without their closest loved ones to hold their hands at the bedside. Many hospitals had transitioned to a virtual platform to deliver bad news and work through these decisions; however, the authors' GOC program³ used a bidirectional platform. This was unique in that both the patient and the bedside clinician were remote. Telehealth programs in

the emergency department such as remote stroke care and tele-psychiatry are examples of established one-directional programs—the patient is in person in the bricks-and-mortar emergency department, but the provider is remote. These programs spared the provider the exposure risks from being physically present during the visit during the pandemic. The programs that were bidirectional—both the patient/family and the provider were remote—included acute unscheduled visits and platforms that connected families to remote providers.

Pairing both the need for virtual conversations and job continuity for nurses sidelined during the pandemic, this Remote GOC Program³ offered a sustainable solution to a major gap in care. The program developed a system by which the bedside team could alert the remote palliative care providers to engage the family in end-of-life decisions.⁴ These included DNR/DNI, MOLST, health care proxy discussions, and disposition. The Remote GOC Program³ was created as a joint endeavor between the division of geriatrics and palliative medicine and emergency medicine. “In decanting the responsibility of goals of care discussions from the emergency department to a calmer, remote setting,” the authors seized a unique moment in time, a time where the most precious conversations regarding end-of-life care could be transitioned to a group of nurses working remotely. While this was a nurse-driven initiative, it spanned disciplines including social work and the division of palliative care and emergency medicine, fueling the success of this program.

The advantages of such a program include offloading the clinical team from having difficult, often prolonged discussions at the bedside. The nurses conducting the interviews were not on site, allowing protection from COVID-19 exposure and conservation of precious personal protective equipment (PPE).⁵ The pandemic created extraordinary emotional and physical stress on bedside care teams. Health care workers struggled to communicate with the patients in full PPE, screaming above the whirl of the PAPR hood and N95 masks. Face shields prevented

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not only droplets from spreading but words from traveling, and conversations were strained at best.⁶ Caregivers of patients who were not capable of making end-of-life decisions for themselves attempted to connect to next of kin via iPad. The telehealth platform for end-of-life care was born. Considerations on supporting the entire health care workforce included providing work during quarantine, providing offsite work to those health care workers at higher risk of contracting severe COVID-19, and providing a channel to support both the emotional needs of the emergency health care workers at the bedside and the need to work for those sidelined; this program was ideal.

The authors created a logic model for Remote GOC Program,³ for other institutions to replicate their implementation. The inputs included the key partnership between emergency medicine and palliative care, nurses who were not onsite, the technology to perform the telehealth visits. Outputs include number of referrals into the program, GOC discussions with families, and any changes in code status. Evidence of the anticipated impact of this program after the pandemic will be continued offloading of the cognitive burden of the bedside clinician and providing meaningful work for nurses sidelined from clinical practice.

The pitfalls of this type of program are typical of many telehealth programs, with a few unique challenges. Families may not have access to the technology needed to conduct the telehealth interview. This lack of access is more prevalent in lower socioeconomic and rural areas.⁷ These types of technology barriers may be more profound during a very intense end-of-life discussion compared with a virtual visit for an uncomplicated self-limited medical condition. Glitches in Wi-Fi or software may be extremely intrusive in these sensitive moments. There may also be conflicting advice given to the patient's family by a telehealth nurse who is not the patient's primary in-person bedside nurse. Would the weight given to the information provided to make such difficult decisions be watered down by the nurse being remote? There is something profound about the bedside clinician giving advice regarding advanced directives with the patient in front of them. Would a virtual approach convey the same meaning?

Health care providers, including nurses, are often sidelined from clinical care secondary to injury, illness, exposure, or, recently, COVID-19 quarantine.⁸ This unique GOC program³ paired the nurses who were not able to work clinically to participate in a valuable program. The use of nursing in telehealth has expanded rapidly over the past 5 years. A gap still exists around telenursing and disaster care. This application of telehealth as an avenue for emergency nurses to use their specialized skillsets begins to fill this gap. The telehealth platform for nursing seemed counterintuitive at first, with the goals of bedside nursing to be

truly a hands on specialty. There was a delayed launch of the specific telehealth nursing applications.⁸ The potential for delivering nursing care such as patient history, triage, individualized patient education, postdischarge counseling, and care coordination is enormous.

Nurse-led telehealth initiatives during the pandemic provided a platform for virtual care that limited infection exposures and physical demands and allowed flexibility to work from home. The pandemic disproportionately affected working parents, who had to manage their jobs, their own psychological stressors, and children who were learning at home during lockdown. The use of telehealth to mitigate the occupational psycho-social stressors during the pandemic can be stretched to postpandemic times.⁹ Health care is not only complicated, it has now become draining, leading to high rates of burnout and dissatisfaction. Allowing nurses to intermittently perform their duties from home is one possible solution, for some nurses, some of the time.¹⁰ The Remote GOC Program³ manuscript provides important feasibility evidence that remotely working nurses can engage patients in end-of-life discussions. During staff shortages, remote nurses can potentially help perform the admission intake for patients boarding the emergency department; they may be able to provide more continuous visual monitoring or patient surveillance care when staffing levels cannot be maintained. Remote nurses might be engaged to have more comprehensive discharge planning meetings with patients and their families. The pandemic taught us that you can be an emergency nurse but do not need to be in an emergency department to deliver specialty care. It is about the skill set and not the location. The paper by Liberman et al³ illustrates that very nicely. Through their discussion about end of life, they have breathed new life into how we care for patients.

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CONSIDERATIONS FOR COLLABORATIONS: INTERNATIONAL NURSING CONTINUING PROFESSIONAL DEVELOPMENT



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In the January 2022 issue of the *Journal of Emergency Nursing*, Calder et al¹ discuss the development of emergency nursing educational activities within Denmark. Efforts to standardize continuing professional development (CPD) activities will assist in achieving baseline competency in a rapidly changing health care environment, no matter the geographical location. The World Health Organization recently called for an increased expansion of CPD processes.² Many countries link CPD to academic progressions and nurse credentialing³; however, there are varying definitions. For example, the Nursing Council of Hong Kong defines CPD as "...any post-registration/post-enrollment educational skill or experience updating which is nursing-specific or health care related with an aim to enrich the nurses' contribution to quality health care and help them in their pursuit of professional goals,"⁴ whereas nursing CPD is defined by the American Nurses Credential Center (ANCC) as an educational activity that builds upon the educational or experiential knowledge of a professional registered nurse.⁵

The administrative bodies, generally referred to as regulators, of nursing and midwifery professional practice have a strong voice in the regulation of practice and have used this influence to motivate and inspire specific

CPD requirements.⁶ Some studies have called for specific CPD requirements for advanced practice nurses and midwives, especially in pharmacology.⁷ Regardless of the regulatory body over nursing practice in a particular region, flexibility toward professional development, especially during this pandemic, is necessary.⁸ Knowing and understanding nurses' professional practice needs and development requires awareness and perspective of the particular health care landscape.

Perspective Outside the United States

Nursing CPD can mean several different things throughout the world. This often depends on the regulatory body for the country, territory, or providence. Some ministries of health, nursing organizations, and nursing and midwifery councils have developed and provided their own regulation around continuing education of health care professionals. Still others rely on other governmental agencies to develop, monitor, and enforce nursing care models.

In the Republic of Ireland, CPD is regulated by the Nursing and Midwifery Board of Ireland (NMBI).⁹ Multiple types of organizations can develop CPD activities. The activities require review and approval through the NMBI to be valid and accepted for nursing professional development.¹⁰ The evaluation process is less formal in the Republic of Ireland. Evaluating educational activities is at the discretion of the developer who provides the educational content. Some activities that provide educational content and support for nurses and midwives are not considered professional development and are not approved through the NMBI. These activities may include mentorship, journal clubs, and case reviews. At present, the NMBI does not require nurses and midwives to provide evidence of participation in CPD to maintain their annual registration.¹⁰

Canadian nurses are not regulated by a national nursing licensure body. They are accountable to the province or territory in which they practice.¹¹ Canadian nurses and midwives are self-regulated in their professional responsibility, meaning they are not required to obtain a specific number of CPD hours for re-licensure. Each provincial and

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territorial regulatory body has continuing competency programs that nurses use to demonstrate their competence,¹¹ such as a portfolio, instead of CPD activities or a specific number of required hours.

In Hong Kong, nursing practice is regulated by the Nursing Council of Hong Kong. Under this regulatory body, the Professional Development Committee advises the Nursing Council on many things, including the authorization of CPD providers, their educational activities, and their performance.¹² To maintain nursing licensure, nurses must accumulate a minimum of 45 CPD points every 3 years.⁴

These different regulatory models, of which there are many more, do have some elements in common. Most notable is management and influence over the educational content that counts toward nursing re-licensure. Just as significant is the desire for collaboration among nurses, midwives, or other health care providers to develop high-quality nursing education within their country or region.

Lessons Learned Through Successful International Collaboration

Sigma Theta Tau International Honor Society of Nursing (Sigma), founded in 1922 by 6 nurses at the then Indiana University Training School for Nurses in Indianapolis, IN, is an international nursing organization. Sigma's mission is to develop nurse leaders anywhere, in order to improve health care everywhere.¹³ With more than 135 000 members in more than 110 countries, Sigma has a unique vantage point and much experience collaborating with nurses from around the world.

Sigma has gained valuable insights into international collaboration by developing and delivering educational programming such as online CPD courses, leadership development programs, webinars, and in-person and virtual conferences. Sigma's history of international collaboration also involves the publications of books and peer-reviewed journals. The in-person and virtual conferences feature multiple educational topics, including research, evidence-informed practices, creating healthy work environments, and many more with the presence of international partners. Sigma has a presence at and works with the United Nations and collaborates with its many international chapters, committees, and task forces.

Collaborative projects result in higher quality and satisfaction when expectations by and for all involved parties are clear. When setting expectations, it is important to establish a timeline that includes cultural considerations for holidays and vacations. In the US, "taking a vacation" does not mean the same thing as in Europe or Australia when someone is "going on holiday." Both are used to

describe taking time off from work with a high probability of traveling during that time. However, in the US, the word "holiday" generally refers to a short period of time away from work, 1 or 2 days perhaps, and is generally tied to a national or religious event, frequently involving celebrations and feasts. These days are often bank holidays, originally designated by the government and when banks were closed. If someone is "going on holiday" for a month, they may not be checking their work email or phone. These differences in terminology and expectations should be considered in project timelines.

There are other considerations regarding religious holidays to take into consideration as well. While asking about religious preferences may not be a routine part of leading a project or committee, asking about holidays or observances should be considered. For example, the Muslim faith observes prayer 5 times a day. When scheduling an all-day meeting or orientation, consider asking about ideal times to take a break from working. In 2014, Sigma hosted its annual International Nursing Research Congress in Hong Kong. During this event, Sigma held its onsite Career Center, an opportunity for participants to meet with career advisors to discuss various topics. As privacy was an issue in this particular culture, partitioned screens were needed in between the participants to protect their privacy.

Considerations for general working days and schedules may also need to be considered. For example, in many countries in the Middle East, typical workdays are Sunday through Thursday. Differences in time zones and dates need to be clarified if you are working with countries such as Australia that may be 12 to 16 hours ahead of US time zones. Projects that involve nursing schools with faculty in academia should consider the academic calendar. The traditional academic calendar in the US is August or September through May or June. In New Zealand and Brazil, the academic calendar is generally from March through November or December.

In addition to planning when you will collaborate, it is also important to consider how you will communicate. Discuss the platform that works best for all individuals involved. Although video streaming meetings have become very common, the Wi-Fi capabilities in some areas may not be able to support the speed necessary to have seamless communication. A broken connection combined with English not being someone's first language or accents could contribute to members of a group feeling disengaged. Consider using closed captioning during meetings, setting expectations to utilize a microphone, reducing background noise by utilizing mute functionality when not speaking, and sending documents well in advance, in case translation is needed.

When beginning an international collaboration, it is important to understand even some of the most basic terms and come to an agreement on what terminology should be

used. The titles, qualifications, and preparation to become a nurse and the scope of practice can look very different in many cases. In Nigeria, a chief nursing officer may be a clinically practicing nurse with extensive experience, and the term clinical is used rather than bedside. It is also helpful to understand the preparation for working with nurses in various countries. In the US, nurses are prepared as generalists and can then begin caring for individuals wherever they choose to work. This is not the case in other countries. In Finland, nurses specialize in pediatric nursing, acute care nursing, or mental health nursing. Once their training as pediatric nurses has been completed, nurses are only credentialed to care for that population and require additional training for other areas. This is the same for nurses in the United Kingdom, Saudi Arabia, Italy, Indonesia, Chile, and many more.

Scope of practice can vary between countries. Unlike the US, in Australia, nurses are legally able to independently prescribe and administer vaccinations in most (but not all) jurisdictions. The same is true for childhood immunizations in the United Kingdom. Many other countries, including Denmark, Sweden, Iceland, Kenya, and Columbia, have some level of prescribing authority for nurses. The Advanced Practice Nurse prescribing authority model in the US may be most similar to the models in Singapore, South Korea, and Taiwan.¹⁴

Conclusion

As our health care environment rapidly changes, so do the continuing educational needs of nurses and midwives. Interdisciplinary and international collaboration is essential during the current pandemic. We recognize and applaud the authors for their work and program development. We see where their efforts could serve as a model for future emergency nursing collaboration among countries. We also hope that our lessons can be passed along to others to make their international partnerships even more successful.

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IMPLEMENTING A NOVEL NURSING SITE MANAGER ROLE IN THE PEDIATRIC EMERGENCY DEPARTMENT FOR PATIENT AND STAFF SAFETY DURING THE COVID-19 PANDEMIC

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NCPD Earn Up to 11.5 Hours. See page 117.

Contribution to Emergency Nursing Practice

- A pandemic response requires agile systems and rapid dissemination of biocontainment policies and procedures. Emergency nurses are uniquely positioned in their front-line role to convene multidisciplinary health care teams for safety and well-being.
- We designed a novel nursing role to ensure safety and disseminate rapidly evolving policy and environmental changes.
- Site managers foster the adaptive capacity and resilience of the multidisciplinary team by serving as real time resources for current evidence-based science, rapidly changing policies, personal protective equipment donning and doffing techniques, use of innovative communication technologies, and identification of staff burnout, severe stress, and compassion fatigue.
- This role may be replicated and individualized to meet the needs of other institutions.

Key words: COVID-19; Emergency department; Nursing; Pediatric

Constituting the majority of the health care workforce, nurses are the front-line defense in response to an infectious disease outbreak and are at high risk for infection themselves. Given their crucial role of emergency nurses in the management of prevailing epidemics, it is imperative that nurses receive adequate support and protection. Epidemics such as the West African Ebola outbreak from 2014 to 2016 have demonstrated the consequences for not protecting health care workers and emergency staff. Lessons learned include severe physical and mental health consequences for health care workers and the community at large. In the Ebola epidemic, “most healthcare worker deaths could have been prevented with simple interventions such as diagnostic testing, proper equipment and training, which makes this loss especially devastating.”¹ Much of the worldwide severe acute respiratory syndrome outbreak was hospital based, and health care workers were a significant portion (37%-63%) of suspected cases in affected countries.²

There are limited data on infection and mortality rate from coronavirus disease 2019 (COVID-19) among health care workers in the United States and around the world. Among 6760 adults hospitalized from March 1 to May 21, 2020, 5.9% were health care providers, with nursing-related occupations (36.3%) representing the largest portion of hospitalized providers.³ In the US and Mexico, health care workers represent 1 in every 7 COVID-19 cases.⁴ Notably, “these two countries account for nearly 85% of all the COVID-19 deaths among health care workers in the [Pan American Health Organization] region.”⁴ This reality, along with the idea that “there can be no patient safety without health worker safety,”⁵ made it immediately apparent that programs supporting the emergent and unprecedented educational needs of emergency nurses had to be implemented in a rapid, sustainable manner. Emerging

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TABLE 1
Site manager orientation curriculum

Content	Time	Teaching method
COVID-19 introduction	10 min	Didactic lecture, clinical case study
Infection prevention and control basics	15 min	Didactic lecture, clinical case study
Personal protective equipment indications and use, troubleshooting problems	15 min	Didactic lecture, clinical case study
Personal protective equipment donning and doffing practice	15 min	Skills workshop
Drive-through swab protocols and family education	5 min	Didactic lecture
Special care practices for the emergency department, resource review	15 min	Didactic lecture, clinical case study
Psychological first aid practices	20 min	Didactic lecture
Applying psychological first aid	15 min	Clinical case studies
Orientation to the practice environment	10 min	In-situ orientation, narrative sharing

COVID-19, coronavirus disease 2019.

from this call to action, we developed a nursing site manager program.

Our site manager program created a nursing role to support the multifaceted physical and psychological needs of staff during a pandemic. The setting was a 52-bed emergency department with an annual census of 60 000 visits in an urban, quaternary-care, freestanding pediatric hospital. The urgent needs of staff included rapid roll out of personal protective equipment (PPE) education, expertise in current COVID-19 research, adaptability with quickly

evolving policies and procedures, and peer-to-peer coaching to support coping and resilience.

The site manager team was intentionally composed of nurses who volunteered to participate, not selected “leaders” or senior staff. The team consisted of 40 nurses whose experience ranged from novice to expert. This demonstrated the value of all nurses regardless of where they were along their career journey. Site managers created and fostered an environment of teamwork and inclusivity, encouraging each individual to share and celebrate their unique strengths and talents. This self-selected team, by nature of its diversity, had balanced skills, complementary abilities, and individual strengths such as emotional intelligence, resilience, adaptability, technical skills, and communication skills. Site managers became a unified team navigating uncharted waters during a time of fear and uncertainty.

Key stakeholders involved during the initial development and implementation of the site manager program included hospital-wide biocontainment team leaders, infection control experts, emergency department physician and nursing leadership, and staff nurses, clinical assistants, environmental services, and administrative staff. The group acknowledged any questions or concerns that arose and addressed them in real time or within 24 hours during the daily COVID-19 leadership meetings.

Site Manager Orientation Program

Site manager orientation included a 2-hour course focused on the knowledge and skills needed to support multidisciplinary staff in the provision of safe, timely care of patients with symptoms concerning for COVID-19. Two departmental nursing leaders implemented this curriculum in collaboration: the global health fellow and the professional development specialist. Course content included modules highlighting infection control basics, PPE donning and doffing practices, and psychological first aid principles (Table 1).

Learning methods combined high-yield didactic sessions with hands-on training, including skill practice with PPE donning and doffing, current COVID-19 management, and relevant research findings. Application of public health principles emphasized the rationale behind the adaptations to existing policies, procedures, and the environment of care. Learners achieved competency validation in the ability to don and doff PPE during a demonstration against a skills objective checklist (Centers for Disease Control resources found at website link in the reference list).⁶

Unique to this site manager program was the addition of coping and resiliency education and principles of providing psychological first aid to staff during this

Emergency Department COVID-19 Site Manager: Roles and Responsibilities

Background: In response to the COVID-19 pandemic, we created a unique role to support staff safety and the provision of safe, timely, evidence-based care to children and families.

Role: Oversee the ongoing implementation of precautions for healthcare workers and patient safety to support the safe and effective delivery of care for patients with symptoms concerning for COVID-19.

Responsibilities: To perform effectively in this role, the site manager remains up-to-date with current guidelines and procedures to be aligned, coordinated and consistent with other ED site managers and hospital teams. Current guidelines will be disseminated by chain of command from Emergency Management/Command Center and through ED COVID-19 leadership. Please direct all questions and concerns up through your chain of command. This site manager should not be assuming a patient assignment; instead, acts as a resource maintaining the “30,000-foot view”, supporting the provision of safe, timely care by the following:

At start of shift:

- Ensure staff caring for patients with symptoms concerning for COVID-19 are proficient in PPE use, including donning and doffing
- Ensure appropriate supplies are stocked and available in the unit and for “drive-through” testing
 - o Check N95 drop-off stations and organize masks (or delegate)
 - o Check resuscitation equipment and communication devices
- Assess properly functioning negative pressure in negative pressure rooms (ball indicator)
- Ensure used powered air-purifying respirators (PAPRs) are picked up for cleaning
- Connect with screener/triage staff
 - o Provide them with Site Manager phone number to contact you if they are worried about a patient coming back that is a concern for COVID-19
- Communicate with ED Coordinator; request they call you to respond when patient call lights ring

During shift:

- Facilitate team huddles when indicated to review updated procedures and processes
- Participate in ED COVID-19 rounds when on shift
- Facilitate flow into and out of the unit, including assisting with patient transport
- Check EMS doffing station (in ambulance bay) – alert environmental staff if it needs cleaning
- Ensure COVID-19 precautions are documented in each patient’s chart appropriately
- Assist with supporting staff obtaining swab samples from “drive through” testing
- Support the nurses on the team with managing patient assignments
 - o Examples: support comfort rounds, obtain food for families, enforce visitor policy, notify lab control when COVID-19 swabs are sent, collaborate with ancillary staff (respiratory, radiology, IV team, social work, etc.)
- Coach and mentor, act as a clinical resource to support staff and answer questions
 - o When EMERGENT questions arise, use the appropriate chain of command to resolve
 - o If questions are NON-URGENT, please email the COVID-19 leadership group
- Offer and provide psychological support to staff, if staff desire; offer referral to employee assistance program
- Act as “gatekeeper” for resuscitations (see resuscitation document for details)
 - o Obtain supplies to support the care of critical patients (airway equipment or medications)
 - o Co-lead low-fidelity resuscitation simulations with MD COVID-19 super-users
- Use downtime to practice safe PPE use, discuss clinical scenarios
- Support implementation of new initiatives and processes
 - o Refer to the hospital’s internal COVID-19 website for the most up-to-date information
- Support environmental service staff in safe linen and trash removal – utilize their chain of command with questions

At conclusion of shift:

- Email COVID-19 leadership team with non-urgent questions, concerns and ideas
 - o Provide brief summary of shift – support offered, general volume and acuity of patients
 - o Provide PPE supply update if anything concerning

FIGURE 1

Emergency department COVID-19 site manager: Roles and responsibilities. COVID-19, coronavirus disease 2019; PPE, personal protective equipment; EMS, emergency medical services; IV, intravenous; MD, medical doctor.

unprecedented pandemic. Site managers received education to support the mental health and well-being of their colleagues. This approach involved humane, supportive, and practical interventions for staff suffering trauma and stress in ways that respect their dignity, culture, and abilities. The aim was to support staff resilience and adaptation to prevent or mitigate burnout and compassion fatigue. Site managers received resources on healthy coping strategies and methods to build resiliency to use and to share with staff. Education focused on identification of those at risk and referral to department leadership or our hospital's Office of Clinician Support for expert services as needed.

At the conclusion of the program, nurses were oriented to the 17-bed cohort area reserved for patients suspected of or confirmed with COVID-19. This orientation included incorporating available resources and discussing potential scenarios to allow for immediate application of the course content and skills. One such scenario was the presentation of a pediatric patient arriving by ambulance whose chief complaint was fever and shortness of breath. Site managers quickly identified these symptoms as potential COVID-19 and initiated airborne, contact, and droplet precautions. They facilitated patient placement into one of the COVID-19 cohort bedspaces and educated accompanying family members on the need for such precautions. Because strict isolation was necessary for these patients, site managers enlisted the assistance of child life specialists to help with distraction techniques to decrease the patient's fears and anxiety.

Evaluation of the effectiveness of the orientation program included a knowledge-based postcohort survey. In this survey, each of the 40 participants (100%) stated this experience expanded their knowledge of COVID-19 and confidence in their clinical practice and assessment skills. Each participant demonstrated to the instructors the ability to safely don and doff PPE. A precourse assessment survey was not conducted because of the rapid, emergent need to implement this role to protect the health and well-being of ED staff.

Site Manager Roles and Responsibilities

Roles and responsibilities were indoctrinated throughout the program and were divided into 3 domains of support: for patients/families, for staff, and for public health systems (Figure 1). By design, site managers did not have a patient assignment so that they could focus on supporting safety. They assisted staff with patient care activities in the COVID-19 cohort area while monitoring for safety protocol compliance and serving as a resource when process-related issues arose.

Site managers' support for patients/families included family education, comfort rounds, assessment, and referral to meet social health needs such as access to nutrition and eviction protection. Our institution's family education materials can be found in the website listed in the corresponding reference.⁷ Additional resources are listed in Table 2.

Support for staff notably included safety protocol reinforcement, especially in triage, in the COVID-19 cohort areas and during patient resuscitations. Site managers reinforced patient screening at the point of triage to identify patients suspected of having COVID-19 and to facilitate prompt isolation of these patients. Additional responsibilities involved educating staff, including new residents, specialty consultants, and environmental service staff in safe practices, including PPE donning and doffing to support their safety as vulnerable members of the care team.

The site managers' role during resuscitation and emergency response was to serve as gatekeeper at the entrance to the patient's bedspace to limit the number of personnel in the room to decrease the staff's exposure to COVID-19. They ensured that all responders wore appropriate PPE and facilitated acquiring the needed equipment and supplies because bedspaces were minimally stocked to prevent contamination. Site managers supported staff during critical events by monitoring safety protocol adherence, promoting innovative communication technologies, ensuring availability of appropriate PPE donning and doffing stations, and facilitating team huddles to review team performance.

The site managers' role included fostering the adaptive capacity and resilience of all members of the multidisciplinary team, including environmental service staff, clinical assistants, nurses, physician assistants, nurse practitioners, and attending physicians. Assisting staff to adapt innovative electronic technologies to promote optimal communication with families and minimizing potential exposure proved to be essential during the pandemic. Similarly, the site managers' role of monitoring and coaching safe PPE practices remained critical to promoting staff resiliency.

Opportunities were available for site managers to collaborate with our global health team to review and contribute to current pediatric COVID-19 research and public health initiatives. Multidisciplinary activities included literature and case reviews of all patients with COVID-19 evaluated in the department. Site managers reviewed publications to select literature that was timely and relevant to emergency staff and disseminated these to physicians, nurses, and clinical assistants. Case reviews contributed to studies on presentation and emergency care needs of children infected with COVID-19, as there were scant existing data for this patient population.

With the support of institutional leadership, site managers participated in voluntary community outreach activities. For example, site managers supported public health initiatives by educating local emergency medical service colleagues in safe transfer practices and families regarding the importance of participating in contact tracing, physical distancing, and quarantining initiatives. Site managers were also invited to collaborate with local public school nurses in safe practices as they prepared to return to school to care for over 50 000 students. While participating in these activities, site managers came forward with innovative ideas and connected with new mentors beyond the emergency department.

Throughout the initial surge in cases, the site manager team met weekly with COVID-19 leadership. With the transition from the acute response of the pandemic, the meeting frequency decreased to monthly. Meetings included a combination of policy updates and education (Figure 2), as well as unstructured time for open discussion. Site managers were encouraged to share all COVID-19-related problems so that departmental and infection control leadership could develop a clear procedure or policy. For example, certain challenges resulted in policy modifications for eyewear-cleaning protocols, reorganization of patient rooms to minimize supply contamination, and re-evaluation of patient transport practices.

Site Manager meetings were recorded and disseminated to the team to promote inclusivity of those working off-shift or unable to attend. During the meetings, nursing leadership addressed questions solicited from the team. Site managers could presubmit their questions in an optional forum if they wished to remain anonymous. These forums provided a clear, direct channel for site managers working at the bedside to escalate concerns up the chain of command and to propose practical solutions. Conversely, these forums served as a channel for the leadership to disseminate information to those on the frontlines, thus supporting a clear top-down/bottom-up communication model. Therefore, site managers actively participated in the multidisciplinary COVID-19 leadership team.

Although the early-hypothesized needs of the department dictated initial roles and responsibilities of the site manager, team members were encouraged to provide suggestions to adapt or edit the role as these demands evolved. For example, 7 months into the pandemic, during a lull when COVID-19 cases were not rising, site managers reassessed skill competency in PPE donning and doffing for the multidisciplinary team to ensure safe PPE practices. This re-education was in prediction of a second surge in cases to reinforce procedures that promoted continued staff and patient safety.

The site manager role and responsibilities evolved monthly on the basis of the needs of staff as the pandemic progressed. Team members received suggestions from the staff they supported. Therefore, all staff nurses providing direct patient care contributed meaningfully to the evolution of the site managers' role by identifying vulnerabilities in current protocols that required additional support and adaptation. Changing paradigms, the site managers worked for their colleagues and peers. In this light, when nurses and multidisciplinary members of the team received adequate support, patient care appeared more effective, patient-centered, efficient, equitable, and safe.

Ongoing Evaluation and Change

During the COVID-19 pandemic, providing ED staff with extra psychological and physical support through the work of the site manager team has the potential to improve patient care. Staffing the emergency department with 1 volunteer site manager 24/7 helped our department facilitate COVID-19 processes to deliver safer patient care. Since the implementation of our site manager program in March 2020 through April 2021, our emergency department evaluated 10 082 patients for COVID-19. The site managers were a valuable resource to mitigate this additional workload burden while prioritizing safety. Within the first 2 months of implementation of the role, the percentage of patients placed in an ED bed within 30 minutes of arrival increased from 55% to 96%. This helped to decrease potential COVID-19 exposure between patients and families in the ED waiting area. In review of our internal data, we discovered that appropriate implementation of constantly evolving isolation/precautions protocols for COVID-19 patients in the emergency department increased by 91% immediately after the launch of the site manager program. This improvement sustained through the writing of this paper.

With a reduction in our patient census during the pandemic, reallocation of nursing resources allowed us to implement the site manager's role on a permanent basis without any significant budgetary impact. There was no additional stipend for nurses assuming this role. With the expectation that our patient census will increase after the pandemic, the cost to maintain this role has yet to be determined. As the pandemic resolves, expansion of the site manager's role to a permanent clinical nursing leader position is in development.

Our institution adopted process changes that supported the site manager position. For example, the environment of care was modified to create dedicated donning and doffing stations with defined hot, warm, and cold zones. Innovations in technology such as web

TABLE 2

Patient, family and health care provider COVID-19 resources

Patient resources

- FDA: COVID-19 Educational Resources <https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-educational-resources>
- FDA: Multi-lingual COVID-19 Resources <https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/multilingual-covid-19-resources>
- FDA: COVID-19 Vaccine Information <https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-vaccines>
- NIH: Supporting Mental Health During the COVID-19 Pandemic <https://www.nimh.nih.gov/news/science-news/2020/supporting-mental-health-during-the-covid-19-pandemic>

Family resources

- CDC: Helping Children Cope <https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/for-parents.html>
- VA: Strategies for Families to Adapt to the COVID-19 Pandemic https://www.ptsd.va.gov/covid/covid_family_strategies.asp
- CDC: COVID-19 Parental Resources Kit-Childhood <https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/parental-resource-kit/childhood.html>
- NIH: Helping Children and Adolescents Cope with Disasters and Other Traumatic Events <https://www.nimh.nih.gov/health/publications/helping-children-and-adolescents-cope-with-disasters-and-other-traumatic-events/>
- USDA: COVID-19 Resources for Individuals and Families <https://www.fns.usda.gov/disaster/pandemic/covid-19/resources-individuals-families>

Health care provider/nurses' resources

- ENA: COVID-19 Information <https://www.ena.org/practice-resources/covid-19>
- Aiken: Nurses: How to Help Your Patients Cope with COVID-19 <https://online.usca.edu/articles/rnbsn/help-patients-cope-covid-19.aspx>
- AACN: Clinical Resources <https://www.aacn.org/clinical-resources/>
- ANA: COVID-19 Resource Center <https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/>
- HHS: COVID-19 Resources for Healthcare Professionals <https://combatcovid.hhs.gov/hcp/resources>
- WHO: COVID-19 Resources and Guidance <https://healthcluster.who.int/resources/covid-19-resources-and-guidance>

FDA, U.S. Food and Drug Administration; NIH, National Institute of Mental Health; CDC, Centers for Disease Control and Prevention; VA, U.S. Department of Veteran's Affairs; USDA, U.S. Department of Agriculture; ENA, Emergency Nurses Association; AACN, American Association of Critical Care Nurses; ANA, American Nurses Association; HHS, U.S. Department of Health and Human Service; WHO, World Health Organization.

conferencing platforms and portable tablets enhanced communication between the care team and the patients and families in isolation to minimize staff exposure. Hospital-wide protocols established PPE conservation and N-95 mask reuse. Dedicated storage areas served as departmental pick-up and drop-off zones for reusable masks and eyewear between shifts. Rapid point-of-care testing for COVID-19 in the emergency department expedited patient care and disposition.

Approximately 1 year after the implementation of the site manager role, a multidisciplinary survey assessed the perceived effectiveness of the role (*e-Content*). This survey had a 22% response rate. Of the 65 respondents, 97% of nurses, and 93% of physicians stated that the role was helpful during the COVID-19 pandemic. Open-ended responses from the survey are listed in *Table 3*.

Topic list
<ul style="list-style-type: none"> · Severe Acute Respiratory Syndrome Coronavirus-2 Transmission · Care of the Pediatric Patient with COVID-19 · Care of the Adult Patient with COVID-19 · Cardiac Complications of COVID-19 in the Pediatric Patient · Multisystem Inflammatory Syndrome in Children (MIS-C) · Return to School Considerations · Coping and Resilience · Psychological First Aid · Modified Resuscitation Practices for Safety · Personal Protective Equipment (PPE) Practices and Cleaning Processes · Maximizing Personal Safety · Introduction to Public Health Principles · Social Determinants of Health · Discharge and Home Care Education for Pediatric Patients

FIGURE 2
Site Manager Meeting Education Topics.

Conclusion

With the contributions of every member of the site manager team, our program was a model of shared governance, collaborative decision making, and staff nurse autonomy. We learned that the shared governance framework of the team, as exemplified in the self-designed role and responsibilities, has helped maintain confidence and buy-in for the team's high professional standards. Site managers were able to address the complex, interrelated health needs of patients and families while prioritizing staff safety. They protected and championed safety for all, supporting rapidly

evolving science and practice changes while maintaining quality patient care.

Implementation of the site manager's role as we described has assisted our department in the provision of safety for staff, patients, and families. We believe that this role could be adapted to meet the needs of other departments and institutions. In the event of a future pandemic, further study is necessary to determine how the site manager's role would be executed and expanded in multiple settings where both pediatric and adult patients receive care. However, the knowledge and skills gained from this program may serve as a foundation for

TABLE 3

Site manager role effectiveness survey responses

	Staff Response
Registered Nurse	<p>I find the role hugely helpful. With the inability to leave the room without doffing, the Site Manager is instrumental in obtaining supplies, relaying messages, providing an extra pair of hands. It is also helpful that this person is globally aware of everything happening on the team in order to lend support, offer rooms to triage, etc.</p> <p>Site Managers have the broader view of the flow and facilitate safe and efficient care. Better flow and resources and safety when a Site Manager is part of the team.</p> <p>Great resource, has global view of the team.</p> <p>Site managers are a great “go-to” for all COVID-related questions.</p> <p>Able to help the team RN feel supported during times of high volume and heavy COVID burden.</p> <p>It is useful in managing patient flow and having another set of RN hands. Alleviates some of the rooming from the charge nurse.</p>
Physician	<p>Maintaining COVID infection prevention and control practices has added new tasks that need to be covered during clinical shifts. The environment needs to be maintained and the extra hands to support patient care are so helpful.</p> <p>Helpful that they [site managers] know the latest rules.</p> <p>It is helpful to have someone knowledgeable about the COVID-related policies as they change.</p> <p>Provides expertise re: COVID placement, protocols, etc.</p> <p>Help with current policies. Help with in-room tasks. Help with training of new staff and trainees.</p> <p>Can help facilitate care for patients when nurses are busy with sick patients. Can help keep a finger on the pulse for sicker patients in the pod.</p> <p>Aware of the larger picture of what’s going on with the team, very helpful in being the clean person and getting supplies for people gowned up.</p>

other clinical nursing leadership roles. As frontline providers and emergency staff, site managers are change agents, brave professionals lighting the way for others, providing solace and safety, and supporting best practice patient care.

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Author Disclosures

Conflicts of interest: none to report.

Supplementary materials

Supplementary material associated with this article can be found in the online version at [doi:10.1016/j.jen.2021.07.009](https://doi.org/10.1016/j.jen.2021.07.009).

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REMOTE ADVANCE CARE PLANNING IN THE EMERGENCY DEPARTMENT DURING COVID-19 DISASTER: PROGRAM DEVELOPMENT AND INITIAL EVALUATION



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NCPD Earn Up to 11.5 Hours. See page 117.

Contribution to Emergency Nursing Practice

- The current literature on innovative delivery of health care indicates a growing need for remote and telehealth options, particularly in the context of the novel coronavirus disease.
- This article contributes an innovative method for utilization of telehealth and remote nursing to engage in goals of care conversations for patients presenting to the emergency department.
- Key implications for emergency nursing practice found in this article are the utilization of remote nurses to engage in goals of care conversations with families of patients presenting to the emergency department. Due to infection-control restrictions, these families were prevented from accompanying patients to the hospital. Further implications include the reassignment of nurses who could not provide in-person patient care due to coronavirus health restrictions.

Abstract

Background: The coronavirus disease 2019 pandemic caused an unprecedented surge of patients presenting to emergency departments and forced hospitals to adapt to provide care to patients safely and effectively. The purpose here was to disseminate a novel program developed under disaster conditions to address advance care planning communications.

Methods: A program development and initial evaluation was conducted for the Remote Goals of Care program, which was created for families to communicate patient goals of care and reduce responsibilities of those in the emergency department.

Results: This program facilitated 64 remote goals of care conversation, with 72% of conversations taking place remotely with families of patients who were unable to participate. These conversations included discussions of patient preferences for care, including code status, presence of caregivers or surrogates, understanding of diagnosis and prognosis, and hospice care. Initially, this program was available 24 hours per day,

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7 days per week, with gradual reduction in hours as needs shifted. Seven nurses who were unable to work in corona-positive environments but were able to continue working remotely were utilized. Lessons learned include the need for speed and agility of response and the benefit of established relationships between traditionally siloed specialties. Additional considerations include available technology for patients and families and expanding the documentation abilities for remote nurses. A logic model was developed to support potential program replication at other sites.

Discussion: Upon initial evaluation, Remote Goals of Care Program was well received and demonstrated promise in decanting the responsibility of goals of care discussions from the emergency department to a calmer, remote setting. In future iterations, additional services and technology adjustments can be made to make this program more accessible to more patients and families. Other facilities may wish to replicate our Remote Goals of Care Program described here.

Key words: COVID-19; Advance care planning; Goals of care; Telehealth; Emergency department

Introduction

PROBLEM DESCRIPTION

In late 2019, first reports of human transmission and circulation of the severe acute respiratory syndrome coronavirus 2 coronavirus disease 2019 (COVID-19) in Wuhan, China, began to make global headlines.¹ By March 1, 2020, New York City reported its first confirmed case of COVID-19 and quickly became an international hot spot.² Throughout the spring of 2020, health care systems across New York were forced to adapt usual operations to accommodate a surge of patients with COVID-19 who required hospitalization and, often, critical care services. These adaptations, including reassignment of clinical providers to areas outside their expertise, resulted in the use of traditionally nonclinical spaces for clinical care and, with limitations on supplies, often placed additional stress on providers in addition to the surge.

Those with pre-existing comorbidities, particularly hypertension, cardiovascular disease, diabetes, and chronic obstructive pulmonary disease, are at increased risk for morbidity and mortality from COVID-19.^{3,4} In addition to presence of comorbidities, older age has been identified as a significant risk factor for severe disease and mortality.⁵ During the COVID-19 surge in New York, many of the patients presenting to the emergency department were older

adults and those with chronic comorbidities. It became imperative during the peak of the pandemic to speak with patients and families and clarify goals of care (GOC) as an early intervention to help avoid unwanted use of scarce resources.

Before the onset of the COVID-19 pandemic, GOC and Advance Care Planning (ACP) discussions, often including family and loved ones, were standard of care for patients presenting to the hospital with multiple comorbidities, advanced illness, or advanced age.^{6,7} The addition of the COVID-19 pandemic magnified the need for GOC and ACP discussions as ensuring goal-concordant care and avoiding unwanted intervention became a pressing concern for most health care systems.⁸ Traditionally, GOC and ACP discussions can be an iterative process involving multiple discussions and a significant time investment for clinicians, patients, and families. The COVID-19 pandemic placed additional time and resource pressure on the health care providers who would usually be involved in these conversations because of the increasing volume of high acuity patients presenting to the emergency department. This led to some clinicians being utilized in roles where they did not have specialty training, including GOC conversations. In addition to the limited providers available, most patients in the emergency department were not able to have family accompany them to admission because of a no visitation rule that was put in place to protect patients, families, and staff.

AIMS

The implications of this new clinical reality required attempts to find alternative routes to conduct these conversations in an innovative manner. Building upon previous strong relationships between the Division of Geriatrics and Palliative Medicine and the Emergency Medicine Service Line, a Remote GOC Program was established to have these vital conversations and facilitate communication with families during the height of the COVID-19 pandemic.^{9,10} The goal of this program was to provide a resource for ACP and GOC conversations for patients who may have been unable to have these conversations and who could not have loved ones present to identify their wishes.

Methods

DESIGN

A program development and retrospective evaluation design were used. The health system Institutional Review Board approved this study and waived the need for informed

TABLE 1
Logic model of Remote GOC Program

Planned work		Intended results		
Inputs	Activities	Outputs	Outcomes	Impact
<ul style="list-style-type: none"> • ED and geriatric and palliative medicine partnership • Registered nurses who could not work onsite • Laptops, HIPAA compliant communication platform • Patient baseline code status* 	<ul style="list-style-type: none"> • Online training in GOC and end-of-life conversations for remote nurses • Introductory discussions with referring ED providers • Discussions surrounding existing resources (surrogates, caregivers, health care proxies) • Discussions surrounding patient wishes (DNR/DNI, MOLST, chaplaincy, hospice) • Discussions surrounding patient care (diagnosis, prognosis, treatment) 	<ul style="list-style-type: none"> • GOC and end-of-life conversations with patient families • Completed GOC notes in EMR • Number of referrals into the program • Changes in code status* 	<ul style="list-style-type: none"> • Increased recognition of the need for GOC conversations • Increased referrals to remote nurses • Discharge to appropriate level of care from the emergency department (hospice, home) • Discharge to appropriate level of care after admission (hospice, SNF, home) 	<ul style="list-style-type: none"> • Long term increase in GOC and end-of-life conversations • Increase in goal-concordant care

Outcomes and impact were not yet measured for program implementation. ED, emergency department; GOC, Goals of Care; EMR, electronic medical record; DNR, Do-Not-Resuscitate; DNI, Do-Not-Intubate; MOLST, Medical Orders for Life Sustaining Treatment; SNF, skilled-nursing facility; HIPAA, Health Insurance Portability and Accountability Act.

* Not measured owing to disaster context of implementation.

consent. Informed consent waiver was approved by the Institutional Review Board because collection and review of patient data was performed via retrospective chart review.

SETTING

This work was conducted in the emergency departments across a large health system in the New York metropolitan area. Because of the remote nature of the program, 12 emergency departments were able to participate simultaneously. Typically, these emergency departments serve approximately 650 000 patients per year combined.

PARTICIPANTS

Participants were included by consult referral at the clinical judgment and discretion of the clinician team providing care in the emergency department between April and June of

2020. Of the patients hospitalized with COVID-19 in this health system, at least half were age 63 years or older, 57% had history of hypertension, and 34% had history of diabetes.¹¹

REMOTE GOC PROGRAM

In response to this potential communication barrier introduced by the increasingly busy ED environment, redeployed clinicians, and limited family accompaniment, the Remote GOC Program was developed to continue communication with families of patients in the emergency department to understand the goals and needs of the patients. As a pragmatic choice, this program utilized nurses who were unable to work in COVID-positive environments but could continue working remotely via telehealth to supplement the clinical resources within the emergency departments (Table 1). Initially, the program included 7 remote

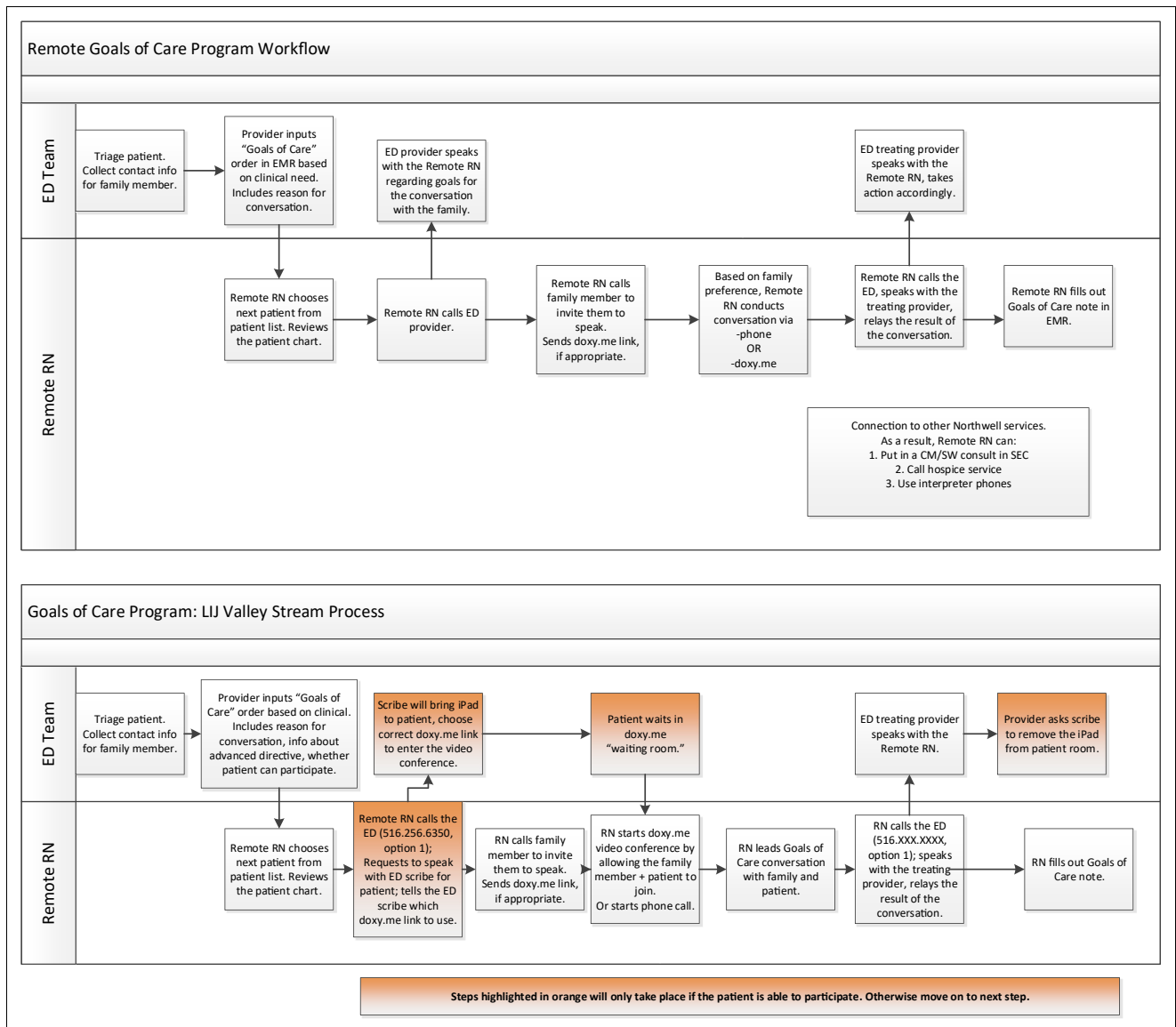


FIGURE 1

Flow diagram of remote Goals of Care Program communication. ED, emergency department; EMR, electronic medical record; RN, registered nurse; CM, case manager; SW, social worker; SEC, sunrise emergency care.

nurses from various specialties, including pain management, medical/surgical, emergency, and operating room nursing. As staffing needs changed in the hospitals, the size of the Remote GOC Program was reduced to accommodate the same. The program began in April 2020 and provided remote GOC support 24 hours per day, 7 days per week, using 7 nurses covering 4.5 full-time equivalent positions. As the first wave of the pandemic began to lessen by June, the

remote GOC support was reduced to 16 hours per day, 7 days per week. This phase of the Remote GOC Program utilized 4 nurses to cover 3 full-time equivalents.

To support the providers, the registered nurses were given laptops and communication software to remotely guide conversations with patients' families. The majority of the nurses were not previously trained in end-of-life or GOC conversations, so they were provided training via a

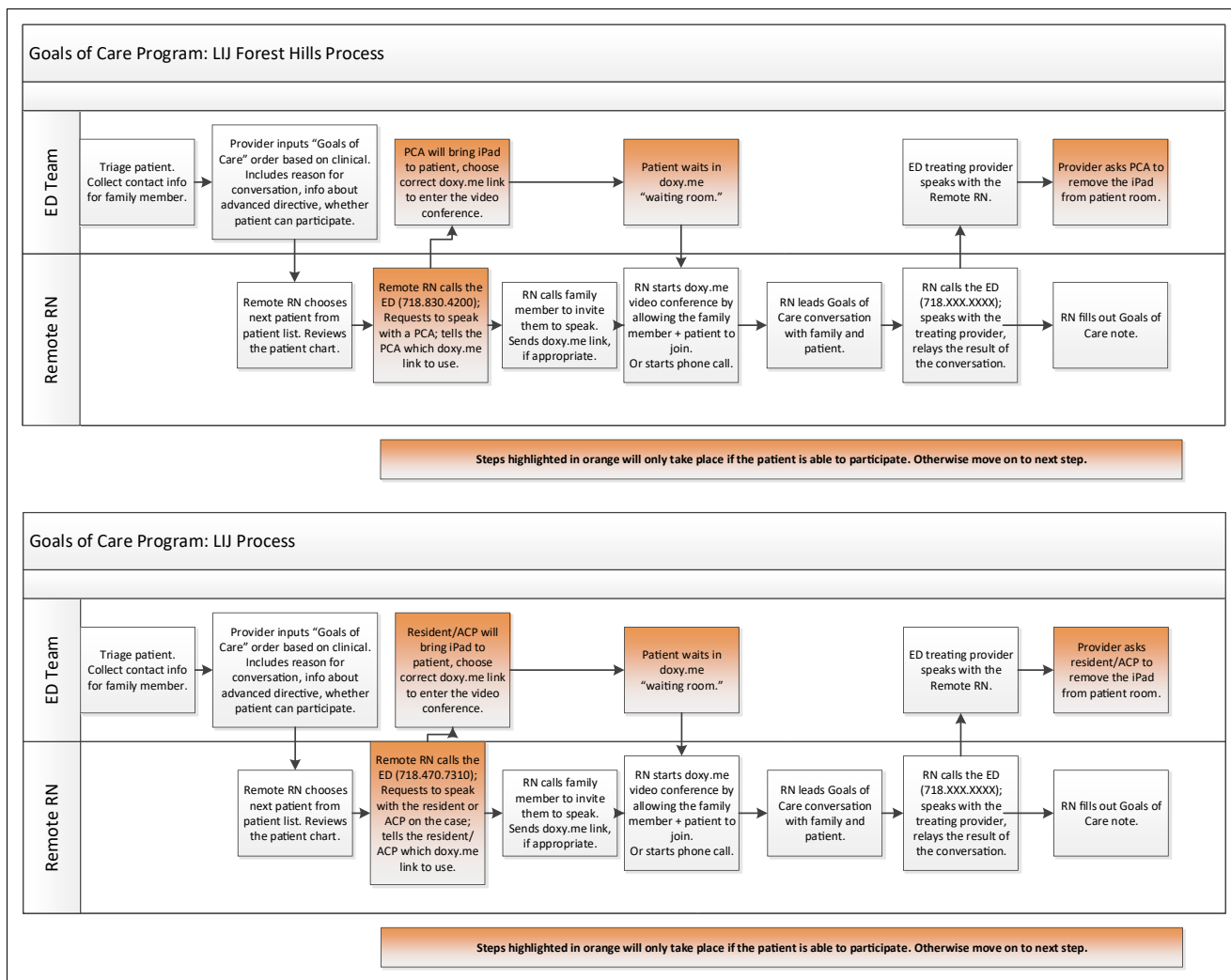


FIGURE 1
Continued.

prerecorded online course created by the system Geriatrics and Palliative Medicine team. These courses focused on how to have GOC conversations, how to have discussions on end-of-life care and bereavement support, and the importance of advanced directives and health care proxies, particularly in the midst of the COVID-19 pandemic. The materials provided to the remote nurses included context for the workflow within the emergency department, instructions on how to use the secure technology and how to educate families on its use, on-site contact information, and additional resources for ACP support. Owing to the nature of the pandemic surge, the educational materials and

workflow were streamlined to allow for quick initiation of the program.

Upon referral for a patient requiring a GOC discussion, the ED team would enter a "Goals of Care" order in the patient's electronic medical record (EMR), including the reason for the conversation (Figure 1). As previously described, patients were identified on the basis of the medical judgment of the ED team and their anticipated ACP need. The remote GOC nurses would receive notification of the GOC order and contact the ordering provider to further discuss the purpose of the GOC conversation. Where possible, patients would be involved in the GOC

TABLE 2
Demographic characteristics

Demographic category	N	%
Sex		
Female	40	63
Male	24	38
Age category (y)		
<65	10	16
65-74	10	16
75-84	11	17
85-94	23	36
≥95	10	16
Race		
Caucasian/White	39	62
African American/Black	11	17
Asian	4	6
Other/Multiracial/Unknown	9	14
Participants in conversation		
Family	46	72
Other	11	17
Patient	4	6
Patient and family	1	2
COVID-19 status at time of ED encounter		
Confirmed COVID-19 negative	31	48
Confirmed COVID-19 positive	26	41
Suspected COVID-19 positive	1	2
Unknown	5	8
Patient residence prior to ED present		
Community home	37	58
Skilled-nursing facility/Rehab	23	36
Assisted-living facility/Group home	4	6
Prior advance directive		
Yes	31	48
No	28	44

COVID-19, coronavirus disease 2019; ED, emergency department; Rehab, Rehabilitation.

conversations, but there was often limited ability to speak to patients directly, owing to the acuity of their illness and the technology available to patients in the emergency department. If patient communication was limited, nurses contacted family or surrogate decision makers remotely using a Health Insurance Portability and Accountability Act (HIPAA) secure platform or traditional landline phone calls, depending on the preferences and technology available to the families. During these conversations, the nurses

TABLE 3
Services/Resources discussed during remote GOC calls

Activity	N	%
Completed health care proxy	22	34
Have a surrogate	16	25
Have a caregiver	9	14
Discussion of:		
DNR	45	70
DNI	45	70
MOLST	42	66
Treatment	21	33
Diagnosis	20	31
Prognosis	15	23
Hospice	13	20
Chaplaincy	4	6
Remained full code	31	48

DNR, Do-Not-Resuscitate; DNI, Do-Not-Intubate; MOLST, Medical Orders for Life Sustaining Treatment.

discussed the patient’s current health and living situation with families, including whether the patient already had some form of advance directive or health care proxy and whether the patient had a caregiver or surrogate. Conversations also included discussion of the patient’s current treatment needs, prognosis, diagnosis, whether the family believe the patient would want to complete a Do-Not-Resuscitate (DNR), Do-Not-Intubate (DNI), or Medical Orders for Life Sustaining Treatment (MOLST) form, and whether the patient would be open to hospice services, if medically indicated. After the GOC conversation with patients’ families, the remote nurse would contact the ED treating provider to relay the details of the conversations. The remote nurse would also complete the GOC note in the EMR and enter any follow-up needs for the patient, including additional consults, such as social work, case management, palliative care, and hospice services.

DATA COLLECTION

Patient information was collected from Allscripts Sunrise Emergency Care, the EMR, in July 2020. Study data were collected and managed using REDCap electronic data capture tools.^{12,13} REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies, providing 1) an intuitive interface for validated data capture; 2) audit trails for tracking data manipulation and export procedures; 3)

TABLE 4

Outcomes

Disposition	N	%
ED disposition		
Admission to hospital	51	80
Expired	5	8
Inpatient hospice	5	8
Home	2	3
Home with hospice	1	2
Hospital disposition		
Expired	18	28
Assisted-living facility	4	6
Skilled-nursing facility/Rehab	14	22
Home	7	11
Inpatient hospice	7	11
Home with hospice	5	8

Rehab, Rehabilitation.

automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for data integration and interoperability with external sources.

Deidentified demographic data were collected from the medical record. Primary outcomes included details of early GOC discussion in emergency departments and disposition after GOC discussions. GOC were defined as Code Status, with options being DNR and/or DNI, and Full Code (cardiopulmonary resuscitation and intubation desired). Other potential topics of discussion during these conversations included appointment of a health care proxy, diagnosis, treatment, prognosis, chaplaincy, and hospice.

ANALYSIS AND EVALUATION

Owing to the disaster context in which this program was initiated and the retrospective nature of data collection, the study was not designed to provide analysis on statistically significant changes for patient outcomes. To provide context for the patients who were included in the program, demographic details and descriptive statistics are reported. As changes in health outcomes cannot be reported, this program was evaluated on the basis of the logic model provided in [Table 1](#).

Results

We included 64 patients for whom a health care professional was consulted to have a remote GOC conversation between April and June 2020. Across the health system, all 64 patient

records were reviewed and included for analysis. [Table 2](#) presents the demographic characteristics and patient information upon presentation to the emergency department. Sixty-three percent of patients who received remote GOC conversations were female, and almost 70% were aged 75 years or older. Just under half of patients (42%) presented from a communal living residence, including skilled-nursing or assisted-living facilities. About half of patients were confirmed or suspected COVID-19 positive, and although there were instances of patient involvement in the remote GOC conversations (8%), most conversations were with family (72%). Before presentation in the emergency department, 48% of patients already had some form of advance directive documentation. Of the patients residing in a skilled-nursing or assisted-living facility, 51% presented to the emergency department with advance directive documentation.

[Table 3](#) outlines the course and outcomes of the GOC conversations and the topics covered with patient families. Most GOC conversations involved discussion of DNR, DNI, and/or MOLST; fewer conversations involved discussion of the patient's diagnosis, treatment, and prognosis. After discussion of DNR/DNI and MOLST, 34% of patients completed a health care proxy, although a majority of these patients had a previous form of advance directive, and 48% of patients remained Full Code. Only 6% of discussions involved the offering of chaplaincy services, and 20% involved discussion of hospice.

[Table 4](#) presents the disposition outcomes for the patients who received remote GOC conversations upon presenting to the emergency department. Eighty percent of patients were admitted to the hospital, 8% died while in the emergency department, and 10% were discharged from the emergency department directly to inpatient or home hospice. Of the patients admitted to the hospital from the emergency department, 28% expired before discharge, 28% were discharged to a skilled-nursing or assisted-living facility, and 19% were discharged to inpatient or home hospice ([Figure 2](#)). Of the patients who died during hospitalization, 55% remained Full Code after the GOC conversation with the remote nurse. Of all patients who had remote GOC conversations, 28% were discharged to hospice either from the hospital or directly from the emergency department.

Discussion

The COVID-19 pandemic forced hospitals and health systems to create innovative solutions to provide high quality patient care while in the midst of an unprecedented crisis.

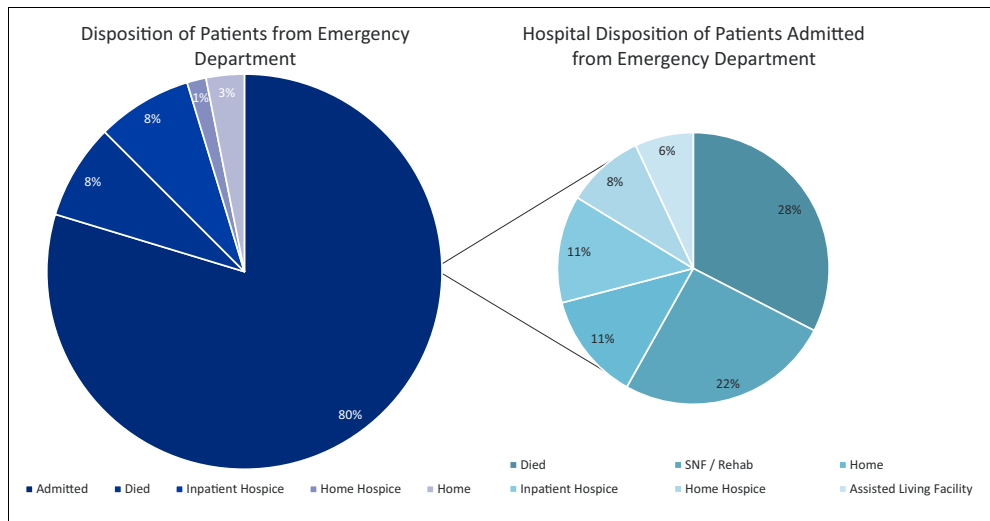


FIGURE 2
 Visual representation of patient disposition from both the emergency department and subsequent admission. SNF, Skilled-Nursing Facility.

The Remote GOC Program was created to continue vital GOC discussions for patients and families while restrictions on family visitation and provider time and resources were mounting. As the majority of patients were not able to participate in the GOC conversations owing to the acuity of their illness, fast and open communication with families was vitally important. This program relied heavily on the relationship between the Division of Geriatrics and Palliative Medicine and the Emergency Medicine Service Line that was created before the pandemic. This relationship was vital to creating and running the Remote GOC Program quickly, as there was well-established communication and trust between these traditionally siloed groups. Although this was a nursing-driven initiative, this program provided interdisciplinary benefit across nursing, social work, and ED providers. Although small, this initial, disaster-related program highlighted the strengths and opportunities involved in remote GOC conversations.

A major strength of the Remote GOC Program was the collaborative relationship that allowed for quick setup and decision making. This program required innovative use of personnel and technology that was easily accommodated through collaboration among health care teams. This program was effective in maximizing staffing ability by using nurses who were not able to safely remain in a patient-facing setting in a new capacity. As an estimated 104.2 per 100 000 nurses experience a work-related injury, this style of telenursing may also serve as a potential option for nurses requiring light-duty assignments.¹⁴ This utilization made the redeployed nurses feel valued, and the staff in

the emergency department appreciated the additional help during a busy time. This freed providers in the emergency department to perform procedures and attend to the immediate stabilization needs of the patients while the patient's further GOC were established. In addition, the Remote GOC Program was able to decant the time-intensive and delicate aspects of the GOC conversations from the busy ED environment. By allowing these conversations to occur in the nontraditional but much calmer environment of remote telehealth, they could be deeper and more meaningful toward providing goal-concordant care, as evidenced by the noteworthy proportion of discharges to hospice for these patients. Establishing and documentation of health care proxies were also vitally important for patients who were later admitted to the hospital, as this documentation clarified appropriate contacts at a time when families were unable to visit patients in the hospital.

As hospitals and emergency departments begin to transition back to prepandemic operations, this Remote GOC Program can continue to be useful for patients presenting to the emergency department who would benefit by GOC conversations before inpatient admission. Although these conversations can be lengthy, they are important for directing decision making and connection to appropriate resources directly from the emergency department. This style of remote care provision is also transferable to additional specialties and health care needs. Although telenursing has been utilized in rural communities for some years, the global pandemic has sparked innovations in telenursing and patient care in a way that is

more universal.¹⁵⁻¹⁸ This shift toward increased access to telehealth services is in line with previous programs that are able to provide robust patient care at home, including programs for dialysis and palliative medicine.^{19,20} This Remote GOC Program and other telehealth-based programs will continue to grow as a viable option for emergency departments as reimbursement for telemedicine evolves and expands.^{21,22}

This article provides an outline of a Remote GOC Program implemented in New York during the height of the first COVID-19 surge. This program was able to gather ACP information and provide GOC conversations with detail and nuance. This program was especially valuable during the time that families could not accompany patients to the ED setting to provide context for patient wishes. Although this program was pragmatically implemented and was not designed to show statistically significant changes, future studies should examine whether these conversations improved adherence to goal-concordant care. This program is valuable in that it is easily modifiable and transferable to many settings and specialties and utilizes the telehealth format that will likely continue to grow out of the COVID-19 pandemic.

LIMITATIONS

Although the Remote GOC Program was a valuable use of resources during the first surge of the COVID-19 pandemic, there were areas of the program that could be improved upon. First, the technology used was sometimes a significant barrier for patients and families. The communication software utilized by the remote nurses was sometimes difficult to navigate for families outside of the hospital, especially for those who did not have a stable internet connection or familiarity with remote communication software. Within the emergency department, having the remote nurse contact the patient was equally difficult. The hectic ED environment was not conducive to video conferencing, and the patients included in this program were mostly older, with less experience with the needed technology and no family to support them. In addition, patients who had sensory difficulties, including hearing loss, vision loss, or cognitive decline, in addition to their reason for presenting to the emergency department, were less able to participate in conversations. Even when the remote nurses were able to have GOC discussions with families, the staff within the emergency department was still required to contact the families to give status updates regarding the

patient during a particularly tense time. ED staff was also required to complete MOLST documentation within the emergency department, as these forms are still completed on paper and require the presence of the patient or family to complete. Although an electronic MOLST process is available in New York State, it is not currently utilized by the health system. Finally, this program description does not include a comparison group. In addition, chaplaincy services were limited because most of the chaplaincy personnel were not on-site during the initial COVID-19 surge. Only a small portion of patients requested chaplaincy services, and their needs were met through the reduced staffing model available. Future studies should assess the benefit and practicality of remote chaplaincy services for patients who are agreeable.

Although the intention of this program was not to determine the efficacy of an intervention, the lack of a comparison group limits the strength for the current work and the ability to utilize inferential statistics. Similarly, owing to the disaster context in which the program was utilized, we were not able to collect the number of patients and families approached who refused or could not participate. Further studies on program implementation can be structured to include comparison groups and population approached for statistical analysis but hopefully not within the context of a global pandemic.

Conclusion

Overall, the Remote GOC Program was well-received and will be utilized again, should the need arise. In future iterations, preparation of the program should be started as early as possible and can be expanded to other services, including Hospital Medicine and select consult services. The earlier start time and expansion of services will allow for an improvement in training on the technology used and documentation needs. Additional time and comfort with the technology will allow the remote nurses to assist patient families in troubleshooting common connection problems before the GOC conversation and be familiar with alternatives if the primary communication method is unavailable. Additional training on documentation and expansion of documentation access for remote nursing staff would also be helpful. GOC conversations can be very delicate and nuanced discussions that are heightened in the midst of an unexpected public health crisis. Detailed documentation of the GOC conversation will allow

providers in the hospital to build on these conversations with patients and families as the patient moves through their disease course. Through this program, remote nurse staff were able to identify additional resources through GOC conversations that may not have been easily accessible without this program, such as hospice care and specialized consults.

Author Disclosures

Conflicts of interest: none to report.

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THE EFFECT OF MUSIC-MOVING TOYS TO REDUCE FEAR AND ANXIETY IN PRESCHOOL CHILDREN UNDERGOING INTRAVENOUS INSERTION IN A PEDIATRIC EMERGENCY DEPARTMENT: A RANDOMIZED CLINICAL TRIAL



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Contribution to Emergency Nursing Practice

- The current literature indicates that intravenous catheter insertion may cause pain and fear, especially in preschool children.
- This study contributes to the literature by using a new distraction method with preschool-aged children: a toy with music and movement. This study trialed a new method and is a step forward in finding new evidence for emergency nursing practice.
- Key implications for emergency nursing practice found in this article are that other non-pharmacologic distraction interventions should be considered to reduce intravenous needle-related fear and anxiety in this population.

Abstract

Introduction: Intravenous catheter insertion is a highly invasive medical procedure that causes fear and anxiety in children. This study aimed to analyze the effect of a toy (with music and

movement) distraction method on fear and anxiety in children aged 4 to 6 years.

Methods: This experimental, randomized clinical trial used parallel trial design guided by the Consolidated Standards of Reporting Trials checklist. Using simple randomization, eligible children (age 4-6; N = 60) were assigned to the intervention group (n = 30), who received the toy distraction method, or to the control group (n = 30), who received standard care. The Children's Fear Scale was used to evaluate the fear levels, and Children's State Anxiety Scale was used to evaluate anxiety levels. Physiological parameters (pulse, oxygen saturation) and crying time were monitored by the researcher as indicators of fear and anxiety. The chi-square test, repeated measures analysis of variance, Friedman test, *t* test, the Mann-Whitney *U* test, Wilcoxon test, and the intraclass correlation test were used for data analysis.

Results: There was no statistically significant difference in terms of fear and anxiety scores, physiological parameters, and crying time during the procedure between the children in the intervention and control group.

Discussion: We found that this method of toy distraction was not effective in reducing fear or anxiety during the intravenous catheter insertion procedure. Accordingly, we recommend that this distraction method be performed in different age groups and with larger samples in various painful and stressful practices in the future and that comparison be made with various distraction methods.

Key words: Child; Fear; Anxiety; Intravenous insertion; Distraction; Toy; Pediatric emergency department

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Introduction

Intravenous (IV) catheter insertion is a medical procedure commonly performed with children admitted to the emergency department, and although it may seem a minor intervention, it can cause significant fear and anxiety.¹⁻³ In particular, preschool children are afraid to have actions performed on their bodies, especially because they may believe that needle intervention will disrupt body integrity and cause disability. At the same time, they may think of interventions as a punishment given to them because of illness or because they did not listen to the parent. They may be reactive to medical interventions amid such imagined thoughts.⁴

The effect of previous painful and fearful interventions on children continues in the adult period, which can lead to avoiding further medical procedures as a response to increased pain and fear.¹ During medical procedures involving the child, controlling pain, fear, and anxiety by using a timely and effective method can increase tolerance against pain, fear, and anxiety that may occur in later interventions. Therefore, emergency nurses should manage interventions, such as invasive or noninvasive procedures, whose long-term negative physical and emotional effects children find fearsome to mitigate.¹⁻³

One of the most common methods of controlling fear and anxiety during diagnostic and treatment procedures in children is to divert attention. Distraction is a type of attention activity in which the child's attention focuses on a stimulus other than the procedure (eg, a toy). Distraction is also a part of holistic comfort intervention. The theory of holistic comfort is a multifaceted approach model that, beyond relieving pain, focuses on treating experiences such as fear, anxiety, and distress in children during invasive nursing procedures.⁵ Distraction has been used by families and health professionals in mitigating pain, fear, and anxiety related to medical procedures and determined to be effective. Some of these methods include using distracting cards, watching cartoons, blowing balloons, creating balloons by blowing foam, talking about things unrelated to the intervention, playing music, playing, showing a kaleidoscope, a cold device with vibration, and using virtual reality goggles.^{2,6-9} For the distraction intervention to be effective, it is important to use appropriate interventions for each child's age. Concrete objects are needed to divert the attention of babies and young children. Visual or audible toys can be effective in distracting preschool children.²

Playing is a tool that helps the child transfer the fear and anxieties related to the distorting traumatic event to the play or the toy, thus assisting the child to cope and adapt.¹⁰ The role of playing as a distraction tool and its value in the

integral development of a normal child is indisputable. The role and value of playing increase proportionally when the child is vulnerable in the event of illness. Distracting the child with toys from the preparation stage until the end of the intervention does not require extra nursing time or effort; it can be used with the support of parents or in cooperation with the child. These nonpharmacological methods can increase autonomy in the development of nursing practice. Therefore, nurses and other health care workers should create suitable playing environments for children and support their playing by offering the materials necessary for various games.¹⁰⁻¹² According to the results of some studies, playing has been found to help expedite children's recovery in hospital.¹³⁻¹⁵

In the literature, there are studies on therapeutic play and toy use during invasive procedures.¹⁶⁻¹⁸ However, very little previous research was found on therapeutic play in children aged 4 to 6 years during procedures in the emergency department. Furthermore, no studies examining the effect of toy distraction to reduce fear and anxiety during the IV insertion practice in this age group were found. Toy distraction is an example of nonpharmacological methods, and it is an important responsibility of the nurse to use nonpharmacological interventions to reduce pain, fear, and anxiety. This study aimed to analyze the effect of a toy (with music and movement) distraction method on fear and anxiety in children aged 4 to 6 years undergoing IV insertion in a pediatric emergency department.

The hypotheses of the study were as follows:

Hypothesis 1: In children to whom the IV catheter insertion procedure is applied, the toy distraction method reduces fear and anxiety during and after the procedure.

Hypothesis 2: In children to whom the IV catheter insertion procedure is applied, the toy distraction method reduces the crying time during and after the procedure.

Hypothesis 3: In children to whom the IV catheter insertion procedure is applied, the toy distraction method keeps physiologic parameters within normal limits during and after the procedure.

Methods

STUDY DESIGN

This study was a 2-arm parallel design experimental, randomized clinical trial analyzing the effect of a toy (with music and movement) distraction method on fear and anxiety before, during, and after the IV insertion procedure in children aged 4 to 6 years in a pediatric emergency department. The study took place between July 2018 and November 2018.

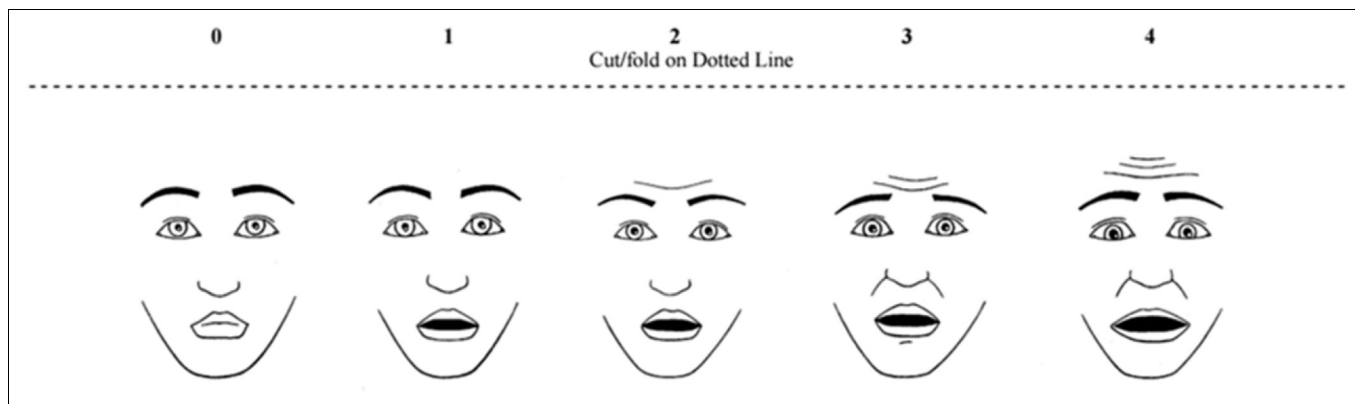


FIGURE 1
Children's Fear Scale.

SETTING

The study took place in a pediatric emergency unit of a hospital in a province of the middle Black Sea region in Turkey. An average of 10 000 children come to the unit annually. The most common patient presentations are acute gastroenteritis, fever, and respiratory diseases.

SAMPLE

The study sample was comprised of 60 children who presented to the emergency department when the researcher was on duty between July to November, 2018, and were selected according to the inclusion criteria and underwent IV insertion. The inclusion criteria were being between the ages of 4 and 6 years, conscious, and with the ability to communicate. The exclusion criteria were that the children had chronic and/or severe illness, mental/psychiatric illness, visual and/or hearing impairment, and inability to communicate verbally. The sample size calculation was done with the G power 3.1.9.2 (Heinrich Heine University) package program. On the basis of previous research using a similar scale, our power analysis was based on a common standard deviation of 2.69 for the control and intervention groups.⁹ With an effect size of 0.74, a power of 0.80, and an acceptable type I error size of 0.05, the minimum number of patients to be taken per group was determined as 30.⁹

ALLOCATION

Participants were selected via continuous enrollment on the basis of when the researcher was on duty and then randomly allocated. Upon admission to the pediatric emergency department, patients were registered and assigned auto-

mated numbers in the Hospital Management Information System (HMIS). The emergency department secretary gave a consecutive application number for each child for whom the provider instructed to have an IV catheter. A coin was tossed to determine which group (odd or even) would be assigned to the control group. A simple randomization method was used, assigning patients with odd automated HMIS numbers to the control group ($n = 30$) and those with even automated HMIS numbers to the intervention group ($n=30$). This was done systematically until the calculated sample size in a 1:1 ratio was achieved.

DATA COLLECTION TOOLS

The study data were obtained using Child and Family Information Form, Child Fear Scale, and Children's State Anxiety Scale (CSA). As outcome variables, the children's fear and anxiety levels, crying times (with a timer with stopwatch), and physiological parameters (oxygen saturation [SpO₂] and pulse with a calibrated pulse oximeter device) were evaluated separately before, during, and after the procedure.

CHILD AND FAMILY INFORMATION FORM

This form consists of questions including the child's socio-demographic characteristics and previous venipuncture (venous blood draw or IV treatment), emergency visits, and hospitalization history.

CHILDREN'S FEAR SCALE

The Children's Fear Scale (CFS) was developed by McMurtry et al¹⁹ to measure the fear levels of children aged 4 to 10, and it was adapted to Turkish by Özalp Gerçeker et al.²⁰

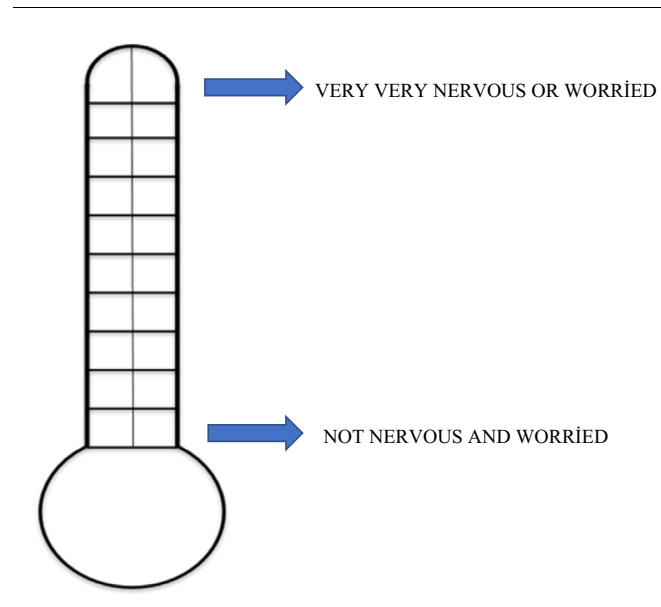


FIGURE 2
Children's State Anxiety Scale.

The validity index of CFS in this study was found to be 0.89. This scale is a 0 to 4 visual scale display of 5 drawn facial expressions ranging from a neutral expression (0 = no fear) to a scared face (4 = severe fear), which is very easy to use (see Figure 1). This scale can be used by the child aged 4 to 10 years, their parents, and researchers to assess the fear that develops in reaction to the procedure.²⁰ In this study, the researcher pointed out each face and explained its meaning (ie, first face is not scared at all, the third is experiencing increasing fear; the fifth is experiencing the most fear). In each procedure (before, during, and after the procedure), the researcher asked the children, "Which face shows your fear now?"

CSA

Developed by Ersig et al²¹ to measure the anxiety levels of children aged 4 to 10 years, the CSA scale was adapted to Turkish by Özalp Gerçeker et al.²⁰ The validity index of CSA in this study was found to be 1.00.²⁰ The CSA is similar to a thermometer with a bulb at the bottom and horizontal lines at intervals going upward (see Figure 2). On this scale, children are told, "Think about all your anxious or nervous feelings being in the bulb or lower part of the thermometer," or, "If you are a little worried or nervous, emotions may go up a little in the thermometer. Emotions can go all the way to the top if you're very, very anxious, or nervous. Put a line on

the thermometer that shows how worried or nervous you are." When children did not understand this analogy, we used an alternative script that did not explicitly describe a thermometer. Children were asked to "Pretend that all of your worried or nervous feelings are in the very bottom down here (point to scale). If you are a little bit worried or nervous, the feelings might come up just a little bit (move finger up). If you are very, very worried or nervous, the feelings might go all the way to the top (move finger up to top). Put a line showing how much worry or nervousness you feel." To measure state anxiety (CSA), the child was asked to mark what they were feeling "at that moment." After data collection, researcher reviewed and scored children's CSA ratings. A transparent overlay with marked half point increments was placed on top of the child's ratings, which were then rounded up to the closest half point increment. The score can range from 0 to 10.²⁰

DATA COLLECTION

Figure 3 shows the Consolidated Standards of Reporting Trials diagram for the progress of the study. Before the procedure, the purpose of the study was explained to the parents, and their verbal and written assents and consents were obtained. Then, the Child and Family Information Form was completed by parents. The children and their parents were informed about the use of scales to evaluate the

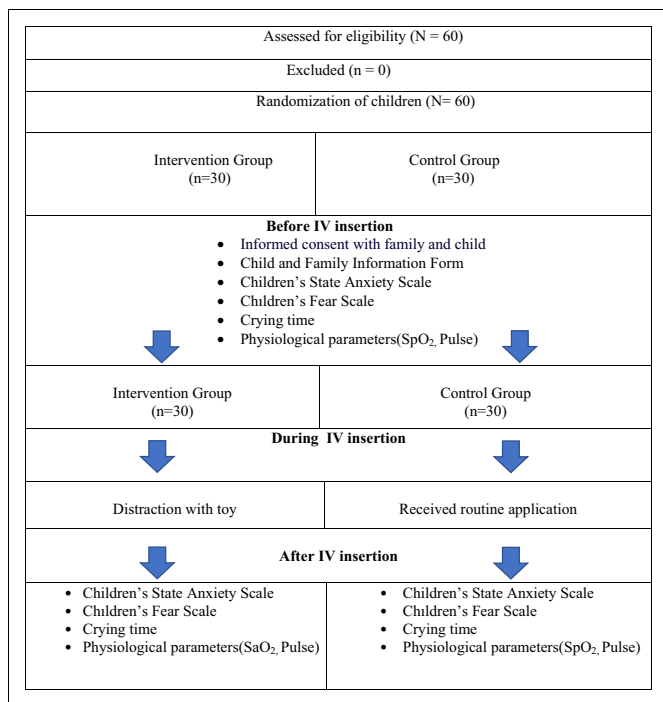


FIGURE 3
Study flowchart.

children's fear and anxiety levels before, during, and after the procedure.

IV CATHETER INSERTION PROCEDURE

IV catheter insertion was performed in all children in the pediatric emergency department by 1 nurse with pediatric emergency department experience using a 24-gauge IV catheter. The IV insertion procedure took an average of 3 minutes (range:1-5 minutes). Parents stayed with their children before, during, and after the procedure. Before, during, and after IV insertion, the CFS scores were evaluated by the child, the parent, and the researcher, and the anxiety scale scores were evaluated by the child. The fear level caused by the procedure was evaluated with the CFS scale, and the anxiety level was evaluated with the CSA scale. During this evaluation procedure, children, parents, and the researcher were blind to each other's scale scores. In addition, physiological parameters (pulse, SpO₂) were measured with a pulse oximeter, and crying time was followed by the researcher with a stopwatch before, during, and after the procedure. Crying time is defined as pre-intervention crying

(elapsed time between entering the treatment room and placing the child on the treatment bed), crying during IV insertion (elapsed time between initiating the process of IV insertion and completion of the intervention) and post-intervention crying (elapsed time between the completion of the intervention and the end of crying).

INTERVENTION

Intervention Group (Toy Distraction Group)

Each child in the intervention group was given a choice to play with 1 of 2 toys with bee and rabbit figures. These toys appeal to all age groups, although they are attractive for the 4 to 6 age group. These toys dance to the music playing during the movement. They distract children with the music and lights flashing around them during the dance. The toys were introduced to the children by the researcher 5 to 10 minutes before the procedure. Children were asked to choose one, and they were allowed to play with the toy of their choice. The toy was placed on a hard surface in front of the bed or on the bed. After the child was asked to choose whether to perform the procedure lying down or sitting, the toy was placed in the child's line of sight to let them concentrate on the toy. The IV insertion procedure was carried out at least 5 to 10 minutes after the child concentrated on the toy. During the procedure, the child was allowed to take the toy and look at the lights and movements.

Control Group

Standard care was maintained for the children in the control group. In many hospitals in Turkey, no pharmacological or nonpharmacological methods are routinely used to reduce pain, fear, or anxiety during IV puncture procedure. Parents are allowed to stay with the child during the procedure. In this study, all parents stayed with their children during the IV insertion procedure.

ETHICAL CONSIDERATION

The study was approved by the University Scientific Research and Publication Ethical Board in Turkey, ethical approval number 2018-08-18-KAEK-141. Written permission was obtained from the Provincial Health Directorate for the study to be carried out in the relevant institution. Written and verbal explanations were made to the children and their parents about the purposes of the study and the study plan, and written consent from parents and verbal assent from the children was taken. In addition, they were

TABLE 1
Comparison of groups according to their descriptive characteristics (N = 60)

Descriptive characteristics	Intervention group (n = 30)		Control group (n = 30)		Total (N = 60)		χ^2*	P
	n	(%)	n	(%)	n	(%)		
Gender								
Girl	14	46.7	17	56.7	31	51.7	0.60	.44
Boy	16	53.3	13	43.3	29	48.3		
Children's age								
4 y	13	43.4	12	40.0	25	41.7	0.88	.96
5 y	7	23.3	7	23.3	14	23.3		
6 y	10	33.3	11	36.7	21	35.0		
Accompanying parent								
Mother	21	70.0	19	63.3	40	66.7	0.30	.58
Father	9	30.0	11	36.7	20	33.3		
Venipuncture history								
1-4 times	20	66.7	13	43.3	33	55.0	3.30	.07
≥5 times	10	33.3	17	56.7	27	45.0		
Previous emergency visits								
1-5 times	12	40.0	8	26.7	20	33.3	1.20	.27
≥6 times	18	60.0	22	73.3	40	66.7		
Hospitalization history								
Yes	18	60.0	13	43.3	31	51.7	1.67	.20
No	12	40.0	17	56.7	29	48.3		

* Test: Chi-Square test.

also told that they could withdraw from the study at any time without being required to explain their reasons.

STATISTICAL ANALYSIS

SPSS Version 24.0 package program (IBM Corp, Armonk, NY) was used to evaluate the data. The distribution of demographic variables between groups was analyzed using the chi-square test. Normality was evaluated using the Kolmogorov-Smirnov test. For the data meeting normal distribution conditions, *t* test in independent groups, and 2-way analysis of variance in repeated measurements were performed. In the non-normally distributed data, the Mann-Whitney *U* test between the groups and the Friedman test for repeated measurements were used. In cases where there was a significant difference, the Wilcoxon test was used in binary comparisons to determine and interpret from which group or measurement the difference originated.²² An intraclass correlation test was used to evaluate consistency between observers. A *P* value of <.05 was considered statistically significant.

Results

COMPARISON OF THE GROUPS

A total of 60 children, 31 (51.7%) girls and 29 (48.3%) boys, were included in the study. The identifying features of children are shown in Table 1. The intervention and control groups were similar in terms of age, gender, accompanying parents, history of previous IV insertion, emergency department visits, and hospitalization history.

COMPARISON OF GROUPS IN TERMS OF ANXIETY LEVELS

The comparison of mean CSA scores within each group and between the groups according to the procedure time is given in Table 2. Whereas there was no statistically significant difference between the groups in terms of preprocedure and procedure anxiety scores (*P* > .05), there was a significant difference after the procedure (*z* = 2.25, *P* = .03). CSA scores within the groups increased during the procedure.

TABLE 2
Comparison of Children's State Anxiety Scale score averages within and between groups by procedure time

CSA score	Preprocedure		During the procedure		After the procedure		Timepoint comparison test* P value	Pairwise comparisons†
	Mean	SD	Mean	SD	Mean	SD		
Intervention group (n = 30)	1.53	1.59‡	5.33	2.73‡	0.97	1.13‡	51.98 <.001	1-2: <i>P</i> < .001 2-3: <i>P</i> < .001 1-3: <i>P</i> = .02
Control group (n = 30)	1.10	1.09‡	6.27	2.83‡	2.47	2.47‡	46.26 <.001	1-2: <i>P</i> < .001 2-3: <i>P</i> < .001 1-3: <i>P</i> = .01
Group comparison, <i>z</i> §	0.83		1.05		2.25			
<i>P</i>	.41		.29		.03			

CSA, Children's State Anxiety Scale; SD, standard deviation.

* Test: Friedman test (within group).

† Test: Wilcoxon test.

‡ Same upper index in the line shows statistical indifference (variance analysis in repeated measurements).

§ Test: Mann-Whitney *U* test (between group).

Furthermore, postprocedure mean CSA scores increased compared with preprocedure CSA scores within the control group. Postprocedure mean CSA scores decreased within the intervention group compared with the preprocedure CSA scores. This result was statistically significant ($P < .001$).

COMPARISON OF GROUPS IN TERMS OF FEAR LEVELS

Table 3 examines the comparison of the in-group and between-group CFS scores of the children participating in the study according to the procedure time, as reported by parents and the researcher. We found that there was no statistically significant difference between the groups in terms of fear scores evaluated by the child, parent, and researcher at all procedure times ($P > .05$). We determined that the highest fear score was found during the procedure in all 3 evaluations of the groups, and this result was statistically significant ($P < .001$). Furthermore, we saw that the fear score evaluated by the parent and the researcher after the procedure was higher in the control group and decreased in the intervention group compared with the preprocedure, even though it was not statistically significant.

Table 4 presents compatibility between the average of CFS scores (before, during, and after the procedure) determined according to the evaluations of the child, parent, and researcher. The consistency among the observers for the fear score is statistically significant in terms of the intervention

group and control group for each procedure time ($P < .001$).

COMPARISON OF GROUPS IN TERMS OF PHYSIOLOGICAL PARAMETERS AND CRYING TIMES

Table 5 shows the comparison of physiological parameters (pulse, SpO₂) and crying time of the children participating in the study according to the procedure time. Although there was no significant difference between the groups before and during the procedure in terms of pulse averages ($P > .05$), we found that the postprocedure pulse averages of the intervention group were higher than those of the control group, and there was a significant difference ($t = 3.06$, $P = .003$). According to the averages, we determined that the highest pulse average was in the intervention and control group (within itself) during the procedure, and this result was a statistically significant difference ($P < .001$). In terms of SpO₂ values, we saw that there was no statistically significant difference both within and between the groups in terms of all procedure times ($P > .05$). According to the averages, the highest SpO₂ was found after the procedure in both the intervention and control group.

In terms of crying time, we found that there was no statistically significant difference between the groups in terms of all procedure times ($P > .05$). The highest crying time was during the procedure in both groups, and this result was statistically significant in terms of procedure time ($P < .001$).

TABLE 3
Comparison of CFS score averages within and between groups by procedure time

CFS self-reported	Preprocedure		During the procedure		After the procedure		Timepoint comparison test* P value	Pairwise comparisons†
	Mean	SD	Mean	SD	Mean	SD		
Intervention group (n = 30)	1.36	1.43‡	2.97	1.10‡	0.97	1.10‡	35.37 < .001	1-2: P < .001 2-3: P < .001
Control group (n = 30)	1.03	1.10‡	2.87	0.97‡	1.03	0.93‡	46.65 < .001	1-2: P < .001 2-3: P < .001
Group comparison, z‡ P	0.70		0.56		0.56	.58		
	.48		.58		.58			
CFS parent-reported	Preprocedure		During the procedure		After the procedure		Timepoint comparison test* P value	Pairwise Comparisons†
	Mean	SD	Mean	SD	Mean	SD		
Intervention group (n = 30)	1.70	1.47‡	2.67	1.12‡	0.83	1.12‡	29.85 < .001	1-2: P = .007 2-3: P < .001 1-3: P = .005
Control Group (n = 30)	0.97	0.96‡	2.83	0.99‡	1.00	0.95‡	47.90 < .001	1-2: P < .001 2-3: P < .001
Group comparison, z‡ P	1.90		0.53		1.06			
	.06		.60		.29			
CFS Researcher-reported	Preprocedure		During the procedure		After the procedure		Timepoint comparison test* P value	Pairwise comparisons†
	Mean	SD	Mean	SD	Mean	SD		
Intervention group (n = 30)	1.50	1.41‡	2.70	1.15‡	1.07	1.57‡	29.04 < .001	1-2: P = .001 2-3: P < .001
Control group (n = 30)	1.00	1.08‡	2.80	1.06‡	1.13	0.90‡	45.98 < .001	1-2: P < .001 2-3: P < .001
Group comparison, z‡ P	1.30		0.22		1.18			
	.20		.82		.24			

CFS, Children's Fear Scale.
 * Test: Friedman test (within group).
 † Test: Wilcoxon test.
 ‡ Same upper index in the line shows the statistical indifference (variance analysis in repeated measurements).
 § Test: Mann-Whitney U test (between group).

Discussion

This study investigated the effectiveness of the toy (with music and movement) distraction method for children who underwent IV insertion. The toy, used before, during, and after IV insertion, was expected to reduce fear and anxiety, shorten the crying time, and keep the vital signs within normal limits. However, the results did not support the hypotheses of the study. We found that the

intervention group and the control group had similar levels of fear and crying time, which were observed both by the parent and the researcher and reported by the children. Anxiety levels decreased only in the postprocedure intervention group compared with the control group. These findings are surprising. However, the literature reveals mixed findings when the effects of distraction methods used during invasive procedures in the 4- to 6-year-old age group are investigated. Some

TABLE 4

Intraclass correlation coefficient among child, parents, and researcher for Children's Fear Scale score averages by procedure time

Groups	Preprocedure			During the procedure			After the procedure		
	F	ICC	P value	F	ICC	P value	F	ICC	P value
Intervention group (n = 30)	9.30	0.89	< .001	16.10	0.93	< .001	14.65	0.93	< .001
Control group (n = 30)	16.10	0.94	< .001	31.58	0.97	< .001	6.73	0.85	< .001

F, analysis of variance test; ICC, intraclass correlation coefficient.

studies have demonstrated that various distraction methods used during invasive procedures in preschool kids were effective in minimizing fear and anxiety.²³⁻²⁷ Other studies have also reported that the therapeutic toy is an effective method in reducing stress, negative emotions, fear, and behavioral distress in areas other than the pediatric emergency department and during various invasive procedures.^{12,13,15,28,29}

In some studies, findings showed that the distraction methods were not effective on pain, fear, distress, and anxiety. Carlson et al³⁰ found that the kaleidoscope used during the invasive procedure was not effective on pain and fear, and Cassidy et al³¹ found that watching television during children receiving preschool immunizations was not effective on pain and anxiety. MacLaren and Cohen³² found that toy distraction, compared with cartoon-watching distraction, was not effective on the distress of young children who underwent venipuncture. A similar study found that the technique used by the parent to distract the child with a toy had no effect on pain and distress during vaccination.¹⁷ Potasz et al²⁸ examined the effects of playing in the toy library on depression and cortisol levels of 4- to 14-year-old children who were hospitalized because of respiratory disease; they found that it was ineffective in the 4- to 7-year-old age group. Another study showed that the Buzzy distraction (regional cold application with vibration, MMJ Labs, Atlanta, GA) used during the venipuncture procedure in 4- to 10-year-old children did not reduce their fear.³³ Burns-Nader et al³⁴ found that using a tablet computer during injection in 4- to 11-year-old children did not reduce pain and distress. Our study findings are similar to these previously published results.

In our study, we found no statistically significant difference between the intervention and control groups' fear levels during each procedure time among all 3 assessments (child, parent, and researcher) ($P > .05$). Furthermore, we found that the consistency of the fear score averages evaluated by

the child, parent, and researcher in terms of all procedure times were similar ($P < .001$). We interpret this finding to indicate that children understood the scale of fear well and made the assessment correctly. In some studies, the parents and nurse of the child evaluated the fears and pain of the children during the procedure, and there was significant correlation between the pain/distress level determined by the parent/nurse and the pain/distress level determined by the child.^{9,19,29,35} Therefore, we conclude that it is important to involve parents and nurses in the fear management and evaluation of children.

Along with fear and anxiety perception, there may be changes in pulse, blood pressure, respiratory rate, and SpO₂. One study reported that as the level of fear and anxiety increases, blood pressure and pulse rate may increase and SpO₂ may decrease; SpO₂ may increase as fear and anxiety decrease.³⁶ Measurements of physiological parameters are very useful in terms of determining anxiety and fear that may occur in the patient during invasive procedures. In our study, no significant difference was observed in the physiological changes (pulse and SpO₂) of the children during the procedure ($P > .05$). According to the averages, we determined that the pulse rate was highest during the procedure, and SpO₂ was the highest after the procedure, in both the intervention and control groups. Our findings were consistent with those in the previously published literature.³⁷⁻³⁹

Whereas we found no significant difference between the groups in terms of heart rate before and during the procedure ($P > .05$), the heart rate of the intervention group was significantly higher than that of the control group after the procedure ($t = 3.06$, $P = .003$). Although the postprocedure anxiety and fear levels of the children in the experimental group decreased compared with the levels during the procedure, the fact that the physiological parameter values did not concurrently stabilize suggests that the toy distraction is not effective in reducing the average heart

TABLE 5
Comparison of physiological parameters and crying time averages within and between groups by procedure time

Parameters	Preprocedure		During the procedure		After the procedure		Timepoint comparasion test* P value	Pairwise comparision†
	Mean	SD	Mean	SD	Mean	SD		
Pulse								
Intervention group (n = 30)	117.30	20.92‡	133.06	19.67‡	126.77	16.90‡	Group: $F = 3.58, P = .06$ Time: $F = 42.20, P < .001$ Group x Time: $F = 4.31, P = .02$	1-2: $P < .001$ 2-3: $P < .001$ 1-3: $P < .001$
Control group (n = 30)	114.20	13.79‡	125.79	14.99‡	111.67	21.08‡		
Group comparisons, t‡ P	0.68 .50		1.59 .12		3.06 .003			
SpO₂								
Intervention group (n = 30)	97.30	(2.25)‡	96.86	(2.75)‡	97.53	(2.70)‡	Group: $F = 0.004, P = .95$ Time: $F = 1.29, P = .26$ Group x Time: $F = 0.67, P = .42$	-
Control group (n = 30)	95.73	(13.58)‡	97.30	(1.23)‡	98.56	(1.10)‡		
Group comparisons, t‡ P	0.52 .61		0.79 .43		1.94 .06			
Crying time								
Intervention group (n = 30)	4.83	7.60‡	32.00	20.24‡	10.28	9.23‡	Group: $F = 0.04, P = .95$ Time: $F = 34.81, P < .001$ Group x Time: $F = 0.74, P = .48$	1-2: $P = .007$ 2-3: $P = .007$
Control group (n = 30)	8.30	14.79‡	28.50	29.75‡	11.47	27.33‡		
Group comparisons, t‡ P	1.14 .26		0.53 .60		0.42 .68			

* Test: 2-way analysis of variance in repeated measurements (within group).
 † Test: Wilcoxon test.
 ‡ Same upper index in the line shows the statistical indifference (variance analysis in repeated measurements).
 § Test: independent sample t test (between group).

rate. Studies conducted on this topic have shown mixed results regarding changes in physiological parameters in children during painful and stressful procedures. Aitken et al⁴⁰ and Miller et al⁴¹ found that, similar to our study, there was no significant difference between the groups' pulse rates during the procedure. Another similar study reported that the postprocedure heart rate of the children in the digital game group was higher than of those in the control group, but the difference was not significant.⁴² The same study did not report any significant difference between the groups in terms of other vital signs and SpO₂ averages.⁴² Further research is needed to evaluate the effect of the toy distraction method on physiological parameters.

In our study, there was no statistically significant difference between the groups in terms of crying time, and crying time in both groups was the highest during the procedure. In the study of Meiri et al,⁴³ investigating the effect of medical clowns on pain and anxiety during venous blood drawing in children between 2 and 10 years old, they found that the crying time of children in the intervention group was significantly lower than that in the control group. In the study of Pontes et al,⁴⁴ investigating the effect of therapeutic play on behavioral responses during vaccination in 3- to 6-year-old children, they found that the control group cried more and showed reactive behaviors compared with the intervention group. Tsao et al⁴⁵ found that the group on which a picture book was used had less crying and reactive behavior compared with the control group. This study is not similar to these findings observed in the literature. In the study of Akgül et al,²³ a difference in total crying time and crying time after the blood drawing procedure was noted between groups for children watching a cartoon video in 3- to 6-year-old children. No significant difference in crying time during the procedure was noted, which is similar to our study.²³

Limitations

This study has some limitations. The first of these involves a small sample size. The study was only conducted while the nurse applying the IV insertion was on duty (the nurse worked day/night shifts on different days of the week). This was the second limitation in our study. Another limitation was the fact that there are numerous reasons for crying that may not all be explicitly known. In children, crying can sometimes be caused by various factors (physical, emotional, and cultural). Study participants with various acuity levels and hydration status may also have resulted in unmeasured confounding. This study was not double blind. The first researcher evaluated the children's physiological parameters and fear scores. The researcher knew

which child was in which study group. In future research, the potential for observer bias should be further minimized. In addition the clinical trial protocol was not registered.

Implications for Emergency Clinical Care

Medical and nursing procedures can cause fear and anxiety in children, and these experiences can have lasting effects into adulthood. Health care professionals need to consider useful interventions such as controlling or alleviating children's fear and anxiety during these procedures to increase the comfort of the child and family in pediatric emergency departments and to improve the quality of nursing care.⁴⁶ This randomized clinical trial is the first (original) in that the toy (with music and movement) has not been studied for preschool children before. With this study, we aimed to reduce children's fear and anxiety. However, these findings were surprising to us because previous studies on the therapeutic play/toy distraction method indicated that this method was effective. Although our study results did not reveal significant differences during procedure, this distraction method is safe and practical, takes a short amount of time, and is cost-effective. It can be considered as a clinical alternative for distraction during IV insertion or other procedures. Therefore, the effect of this promising distraction technique should not remain with these study results. Future studies are recommended to support toy distraction with larger sample groups in preschool groups, in different pediatric clinics/departments, in various invasive/noninvasive interventions, and to compare cost, convenience, and effectiveness with various distraction methods.

Conclusion

Although the toy distraction method tested in this study decreased fear and anxiety levels (during and after IV insertion procedure) in 4- to 6-year-old children in the intervention group, the results were not statistically significant in comparison with the control group. Studies on the effects of distraction methods used in preschool children in the emergency department on fear and anxiety are limited. Further studies should be conducted in this population. Future research is suggested to support toy distraction with larger sample groups in various invasive/noninvasive interventions, with evidence-based studies in different age groups, and to compare with various distraction methods. Emergency departments are areas of rapid patient movement and with possible time and space

constraints. For the nurses working in the emergency department to be better equipped in cooperation with the child, awareness should be raised regarding the mitigation of children's pain, fear, and anxiety. The use of various distraction methods in the emergency department will enhance and contribute to clinical and care services, helping minimize fear and anxiety for children in the clinical environment.

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NATIONAL ESTIMATES OF WORKPLACE TELEHEALTH USE AMONG EMERGENCY NURSES AND ALL REGISTERED NURSES IN THE UNITED STATES

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Contribution to Emergency Nursing Practice

- What is already known on telehealth is emerging as an essential modality to provide emergency care.
- The main finding of this paper is a larger proportion of emergency nurses reported telehealth was used in their clinical setting and in their individual clinical practice compared to other hospital nurses.
- Recommendations for translating the findings of this paper into emergency clinical practice include emergency nurses may be poised as potential leaders in the discipline on telenursing models of care that require inpatient nursing skills.

Abstract

Introduction: The goal of this research was to quantify the baseline status of prepandemic workplace emergency nursing telehealth as a key consideration for ongoing telehealth growth and sustainable emergency nursing care model planning. The purpose of this research was to: (1) generate national estimates of prepandemic workplace telehealth use among emergency and other inpatient hospital nurses and (2) map the geographic distribution of prepandemic workplace

emergency nurse telehealth use by state of nurse residence.

Methods: We generated national estimates using data from the 2018 National Sample Survey of Registered Nurses. Data were analyzed using jack-knife estimation procedures coherent with the complex sampling design selected as representative of the population and requiring analysis with survey weights.

Results: Weighted estimates of the 161 865 emergency nurses, compared with 1 191 287 other inpatient nurses revealed more reported telehealth in the workplace setting (49% vs 34%) and individual clinical practice telehealth use (36% vs 15%) among emergency nurses. The geographic distribution of individual clinical practice emergency nurse telehealth use indicates greatest adoption per 10 000 state residents in Maine, Alaska, and Missouri with more states in the Midwest demonstrating emergency nurse adoption of telehealth into clinical practice per population than other regions in the United States.

Discussion: By quantifying prepandemic national telehealth use, the results provide corroborating evidence to the potential long-term adoptability and sustainability of

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telenursing in the emergency nursing specialty. The results also implicate the need to proactively define emergency nursing telehealth care model standards of practice, nurse competencies, and reimbursement.

Key words: Telenursing; Telemedicine; Health utilization; Emergency; Emergency nursing

Introduction

The SARS-CoV-2 (COVID-19) pandemic presented the need to rapidly evolve the traditional in-person care model to decrease exposure. Emergent infection control considerations for clinicians and patients in higher risk health care settings and worldwide shortages of personal protective equipment gave rise to telehealth as a crucial component of emergency health care during the pandemic.¹⁻³ Telehealth, defined as a remote health care encounter between 2 clinicians or between a patient and a clinician, can be used for direct patient care at home, remote consults to specialists, and chat visits asynchronously.⁴⁻⁹ During the pandemic, telehealth has been quickly leveraged to (1) safely keep people at home; (2) disseminate information; (3) allow decisions around testing to be made; (4) coordinate testing when appropriate; and (5) risk stratify patients for evidence-based and resource efficient care.¹⁰⁻¹²

Although telehealth has existed for decades, its use in emergency departments had not been widespread over the last 10 years; it grew significantly in 2020 requiring quick expansion and uptake.¹⁰⁻¹² Telehealth definitions, compared with telemedicine, are characterized as more all-encompassing, including medical encounters as well as the programs, processes, and community objectives and will be used for this article.¹³ Telehealth use in emergency departments includes on-demand care for patients at home, teletriage or evaluating ED patients remotely for orders and triage, on-site consults for remote evaluation between patient and ED provider or specialist, and provider-to-provider consults between hub and spoke hospitals. Specifically, studies have demonstrated the feasibility, efficacy, and effectiveness for emergency interdisciplinary and medical care provided by telehealth for stroke,^{14,15} cardiovascular,¹⁶ trauma,¹⁶⁻¹⁹ burn,²⁰ and eye²¹ emergencies with an emphasis on decreasing rural access disparities²² and mortality.¹⁴⁻¹⁶

The state of the science around telehealth specific to the ED setting is still emerging, hastened by the COVID-19 pandemic.^{23,24} Before the pandemic, telehealth use in the emergency department contributed to the reduction of ED workload burden and improved patient outcomes. This was seen in triage, assessment, and treatment of lower acuity complaints and in providing care to individuals in communities without immediate access to emergency care. For example, outpatient direct-to-consumer programs can

be used to prioritize which patients can be evaluated virtually, and assist in determining the best location for care (eg, emergency department or primary care setting).²⁵ In a matched cohort study evaluating efficiency and patient safety in the emergency department, screening by means of telehealth achieved the same level of efficiency as in-person screening.²⁶ A 2015 systematic review of telemedicine applications for ED use described its value in addressing health care needs and access for rural communities.²⁷ A 2018 report described a teletriage program with the goal of optimizing ED efficiency and increasing patient satisfaction.²⁸ A study on the same ED efficiency and patient satisfaction goals in 2019 showed that ED throughput is not affected despite improved time to provider and left without being seen.²⁹ A 2019 systematic review of use of telehealth in rural areas also supported the idea of a program reducing unnecessary patient transfers and overtriage (defined as misidentification of patients presenting with minor illnesses/injuries who on initial assessment appear to be critically ill), meanwhile allowing local emergency departments to support and manage patients without transfer.⁵ Reports from the COVID-19 pandemic have found that willingness to use telehealth was high.²⁴ The benefits of interdisciplinary ED telehealth are balanced by its limitations: lack of information exchange, limited examination, lack of access to diagnostic testing, and unidentified unmet needs.⁵

Furthermore, the telehealth platform is a promising format in which to deliver nursing care, including patient history, adapted visual or sensor-assisted physical examinations, patient counseling and education interventions, follow-up evaluation, and care coordination. In the outpatient setting, nurse-led models of care have been well established for home monitoring to reduce the exacerbations of common chronic diseases such as congestive heart failure³⁰ and provide care for older adults who are frail.³¹ The pandemic challenges have resulted in nurse-led innovations in telehealth use in the inpatient setting as well. For example, telehealth is emerging as an essential modality by which to engage remote family presence in the care of a patient physically receiving intervention and monitoring in the emergency department or hospital setting.³²⁻³⁴ A substantial gap in the published science has been identified relative to telenursing care in disaster response.³⁵ By reducing physical job demands, risk for violence, and infectious disease exposures while potentially enabling more flexible scheduling options, telehealth may

TABLE 1
Telehealth variables from NSSRN survey items

Survey section header

"In the following questions, the term telehealth refers to communication technology, such as remote conferencing through phone and/or video, used to connect geographically dispersed practitioners"

Variable name	Question identifier	Stem	Response options
Telehealth in the workplace setting	B21	For the primary nursing position you held on December 31, 2017, did your workplace use telehealth?	<ul style="list-style-type: none"> • Yes • No->Skip questions below
Individual clinical practice telehealth	B22	Did you personally use some form of telehealth in the primary nursing position you held on December 31, 2017?	<ul style="list-style-type: none"> • Yes • No->Skip questions below
Telehealth type	B23	Which type(s) of telehealth did you use in the primary nursing position you held on December 31, 2017?	<ul style="list-style-type: none"> • Provider to Provider • RN to patient direct calls (eg, care management/home monitoring) by phone and/or video • NP primary care e-visits* • Other

NSSRN, National Sample Survey of Registered Nurses; NP, nurse practitioner; RN, registered nurse.

* Not analyzed in this study focusing on emergency nursing use.

be a crucial priority option to enhance disaster surge demands for nursing workforce capacity by continuing to engage retired or injured nurses in emergency nursing care delivery.³⁶ Thus, although the use of telehealth by clinical site to clinical site as hub and spoke,⁴⁻⁹ and by emergency licensed independent providers²⁷ has been quantified, there remains a gap in the currently published science on the rate of telehealth use among inpatient nurses in general, and emergency nurses specifically.

PURPOSE

To address the gaps in the currently published science, the purpose of this research was to (1) generate national estimates of prepandemic workplace telehealth use among emergency and other inpatient hospital nurses and (2) map the geographic distribution of prepandemic workplace emergency nurse telehealth use by state of nurse residence.

Methods

We generated national estimates using data from the 2018 National Sample Survey of Registered Nurses.³⁷ We downloaded the dataset on January 19, 2021. As this was an

epidemiologic analysis of a publicly available dataset, the study was not considered human subjects research, and no human subjects ethical review or approval was required. Survey validity, reliability, sampling, and administration procedures are available on the US Department of Health and Human Services website.³⁷ Population density estimates from 2018 by state were downloaded from the US Census Bureau website.

SURVEY DEVELOPMENT

As a secondary epidemiological analysis of an existing dataset, the authors of this research did not develop the original survey data collection tool.³⁷ The US Census Bureau administered the survey on behalf of the Department of Health and Human Services. According to federal guidelines for statistical surveys established by the Office of Management and Budget, survey items are prepared using a standard process that includes cognitive interviewing for validity.³⁸

PARTICIPANTS

Inclusion criteria for this analysis were registered nurses who reported that their primary nursing position on December 31, 2017 was in a hospital inpatient or ED setting and

TABLE 2
National estimates of the demographic characteristics of emergency nurses and other inpatient nurses

Variable	Emergency nurses (N = 161 865)		Other inpatient nurses (N = 1 191 287)	
	N	%	N	%
Sex				
Male	35 594	21.99	134 973	11.33
Female	126 271	78.01	1 056 314	88.67
Age,* <i>mean [95% CI]</i>	40.70	[39.84-41.57]	42.59	[42.25-42.94]
Race and ethnicity				
Hispanic	22 791	14.08	140 691	11.81
White non-Hispanic	114 843	70.95	826 753	69.40
Black non-Hispanic	10 732	6.63	88 989	7.47
Asian non-Hispanic	6021	3.72	85 654	7.19
American Indian	664	0.41	2740	0.23
Pacific Islander	3108	1.92	7267	0.61
Other	1489	0.92	13 700	1.15
Multiple	2218	1.37	25 613	2.15
Marital status				
Married	105 973	65.47	808 050	67.83
Widowed, divorced, or separated	22 645	13.99	160 228	13.45
Never married	33 247	20.54	223 009	18.72
Highest degree in nursing				
Diploma	2784	1.72	50 931	4.23
Associate's	58 709	36.27	379 306	31.84
Bachelor's	89 576	55.34	707 148	59.36
Master's	10 635	6.57	52 774	4.43
Doctorate	162	0.10	905	<0.01
Years of experience in nursing,† <i>mean [95% CI]</i>	10.93	[10.10-11.76]	12.97	[12.61-13.32]
Work time				
Full-time	135 837	83.92	955 889	80.24
Part-time	26 028	16.08	235 398	19.76
Usual h/wk, <i>mean [95% CI]</i>	37.16	[36.33-37.98]	36.48	[36.15-36.82]
Household annual income in USD				
≤25,000	324	0.20	3693	0.31
25,001-3,000	453	0.28	6076	0.51
35,001-50,000	5924	3.66	62 185	5.22
50,001-75,000	33 344	20.60	262 798	22.06
75,001-100,000	38 330	23.68	300 085	25.19
100,001-150,000	46 229	28.56	360 245	30.24
150,001-200,000	25 073	15.49	124 132	10.42
>200,000	12 188	7.53	72 073	6.05

USD, United States dollar.

* Truncated at 78 years.

† Truncated at 50 years.

TABLE 3

Telehealth use

Telehealth variables	Emergency nurses (N = 161 865)		Other inpatient nurses (N = 1 191 287)	
	N	%	N	%
Telehealth in the workplace setting	79 816	49.31	399 558	33.54
Individual clinical practice telehealth	58 838	36.35	183 458	15.40
Telehealth type				
Provider to provider	43 105	26.63	115 317	9.68
Nurse to patient	9210	5.69	65 521	5.50

whose primary position included any patient care. Those who reported their primary nursing position was “Emergency Department, not Critical Access Hospital” were coded as emergency nurses. Those who reported working in a Critical Access Hospital, inpatient unit, hospital ancillary unit, other hospital setting, inpatient mental health/substance abuse, or inpatient hospice unit were included as other inpatient unit nurses. We excluded nurses who had retired and advanced practice registered nurses from this analysis (certified registered nurse anesthetists, certified nurse specialists, nurse midwives, and nurse practitioners). We also excluded those who reported a primary nursing position in clinic/ambulatory settings, hospital nursing home unit, hospital administration, nursing home, rehabilitation or long-term care, correctional facility, or other types of settings (eg, home health, occupational health, insurance company, dialysis center).

VARIABLES

We included demographic information collected on sex, race/ethnicity, age, marital status, highest educational attainment in nursing, years of experience in nursing, full-time/part-time, usual number of hours worked per week, and household income. Telehealth was quantified for this study using the items listed on [Table 1](#).

ANALYSIS

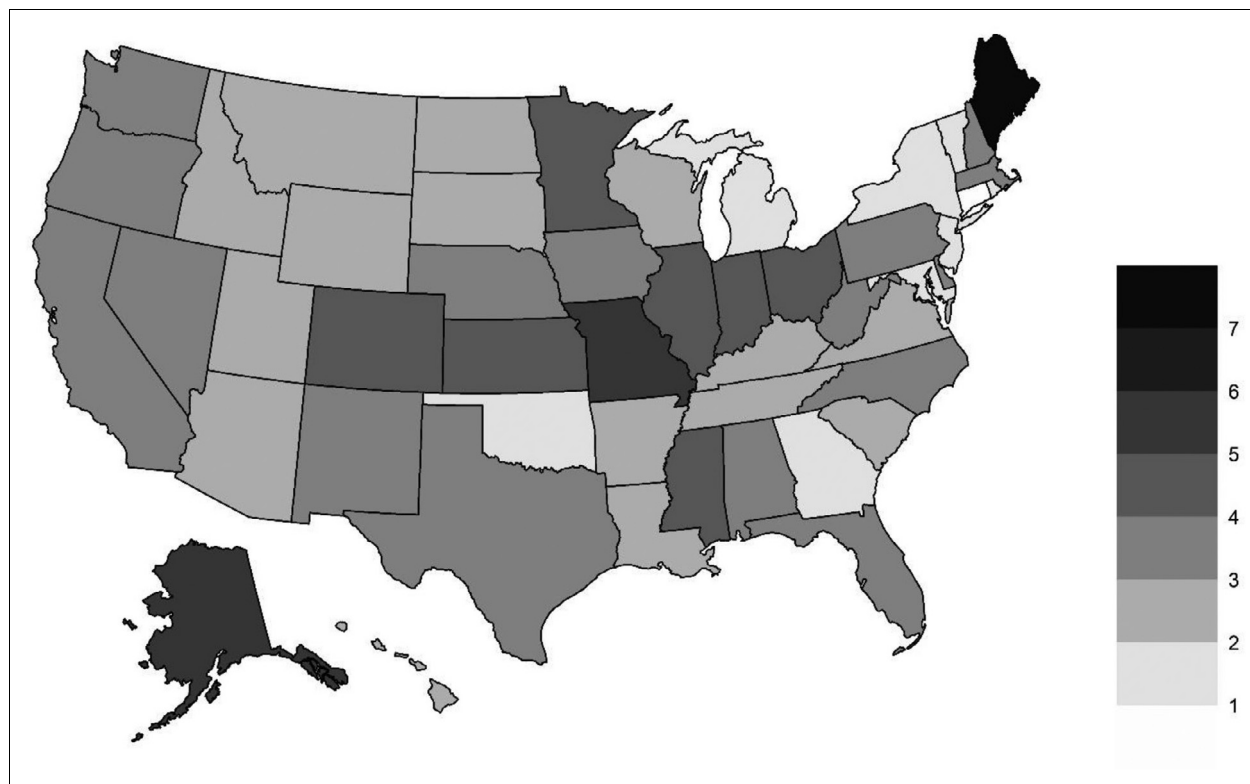
Consistent with the analytic technique recommended by the survey developers to obtain nationally representative estimates, sample estimates were applied using the jack-knife estimation procedure. The jack-knife estimation procedure was recommended by the survey developers to obtain weighted population estimates. Briefly, the procedure allows for a more unbiased estimate of the standard error, significance, and confidence interval compared with traditional

statistics. The procedure iteratively slices out 1 observation at a time to generate a pseudo value, thereby reducing undue influence of any 1 observation or outlier on the final numerical estimates. Weighted estimates were reported. We used STATA (version 14.0, STATA Corporation, College Station, TX) software. Using R (version 4.0.3, R Core Team, Vienna, Austria) software, a choropleth map was generated to visualize the geographic distribution of emergency nurses who endorsed individual clinical practice telehealth use by state per capita of the general population. A choropleth map is a geographic map with areas shaded in various depth or color intensity to visualize data points by geographic characteristics.

Results

Nearly 4 million registered nurses are represented in the original dataset (weighted N = 3 957 661) which is a weighted national estimate derived from 50 273 respondents. The subpopulation included in this analysis represented 1.4 million nurses estimated from 859 emergency nurses (weighted N = 161 865) and 7359 other inpatient nurses (weighted N = 1 191 287). [Table 2](#) includes the national estimates of the demographics for emergency and other inpatient nurses.

[Table 3](#) depicts telehealth use by percent of emergency nurses compared with other nurses. Nearly half (49.31%) of emergency nurses reported that telehealth was used in their workplaces at the end of 2017, whereas only one-third (33.54%) of other inpatient nurses reported that telehealth was used in their work environment. More than twice the proportion of emergency nurses (36.35%) reported using telehealth in their own clinical practice than other inpatient nurses (15.40%). Although the direct nurse-to-patient percentages of telehealth use were similar (both 5%-6%), 27% of emergency nurses participated in provider-to-provider



FIGURE

Emergency nurse individual clinical practice telehealth use per 10 000 state population. Results for North and South Dakota (West North Central Other); Montana and Wyoming (Mountain Other); Rhode Island and Vermont (New England Other) were combined from bi-state, rather than single state, data and averaged across the 2 states. Nurses were analyzed by their state of residence, which may not represent the state in which they were actively working.

telehealth, whereas only roughly 10% of other inpatient nurses individually, in clinical practice, used the telehealth platform for provider-to-provider consultation and care.

The geographic distribution of individual clinical practice telehealth use by emergency nurses per state capita is depicted on Figure. The highest use rates were in Maine (7.36/10 000), Missouri (5.42/10 000), and Alaska (5.02/10 000). The lowest rates were observed in Connecticut (0.94/10 000), Maryland (1.35/10 000), and Georgia (1.38/10 000).

Discussion

We conducted a secondary data analysis of prepandemic telehealth use to better understand and contextualize the rapid growth of telehealth use during the COVID-19 pandemic. To our knowledge, this is the first study to generate national estimates of emergency nurse telehealth

use and other inpatient nurse telehealth use at the national US level. Although the COVID-19 pandemic has necessitated exponentially increased use of telehealth modalities to reduce infectious disease exposures, we quantified prepandemic use estimates, which provide baseline knowledge that contributes to the advancement of telehealth adaptation and growth.

The main findings of our results indicate that at the end of 2017, half of the emergency nurses already reported telehealth use in their work environments with more than one-third of emergency nurses using telehealth in their own clinical practice. Our baseline figures indicate that telehealth in emergency care before the COVID-19 pandemic was common and will only continue to grow. As it expands, there is a large need for better care collaboration, which includes a variety of care team members including nurses. In provider-to-provider services, nurses can provide direct care and support interdisciplinary care and care coordination. Advanced practice providers have already been used in teletriage for direct patient care and screening for e-visits. Despite these use

cases, emergency telenursing may have been vastly underused, likely owing to the low engagement of telehealth before the pandemic, reimbursement models, and the need for specific roles and care models during the pandemic. The future of emergency telenursing requires an intentional plan that includes defining and advocating for the unique value that nursing provides in emergency telecare, education and training that reflects the new telehealth scope, and reimbursement and implementation processes that enable successful caregiving practices.

In our study, telehealth use among emergency nurses was much higher than among other inpatient nurses, in which only one-third reported telehealth in their work environment and only half of these reported integrating the modality into their own personal clinical practice. This widespread experience and adoption in the specialty pre-pandemic provides an important implication for prioritizing the ongoing growth of telehealth in emergency nursing as a solution to pandemic- and pandemic recovery–related challenges. For example, the occupational exposures of the pandemic place emergency nurses at high risk for burnout.³⁹ The different job demands and task variety inherent to integrating telehealth care delivery may eliminate several root causes of burnout in future crises. These improvements include adding telehealth shifts into in-person care shift mix, more flexible hours and scheduling, different types of patient interactions, and better career development. Telehealth also allows for more interaction with specialists and can extend both the scope and practice for nursing staff. These hypothetical advantages require further research evidence, but much newer research shows that having mixed shifts and access improve some burnout symptoms.^{39,40} Some nursing staff may find the change and feeling of distance to patients as a disadvantage; however, with training geared at bedside manner (a term referring to bedside manner in the telehealth setting) and virtual care empathy, some of this feeling of interpersonal distance can be alleviated. Telehealth care delivery shifts will continue to make a change in how data and information will be exchanged between patient and clinicians.

The geographic distribution of individual clinical practice nurse telehealth use in our study indicated greatest clinician adoption per 10 000 state residents in Maine, Alaska, and Missouri. More states in the midwestern region demonstrated higher adoption of telehealth than western, north-eastern corridor, middle Atlantic, or southern states. Although telehealth use increased substantially as a result of the COVID-19 pandemic in the US, disparities in its uptake exist because of connectivity, access to devices and services that are being offered in these regions.⁴¹ Although telehealth had initially been reimbursed in rural areas

allowing for increased use, 1 study of telehealth use during the COVID-19 pandemic reported urban residents as more likely to use these modalities over rural participants.⁴² Within urban areas, not all groups of residents used these programs equally. Ongoing and priority efforts are required at the individual practice, organization, region, state, and national levels to ensure telehealth adoption and availability are used to decrease access disparities, rather than exacerbate a digital access divide.

Whereas many benefits of telehealth exist, concerns and potential shortfalls are well documented. Misguided reliance on emergency telehealth could increase already existing racial, socioeconomic, and geographic disparities especially for populations that lack device and internet access and technological literacy.^{32,34} Finally, although temporary provisions have been made during the COVID-19 pandemic to allow for the use of technological platforms that might not be Health Insurance Portability and Accountability Act compliant, there's a continued need to evaluate and address concerns regarding issues specific to patient privacy.^{33,34} Emergency nursing leaders are in a crucial place to leverage their clear position as pre-pandemic early adopters of site-to-site telehealth adoption, as seen in the results of our present study with disaster pandemic telehealth use. The specialty expertise inherent with being early adopters of site-to-site may be leveraged to inform disaster recovery and post-pandemic care models for direct-to-patient nursing care requiring inpatient nursing expertise and skill levels. Although much of the current telehealth growth was supported by special disaster waivers for reimbursement and privacy,³⁵⁻³⁴ proactive planning for sustained emergency telenursing models is timely and important to leverage crucial opportunities to improve access and efficiency and balance emergency workforce job demands with novel care delivery opportunities.

EMERGENCY PATIENT OUTCOMES AND NURSE SENSITIVE TELENURSING INDICATORS

Although decades of research have established the feasibility, efficacy, and effectiveness of interdisciplinary and medical emergency telehealth, telehealth patient outcomes that are most affected by nursing care or emergency nursing care have yet to be clearly defined and delineated. Theoretical development, informatics, and outcomes research specific to nursing are needed in this area. Between 2011 and 2013, Mueller et al²² evaluated tele-emergency services in the upper Midwest between rural low-volume hospitals and an urban “hub” emergency department. The study results included improved quality of care, improved care

coordination, and expansion of the care team and resources during critical events.²² Previous research has shown other important outcomes with the use of tele-emergency/teleconsultation. These include confirmation and alteration of patient diagnosis and treatment, better care management, guidance in preparing patients for transfer, reduction in unnecessary patient transfers, and recommendations for transfer to local care vs specialist care.^{5,14-22} For example, by examining high resolution images, ophthalmologists were able to recommend where to transfer patients—to local facility vs specialist care.²¹ Similarly, by viewing images, burn specialists were able to recommend to what type of facility patients should transfer.²⁰ In addition, several studies have illustrated the use of real-time telehealth consultation with specialists in stabilizing serious trauma patients before transferring to a trauma center.¹⁶⁻¹⁹ Furthermore, for patients with stroke or acute myocardial infarction, teleconsultation has improved adherence to clinical protocols and reduced mortality.¹⁴⁻¹⁶ As our results demonstrate a prepandemic update of emergency nursing telehealth, additional scholarship is needed to elucidate best-practice emergency telenursing activities, patient outcomes, and nurse-sensitive measures of telehealth feasibility, efficacy, and effectiveness.

TELEHEALTH IN DISASTER SETTINGS

Our results provide prepandemic baseline estimates before a rapid uptake and evolution in response to the large-scale disaster care of the COVID-19 pandemic. Telehealth in disaster settings has evolved from its use by the military or nongovernmental organizations in austere and conflict-affected areas. A clear advantage of telehealth during a disaster is the ability for affected communities to rapidly access health care using out-of-state providers (when providers are licensed to provide care in the patient's state, participate in interstate compacts, or state licensing requirements are relaxed under emergency executive orders),⁴³ while also minimizing the logistical and safety issues.^{44,45} However, limitations in telehealth in disaster settings in the past have included a lack of infrastructure such as limited or nonfunctioning cellular service and restrictions on health care provision across state lines.^{43,46} Early in the COVID-19 pandemic, the Centers for Medicare and Medicaid Services expanded telehealth services under an 1135 waiver—allowing for Medicare to pay for office, hospital, and other visits completed by telehealth, as well as allowing flexibility in reducing or waiving the cost-sharing requirement for telehealth visits paid by federal health care programs.⁴⁷ Substantial changes in telehealth coverage spurred by the events of

2020 will likely continue into the future, as policy around telehealth evolves.⁴⁸ Health care will likely see a rapid increase in innovations in telehealth as a result of the pandemic. Launched during the COVID-19 pandemic, the Department of Defense in conjunction with the Veteran's Health Administration is developing the National Emergency Tele Critical Care Network, a cloud-based health information system designed to provide virtual critical care during disasters and other public health emergencies.⁴⁹ In the postdisaster recovery phase, it is reasonable to anticipate major advances in telehealth reimbursement, privacy, and nurse education or competency rules and regulations.⁵⁰ The crisis places the emergency nursing specialty in a crucial position and inflection point to proactively define sustainable and effective emergency nursing care models in the disaster recovery and postpandemic phase.⁵¹

FUTURE RESEARCH ON FAMILY PRESENCE

The 2018 National Sample Survey of Registered Nurses did not include family presence specifically as a type of telehealth (Table 1). The provision of patient- and family-centered care in the emergency department is vital to ensuring high-quality care experience, and failure to incorporate family presence into emergency care can lead to a multitude of adverse consequences.⁵² The advancement of emergency telehealth has the potential to dramatically shift how patient- and family-centered care is delivered, but there is a paucity of evidence to address potential barriers and a lack of guidance related to provider and family education, resource acquisition, and policies and procedures specific to the virtual integration of family presence in emergency care.³²⁻³⁴ In the emergency department, family presence has traditionally relied on physical presence by allowing caregivers at the bedside, practicing regular structured in-person communication, and engaging multidisciplinary support during an emergency encounter, but as telehealth continues to expand, challenges remain to support family presence in the absence of in-person interactions.³³

Family satisfaction with emergency telehealth is due in part to flexibility in timing, decreased costs associated with travel, increased access to social support, better ability to tailor care delivery to patient and family needs, reduced wait times, and fewer interactions with sick people.^{30,53,54} Telehealth also offers opportunities to involve additional family caregivers who may not be physically present at the time of acute illness or injury.^{34,53} In addition, increased use of telehealth may mitigate existing barriers that have plagued full adoption of family presence in emergency care. For example, issues with crowding and high acuity

negatively affect clinicians' ability to provide respectful, sensitive care, but improved triage and care efficiencies with telehealth may reduce workload burden and lead to less rushed, higher quality, and more invested care interactions. In addition, the lack of a previous existing relationship between the patient, their family, and the ED clinician can inhibit the ability to quickly establish a connected care partnership. Telehealth can create more personalized interactions by allowing clinicians to connect to patients and families on a personal level from their homes. Finally, emergency telehealth may help facilitate communication and care coordination by simultaneously engaging language interpreters and consulting physicians in a telehealth session.⁵²

Limitations

Consistent with any study that relies on self-reported measures, the results should be interpreted to represent the perceptions of nurses nationally in the US and may not accurately quantify the actual telehealth device and platform available in organizations across the country. The sampling design and weights used are best-practice methods to generate a nationally representative sample, though response and representation bias are possible. The geographic distribution depicts the nurse's state of residence, which may not represent their state(s) of practice. This was a limitation particularly for travel and short-term contract nurses or those who participate in interstate compacts and deliver care in several states during the same clinical shift. We excluded nurses who did not deliver direct patient care, which may have limited the perceptions of an organization's telehealth use from an executive's or a manager's perspective or from places such as poison control centers located adjacent to or within emergency departments. As telehealth platforms and activities expand to include additional video and sensor capabilities, the conceptual meaning of what does or does not constitute telehealth may also change, creating a measurement error in how participants interpret and respond to the survey items for nursing activities such as telephone voice-only telerriage or previsit patient consultation.

Implications for Emergency Clinical Care

Our results and discussion can be used to raise awareness among emergency nurses about integrating various forms of telehealth into individual practice, as a potential replacement for several traditional in-person care activities (such as

patient education), site-to-site access to higher levels of care or specialization, and a family presence platform. We demonstrate that emergency nurses were prepandemic early adopters and leaders among inpatient nurses for site-to-site telehealth care delivery, positioning the specialty as potential leaders for all postdisaster telenursing models of care that require inpatient nursing skills. Inpatient and emergency nurse leaders are also in a crucial position to develop novel and telehealth-adapted nursing care models that integrate telehealth platforms to enhance remote family presence; shift physical care processes to remote care platforms when feasible; and integrate remote monitoring, patient education, and patient history taking. Interdisciplinary collaboration is essential in developing this leadership and telehealth innovation for inpatient care. Whereas a larger percentage of emergency nurses used provider-to-provider telehealth compared with other inpatient nurses before the pandemic, only between 5% and 6% of all hospital nurses used direct-to-patient health care in their individual practices. Thus, emergency nurses were early adopters of telehealth in general, but telehealth use in providing direct patient care was substantially limited prepandemic, and sustainable growth will require thoughtful and structured change management in the absence of extensive prepandemic direct telehealth care experience.

The job demands of the pandemic resulted in increased telehealth to reduce unnecessary infection exposure and divert nonurgent patients from the hospital setting as disaster surge resource conservation. Whereas much of the published literature indicates the need to shift emergency nursing care to the telehealth platform whenever possible, this telehealth function was actually largely performed or assumed by licensed independent providers^{55,56} responsive to financial structures, rapid care models, competency development, and reimbursement models and waivers that prioritize licensed independent provider provision of telehealth direct to patient care.⁴⁷ Without intentional and aggregate advocacy through organizations such as the Emergency Nurses Association, we risk missing an opportunity to optimize emergency nursing telehealth and revert to prepandemic care models. Priority engagement of nurse executives, emergency managers, advanced practice care providers, nurse educators, bedside nurses, and interdisciplinary colleagues is essential in this moment in time to proactively define the next generation of nurse competency, care models, and reimbursement practices.

Anticipating the future as telehealth models evolve, emergency nurses are in a crucial role to evaluate the quality and usability of telehealth service provider vendors and technology in their practice settings, while influencing the organization's purchasing decisions to support high-quality and

affordable care. As a specialty, emergency nurses are poised in an essential position in this pandemic recovery era to redefine not only telehealth nursing models but the role of the stretcher-side nurse in telehealth with well-defined practice competencies and educational requirements.⁵⁷ As emergency telehealth evolves to incorporate home-based emergency care, there will be a larger scope of practice using this technology, and telenursing will become crucial to care coordination and team-based practice. Caution and sensitivity to patient privacy are paramount as telehealth models exponentially evolve, with an ongoing priority need to evaluate and address both Health Insurance Portability and Accountability Act compliance and proactively prevent and mitigate issues specific to protecting patient privacy.^{33,34} Furthermore, to develop sustainable growth in emergency telehealth care models, additional roles may need to be created to help clinicians, families, and patients navigate and troubleshoot technology.³³ Educational content specific to patient-centered care and family presence must be added to both professional education curricula as well as tailored to patients and families.^{34,52,58} Establishment of immediate, individualized assessments of patient and family dynamics, available resources, needs, and care goals is critical to successfully implementing emergency telehealth.⁵²

Conclusions

Emergency telenursing has expanded because of the pandemic. We suggest that including nursing in future policy, education, and processes will expand how well care collaboration will be for patients. The input of emergency nursing leaders is essential to continue to define reimbursement for the valuable services the specialty's workforce can provide over telehealth. As technology use increases, nurses will continue to be key members of the clinical care team and need to not only be included but also lead the aspects of the interdisciplinary decision-making process that defines nursing practice in the future of health care.

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Supplementary Data and Analytic Code

The data used for this study is publicly available at the United States Census Bureau Website.³⁷ Analytic code is available as e-content can be found in the online version at doi:10.1016/j.jen.2021.07.001.

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RISK ASSESSMENT OF SELF-INJURIOUS BEHAVIOR AND SUICIDE PRESENTATION IN THE EMERGENCY DEPARTMENT: AN INTEGRATIVE REVIEW

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NCPD Earn Up to 11.5 Hours. See page 117.

Contribution to Emergency Nursing Practice

- Suicide is preventable; therefore, it is vital that evidence-based tools are used for identification, treatment, and prevention.
- This review indicates no evidence that any particular risk tool has a high predictive ability aimed at indicating future self-harm or suicide. The use of risk assessment tools has been recommended, despite lack of clarity regarding best practice to identify patients at the highest risk of suicide.
- Risk assessment tools should not be used in isolation from clinical judgment and experience to evaluate patient risk for future self-harm and suicide. Staff education and training are paramount for suicide prevention, especially during the coronavirus disease pandemic.

Abstract

Introduction: Globally, there is a lack of clarity regarding the best practice to distinguish patients at the highest risk of suicide. This review explores the use of risk assessment tools in emergency departments to identify patients at high risk of repeat self-harm, suicide attempts, or death by suicide.

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Methods: The review question (“Does the use of risk assessment tools in emergency departments identify patients at high risk of repeat self-harm, suicide attempts, or death by suicide?”) focused on exposure and outcome. Studies of any design were included. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines were used. Study characteristics and concepts were extracted, compared, and verified. An integrative approach was used for reporting through narrative synthesis.

Results: Nine studies were identified for inclusion. Two risk assessment tools were found to have good predictive ability for suicide ideation and self-harm. Three had modest prediction of patient disposition, but in one study, the clinical impression of nurses had higher predictive ability. One tool showed modest predictive ability for patients requiring admission.

Discussion: This review found no strong evidence to indicate that any particular risk tool has a superior predictive ability to identify repeat self-harm, suicide attempts, or death by suicide. Best practice lacks clarity to determine patients at highest risk of suicide, but the use of risk assessment tools has been recommended. Nevertheless, such tools should not be used in isolation from clinical judgment and experience to evaluate patients at risk. Education and training to augment risk assessment within the emergency department are recommended.

Key words: Suicide; Emergency department, Hospital; Risk assessment

Introduction

Commonly misclassified and underreported, suicide remains highly stigmatized and is still an illegal act in many countries.¹ The World Health Organization (WHO)¹ defines suicide as “the act of deliberately killing oneself” (Supplementary Appendix 1). It is the 15th most common

cause of mortality, accounting for 1.4% of deaths across the worldwide population.^{1,2} In 2013, the WHO¹ launched their inaugural mental health action plan with the aim of reducing the rate of suicide in all countries by 2020.

Patients who attempt suicide present through an emergency care pathway, of which the emergency department is just one part. The emergency department is time-bound, with competing priorities arising from patient intensity and the need to rapidly determine disposition and move patients.³ These factors can create barriers to effective holistic assessment and care, which may result in missed opportunities to identify suicidal intentions.⁴

Risk assessment tools should ensure that patients at high risk of death by suicide are identified in emergency departments to reduce mortality by suicide after visit to a health care setting.⁵ Despite assessment tools advocated by WHO¹ and The Joint Commission,⁶ globally, there is a lack of clarity regarding best practice to identify which patients are at highest risk of suicide. Prevention of suicide typically employs standardized, systematic assessment tools to guide clinicians and supplement clinical evaluation to identify those at highest suicide risk,⁷ the aim being to decrease any unnecessary interventions, redirect scarce resources, and expedite care delivery to appropriate treatment.⁸

In 2017, a total of 13 goals for suicide prevention were released by the US Surgeon General and the Action Alliance forming a national strategy for suicide prevention.⁹ One key goal of the national strategy is to reduce access to lethal means.⁹ Screening is valuable in the identification of identifying lethal means and could put time and distance between lethal means and individuals who are in crisis, preventing suicide and saving lives.⁹

Yet, suicide mortality has not decreased drastically over the last 25 years, especially compared with other leading causes of death worldwide.¹⁰ In 2012, 804 000 people worldwide died by suicide, compared with 793 823 in 2017—a decrease of only 1.27%.¹¹ For each one of these deaths from suicides, it is estimated that there are an additional 20 people who have attempted suicide.¹ Disability caused by nonfatal suicide attempts account for 39 million adjusted life years or the loss of 39 million years of full health.¹² Furthermore, approximately 6 close relatives will be bereaved by a family member's suicide, putting them at greater risk of suicide themselves.¹³

More recently, the COVID-19 pandemic may also lead to a further increase in suicide rates.¹⁴ COVID-19 has already negatively affected psychological and sociological factors for many individuals, which means that the prevention of suicide needs urgent consideration, now even more so than ever.¹⁵

The National Institute for Health and Care Excellence encourages risk and needs assessment of patients but does

not recommend the use of risk assessment tools to determine patient disposition or treatment.¹⁶ In contrast, The Joint Commission⁶ requires all patients who are being evaluated or treated for behavioral health conditions to be screened for suicide ideation using a validated screening tool. Despite nearly all practice guidelines stating the need for assessment, evidence suggests that only 60% of people who harm themselves receive a mental health assessment at the point of their presentation in the emergency department.¹⁷ This reiterates missed opportunities as the emergency department represents a conduit for those at risk of suicide and other health care settings where contact with health care providers occurs.²

Chock et al¹⁸ determined that each year, 70-80% of patients who present to the emergency department with suicidal intentions die by suicide. Suicidal ideation is present in around 8.7% of ED patients in the United States, but only 6.5% of current screens are positive.^{19,20} Around 16-24% of ED patients who present with self-harm will repeat attempts with more lethal methods.^{21,22} Nearly 4% of people presenting to hospitals in the United Kingdom die by suicide in the 5 years after presentation (rates 16-60 times higher than in the general population).^{21,22} Suicide is preventable; therefore, it is vital that appropriate, evidenced-based practice is used for the identification, treatment, and concurrently, the prevention of suicide worldwide.¹

The purpose of this integrative review was to investigate how effectively risk assessment tools identify those at high risk of repeat self-harm, suicide attempts, or death by suicide. Our primary question was, "Does the use of risk assessment tools in emergency departments identify patients at high risk of repeat self-harm, suicide attempts, or death by suicide?" Additional review questions used to structure review findings were as follows:

1. What tools are currently being used in practice?
2. What outcomes are used to measure the effectiveness of risk assessment tools?
3. Do any specific tools have greater predictive ability for specific outcomes compared with other tools?
4. What risk items are identified within tools?
5. What other factors are reported to aid the identification of patients at risk?

Methods

DESIGN

The integrative approach to this review enabled amalgamation of diverse methodologies.²³ Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines were

TABLE 1
Search terms and eligibility criteria

Concepts	Search terms	Inclusion	Exclusion
Population	Suicide (MeSH term) Self-murder Self-immolation OR End own life Self-harm AND Death (MeSH term) Mortality (MeSH term) Dying OR Fatality AND Emergency service (MeSH term) ED Emergency Department A and E OR Accident and emergency Casualty A + E A&E Emergency Room ER AND	-Participants over 18 years -Patients presenting to the emergency department at high risk of death by suicide/ repeat self-harm (presenting with many risk factors) -Worldwide studies	-Participants under 18 years -Patients outside of the ED setting -Patients who are not at high risk of suicide/ repeat self-harm (unless controls)
Exposure	Ask suicide screening questions ASQ Beck fast scan Beck scale for suicide ideation Colombia suicide severity rating scale C-SSRS OR Depression scale Health resources (MeSH term) Mass Screening (MeSH term) Patient health questionnaire (MeSH term) Patient safety screener PHQ-9	-Risk assessment tools that identify suicide or self-harm risk	-Tools that do not identify suicide or self-harm risk -Tools that only identify single mental health disorders in isolation
Concepts	Search Terms	Inclusion	Exclusion

continued

TABLE 1
Continued

Concepts	Search terms	Inclusion	Exclusion
Exposure	Prevention resources PSS-3 Risk assessment (MeSH term) Risk assessment tools SAFE-T SBQ-R Scale for suicide ideation Screening tools OR SSI-W Suicide behavior questionnaire revised Suicide risk screen Universal screening Tools Instruments AND		
Outcome	Decline Decrease Minimi*e OR Reduction	-Use of above outcomes highlighted to demonstrate the effectiveness of tools to identify patients at risk	-Does not use outcomes that demonstrated the effectiveness of risk assessment tools -No outcomes shown -Incomplete studies
Types of studies		-Any primary research	-Reviews -Meta-analysis -Discussion papers -Commentaries
Language		-English language	-Not written in the English language
Year		-Studies published after 2010	-Studies published before 2010

used.²⁴ The Population, Exposure, and Outcome framework was applied to the primary review question.²⁵

SEARCH STRATEGY

Databases

Multiple electronic databases were selected to ensure that elements of the topic were not omitted by limiting the field of practice. Through Ovid, the following were accessed: CINAHL (1937 onwards), Embase (1974 onwards), MEDLINE (1946 onwards), PsychINFO (1967 onwards), PubMed, and Proquest. Reference list searching was carried out on all papers selected for full text reading.

Search Terms and Eligibility Criteria

Medical Subject Heading index was used to identify search terms. Eligibility criteria for inclusion/exclusion were developed using current literature to provide rationale (Table 1).

CRITICAL APPRAISAL

Relevant checklists from Joanna Briggs Institute were used to critically appraise each piece of literature. The critical appraisal results are available as online supplemental material (Supplementary Appendix 2).²⁶

DATA SYNTHESIS

Qualitative data synthesis was achieved by grouping the outcome measures and identification of commonalities and connections between studies.²⁷ Data were tabulated using Microsoft Excel to organize and manage data extracted. Comparisons were made across items according to the characteristics. Owing to the diversity of study methodologies, outcome measures, and heterogeneity of risk items on tools, quantitative results could not be combined.²⁸

Results

SEARCH OUTCOMES

This process is demonstrated by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis flow diagram (Figure 1).²⁴

SUMMARY OF CRITICAL APPRAISAL

No studies were excluded from critical appraisal. A decision was reached that qualitative data may generate new insights at the point of synthesis.

STUDY CHARACTERISTICS

Nine studies were included: 5 American, 2 Canadian, 1 English, and 1 Taiwanese. This review includes 7 multi-site ED studies ranging from 2 to 32 sites, with 2 studies conducted in singular urban hospitals. Sample sizes ranged from 51 to 6442. A plethora of different risk assessment tools were used: most commonly the SAD PERSONS scale ($n = 5$) and the Columbia-Suicide Severity Rating Scale ($n = 3$).

Seven studies provided data for a response rate, and this ranged from 47.7% to 84%. All studies included 2 or more outcome measures, namely, a repeat incidence of self-injurious behavior ($n = 7$), revisit to the emergency department due to self-injurious behavior ($n = 2$), or admission to a psychiatric hospital ($n = 2$) (Table 2).

DATA SYNTHESIS

Five studies evaluated single tools, and 4 evaluated multiple synthesized risk assessment tools.^{29–37} In total, 15 heterogeneous tools and 23 risk items were identified across the 9 studies. The different types of assessment tools are listed in Table 3.

REPORTED PREDICTIVE ABILITY AND OUTCOMES OF RISK ASSESSMENT TOOLS

To measure the predictive ability, 3 principal review outcomes were identified: self-harm or suicide incidences, admissions to hospital, and patient disposition. Other outcomes were self-harm service quality, suicide risk screening frequency, and adverse events occurring in the ED setting (Table 3).

Only 3 tools were investigated by more than 1 study, which found the Columbia-Suicide Severity Rating Scale (C-SSRS) to have poor predictive value of suicide, self-harm, admission, and adverse events in the emergency department, with modest predictive value for discharges.^{20,30} The SAD PERSONS Scale (SPS) was found to be slightly more effective at predicting admissions and discharges than the C-SSRS but does not predict suicide or self-harm.^{29,31,32} The Modified SAD PERSONS Scale (MSPS) does not effectively predict self-harm or suicide but, like the C-SSRS, had moderate predictive value for patient disposition.^{30,32}

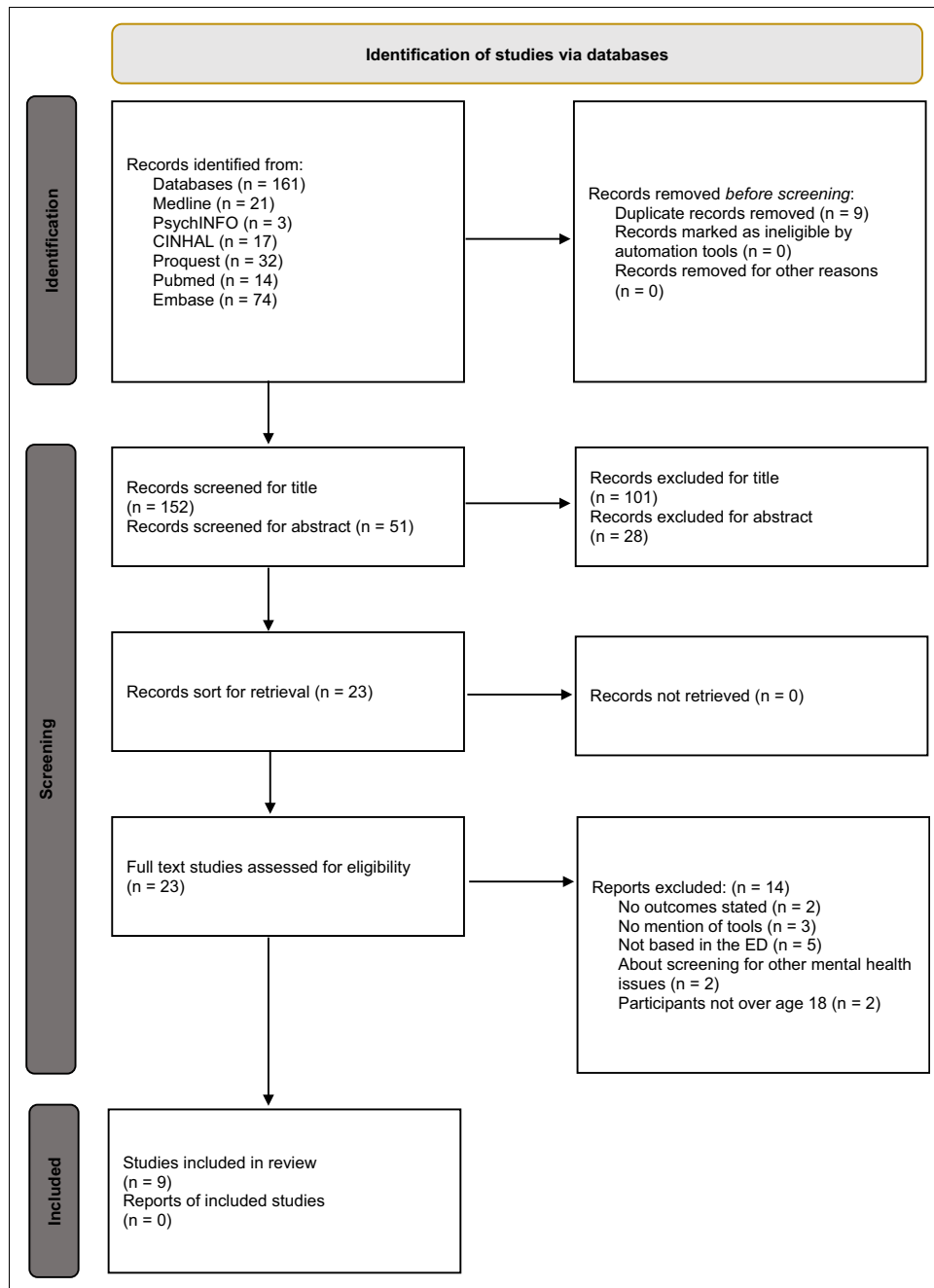


FIGURE 1
PRISMA Diagram.

RISK ITEMS

Across the tools, 23 risk items—other factors that could potentially aid in the identification of patients at risk—were heterogeneous, indicating the wide spectrum of risk factors

associated with suicide. The risk items most commonly recurring were hopelessness; suicide ideation, attempts, or plans; and drug and alcohol abuse. The SAD PERSONS scale contains 3 risk items (suicidal thoughts, suicide attempt, and suicide plans) that appear to create the foundation for the Beck

TABLE 2
Study characteristics

Author and year	Country	Total of EDs	Sample size	Response rate	Outcomes measured	Assessments	Key findings	Follow-up	Critical Appraisal score, %
Randall et al ³⁷ 2012	Canada	2	157	Stage 1- 67% Stage 2- 86.7% Stage 3- 82.0%	1. Engaging in self-harm 2. Visit to ED due to self-harm	1. Beck Hopelessness Scale 2. Barrett Impulsiveness Scale 3. Brief Symptom Inventory 4. Drug Abuse Screening Test 5. CAGE questionnaire	The diagnostic use of tools is limited.	3 mo	36%
Allen et al ³⁵ 2015	USA	6	1068	47.70%	1. Prevalence 2. Correlations 3. Subsequent clinical interventions	Psychiatric Emergency Research Collaboration Screener	The tools questions present might capture suicide risk.	None	33%
Wu et al ³⁶ 2014	Taiwan	1	147 284 (control)	74.8%	1. Self-harm repetition 2. Change in score	Chinese SAD PERSONS scale	Nurses found this tool to raise awareness of suicide risk.	6 mo	78%
Quinliyan et al ³² 2014	England	32	6442	n/a	1. Repetition of self-harm 2. Self-harm service quality	1. SAD PERSONS scale 2. Nonvalidated, locally developed tool	Tools decreased repeat self-harm and therefore decreased suicide risk, but when data adjusted for case mix differences, association attenuated.	6 mo	55%

continued

TABLE 2
Continued

Author and year	Country	Total of EDs	Sample size	Response rate	Outcomes measured	Assessments	Key findings	Follow-up	Critical Appraisal score, %
Chang and Tan ³⁰ 2015	USA	1	50	n/a	<ol style="list-style-type: none"> 1. Need for psychiatric admission 2. Prolonged stay at a psychiatric facility >5 days 3. Adverse events in the ED 	<ol style="list-style-type: none"> 1. Columbia-Suicide Severity Rating scale 2. SAD PERSONS scale 3. Patient Health Questionnaire 9 4. Beck Scale for Suicidal Ideation 5. Clinical Impression 	Tools show poor predictive value for adverse outcomes.	2 wk	62.5%
Stuck et al ³⁴ 2014	USA	1	224	n/a	<ol style="list-style-type: none"> 1. Frequency of ED visits vs clinic visits 2. Suicide risk screening frequency 3. The frequency of such visits before and after the 2011 implementation of universal screening 	Suicide Risk screener	Unclear whether it helps prevent suicide.	None	75%
Katz et al ³³ 2017	Canada	2	5462	60.70%	<ol style="list-style-type: none"> 1. Intentional self-harm 2. Late effects of intentional self-harm 3. Poisoning of undetermined intent 4. Other events of undetermined intent 	Modified SAD PERSONS scale	Modified SAD PERSONS scale does not predict suicide risk.	1 y	62.5%

continued

TABLE 2
Continued

Author and year	Country	Total of EDs	Sample size	Response rate	Outcomes measured	Assessments	Key findings	Follow-up	Critical Appraisal score, %
Miller et al ³⁸ 2017	USA	8	1376	84%	1. Suicidal behavior 2. Death by suicide 3. Suicide attempt, interrupted or aborted attempts 4. Suicide preparatory acts	Columbia-Suicide Severity Rating scale	Tools may identify more patients but do not reduce suicide risk.	1 year	78%
Mullinax et al ³¹ 2018	USA	1	267	n/a	1. Discharge following enrollment visit 2. Death by suicide within 1 month or 1 year of enrollment 3. Patient disposition	1. Modified SAD PERSONS scale 2. Columbia-Suicide Severity Rating Scale 3. Suicide Assessment 5-Step Evaluation and Triage scale	Does not recommend use of tools owing to missed deaths.	1 year	62.5%

ED, emergency department; SAD PERSONS, sex, age, depression, previous attempt, excess alcohol or substance use, rational thought loss, social support lacking, organized plan, no spouse and sickness.

TABLE 3
Predictive ability of tools

Tool	Year introduced	Number of studies included in	Reported predictive value and measured outcome(s)
Barret impulsiveness scale	1959	1	Good predictive value of self-harm but not in isolation
Brief symptom inventory	1975	1	Good predictive value of self-harm but not in isolation
Drug abuse screening test	1982	1	Good predictive value of self-harm but not in isolation
SAD PERSONS scale	1983	3	Poor predictive value for suicide Alternative studies good predictive value for self-harm but only a weak association when adjusting for differences in the case mix Moderate predictive values for admission, discharge Poor prediction for adverse outcomes in the ED
Cut down, Annoyed, Guilt, Eyeopener questionnaire	1984	1	Did not predict self-harm or suicide
Beck Hopelessness Scale	1988	1	Good predictive value of self-harm but not in isolation
Beck scale for suicidal ideation	1991	1	Poor predictive value for admissions, prolonged stay, and adverse events in the ED
Patient health questionnaire 9	2001	1	Poor predictive value for admission, prolonged stay, and adverse events
Columbia-suicide severity rating scale	2007	2	Unclear of predictive value for self-harm or suicide Poor predictive values for admissions and adverse events in the ED Modest predictive value for discharges
Psychiatric Emergency Research Collaboration Screener	2009	1	Good predictive value for suicide ideation
Suicide Assessment Five-Step Evaluation and Triage	2009	1	Unclear of predictive value for self-harm or suicide ideation Modest predictive value for discharge
Suicide risk screening	2015	1	Unclear of predictive value for self-harm or suicide ideation
Chinese SAD PERSONS scale	n/a	1	Good predictive value for self-harm
Modified SAD PERSONS scale	n/a	2	Does not predict self-harm or suicide Moderate predictive value for patient disposition
Nonvalidated locally developed tool	n/a	1	Good predictive value for self-harm but only a weak association when adjusting for differences in the case mix

Predictive values (good, moderate, modest, poor, unclear) were extracted verbatim from individual studies. Please refer to [Appendix](#) for constructs measured by items in each scale behind predictive value ratings.

ED, emergency department; SAD PERSONS, sex, age, depression, previous attempt, excess alcohol or substance use, rational thought loss, social support lacking, organized plan, no spouse and sickness.

Scale for Suicidal Ideation (BSSI), Suicide Assessment Five-Step Evaluation and Triage (SAFE-T), and Suicide Risk Screener (SRS).^{5,33,38,39} The Psychiatric Emergency Research Collaboration (PERC) screener is composed of questions from the Patient Health Questionnaire-9 (PHQ-9) and the C-SSRS (Supplementary Appendix 3).³⁴

SELF-HARM OR SUICIDE INCIDENCES

Seven studies included self-harm incidences or suicidal behavior as a risk identification outcome. Self-harm incidences included engaging in self-harm, repeat self-harm, intentional self-harm, or another event of undetermined intention. Suicidal behavior included death by suicide, suicide attempts, or a suicide preparatory event. Many studies did not differentiate between self-harming with intent to die (suicide attempt or suicide) and nonsuicidal self-inflicted injury.

The PERC screener and C-SSRS reported high sensitivity at predicting suicidal ideation or self-harm.^{34,35} The SPS and nonvalidated, locally developed tools had good predictive values for self-harm repetition, but this correlation was not seen when adjustments were made for differences in the case mix.³¹ The Beck Hopelessness Scale, Brief Symptom Inventory, Barrett Impulsiveness Scale, and Drug Abuse Screening Test-10 were also found to be significant predictors of self-harm but did not exhibit strong predictive ability when used in isolation.³⁶

The CAGE questionnaire and MSPS did not predict self-harm or suicide.^{30,34} The studies found that the predictive value of SRS, C-SSRS, and SAFE-T scale (for death by suicide and suicide attempts) was unclear as only a small percentage of individuals who went on to die by suicide were identified by these tools.^{30,33,37}

Overall, results show that there is no significant evidence to demonstrate that any of the tools have a strong predictive ability for repeat self-harm or suicide. These results also show that risk assessment tools do not have a strong predictive ability when used without clinical judgment to predict suicide or repeat self-harm and therefore may not have an impact on risk of death by suicide.

ADMISSIONS TO PSYCHIATRIC SERVICES

Only one study directly related the outcome of admissions to demonstrate or evaluate the predictive value of tools. Four studies included a need or request for clinical interven-

tion as a secondary outcome.^{29,30,33,34} Secondary outcomes included need for psychiatric admission or subsequent clinical intervention of any type. The C-SSRS, PHQ-9, and BSSI poorly predicted any admissions to psychiatric services, with the SPS having better predictive ability for predicting admissions.²⁹ Use of the SPS therefore may have a positive impact on patient mortality due to suicide.

PATIENT DISPOSITION

Two studies included patient disposition as their outcomes, highlighting discharge to the patient's home. These studies found that the MSPS, C-SSRS, and SAFE-T are modest at predicting safe discharge.³⁰ The PHQ-9, BSSI, and C-SSRS had poor prediction of a prolonged stay in psychiatric services (>5 days), with the SPS only having better predictive ability for prolonged stays.²⁹ The clinical impression (alone) of nurses had high predictive ability of prolonged hospital admissions compared with attending physicians, whose results were not statically significant at predicting these outcomes.²⁹ Overall, none of the studies demonstrated that these tools had a clear strong predictive ability for patient discharge and therefore are unlikely to affect suicide death rate or repeat self-harm.

ADDITIONAL OUTCOME MEASURES: SERVICE QUALITY, SCREENING FREQUENCY, AND ADVERSE EVENTS IN THE EMERGENCY DEPARTMENT

Throughout the studies, 3 other main outcomes were measured. No difference was seen in service quality score between hospitals that did and did not use tools as a component of risk assessment.³¹ The implementation of universal SRS in the emergency department led to a 53% increase in patient screening.³³ Finally, the C-SSRS, PHQ-9, SPS, and BSSI poorly predict adverse events in the ED setting.²⁹ The implementation of compulsory screening does increase the number of people screened but does not alter the C-SSRS, PHQ-9, SPS, and BSSI's poor predictive ability of adverse outcomes, demonstrating that these tools are not expected to positively affect suicide rates.²⁹

Discussion

It is incredibly difficult to ascertain the risk of a future event such as completed suicide; hence risk of repeated self-harm is the outcome most frequently measured.²⁹ Across the tools

examined, no significant evidence was found that indicates any particular risk tool had a high predictive ability aimed at indicating future self-harm or suicide. Moreover, the intent behind self-harm is difficult to determine. It can be challenging to classify if a presentation of self-harm does or does not have suicidal intent.⁴⁰ Given this, Carroll, Metcalfe and Gunnell⁴¹ and Karasouli et al²² asserted that previous self-harm is one of the clearest risk factors for assessing risk of completed suicide. These findings are supported by other systematic reviews conducted in the ED setting and other secondary health care settings.^{7,42,43} Conversely, in community and outpatient settings, research suggests the PHQ-9 tool to be a strong predictor of suicide attempt or death from suicide.^{44,45} It is most likely that in community environments, patients at highest risk of suicide are reassessed, enabling comparison with baseline assessments, permitting the PHQ-9 to be more effective.³

Throughout the tools examined, a diverse range of risk items were identified. Research demonstrates that there were originally only 3 risk factors for suicide recognized.⁴⁶ Over time, decreased stigma has led to increased research surrounding mental illness, hence an increase in the number of known risk factors.⁴⁷ In practice, the emergency department is a conduit for most initial patient assessments, and consequently, the implementation of briefer tools has prevailed. For example, cognitive assessment of older patients presenting to the emergency department has been focused over time from 30 questions to 4.^{48,49} Hence increasing the number of risk factors on assessment tools may inadvertently cause difficulties in the identification of patients at highest risk. Henceforward, if developed, briefer risk tools populated with evidence-based, relevant risk factors could be more effective in identifying patients at high risk of suicide.^{32,35,36}

Similarly, studies examined demonstrate that throughout various health organizations, there is a multiplicity of tools being used to assess suicide risk (Table 3). Owing to the lack of supporting evidence, it is difficult to establish the most effective tool. Therefore, this review recommends no single tool for use in clinical practice.^{31,42,50,51} Moreover, Harris et al⁵² also established this situation regarding tools to predict future self-harm or suicide in adolescents. It is generally believed that standardized tools could promote widespread screening across all organizations, thus supporting repeated assessment of patients and safer patient transitions, improving care, and reducing risk of death by suicide.^{1,6,53}

Emergency nurses perceive risk assessment tools as useful guides to assess patients, reporting that these tools bring suicide risk factors to the forefront and aid timely and effective referrals.³⁵ Emergency clinicians state that a completed risk assessment tool may provide supportive evidence of

their clinical judgment.⁵¹ Some nursing staff feel that completed risk assessments can be used as a source of useful information by other professionals caring for the patient.⁵⁴ Despite this, emergency clinicians report using risk assessment tools as an “aide-memoire” but do not usually use the scoring systems to aid referral.⁵¹ Emergency nurses and providers report finding risk assessment of patients at high risk of suicide as challenging and time consuming.^{35,51,54} These staff disclose the need for adequate training to ensure accurate risk assessment of patients at high risk of suicide.^{35,51,54}

The Joint Commission advocates only 3 validated suicide risk assessment tools. This includes the SAFE-T with C-SSRS, the Scale for Suicidal Ideations-Worst, and the Beck Scale for Suicide Ideation.⁶ Despite this, globally there is still a lack of evidence to suggest best practice to identify which patients are at highest risk of suicide, and therefore it is hard to advocate a single risk assessment tool.⁵¹ Alongside staff attitudes and the high costs of risk assessments (including training on how to use them), organizations are reluctant to implement a tool which is not evidence based.⁵⁴

Despite recommendations and requirements, risk assessment tools still may not effectively identify those at risk of suicide because of the complexity of psychiatric diseases.^{2,32,55} This highlights the importance of directing patients to specialist care such as psychiatric liaison teams. Psychiatric liaison teams complete comprehensive assessments and provide clinical education for staff to enhance their clinical knowledge and judgment.^{56,57} To assist identification of those patients at risk, Wolf et al⁵⁸ identified that education must include recognizing nonverbal behaviors, emergency department presentation patterns, and mismatch between injury and complaints. Consequently, nurses must understand how to use tools to guide their questions to patients carefully; in particular, to be aware of identifying any questions that result in a lack of eye contact or hesitation.⁵⁸

Pessimism regarding follow-up interventions after acute assessment means that staff may not refer patients to the appropriate resources or create safety plans.⁵⁰ Thus, it is also important for clinicians to link risk assessment and intervention within the emergency department, which are essentially the clinician’s duty of care.^{50,59} Educational interventions should incorporate the importance of the continuity of care between health care providers and effective communication.⁶⁰ Naylor et al⁶¹ argue that clinical leadership training to develop partnerships between the emergency department and mental health care providers should be a focus. Both must regard prevention of suicide as a key service, enabling collaboration between services for suicide prevention.⁶¹ Implementation of training on

counseling regarding access to lethal means is also paramount.⁶² Only 3 of the 15 risk assessment tools evaluated in this review contained items that focused on access to lethal means.^{33,39} Training should focus on misconceptions about prevention of suicide to ensure that training is continued into practice.^{62,63} This will facilitate the identification of patients at high risk of suicide and promote the implementation of interventions.

An incidental finding of this review was the importance of appropriate and timely interventions (in emergency department and outpatient settings). This has the potential to lead to the biggest decrease in suicide risk, particularly with regards to access to lethal means.^{39,44,62–64} Suggested interventions include a secondary assessment within 6 months of initial assessment, provision of a self-administered safety plan, a year of telephone review calls, and direct treatment options.^{32,39} Over time, tools have placed slightly more focus on the importance of an intervention after initial screening and incorporating this into the risk screening and assessment steps. The SAD PERSONS scale, C-SSRS, SAFE-T, and SRS, all include an extensive list of potential interventions for each scoring category.^{33,38,64,65} In addition, the CAGE questionnaire and Drug Abuse Screening Test-10 recommend that patients who score highly on the tools require further detailed assessment.^{66–68} This can be compared with the Barrett Impulsiveness Scale, Brief Symptom Inventory, Beck Hopelessness Scale, BSSI, PHQ-9, and PERC assessment tools, which do not list any suggestions to consider after initial screening.^{34,39,69–73}

Unfortunately, intervention administration is multifaceted and interdependent on environment, leading to barriers for patients to receive an adequate intervention within the ED setting.^{4,61} Therefore, most patients deemed to be at the highest risk may not be provided evidence-based interventions.³⁸ Barriers include insufficient mental health provider staffing, competing emergency department priorities, unavailability of psychiatrist, and patient and family refusal.^{21,50}

Further research is needed to understand whether and how the use of risk assessment tools for ED patients at high risk of suicide affects their assessment, interventions, disposition, and outcome. Policy relating to expected clinical standards and care pathways are needed to create clinical parity for this group of patients. If developed, this would have the potential to educate health care professionals and connect high-risk patients with targeted support and care beyond the emergency department.

STRENGTHS AND LIMITATIONS

Time and resource restraints meant that this review includes only studies written in the English language. Although a single reviewer introduces potential researcher bias, regular research supervision was in place throughout.⁷⁴ The heterogeneity of study methodologies prevented combination of results to precisely determine what impact risk assessment tools have on suicide risk. In addition, the outcomes of admission and patient disposition (used by some of the studies included) have the potential to be strongly influenced by other contributing factors (i.e., hospital crowding and staffing levels) and therefore have weak validity and reliability.⁴² There is potential for publication bias to have occurred, because studies with negative outcomes were not located. The original purpose of this study and time restrictions mean that the diagnostic accuracy of each tool was not assessed in this review. Therefore, the risk of bias within each individual tool was not considered in the methodology. Only risk assessment tools that had been used within the ED setting were reviewed for this review. However, this review includes the most up-to-date and relevant worldwide literature from within the past 8 years.

Implications for Emergency Clinical Practice

Risk assessment tools should not be used in isolation from clinical judgment and experience to evaluate patient risk for future self-harm and suicide. Within the emergency department, education of staff, including staff attitudes toward suicide, should become a key focus to enable suicide prevention. Training should aid discrimination between impulsive and premeditated suicide attempts as this is paramount to alerting health care staff to the level of suicide risk. In addition, training should focus on continuity of care between health care providers and effective staff communication.

Conclusion

We found insufficient evidence to demonstrate the impact of risk assessment tools to reduce the risk of suicide in high-risk patients who present to the emergency department. Studies indicate that tools may be useful to guide health care professionals' assessment of patients at risk of suicide, but they should not be used in isolation from experienced clinical judgment. No relationship was seen between the proliferation of risk items that a tool includes

and its predictive ability. To improve current ED practice in identification of patients at high risk of suicide and self-harm, it is recommended that relevant training of clinicians occurs. Education should raise awareness of confounding factors of suicide. It should also focus on the importance of clinical judgment and recognizing the different types of body language and nonverbal communication expressed in those at risk of suicide. There is a need to develop new and simple tools in the future, which incorporate the known risk factors. Primary research should include diagnostic test accuracy.

Supplementary Data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.jen.2021.10.002>.

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Appendix

Tool/risk item	Barret impulsiveness scale	Brief symptom inventory	Drug abuse screening test	SAD PERSONS scale	Cut down, Annoyed, Guilt, Eyeopener questionnaire	Beck hopelessness scale	Beck scale for suicidal ideation	Patient health questionnaire 9	Columbia-suicide severity rating scale	Psychiatric Emergency Research Collaboration Screener	Suicide Assessment Five-Step Evaluation and Triage	Suicide risk screener
Year of introduction	1959	1975	1982	1983	1984	1988	1991	2001	2007	2009	2009	2015
Hopelessness/depression						✓		✓		✓		
Suicidal thoughts				✓			✓	✓			✓	✓
Suicide attempt				✓			✓				✓	✓
Suicide plans				✓			✓		✓		✓	✓
Impulsiveness	✓								✓			
Cognitive instability	✓			✓				✓				✓
Mental health illness		✓							✓			✓
Somatization		✓										
Hostility		✓										
Drug and alcohol abuse			✓	✓	✓							✓
Insomnia								✓	✓			
Family history									✓			
Stressor event									✓			
Change in treatment									✓			
Gender				✓								
Age				✓								
Social isolation				✓					✓			
Physical illness				✓					✓			
Appetite changes												✓
Lack of protective factors											✓	
Agitation											✓	
Self-harm											✓	
Anhedonia										✓		

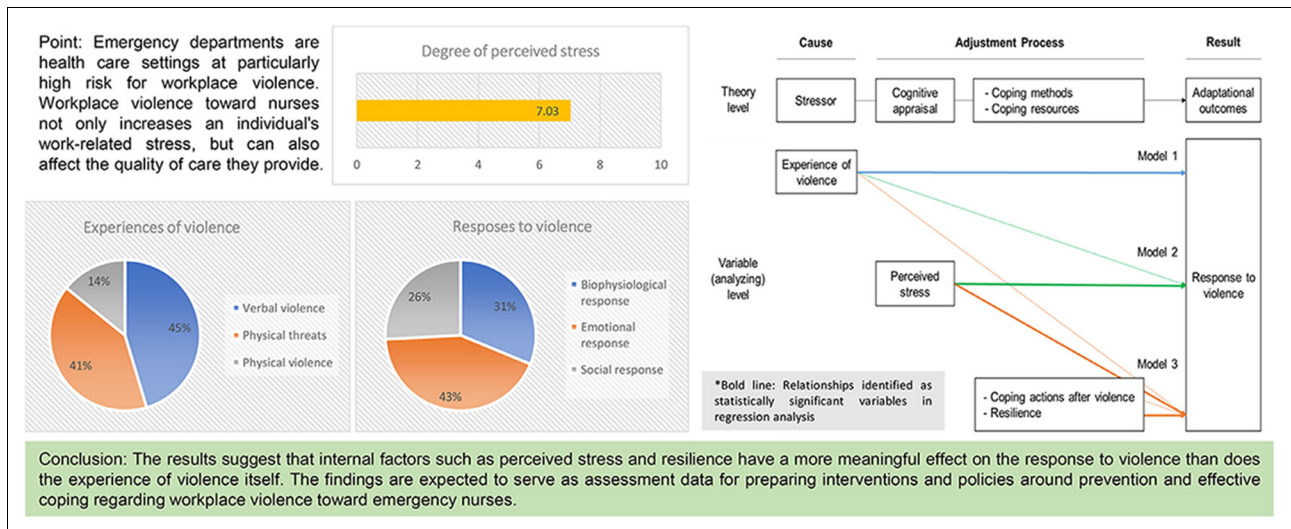
SAD PERSONS, sex, age, depression, previous attempt, excess alcohol or substance use, rational thought loss, social support lacking, organised plan, no spouse and sickness.

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EXPERIENCE OF VIOLENCE AND FACTORS INFLUENCING RESPONSE TO VIOLENCE AMONG EMERGENCY NURSES IN SOUTH KOREA: PERSPECTIVES ON STRESS-COPING THEORY

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Contribution to Emergency Nursing Practice

- What is already known on workplace violence: Nurses working in emergency departments are exposed to the risk of workplace violence.
- The main finding of this paper is that a nurse's response to violence may be influenced more by the perceived level of stress and resilience than by the experience of violence itself.
- Recommendations for translating the findings of this paper into emergency clinical practice include the following: When emergency nurses are exposed to workplace violence, it is necessary to pay attention to their subjective perceptions of stress and internal resources as well as organizational countermeasures.

Abstract

Introduction: This cross-sectional study aimed to explore the experiences of workplace violence involving emergency nurses and to identify the factors influencing the response to violence

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on the basis of the stress-coping theory formulated by Lazarus and Folkman.

Methods: Using a cross-sectional design, a structured questionnaire was administered to measure the experience of violence, perceived stress, coping actions after violence, resilience (Connor-Davidson Resilience Scale), and responses to violence. The participants were 131 nurses who were working in the emergency departments in 9 of 11 general hospitals in 2 cities in South Korea. The collected data were analyzed using descriptive statistics, *t* tests, analyses of variance, Pearson correlations, and hierarchical multiple regression analyses.

Results: The most frequent type of violence was verbal violence, and the main offender involved in all types of violence was the patient. The methods for coping with violence were mainly passive, and emotional responses were the most frequently reported response to violence. In the final model (explanatory power = 41.5%), with response to violence as the dependent variable, the effects of the experience of violence disappeared, and only the effects of perceived stress and resilience remained.

Discussion: The results of this study suggest that internal factors such as perceived stress and resilience have a more meaningful effect on the response to violence than the experience of violence itself. The findings are expected to serve as assessment data for preparing interventions and policies around prevention of, and effective coping regarding, workplace violence toward emergency nurses.

Key words: Violence; Emergency department; Stress; Coping; Resilience

Introduction

Workplace violence (WPV), defined as a violent act directed toward workers, can include physical, psychological, and verbal behavior.¹ WPV affects workers in health care settings in various ways.² WPV in health care settings is

particularly prevalent in the field of nursing and can contribute to work-related stress that can affect individuals and the quality of care they provide.¹ However, this underreported, ubiquitous, and persistent problem has not only been tolerated, but also largely ignored.³ Among health care workers who experience WPV, nurses and nursing aides are affected at the highest rates,^{3,4} largely because they experience the most direct patient contact. Studies conducted in many countries worldwide have shown high rates of violence toward nurses working in hospitals.⁵⁻⁷ In particular, emergency nurses tend to be more frequently exposed to WPV.^{7,8}

Emergency departments are health care settings with a particularly high risk for WPV. The demand for emergency health care is increasing, and violence against staff in emergency departments is increasing because of various factors associated with patients or their families.⁹ The incidence of WPV in emergency departments has been documented in many previous studies that have shown that workers in emergency departments are exposed to considerable rates of various forms of violence.¹⁰⁻¹³ Recent international studies have examined WPV experiences among emergency nurses. The results have shown that a significant number of emergency nurses in Canada (96.6%), China (89.9%), Indonesia (54.6%), Italy (76.0%), Taiwan (92.9%), and the United States (96.7%) have been exposed to at least 1 type of violence.^{4,10,12,14-16}

WPV is a very serious stressor that has negative health outcomes for victims. A systematic review of the aftermath of WPV among health care workers showed that psychological consequences (eg, posttraumatic stress or depression), emotional consequences (eg, anger or fear), and impact on work functioning (eg, sick leave or job satisfaction) were the most frequent and important effects of WPV.¹⁷ Studies conducted on nurses have identified the following results of WPV: psychosocial stress, posttraumatic stress disorder, fear, anger, burnout, and sleep problems. WPV also negatively affects job satisfaction, turnover intention, and professional quality of life.¹⁸⁻²² One phenomenographic study found that emergency nurses perceived WPV as a direct threat to a nurse's life, part of a nurse's job, and a reality that diminishes the desire to work in emergency care.²³

Despite exposure to similar violent situations, the consequences of WPV vary by individual. According to the stress-coping theory formulated by Lazarus and Folkman,²⁴ an individual's adaptational outcomes depend on cognitive evaluation of their stressors and coping styles. Accordingly, individuals can effectively protect themselves from stress threats in an adaptive state by positively evaluating the stress events and by actively using coping strategies and surrounding resources. Jeong et al²⁵ demonstrated a moderating

effect of coping strategies on mental health outcomes related to job stress among South Korean workers. In another study, nurses in general hospitals in South Korea experienced severe levels of WPV and consequent stress responses in almost all hospital departments but were mostly engaged in passive coping at the personal level and lacked support at the organizational level.²⁶ Therefore, it is necessary to explore the perceptions of stress and coping methods to understand the effects of WPV on emergency nurses.

Coping methods are heavily dependent on the resources that are available to people in specific encounters.²⁴ Resilience is defined as the process of effectively negotiating and adapting to, or managing, important sources of stress or trauma.²⁷ This positive factor helps people to manage responses to violent events in the hospital workplace.²⁸ In studies of nurses in South Korea, resilience had a partial mediating effect between the experience of violence and the response to violence²⁹ and was a significant factor influencing the burnout of emergency nurses with response to violence.³⁰

Other studies have comprehensively examined the effects of perceived stress, coping, and resources on the stress response. In a study of veterans, coping (not resilience) played a mediating role in the association between posttraumatic stress disorder and poor social functioning outcomes.³¹ In a study of South Korean intensive care unit nurses based on the stress-coping theory formulated by Lazarus and Folkman,²⁴ experiences of traumatic events, resilience, and social support (but not stress-coping style) influenced the likelihood of posttraumatic stress disorder as a stress response.³² Thus, the intermediate process between stress and the stress response is complex, and the related variables are inconsistent. Buterakos et al³³ reported on the effectiveness of a project to protect emergency nurses from WPV, emphasizing the importance of identifying and strengthening nurses' coping abilities and individual readiness. Therefore, in this study, we explored coping methods and meaningful resources related to the WPV experience of emergency nurses in South Korea. Because the psychological consequences of stress have been the main focus of research thus far, it is important to investigate stress responses, including physical and psychosocial responses, more comprehensively.

In this study, we recognized WPV toward emergency nurses as a meaningful stress situation and tested theoretical relationships using a stress-coping theory. We explored WPV experienced by emergency nurses in South Korea and investigated how perceived stress, coping methods, and resources (ie, resilience) influence the response to violence from the perspective of the stress-coping theory formulated by Lazarus and Folkman.²⁴ This was the main

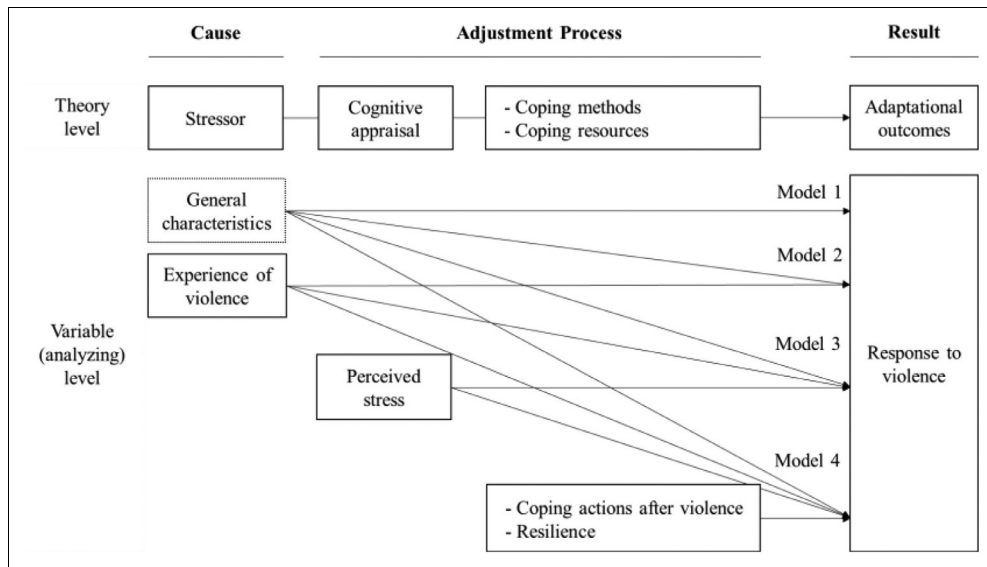


FIGURE
Conceptual and analytic framework tested in this study.

research question: What are the factors that are associated with the response of emergency nurses to WPV?

CONCEPTUAL FRAMEWORKS

The stress-coping theory formulated by Lazarus and Folkman²⁴ is a prominent model that addresses the stress phenomenon in terms of the interaction between humans and their environment. This theory is composed of stress factors, cognitive evaluation of stress, stress-coping style and use of resources, and adaptive results for stress. It includes 2 processes—cognitive appraisal and coping—that serve as critical mediators of stressful person-environment relations and their adaptational outcomes.³⁴ Accordingly, an individual's stress response is influenced and determined by the process of recognizing and coping with stress. In identical stressful situations, individuals show different adaptations or health statuses because of differences in perception and coping processes. Cognitive appraisal is a process by which a person evaluates whether and how a particular encounter with the environment is relevant to their well-being.³⁴ This is explained by the primary appraisal of whether the transaction is irrelevant, benign-positive, or stressful and by the secondary appraisal of coping resources and options.³⁵ Coping is defined as a person's cognitive and behavioral efforts to manage specific needs that are considered to overload their capacity or that exceed their resources.²⁴ Applying a variety

of effective coping methods and appropriately using resources (eg, health and energy, positive beliefs, problem-solving skills, social skills, social support, and material resources) help to achieve adaptational outcomes in stressful situations.²⁴ Folkman³⁵ emphasized that this theory must be verified in real-world scenarios because of the interrelated characteristics of each concept and their complex processes.

In this study, the stress-coping theory formulated by Lazarus and Folkman²⁴ was used to explain the effects of cognitive evaluation and coping processes on the relationship between WPV experiences and adaptive outcomes among emergency nurses in South Korea. The Figure shows the conceptual and analytic framework of the present study derived from the stress-coping theory. The measurement variables in this study were identified through a review of the literature that elucidated the factors influencing the stress response according to the main constituent concepts of the stress-coping theory. We regarded WPV as an important stressor and measured specific experiences of violence. To confirm cognitive appraisal as a factor contributing to stressor adjustment, we measured the level of WPV-related stress perceived by emergency nurses. Another stressor adjustment process involved the coping methods used after an experience of violence (ie, coping through resilience). Finally, adaptational outcomes after the adjustment process were measured as a multidimensional response after violence.

Methods

DESIGN AND PARTICIPANTS

This cross-sectional study was conducted to investigate the exposure of emergency nurses to violence and to identify the factors influencing the response to violence among these individuals. We used a nonprobability convenience sampling method. The participants in this study were registered nurses who had worked in the emergency departments at 11 general hospitals for more than 6 months. The number of participants was determined using G*Power 3.1.9.2 (Heinrich Heine University) on the basis of the Cohen power analysis formula.³⁶ With a significance level of .05, power of 80%, median effect size of .15, and predictor number of 10 in multiple regression analysis, the minimum optimal sample size was 118.

VARIABLES AND INSTRUMENTS

Experience of Violence

A questionnaire developed by Yun³⁷ was used to assess the type and frequency of violence experienced by nurses. The 16 questions consisted of 4 items concerning verbal violence, 5 items concerning physical threats, and 7 items concerning physical violence. The frequencies of verbal violence experienced within 1 week, physical threats experienced within 1 month, and physical violence experienced within 1 year were measured. The original items were modified to change the term “ward” to “emergency room,” which was permitted. The evaluation grades of “1 or less, 1, 2, 3, and 3 or more” were adjusted as follows: The response to each question was scored as 0 points for “no experience,” 1 point for “1 time,” 2 points for “2 to 3 times,” and 3 points for “4 times or more.” Internal reliability (Cronbach alpha) was 0.87 in the study by Yun³⁷ and 0.90 in this study. The values of each subcategory were 0.86 for verbal violence, 0.84 for physical threats, and 0.86 for physical violence.

Perceived Stress

To specifically identify the degree of stress subjectively perceived by emergency nurses when they experienced WPV, a single question directly asking about this topic was selected. The amount of stress from WPV was measured on a numerical rating scale from 0 to 10. A score of 0 indicated “no stress,” whereas a score of 10 indicated “the most stressed state.”

Coping Action After Violence

A tool developed by Lee et al³⁸ was used to assess coping with violence among nurses. This tool is a questionnaire that identifies the coping methods that nurses have used when experiencing WPV. There are not many studies on this topic in South Korea yet, and this tool has not yet been used in other studies. This binary scale of 27 questions investigates the coping actions directly implemented after a violent situation. Each coping action item was scored as “yes” = 1 point and “no” = 0 points. The 2 items “I didn’t do anything because I was embarrassed” and “I didn’t take any action because I didn’t know what to do” were reverse-scored. The Kuder-Richardson 20 reliability score was 0.73, which indicated internal consistency of the binary data in this study.

Resilience

This study used the Korean Connor-Davidson Resilience Scale, which was validated in Korea by Baek et al³⁹ using the tool developed by Connor and Davidson.⁴⁰ This tool consists of 5 subconcepts: hardiness, persistence, optimism, support, and spiritual nature. The 25 questions are scored on a 5-point Likert scale from 0 points for “not true at all” to 4 points for “true nearly all of the time.” Internal reliability (Cronbach alpha) was 0.89 at the time of development,⁴⁰ 0.93 in the study by Baek et al,³⁹ and 0.92 in this study.

Response to Violence

This study used the Korean version of the Assault Response Questionnaire developed by Lanza⁴¹ and validated in Korea by Jang and Lee.⁴² This tool consists of 3 subcategories: biophysiological response (10 items), immediate/delayed emotional response (13 items), and social response (3 items). The 26 questions are scored on a 5-point Likert scale from 1 point for “not at all” to 5 points for “very much.” Internal reliability (Cronbach alpha) was 0.95 at the time of development,³⁸ 0.94 in the study by Jang and Lee,⁴² and 0.94 in this study. The values for each subcategory were 0.91 for biophysiological responses, 0.90 for emotional responses, and 0.88 for social responses.

DATA COLLECTION

Before data collection, the researcher contacted general hospitals registered as emergency medical institutions located in G metropolitan city and J province to provide information

TABLE 1
Response to violence according to general characteristics (N = 131)

General characteristics	Category	n	%	Response to violence		
				M	SD	t or F (P), Scheffé
Sex	Female	125	95.4	81.27	18.78	1.30 (.20)
	Male	6	4.6	71.00	22.79	
Age (y)	≤25	24	18.3	75.13	18.13	1.79 (.15)
	26-30	55	42.0	79.38	18.34	
	31-35	32	24.4	83.63	21.84	
	≥36	20	15.3	87.00	15.44	
Marital status	Single	101	77.1	80.73	18.41	0.08 (.94)
	Married	30	22.9	81.03	21.20	
Education level	Diploma*	57	43.5	79.49	18.33	3.81 (.03) * = † < ‡
	Bachelor's degree [†]	66	50.4	79.80	19.27	
	Graduate coursework [‡]	8	6.1	98.38	13.93	
Clinical career (mo)	≤12	22	16.8	75.64	19.18	0.87 (.46)
	13-60	46	35.1	80.67	18.42	
	60-120	35	26.7	81.40	19.62	
	>120	28	21.4	84.32	19.16	
Clinical career in emergency departments (mo)	≤12	33	25.2	79.06	18.58	2.33 (.08)
	13-60	67	51.1	82.91	17.75	
	60-120	27	20.6	75.15	21.39	
	>120	4	3.1	98.00	15.81	
Position	Staff nurse	114	87.0	80.31	19.45	0.77 (.44)
	Charge nurse or higher	17	13.0	84.12	15.78	
WPV-related policy	Yes	83	63.4	80.59	19.75	.17 (.87)
	No	48	36.6	81.17	17.84	
WPV prevention education	Yes	68	51.9	80.59	20.32	.13 (.89)
	No	63	48.1	81.03	17.64	

M, mean; WPV, workplace violence.

on this study and obtain permission to conduct the study. Data were collected from 11 general hospitals with the consent of the nursing director and head nurse in the emergency departments. Relevant information was posted on the ED bulletin board to ensure that all nurses in the emergency departments had access to information about the study. The questionnaire was distributed in sealed envelopes to the nurses who had received explanatory information about the study and had agreed to participate. The completed questionnaire was then collected by the researcher.

Data collection was performed in February 2016 using a structured self-report questionnaire. The questionnaire consisted of items about general characteristics (demographic data and WPV-related characteristics) and 5 instruments measuring the study variables. The general

characteristics included items about sex, age, marital status, education level, clinical career, and position. WPV-related characteristics were collected through questions about whether the nurse's hospital had policies or guidelines on WPV, whether the WPV that occurred was dealt with promptly, and whether the nurse had received WPV violence prevention training at the hospital. In addition, an open-ended question was included to ask nurses' opinions on the options thought to be effective in preventing WPV.

For ethical reasons, this study was conducted with approval from the Chosun University Institutional Review Board (approval number: 2-1041055-AB-N-01-2016-0002). The questionnaire was provided only to those nurses who volunteered to participate and provided

TABLE 2
Descriptive statistics for variables (N = 131)

Variable	M	SD	Observed range (Range per item)	Possible range
Experience of violence	18.76	9.31	2-48 (0.13-3.00)	0-48 (0-3)
Verbal violence	7.05	3.06	1-12 (0.25-3.00)	0-12 (0-3)
Physical threats	7.83	3.76	1-15 (0.20-3.00)	0-15 (0-3)
Physical violence	3.88	4.50	0-21 (0.00-3.00)	0-21 (0-3)
Perceived stress	7.03	2.15	1-10	0-10
Coping actions after violence	15.56	3.67	3-25 (0.11-0.93)	0-27 (0-1)
Resilience	56.81	11.71	31-97 (1.24-3.88)	0-100 (0-4)
Response to violence	80.80	19.00	33-119 (1.27-4.58)	26-130 (1-5)
Biophysiological response	26.65	9.30	10-49 (1.00-4.90)	10-50 (1-5)
Emotional response	47.56	9.60	18-65 (1.38-5.00)	13-65 (1-5)
Social response	6.60	2.85	3-15 (1.00-5.00)	3-15 (1-5)

M, mean.

written informed consent. Anonymity and confidentiality of the data were maintained to protect the rights of the research participants. The data were only collected for research purposes, and the participants were permitted to withdraw from the study at any time. All emergency nurses who participated in the survey were given a small gift in return.

DATA ANALYSES

The data collected were tested at the .05 significance level with SPSS for Windows 23.0 (IBM Corp). In keeping with the requirements of the stress-coping theory, we used hierarchical regression analysis instead of a single-level model to investigate more effectively how multidimensional variables affect adaptive outcomes.⁴³ A 4-step model is presented to clarify the influence of each combination of independent variables on the adaptational outcome. Specific analyses were as follows: (1) descriptive statistics were calculated for general characteristics and variables; (2) the difference in response to violence according to general characteristics was tested with independent *t* tests and 1-way analysis of variance; (3) postcomparison analyses were performed with the Scheffé test; (4) the Pearson correlation coefficient was used to confirm correlations among the variables; and (5) 4-step hierarchical regression analyses according to the theoretically set steps were conducted to identify the contributions of additionally input variables among the factors affecting the response to violence. In the first phase of the hierarchical regression

analyses, general characteristics were included as control variables. After controlling for variables in phase 1, we conducted phases 2 to 4 of the regression analyses to identify the impact of the independent variables on the response to violence in accordance with the study framework. Experiences of violence were included in the second phase, perceived stress was included in the third phase, and variables related to coping methods and resources were included in the fourth phase.

Results

PARTICIPANTS

A total of 140 questionnaires were collected; of these, 131 were used for analyses after the exclusion of 9 incomplete questionnaires. Table 1 shows the participants' general characteristics, including demographic information and WPV-related items. In response to an open-ended question concerning measures to prevent violence, various opinions were presented, including the 24-hour presence of security management personnel in the emergency departments, reinforcement of closed-circuit television installation, reinforcement of punishment for perpetrators of violence, protection of staff members and active cooperation of organizations to resolve violence, revision of hospital regulations related to WPV, preparation of a systematic manual and response system that could be implemented immediately, and a hotline system that could promptly notify staff of violence-related damage/injury.

TABLE 3
Correlations among the main variables (N = 131)

Variable	X1	X2	X3	X4
Experience of violence (X1)	1			
Perceived stress (X2)	0.53 (< .001)	1		
Coping action after violence (X3)	0.29 (.001)	0.17 (.05)	1	
Resilience (X4)	0.12 (.19)	-0.052 (.56)	0.004 (.96)	1
Response to violence (X5)	0.43 (< .001)	0.62 (< .001)	0.23 (.009)	-0.15 (.08)

DESCRIPTIVE STATISTICS FOR VARIABLES

Descriptive statistics are presented in Table 2. Regarding specific experiences of violence, verbal violence (mean [M] = 1.76, SD = 0.77) had the highest score, followed by physical threats (M = 1.57, SD = 0.75) and physical violence (M = 0.55, SD = 0.64). The most common types of verbal violence were “talking down” (M = 2.15, SD = 0.87) and “yelling” (M = 1.94, SD = 0.89). Patients (99.2%) were the most common perpetrators of verbal violence, followed by families (74.8%), physicians (23.7%), and peer nurses (9.2%; multiple responses were possible). The most common types of physical threats were “making an angry face” (M = 2.23, SD = 0.07) and “expressing anger around the emergency department” (M = 1.67, SD = 0.09). Patients (96.9%) were the most common perpetrators of physical threats, followed by families (73.3%), physicians (5.3%), and peer nurses (2.3%; multiple responses were possible). The most common types of physical violence were “pushing me” (M = 0.95, SD = 0.09) and “spitting toward me” (M = 0.68, SD = 0.09). Patients (81.7%) were the most common perpetrators of physical violence, followed by families (50.4%), physicians (3.8%), and peer nurses (2.3%). Regarding specific coping actions based on the tool items, the most common types were “talking to a colleague” (130, 99.2%) and “trying to defend myself physically” (124, 94.7%). Note that only 31 participants (23.7%) reported the use of professional help such as “requesting counseling.” More than half of the participants responded with “I did nothing because I was embarrassed” (77, 58.8%) and “I did nothing because I did not know what to do” (89, 67.9%) immediately after the violence occurred. Regarding specific experiences of responses to violence, emotional response (M = 3.66, SD = 0.74) had the highest score, followed by biophysiological response (M = 2.66, SD = 0.93) and social response (M = 2.20, SD = 0.95).

DIFFERENCES IN RESPONSE TO VIOLENCE ACCORDING TO GENERAL CHARACTERISTICS

Analyses of the differences in response to violence according to general characteristics revealed significant differences only for education level (Table 1). Post hoc analyses of multiple comparisons revealed that the score for the response to violence was higher among participants with graduate coursework (M = 98.38, SD = 13.93) than among participants with a diploma (M = 79.49, SD = 18.33) or a bachelor's degree (M = 79.80, SD = 19.27).

CORRELATIONS BETWEEN VARIABLES

Analyses of correlations among the variables (Table 3) showed that the nurses' response to violence in the workplace was significantly positively correlated with experience of violence ($r = 0.43$, $P < .001$), perceived stress ($r = 0.62$, $P < .001$), and coping action after violence ($r = 0.23$, $P = .009$).

FACTORS INFLUENCING RESPONSE TO VIOLENCE

Hierarchical regression analyses were performed to identify the factors influencing the response to violence (Table 4). The general characteristics that showed statistically meaningful relations in the earlier analyses were included as control variables after treatment as dummy variables of the categorical types. A test of the assumptions of the regression analysis resulted in a Durbin-Watson value of 1.73, confirming the independence of the residual error. There were no problems with multicollinearity among the independent variables, with a tolerance limit of 0.66 to 0.95 (≥ 0.1) and a variance inflation factor of 1.09 to 1.52 (< 10). The model fits of the 4 regression models were all statistically significant ($F = 3.81-21.74$; $P = .03$ or $P < .001$). In regression model 1, the variable that had a

TABLE 4
Factors influencing response to violence (N = 131)

Variable	Model 1				Model 2				Model 3				Model 4			
	B	95% CI	β	P	B	95% CI	β	P	B	95% CI	β	P	B	95% CI	β	P
Education level*																
Bachelor's degree	0.31	-6.35 to 6.97	0.01	.93	0.30	-5.76 to 6.36	0.01	.92	-0.80	-6.13 to 4.52	-0.02	.77	-0.17	-5.40 to 5.07	-0.00	.95
Graduate coursework	18.88	4.98 to 32.78	0.24	.008	15.19	2.46 to 27.92	0.19	.02	8.60	-2.75 to 19.95	0.11	.14	10.57	-0.69 to 21.83	0.13	.07
Experience of violence					0.84	0.53 to 1.16	0.41	< .001	0.28	-0.05 to 0.61	0.14	.10	0.29	-0.04 to 0.63	0.14	.09
Perceived stress									4.62	3.16 to 6.08	0.52	< .001	4.32	2.87 to 5.76	0.49	< .001
Coping action after violence													0.52	-0.19 to 1.23	0.10	.15
Resilience													-0.26	-0.48 to -0.03	-0.16	.02
F (P)		3.81 (.03)				12.24 (< .001)				21.76 (< .001)				16.38 (< .001)		
Adjusted R ²		0.04				0.21				0.39				0.42		

β , standardized beta; CI, confidence interval.

* Dummy variable: reference group = diploma.

statistically significant influence on the response to violence was graduate coursework ($\beta = 0.24$; $P = .008$) compared with the diploma level of education. In regression model 2 (model 1 plus experience of violence), graduate coursework ($\beta = 0.19$; $P = .02$) and experience of violence ($\beta = 0.41$; $P < .001$) had statistically significant influences on the response to violence. In regression model 3 (model 2 plus perceived stress), only perceived stress ($\beta = 0.52$; $P < .001$) had a statistically significant influence on the response to violence. Education level and experience of violence were no longer significant predictors, but explanatory power increased from 20.6% to 39.0%. In regression model 4 (model 3 plus coping actions after violence and resilience), perceived stress ($\beta = 0.49$; $P < .001$) and resilience ($\beta = -0.16$; $P = .02$) had statistically significant influences on the response to violence. The explanatory power of this final model, with all major independent variables, was 41.5%.

Discussion

Frequent WPV toward emergency nurses is a serious problem worldwide.^{4,10,12,14-16,19,23,44} First, this study focused on the experiences of WPV involving emergency nurses. This study investigated violence experienced by emergency nurses in terms of verbal violence, physical threats, and physical violence. Among these, verbal violence was most common—it occurred between 1 and 3 times per week. These results are consistent with the findings of previous studies, which showed that emergency nurses are exposed to various types of WPV, most frequently including verbal violence.^{4,15,16,44} The perpetrators of all types of violence were (in descending order of violence perpetration) patients, families, physicians, and peer nurses. This result is consistent with the findings of previous studies in which most of the perpetrators were patients.^{8,15,16,30} The most common verbal violence was “talking down,” the most common physical threat was “making an angry face,” and the most common physical violence was “pushing me.” These findings are similar to the results described by Jeung and Oh¹⁹ using the same scale among nurses in South Korea. This information regarding the types of violence experienced by emergency nurses helps to clarify the WPV that occurs in emergency departments and can facilitate efforts to reduce and prevent future WPV involving emergency nurses.

The results for perceived stress indicated that emergency nurses experienced considerable stress (average 7.03 out of 10) from violence during work. According to prior

domestic and international studies, nurses exposed to WPV experience high levels of stress, which are associated with negative outcomes that increase burnout or reduce professional quality of life.^{19,20,45,46} Because the high stress caused by WPV experienced by nurses affects professional work-related factors, it is important to control WPV and manage the resulting stress to ensure consistent medical care quality in the emergency field.

The average score for coping actions after violence was 15.56 out of 27. Specifically, there were high rates of talking to a colleague or trying to protect themselves physically, whereas there were low rates of seeking professional help such as counseling from a health care provider. More than half of the participants responded that they did nothing because they were embarrassed or did not know what to do. In other words, there were many cases where inappropriate or passive coping methods were used or no response was made in the situation where WPV occurred. The tendency of emergency nurses to fail to actively report WPV was also found in previous studies.^{14,34} A study of home-visiting health care workers in South Korea, conducted using the same tool, found that talking to a colleague was the most frequent coping action after violence and that most of the respondents (86.4%) wanted education concerning effective methods of approaching WPV.³⁸ The main reason given for not reporting WPV incidents was that the workers felt that such methods would be ineffective and that such incidents were considered part of the work environment.³⁸ This suggests that nurses have little experience of institutional protection, or belief that institutions have a way to protect them, from potential WPV risks. For emergency nurses, WPV should be perceived not as inevitable but as a problem to be solved. In particular, more organizational measures should be developed for emergency nurses who are likely to become victims of WPV. In the future, exploratory research on how to cope effectively with stressful situations caused by WPV and the reasons for using passive or negative coping methods is needed.

The scores for response to the violence experienced by the participants were rather high, with an average of 80.80 from a possible range of 26 to 130. The highest intensity was observed in emotional response, followed by biophysiological response and social response. These results are similar to the findings of previous studies concerning response to violence involving emergency nurses in South Korea.^{47,48} The response of “being angry” in the emotional subcategory was highest, similar to the results of previous studies in which WPV led to high anger scores among nurses.²⁰ Therefore, when considering the consequences of WPV experienced by emergency nurses, emotional

consequences as well as the physical harm or aftereffects should be carefully reviewed.

The analysis of responses to violence according to general characteristics revealed that the group with the highest level of education (graduate coursework) showed the highest score. Such violence is thought to be more frustrating for nurses with higher educational backgrounds, leading to more negative consequences. However, the results from previous studies on the relationship between nurses' WPV-related experience and education level are inconsistent.^{49,50} Moreover, many other interpretations of, and reasons for, this finding are possible. Other factors related to higher education level (eg, intelligence, limited peer support, and management responsibility) were not measured together in the current study; therefore, the relevance of education level should be addressed carefully. Further study on this issue is needed in the future.

The correlation analysis among the major variables showed that the more experiences of violence the nurses had, the higher the perceived stress caused by violence; furthermore, when the coping action after violence was active, the score for the response to violence decreased. Correlation analysis does not provide information on the direction of causality among the variables, but it does provide basic data for identifying significant factors related to the responses to violence. Thus, our results offer guidance on the means of minimizing the consequences of violence in WPV situations that are unavoidable. These results suggest that an effective approach to reducing the negative consequences of WPV directed at emergency nurses would be to identify the level of stress they perceived owing to violence and to foster effective coping strategies. This is consistent with the main points of the stress-coping theory formulated by Lazarus and Folkman.²⁴

This study explored the factors that influence the response to violence through hierarchical regression analyses. When the experience of violence was added in regression model 2, the explanatory power was greatly increased, from 4.1% to 20.6%. However, the strength of the association of education level and the WPV experience variable decreased in regression model 3; therefore, only perceived stress remained a significant factor even as the explanatory power increased to 39.0%. Thus, the degree to which a violent situation was considered threatening had a greater influence on the response to violence than the experience of violence itself. These results are consistent with the stress-coping notion that no event can act as a stressor without the influence of individual perception or evaluation and that determining the level of stress caused by any event is a method for interpreting the environmental stimuli or coping resources.²⁴ Therefore, perceived stress should

receive greater focus than the stressful situation itself, with the aim of reducing the stress response caused by violence. To reduce future negative consequences of WPV in the health care field, an effective approach may include cognitive therapy, which modulates cognitive evaluation of violent situations. In regression model 4, which included the variables related to coping methods and resources, the explanatory power was 41.0%. In this final model, the significant factors influencing the response to violence were perceived stress and resilience. Accordingly, internal factors such as perceived stress and resilience were more likely to constitute influencing factors than external factors such as the violent situation itself. These findings imply that internal factors have considerable importance. In particular, resilience is an internal coping resource that can aid in positive self-evaluation in stressful situations.⁵¹ A person with a resilient ego is able to adapt successfully because their high degree of control increases or decreases tension and patience in a situation-dependent manner.⁵² Therefore, regarding the negative effects of the experience of violence on the reaction to such violence, resilience may be a protective variable. Coping actions after violence were excluded from among the significant influencing factors presumably because the actions performed by participants in a violent situation are not always effective. Therefore, to prevent WPV toward emergency nurses and minimize its negative consequences, programs to relieve stress due to violence and increase resilience to violence will be useful, along with the provision of organizational prevention measures, environmental considerations, employee training, resources, and so on. In addition, the effects and outcomes of coping methods should be assessed in subsequent studies to explore the relationship between stress coping and response.

The findings in this study are useful in that they show the importance of internal resources and the need for their application to the workplace environment using empirical data. Additional studies are needed to further identify the factors influencing the consequences of WPV among emergency nurses globally. Qualitative studies that include a longitudinal approach are also needed for more in-depth understanding of the phenomenon of WPV involving nurses, and experimental studies are needed to develop a stress management program for nurses exposed to WPV. In addition, institutional policies should be prepared (eg, strengthening guidelines and education for the prevention of violence and maintenance of safety involving nurses in emergency departments), and prompt and appropriate follow-up measures should be instituted for victims and perpetrators after violence, including professional intervention if necessary.

Limitations

This cross-sectional study is limited in terms of its ability to clarify the process and causal relationships between stress and adaptation experiences due to WPV. Because this study only included emergency nurses at general hospitals in a single region and had a small sample, care should be taken when interpreting or generalizing the results. Experiences of violence in this study were measured through a self-report questionnaire that relied on recall, which may differ from empirical data. In addition, there may be errors and biases in the quality and quantity of the experience owing to subjective understanding; therefore, these data should be interpreted with caution. Furthermore, because this study focused only on licensed nurses, in the future it is necessary to expand the population to include nursing assistants as another group of nursing staff who may be affected by WPV.

Implications for Emergency Clinical Care

Similar to the results of other international studies, emergency nurses in this study have experienced various types of WPV, used passive coping methods, and recognized that more effective prevention and follow-up measures are needed. The degree to which individuals perceive stress and their resilience were identified as important factors influencing the negative consequences of violence. Therefore, an individual education and training plan for emergency nurses using these results will be helpful in developing more effective coping in response to WPV, minimizing the damage caused by violence and promoting quick recovery.

Conclusions

This study emphasized the importance of protecting health care professionals from violence and creating a safe working environment in emergency departments, which can deal with human life at its most vulnerable and emotional moments. The results of this study suggest that internal factors such as perceived stress and resilience may have more meaningful effects on the response to violence than the experience of violence itself. The results are expected to serve as assessment data for preparing interventions and policies around prevention and effective coping regarding WPV toward emergency nurses.

Author Disclosures

Conflicts of interest: none to report.

This study was approved by the institutional review board of Chosun University, with which the authors are affiliated (approval number: 2-1041055-AB-N-01-2016-0002). All instruments used in this study were approved for use by the copyright holder. Of these, the Resilience Scale was used after paying for the use of the tool and receiving written confirmation.

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EMERGENCY NURSES ASSOCIATION POSITION STATEMENT: MEDICATION MANAGEMENT AND RECONCILIATION IN THE EMERGENCY SETTING



NCPD Earn Up to 11.5 Hours. See page 117.



Description

Medication reconciliation remains a patient safety issue worldwide. In the United States, The Joint Commission (TJC) began pivoting focus from medication reconciliation toward overall medication management when introducing the seven foundations for safe quality transitions of care in 2013.¹ Medication management as one of the foundations broadly includes activities such as verification, prescribing, administration and monitoring used in conjunction with the current National Patient Safety Goals (NPSG) on medication reconciliation. Medication management is intended to safeguard patients from medication errors and adverse drug events (ADEs) during transitions between care settings, including emergency departments, urgent care centers, other ambulatory emergency settings or other types of care settings.^{1–12} Medication management is more than just an accurate medication history or reconciliation. The three phases of the reconciliation process are imperative to ensure effective medication management and obtaining an as complete and accurate medication history is the first step.² Medication management and reconciliation in the emergency setting is a collaborative effort between nurses, physicians, pharmacists, and patients to reduce risk for patients in health care settings and at home.^{1,2,4,8,9,13–15} This process requires that health care providers, including emergency nurses, communicate clearly with patients and their caregivers about the importance of maintaining an accurate medication list.^{4,13,16} An accurate medication list includes all medications including prescriptions, over-the-counter medications, supplements, herbals, medicinal marijuana, known allergies and last dose.

For patients who present to emergency care settings, an accurate medication history is imperative for patient

safety and to enable appropriate evaluation and treatment. However, in the often busy and chaotic emergency setting where time is essential, obtaining accurate and complete medication history can be an arduous process. With medication information coming from multiple sources (patient, family, caregivers, multiple pharmacies, etc) and other conflicting or competing patient care issues, errors in the communication of significant information at key transition points are possible and can be problematic.^{4,12,13,17–20}

Most patients who present to an emergency department enter through the hospital's triage area. Triage is a process to rapidly sort patients based on patient acuity and resources needed.^{21,22} Triage is intended to identify life-threatening or high-risk situations that require immediate intervention to save lives. When triaging patients, the emergency nurse obtains a brief assessment along with any other relevant medical history and may obtain a focused medication history pertinent to the chief complaint. A more comprehensive medication history (the first phase of the reconciliation process) should be obtained after the initial triage process and stabilizing care prior to admission or other disposition.

Evidence demonstrates that collecting a medication history during triage is more likely to result in errors in the patient record than pharmacy-led acquisitions of medication information.^{19,23–25} In two studies, omission of medications or doses were the most frequent errors attributed to nurses completing the medication history.^{23,24} These findings are due in part to time constraints. Evidence shows that completing an accurate and complete medication history can take 20 to 79 minutes.^{5,23,26,27} The time constraints lead to debate about whether the emergency care setting is the appropriate place to obtain a detailed medication history.¹⁸

Many studies and authoritative bodies in the United States as well as internationally indicate that pharmacists or pharmacy technicians are best suited to compile the medication history and subsequently complete the reconciliation process.^{1,4–6,11,12,15,19,23,24,26–33} Position statements from multiple prominent health care associations are substantiated by research findings. When pharmacists or pharmacy technicians are available in the

emergency setting, their participation in medication management not only improves the medication reconciliation process but effectively improves patient safety and reduces medication errors in the hospital setting.^{15,28–31,34,35} Despite these findings, there are still significant challenges to establishing a dedicated pharmacy staff present in the emergency setting to participate in the medication management process.

In addition to time constraints, there are numerous barriers experienced by emergency nurses in collecting medication histories, including high patient volumes and patient care activities. Not only is the emergency care setting not the most opportune time to collect an accurate medication history, but emergency nurses should not perform the actual reconciliation phase as this is completed by the licensed independent provider (LIP). Emergency nurses can actively contribute to the medication management process through their performance of assessments, interventions, reevaluations, patient education, and discharge. Emergency nurses play an important role in empowering patients to understand the role they play in the medication management process as well as helping them to understanding the potential risks of drug/drug or drug/food interactions.^{3,13,16,20,36} Emergency nurses can educate patients and/or their caregivers on the importance of maintaining and keeping with them an accurate medication history including, dosage and frequency of all prescriptions, over-the-counter drugs, supplements, medicinal herbs, and other substances.^{16,20,36} Additionally, emergency nurses are in a position to advocate for best practices in the medication management process to ensure patient safety.

ENA Position

It is the position of the Emergency Nurses Association that:

1. Medication management is a collaborative partnership between multiple health care disciplines including nurses, physicians, and pharmacists.
2. Ideally, pharmacists or pharmacy technicians are the preferred clinicians to complete the medication history and medication reconciliation.
3. Emergency nurses can support medication management by collaborating with prescribers and facilitating two-way communication regarding any medication changes, additions, or deletions to the patient's current medication regime to patients, families, caregivers and/or transferring facilities especially elderly polypharmacy and other high-risk patients.
4. Emergency nurses can support medication management by collaborating with providers to ensure that daily medications are ordered and being administered to admission patient being held in the department.
5. Emergency nurses obtain an accurate and complete medication list if possible after the initial triage process.
6. Triage is intended to rapidly identify life-threatening or high-risk situations. Thus, collection of comprehensive medication history can be delayed and performed after the patient is stable.
7. Emergency nurses educate patients, their families, and caregivers on the importance of keeping an accurate medication list with them at all times.
8. Emergency nurses participate in policy and guideline development to assure optimal medication management processes are developed.
9. Emergency nurses collaborate with pharmacists and facility leadership to advocate for pharmacy-led medication management as best practice.

Background

Medication reconciliation is a complex multi-pronged process. TJC NPSG number 8 to “accurately and completely reconcile medications across the continuum of care,”⁷ has evolved since first introduced in 2005. When first announced, there was little direction as to the who, what, when, where, and how to complete the process, which led to, and continues to create, confusion among emergency nurses and other health care providers.^{18,37} As initially defined by TJC, the process of medication reconciliation was intended to reduce discrepancies and prevent medication errors but was complex, laborious, and did not necessarily result in accurate information.^{18,19} Because of difficulty in implementation the lack of proven strategies for success TJC, in 2011, suspended the original NPSG and incorporated medication reconciliation into NPSG number 3.¹ This safety goal acknowledges the challenges of reconciliation yet still requires a “good faith effort” to obtain a medication history (the first step) on arrival and then comparing it with those medications that are prescribed (the reconciliation stage). This is done to identify and resolve discrepancies and to improve the safe use of medications across the continuum of care.^{1–3,14}

Factors such as unreliable patient provided information, inaccurate information from outside sources, and ineffective communication among health care providers have been identified as barriers to collecting accurate medication histories.^{20,22,37,38} According to the Institute for Healthcare Improvement^{39,40} and the Institute for Safe Medication Practices⁴¹ inaccurate medication histories may cause up to 50% of all medication errors and as much as 20% of the ADEs seen in the hospital setting. Furthermore, numerous studies have found that medication histories collected by nurses or health care personnel other than pharmacy staff were less accurate,^{24,38} had higher rates of

discrepancies,^{23,32} and higher rates of omissions²⁷ compared to pharmacy staff-led history collection. Preventing medication errors, ADEs, or other harm to patients resulting from an inaccurate medication history should always be the primary goal of medication management regardless of what specialty completes the task.

Emergency department medication reconciliation and management in the United States and internationally is complex. Policies aimed at both are impacted by various factors including the country of origin, the accrediting body used by each hospital, and the various regulatory agencies definitions of what medication reconciliation or medication management entails, all have influence over policies and protocols in the emergency department. International Pharmaceutical Federation³¹ lists 6 different definitions of medication reconciliation. Regardless of these factors accurate medication history, management, and reconciliation depends on emergency nurses around the world to understand their individual facility, country, and regulatory agency guidelines, policies, and procedures.

Overall, medication management is a collaborative, cooperative partnership between multiple health care disciplines, including nurses, physicians, and pharmacists, to ensure medication safety through effective communication. It is essential that information given to a patient, family, caregiver, transferring, or receiving facility include changes, additions, or deletions to the patient's current medication regime. Emergency nurses need to continue advocating for patient safety measures that protect the patient and enable the nurse to be actively engaged in processes without unnecessary barriers.

Resources

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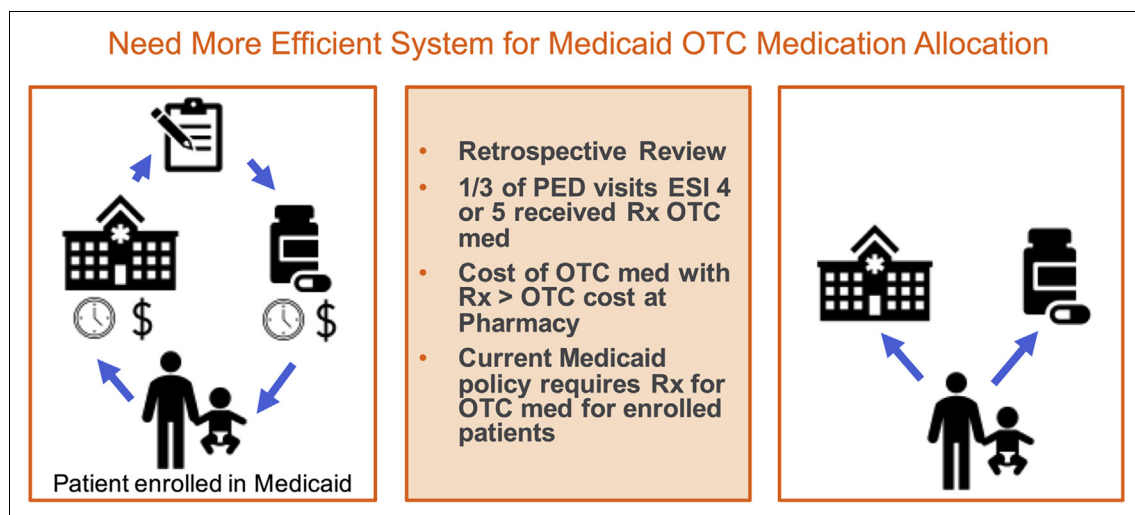
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OVER-THE-COUNTER MEDICATION PRESCRIBING IN A PEDIATRIC EMERGENCY DEPARTMENT: HEALTH RECORDS REVIEW



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Abstract

Objective: The purpose of this project was to describe patterns in over-the-counter medication prescribing for nonacute patients with Medicaid in a pediatric emergency department. Differences were also tested in visit time and charges between patients with and without over-the-counter medication prescriptions.

Methods: Retrospective chart review of children with Missouri Medicaid presenting to a single site between January 1, 2018 and December 31, 2018 was conducted. Low-acuity patients with common diagnoses were included. Over-the-counter medications prescribed, the cost of prescriptions, the time spent in the emergency department, provider care time, patient age, and the month of visit were extracted. Data were analyzed with descriptive statistics and *t* tests.

Results: Approximately 37% of children were prescribed over-the-counter medications, most commonly antipyretics. When comparing visits in which an over-the-counter medication was prescribed to visits without an over-the-counter medication prescription, we found no significant difference in the associated charges, total time in the department, and provider care time.

Conclusion: Over-the-counter medications were prescribed for more than one-third of children cared for in the pediatric

emergency department for low-acuity presentations. These visits may represent a substantial area for Medicaid access barriers, system redesign, and cost savings.

Key words: Pediatric emergency department; Over-the-counter medications; Prescriptions; Medicaid

Introduction

In most states, patients with Medicaid are required to obtain a prescription written by a health care provider to receive Medicaid-paid over-the-counter (OTC) medications from pharmacies.¹ Missouri, the state where we (the authors) practice, is one such a state. Nonurgent visits to the pediatric emergency department (PED) have long served as a safety net for the uninsured and patients with Medicaid to obtain medical care. Patients have relied on the PED for a multitude of reasons, including limited family resources and limited or minimal access to primary care. OTC and prescription drugs often serve as first-line tools for treating many acute and chronic illnesses, making drug coverage an important part of the recipient's care. Requiring a prescription for patients covered by Medicaid to receive common OTC medications free of charge may represent one part of a parent's motivation to go to the PED.

Historically, Medicaid was originally enacted through Title 19 of the Federal Social Security Act in 1965² to provide public health insurance coverage to millions of low-income Americans. Medicaid eligibility was expanded to include children in the late 1980s and again in the early 1990s.³ As part of the law, the federal government covers medication costs by offering matching funds to states to support the financing of medications (both prescription and OTC) for Medicaid programs. State participation is voluntary, and currently all states participate in this federal matching funds program for prescription drugs.⁴ States who choose to cover OTC medications in their Medicaid

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programs are eligible to receive federal Medicaid dollars with the requirement that OTC medications must be *prescribed* by an authorized medical provider to access payment.¹ Children enrolled in Missouri Medicaid currently have no co-payment for OTC medication prescriptions but are limited to a preferred list of covered OTC medications that they can receive free of patient charge.⁵

In Missouri, children represent the largest demographic group served by Missouri Medicaid with one-third of all children in the state enrolled.⁶ From March 2020 to March 2021 during the coronavirus disease (COVID-19) pandemic, the state of Missouri experienced a 35.5% rise in Medicaid enrollment, the second highest increased enrollment rate in the country.⁷ This number may have been affected in part by unprecedented unemployment rates during the pandemic disaster.

According to the Centers for Disease Control and Prevention (CDC), there were 138 million ED visits in the United States in 2017, 20.4% of which were for children younger than 15 years.⁸ One-third of visits for patients aged 15 years or younger were triaged as low-acuity Emergency Severity Index (ESI) 4 and 5, with the most frequent reasons for the visit being fever, cough, abdominal pain, skin rash, and nasal congestion.⁸ Much of the nonurgent care provided in the emergency department can result in crowding, increased cost, poor health outcomes, lack of continuity of care, and inadequate access to primary care.⁹ Rasooly et al¹⁰ evaluated a national sample of ED visits along with the US Census data between 2001 and 2010 and found an increase of 14.4% of ED visits by children over this period.

Children enrolled in Medicaid use the emergency department more commonly than other insured populations. According to the CDC's 2012 National Center for Health Statistics Report, 25% of children covered by Medicaid used the emergency department, whereas uninsured children used the emergency department at 16% and children covered by private insurance at 13%.¹¹ In 2012, children with Medicaid coverage were more likely to have visited the emergency department by one more visit over a 12-month period compared with the uninsured and those with private coverage for less serious medical complaints.¹¹ A study by Samuels-Kalow et al¹² found that among Medicaid-insured children, previous use of the emergency department for lower acuity complaints led to an increased frequency of return ED visits for low-acuity reasons. The growing use of emergency departments for nonurgent child visits contributes to the overall cost of care.¹²

Identifying and overcoming obstacles for patients covered by Medicaid to obtain common OTC medications without the need for a medical prescription may represent one method to reduce the use of PED use for nonurgent visits. Eliminating the need for an OTC medication

prescription may reduce the barriers parents experience when trying to provide timely care for their children. We focused on OTC medication prescribing for patients enrolled in Medicaid in a regional children's hospital PED in Missouri. Our goal was to help identify and quantify OTC prescribing among low-acuity Medicaid-insured patients presenting to PED. We compared PED visits in which an OTC medication was prescribed with those in which they were not prescribed; we examined if there were differences in associated charges, total time in PED, and provider care time.

Methods

SETTING

The study was conducted at an urban, free-standing, Midwestern academic children's hospital with a tertiary care 39-bed PED with an annual volume of more than 70 000 patients per year. Patients are triaged according to ESI criteria.¹³ The area of the PED reserved for lower acuity (ESI 4-5) patients is staffed primarily by advanced practice registered nurses. Over the course of 2018, 18% of patients seen in the PED were considered nonurgent (ESI 5), whereas 23% were semiurgent (ESI 4). Of the low-acuity patients presenting to the PED during the study period payor type for patients presenting to the PED, 59% had Medicaid/Medicare, 34% had commercial insurance, 6% were self-pay, and 1% of the patients were on hospital financial assistance.

STUDY DESIGN AND PARTICIPANTS

We conducted a retrospective chart review of PED visits for children insured by Missouri Medicaid, aged 2-17 years, who presented between January 1, 2018 and December 31, 2018 and were assigned an acuity level of 4 (semiurgent) or 5 (nonurgent). We included one or more of the following common discharge diagnoses: fever, upper respiratory infection, nasal congestion, constipation, insect bites, seasonal allergies/allergic rhinitis, and diaper rash (see [Supplementary content](#)). These diagnoses were chosen by author consensus as they are historically some of the most frequent reasons patients are seen in PED lower acuity setting (patients with ESI 4 and 5). Constipation was chosen as it tends to be a lower severity cause of abdominal pain versus abdominal pain in general, which can include bowel obstruction or appendicitis. Children with complex chronic conditions, such as cystic fibrosis, malignancy, sickle cell disease, Hirschsprung's disease, as well as patients with surgery in the past 30 days, were excluded. In addition, patients who left the PED against medical advice were excluded because their data were incomplete. The initial data report showed that 5053

participants met initial parameters. A power analysis was not conducted.¹⁴ A sample size of approximately 500 (10% sampling) was deemed too large to provide sufficient precision for any effects that would be clinically and practically meaningful. Because manual review of the data was also necessary, we determined that 500 was a feasible sample size.

A second data report was generated on the randomly selected sample and the following information was obtained from the electronic medical record: if and which OTC medications were prescribed, patient's time in department in total minutes (calculated from time of check-in to discharge); provider care time (noted from the time the provider assigned themselves to the patient until the patient was electronically discharged); and the demographic variables of age, month of visit, and diagnosis (see [Supplementary content](#)). Researchers also reviewed the patient's chart to investigate and correct any discrepancies or unclear data. The hospital's financial department provided charge estimates for the visit cost, and pharmacy provided estimated prescription cost.

The Children's Research Institute Children's Mercy Kansas City Institutional Review Board at the hospital approved the study protocol (STUDY00000758).

STATISTICS

Descriptive statistics were used to describe categorical variables. An independent *t* test was used to compare groups (OTC medication prescribed vs OTC medication not prescribed) for time spent in the PED, provider care time, and charges associated with the visit.

Results

POPULATION

Of the 505 randomly selected visit records, 43 were excluded because of electronic medical record screening errors (8.5%). The remaining 462 (91%) medical records were included in the study group. The most common discharge diagnosis was fever (44.2% of visits), upper respiratory infections (19.3% of visits), and insect bites (10.4% of visits) ([Figure 1](#)). Included records were for patients who were aged from 2 to 17 years, with a mean age of 6 years (SD = 3.86). The number of prescriptions for OTC medications was highest during the month of February and lowest during the month of June ([Figure 2](#)).

OTC MEDICATION PRESCRIPTIONS

More than one-third (37.2%) of the study group were prescribed an OTC medication. The 3 most common classes of OTC medications prescribed were antipyretics (54.7%),

antihistamines (26.7%), and stool softeners (16.3%) ([Figure 3](#)).

In addition, we reviewed charges generated for the visits. The mean charge for a PED visit for ESI 4 or 5 was \$365.23. When comparing visits in which an OTC medication was prescribed with visits without an OTC medication prescription, we found no significant difference in the associated charges ($t = 0.65$, $P = .52$, 95% CI [-23.14, 45.73]).

VISIT TIME

The mean time spent in the department was 130.84 minutes if an OTC prescription was provided versus 134.19 minutes if no prescription was given ($t = 0.50$, $P = .62$, 95% CI [-9.80, 16.51]). Direct provider care time spent when a prescription was given was 58.97 minutes compared with 55.47 minutes when no prescription was provided ($t = -0.75$, $P = .46$, 95% CI [-12.75, 5.73]) ([Table](#)).

Discussion

More than one-third (37.2%) of our study participants were prescribed an OTC medication. The top 3 OTC medications prescribed were antipyretics, antihistamines, and stool softeners, which is consistent with the most frequent reasons children are seen in the emergency department as described by Rui and Kang.⁸ The high frequency of the diagnosis of fever coincides with the approximately 12 838 493 total claims for generic ibuprofen prescriptions written for patients with Medicaid coverage in 2018.¹⁵ Even though visits in which an OTC medication was prescribed versus visits without an OTC medication prescription did not show a significant difference in associated charges, it is important to consider whether the PED visit could have been avoided entirely if prescriptions for OTC medications were not required. Future studies could help clarify whether a parent's primary reason for bringing their child to the PED was to obtain an OTC medication prescription. Additional (publicly funded) costs relate to the large disparity in charges for OTC medications when filled by a hospital-based pharmacy versus purchased in a retail outlet. For a standard 118-mL bottle of ibuprofen when dispensed from our hospital's pharmacy the Medicaid reimbursement was \$22.17 to the pharmacy. Comparatively, the out-of-pocket expense for the same medication at any commercial stores was estimated to be \$4.00. For a 188-mL bottle of acetaminophen, the Medicaid reimbursement was \$21.18 if dispensed by the hospital pharmacy, and the pay out-of-pocket cost was between \$2.88 and \$4.00. This has significant implications for the Medicaid program.

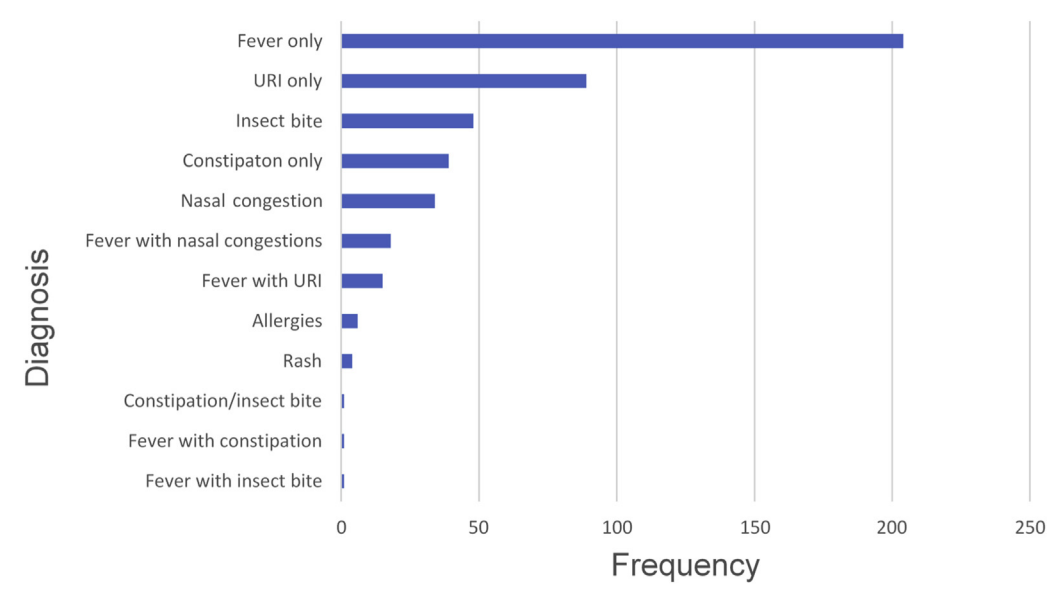


FIGURE 1
 Distribution of diagnoses seen in the PED (ESI 4 or 5). The diagnostic inclusion criteria fever, URI, nasal congestion, constipation, insect bites, seasonal allergies/allergic rhinitis, and diaper rash seen in the PED (ESI 4 or 5). Fever was by far the most common diagnosis given, followed by URI, insect bites, and constipation. PED, pediatric emergency department; ESI, Emergency Severity Index; URI, upper respiratory infection.

There has been increasing interest in ways to reduce avoidable ED use in Medicaid-insured individuals who historically have higher numbers of ED visits.¹² According to Nelson et al,¹⁶ limiting and restricting access to payments

for basic medical care (such as OTC medications) may in part explain why many publicly insured patients must seek out nonurgent care centers and emergency departments for their care as opposed to primary care providers. The

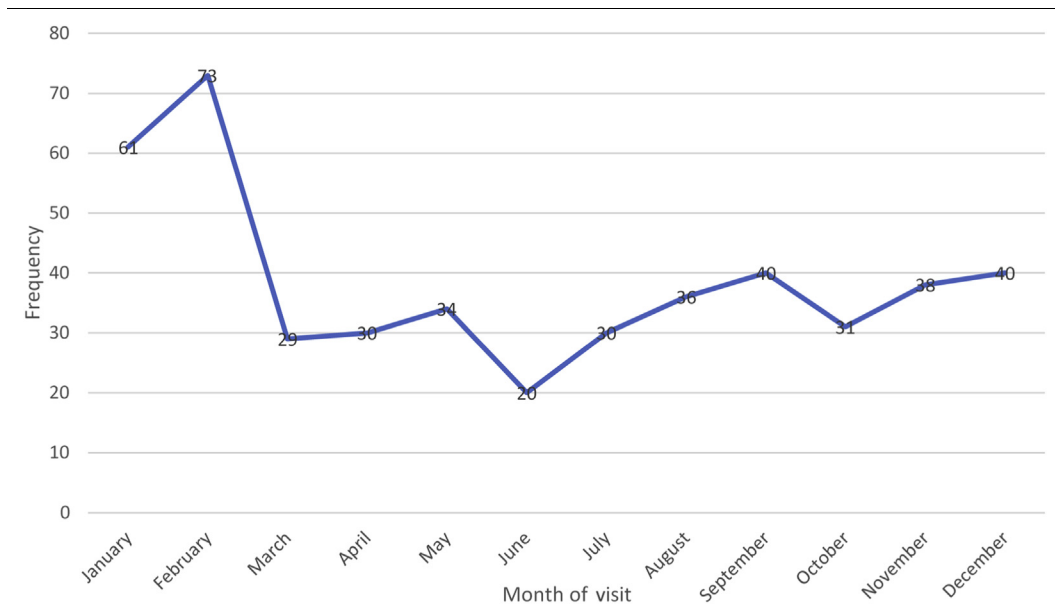


FIGURE 2
 Over-the-counter medications prescribed per month in the pediatric emergency department (ESI 4 or 5). The number of over-the-counter medication prescriptions was highest during the month of February and lowest during the month of June. ESI, Emergency Severity Index.

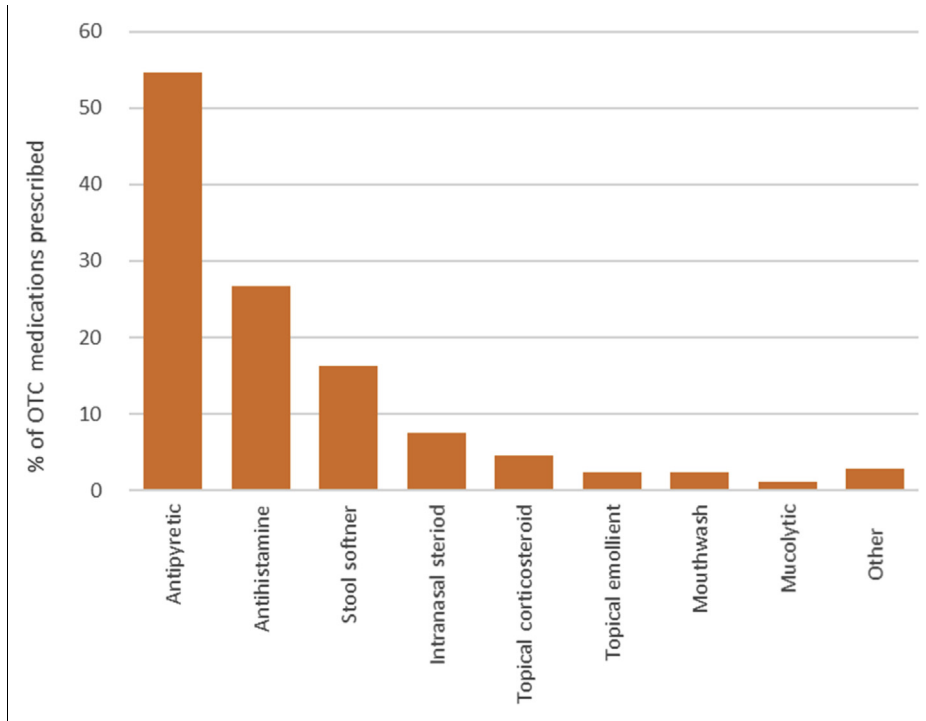


FIGURE 3

OTC medication types prescribed in the PED (ESI 4 or 5). Antipyretics were the most common medication prescribed in the PED. Antihistamines, stool softeners, and intranasal steroids were also commonly prescribed to patients. OTC, over-the-counter; ESI, Emergency Severity Index; PED, pediatric emergency department.

current requirement necessitating a prescription for the payment for OTC medications can be burdensome, especially for families with no or limited access to transportation and who rely on public transit. Parents may be additionally affected financially owing to missed work, and their Medicaid-insured children would most likely also be absent from day care or school owing to a common virus causing a fever. During this illness, their caregivers must take them to their primary care provider or an urgent care, have a telehealth visit, or be seen in the emergency department to get an antipyretic when they may not have funds to purchase it on their own. This Medicaid requirement for OTC medications places additional burdens on health care systems by

increasing the number of patients needing to be served, hence delaying provider accessibility. The state government can play an important role in creating better access to and distribution of OTC medications for children with Medicaid coverage. By reducing patient reliance on prescribing providers to obtain OTC medications, Medicaid may help reduce the potentially avoidable use of the emergency department and primary care visits for such purposes and reduce costs to the Medicaid program. A few other states have already attempted to find better ways to improve OTC medication access for publicly insured individuals. Recently, during the COVID-19 pandemic, the Ohio Department of Medicaid advised that they will reimburse

TABLE

Comparison of time spent in the PED between patients who received and did not receive OTC medication prescription(s)

Time	Prescription not given (n = 290)	Prescription given (n = 172)	Total sample mean (range)	SD	t value	P value
ED provider care time, min	55.47	58.97	56.77 (0-378)	48.77	-0.75	.46
Total time family in PED, min	134.19	130.84	132.94 (0-493)	69.49	0.50	.62

Independent samples t test (not significant).

ED, emergency department; OTC, over-the-counter; PED, pediatric emergency department.

pharmacies dispensing OTC medications without a prescription to help by “reducing provider burden and opening up access to medications to Medicaid beneficiaries.”¹⁷ Arch-Care Advantage Health Maintenance Organization Special Needs Plan, a current New York program for Medicare patients provides members with a prepaid OTC card to buy eligible OTC medications and health-related items redeemable at local stores.¹⁸ PeachCare for Kids, the Georgia State Children’s Health Insurance Program, allows \$12 each month for OTC items with more than 100 items to choose from.¹⁹ Rice Memorial Hospital in Willmar, Minnesota has a dedicated pharmacy-provided vending machine in its emergency department where patients receive a magnetic swipe card from the prescribing provider to access most commonly used drugs.²⁰ Similar programs could be modeled or modified to help improve access to common OTC medications for pediatric patients enrolled in Medicaid.

Implications for Emergency Clinical Practice

As nursing professionals, we should take an active role in improving health and patient care on a local or national level. As those in the discipline with the most direct patient care contact, nurses provide highly valued ideas, practical and innovative solutions, and especially realistic perspectives to policymakers. Nurses can consider contacting state and federal legislatures and find their local state and federal Medicaid agencies at the corresponding website listed in the reference list.²¹

We encourage emergency nurses to inform their patients enrolled in Medicaid that OTC medications can be obtained by requesting a prescription by their primary care prescribing provider. Nurses can also advocate for medical providers to provide standardized weight-based prescriptions for OTC medications covered by Medicaid for enrolled patients at their well-child or, potentially, specialist visits and to update these prescriptions at each in-person or telehealth visit. Families and caregivers should be encouraged to safely store OTC medications at home for common, non-life-threatening symptoms and educated on how to safely store them. Patients and families would benefit from having these OTC medications easily available at home, especially during busy respiratory seasons or the COVID-19 pandemic.

Future Research

The second phase of our project will focus on surveying parents and guardians with Medicaid coverage who visit the PED regarding their needs and access preferences for obtaining OTC medications. These data, along with what is re-

ported here, will be used as a baseline problem identification and needs assessment for interdisciplinary intervention development and feasibility testing. These interdisciplinary interventions may include pharmacist-led medication supply chains and distribution options. We will also be enlisting our informational technology/medical informatics group to help develop automatic prescription templates that could help provide OTC medication prescriptions at childcare well-visits. Despite our efforts, much more research needs to be done on a larger scale to better evaluate the scope of Medicaid’s ability to provide effective and fiscally responsible care to their enrollees.

LIMITATIONS

We acknowledge that this study had several limitations. The study was performed at only 1 site and may not have been representative of smaller populations. We were limited in our financial analysis to charges only. Future studies could be devised to calculate true actual costs. The inclusion/exclusion criteria did not represent all Medicaid-covered children who received care at the study site and may have excluded relevant visits with an OTC medication prescription. The visit was the unity of analysis, and it is possible that the same patient may have been to the emergency department on more than 1 occasion. We were unable to test the assumption to whether nonacute patient visits were to obtain an OTC medication prescription owing to the retrospective design.

Conclusion

The article represents a retrospective, descriptive review of patients seen in the emergency department at the study hospital. One-third of the patients enrolled in Medicaid with an ESI of 4 or 5 received a prescription for an OTC medication at the emergency department. Current Medicaid policy requires that a prescription be obtained for an OTC medication for enrolled patients, although these costs appear to be higher than the actual true cost of the medication. Current OTC medication allocation systems within Medicaid need to be redesigned, thus reducing patient barriers to basic medical care.

Acknowledgments

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Author Disclosures

Conflicts of interest: none to report.

This study was approved by the Institutional Review Board of Children's Mercy Hospital, Kansas City, MO.

Supplementary Data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.jen.2021.09.003>.

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Supplementary Appendix

The diagnosis was pull, by code and then by description. We did not pull by HPI or Discharge Instructions, only if it was active at the time of visit.

Query Summary:

(Diagnosis Code Between J00 AND J06.9) (Acute upper respiratory infections)

OR Diagnosis Description Matches pattern Upper Respiratory%

OR Diagnosis Description Matches pattern % Diaper dermatitis%

OR Diagnosis Description Matches pattern %diaper dermatitis%

OR Diagnosis Description Matches pattern Fever%

OR Diagnosis Description Matches pattern fever%

OR Diagnosis Description Matches pattern Constipation%

OR Diagnosis Description Matches pattern constipation%

OR Diagnosis Description Matches pattern Diaper Rash%

OR Diagnosis Description Matches pattern Nasal congestion%

OR Diagnosis Description Matches pattern Seasonal%

OR Diagnosis Description Matches pattern seasonal%

OR Diagnosis Description Matches pattern allergic rhinitis%

OR Diagnosis Description Matches pattern Insect bite%

OR Diagnosis Description Matches pattern Insect%)

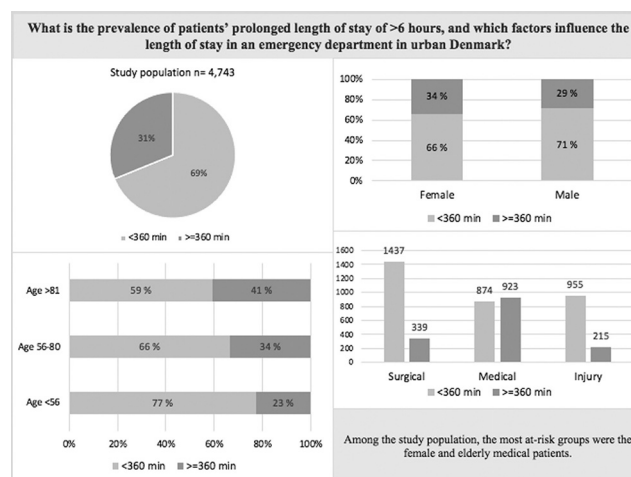
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PREVALENCE OF PROLONGED LENGTH OF STAY IN AN EMERGENCY DEPARTMENT IN URBAN DENMARK: A RETROSPECTIVE HEALTH RECORDS REPOSITORY REVIEW

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PREVALENCE OF PROLONGED LENGTH OF STAY IN AN EMERGENCY DEPARTMENT IN URBAN DENMARK: A RETROSPECTIVE HEALTH RECORDS REPOSITORY REVIEW

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Contribution to Emergency Nursing Practice

- What is already known on this subject: Prolonged length of stay in emergency departments has negative consequences for patients in terms of increased hospitalization, hospital-acquired pressure ulcer, medication errors, and increased mortality.
- The main findings of this paper: Female, older adult, and medical service patients were factors associated with prolonged length of emergency department stay.
- Recommendations for translating the findings of this paper into emergency clinical practice: The key implications for emergency nursing practice involve optimizing system level emergency department output components and developing guidelines for frequency of treatment and care initiatives that should be taken by emergency nurses for patients approaching or past prolonged length of stay to reduce the risk of negative events.

Abstract

Introduction: Prolonged length of stay in emergency departments is associated with increased hospitalization, hospital-acquired pressure ulcers, medication errors, and mortality. In acute admissions in Denmark in 2018, 67% of patients experi-

enced waiting time from arrival to examination. This study aimed to estimate the prevalence of prolonged length of stay (≥ 6 hours) and identify risk factors related to input, throughput, and output components.

Methods: A retrospective health records repository review included 4743 patients admitted to a single urban emergency department in Denmark in January 2019. Data collected from the electronic health record system repository included demographic and organizational characteristics and were analyzed using descriptive statistics and logistic regression.

Results: Among patients admitted in the study period, 31% had a prolonged length of stay of ≥ 6 hours. Prolonged length of emergency department stay was associated with being female (male odds ratio [OR], 0.86; 95% confidence interval [CI], 0.75-0.98), treatment by medical service (OR, 4.25, 95% CI, 3.63-4.98) vs surgical or injury, triage acuity of 2-Orange (OR, 1.45; 95% CI, 1.18-1.78) or 3-Yellow (OR, 1.47; 95% CI, 1.23-1.75) on a 5-level scale, evening (OR, 1.44; 95% CI, 1.24-1.66) or night (OR, 2.36; 95% CI, 1.91-2.91) arrival, ages 56 to 80 (OR, 1.79; 95% CI, 1.52-2.11) and > 81 (OR, 2.40; 95% CI, 1.99-2.88) years, and hospital admission (OR, 1.19; 95% CI, 1.04-1.38) vs discharge from the emergency department to home.

Discussion: Female, elderly, and medical patients were each identified as at-risk characteristics for ≥ 6 -hour length of stay in the emergency department. Acute care patient pathways in the emergency department, particularly for evening and night, with guideline-based care and system level improvements in patient flow are warranted. Further research with larger populations is needed to identify and support interventions to decrease prolonged length of stay.

Key words: Clinical pathway; Emergency department; Emergency nursing; Length of stay; Crowding

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Introduction

Unnecessary waiting time in the emergency department poses a risk to patient safety.¹ High workloads, lack of time, physical demands, and changes in priorities hamper nurses' ability to provide care to patients in the emergency care setting.² This prolonged time in the emergency department affects patient safety in 2 important ways. First, the longer patients stay in the emergency department, the greater their routine care needs such as medication administration of usual prescriptions, personal hygiene, mobilization, psychosocial support, meals or nutrition, documentation, and essential nursing. Second, the care they actually receive may decrease over time because nurses continuously have to balance priorities and make room for newly arrived patients.²

Patients with prolonged length of stay (PLOS) contribute to crowding and limit availability of vacant beds, which is associated with increased mortality rates.^{1,3} Evidence shows that hospitalization length of stay (LoS), mortality, and medication errors increase significantly with longer ED LoS; these results are significant even after adjusting for other factors.⁴⁻⁸ The risk of death increases gradually with an average LoS of ≥ 6 hours in the emergency department compared with patients with a LoS of < 1 hour,⁸ and the risk of hospital-acquired pressure ulcer increases with ED LoS of > 24 hours relative to LoS of < 6 hours.⁹ Overall, PLOS in the emergency department increases total hospitalization time, hospital-acquired pressure ulcer, and mortality. Treatment costs increase as LoS increases, and patients in the waiting room increase job demands on staff, because the staff has to see more patients in less time with fewer resources.^{1,3-9}

Internationally, different initiatives have been introduced to reduce the waiting times for patients in emergency departments, resulting in improvements. In California, a manager-based program reduced average boarding time per admission of 46 minutes and LoS for hospitalized patients of 79 minutes.¹⁰ In New Zealand, a 6-hour ED LoS target was introduced and showed a 1.1% increase in the number of readmitted patients, a 47.3% decrease in ED deaths, and a significant 30% decrease in total hospital deaths.¹¹

JOINT EMERGENCY DEPARTMENTS IN STRUCTURAL REFORMS

In 2007, Denmark initiated structural reforms to increase quality medical services. The rationale was to consolidate the number of hospitals and to centralize specialized care to improve the quality of acute care services.^{12,13} That

reorganization created fewer, larger, and more specialized hospitals with recommendations that all acute patients be received in joint emergency departments (referred to in this manuscript as emergency departments).^{12,13} Emergency health care in Denmark was previously organized in a way that contrasted with the system in the United States. Until the new emergency departments were established, patients were able to refer themselves to a hospital-based emergency department staffed by orthopedic surgeons or general practitioners around the clock. Acutely ill patients were admitted directly to the relevant hospital department, which strained those inpatient departments' capacity, because case loads were largely unpredictable. Today's Danish emergency departments are similar to the emergency departments in the US¹²⁻¹⁵ and are now staffed by a variety of specialists who can quickly initiate relevant treatment. Now, the Danish emergency departments receive all types of acute patients who enter the hospital through the same entrance.^{13,16} In 2018, shortly before this study was launched, emergency medicine was accepted as a specialty based on Danish Health and Medicines Authority's report and recommendation.^{17,18}

Establishing the new emergency departments was challenging for several reasons. First, patients were waiting to be received, examined, treated, and eventually transferred. Second, the introduction was delayed because of new workflows and challenges encountered in the teamwork with inpatient hospital units resisting the new emergency workflow.¹⁵ According to a Danish study of patient experiences in acute admission, 67% of the patients experienced waiting time from arrival to examination, and 68% felt insufficiently informed about developments in the waiting time from their arrival to examination.¹⁹

Over time, the establishment of the emergency departments has helped create new and, in some cases, stronger collaborative relationships internally at the hospitals.¹⁶ Although the new emergency departments have contributed to making patient pathways faster and increased the quality of the services offered, there is also a perceived need to strengthen research on the acute patient pathway and patient flow.¹⁶

AIM

This study examined the acute patient pathway at a Danish emergency department, conceptualized in the framework of input, throughput and output components.²⁰ We aimed to estimate the prevalence of PLOS of ≥ 6 hours and to identify variables associated with LoS for ED patients, including those admitted to an inpatient service. The prevalence of

TABLE 1

Schematic depiction of specialty categorization by teams and Danish Emergency Process Triage

Teams		
Medical	Surgical	Injury
Internal medicine	Gastroenterological surgery	Cardiology
Oncology	Gastroenterology	Pediatrics injury
Neurology	Urology	Orthopedic
Handles care and treatment for patients in level 2-5 triage	Handles care and treatment for patients in level 2-5 triage	Handles care and treatment for patients in level 1-5 triage

DEPT is a 5-stage triage system with 5 degrees of urgency

Structure:

Overall, DEPT is made up of several elements.

a) General maps by which all patients are assessed

b) 53 specific contact cause cards, which cover the majority of the reason for patients contacting Danish emergency department.

1: Red:	Life-threatening condition. Requires immediate treatment.
2: Orange:	Critical condition. Requires quick treatment.
3: Yellow:	Stable, but potentially unstable condition.
4: Green:	Stable and stationary mode. Not urgent.
5: Blue:	Unaffected. Patients with minor injuries and good correlation between cause and effect.

stays of ≥ 6 hours was chosen because mortality, hospitalization, medication errors, and risk of pressure ulcer significantly and gradually increase with ED stays of more than 6 hours.^{1,4-9}

Methods

STUDY DESIGN AND SETTING

This study was a retrospective health records repository review in an emergency department in urban Denmark treating approximately 70 000 acute patients annually at that time. Data were collected by the first author and included a systematically collected sample of 5144 patients admitted to the emergency department from January 1 to 31, 2019. A written consent to access data was obtained from managers from the department contributing data, and the data are available upon reasonable request. Registered research projects that do not include human biological material, but are based on de-identified health record data, are not required to be reported to the National Committee on Health Research Ethics.²¹ The data included no personally identifiable data from the records, only data from a repository system report, and were handled according to the rules

of The Danish Data Protection Agency.²¹ We did not involve patients or the public in the design, conduct, reporting, or dissemination plans of our research.

INCLUSION AND EXCLUSION CRITERIA

From January 2017 to December 2018, the mean monthly patient volume was 5074 patients. In January 2018, there were 5225 ED admissions. Therefore, the sample of 5144 patients was considered equivalent compared with average monthly volumes. This number included all patients treated in the emergency department, regardless of disposition (admit, transfer, discharge). Patients admitted to the following specialties of interest were included in the study: gastroenterological surgery, gastroenterology, urology, internal medicine, oncology, neurology, cardiology, pediatric injury, and orthopedic surgery. Admissions to specialties that do not provide regular treatment in the emergency department and treat patients at their respective departments themselves were excluded from the study: hematology, gynecology, obstetrics, and nephrology, because uncertainty existed regarding who treated the patient (assigned team vs specialist). Patients who died in the emergency department or upon arrival were excluded. Patients

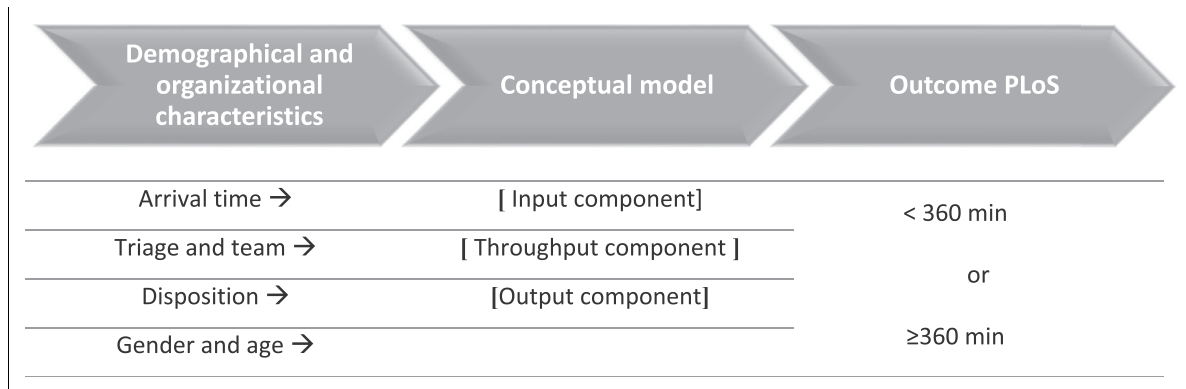


FIGURE 1

Schematic depiction classifying the independent variables on the left in relation to the conceptual model, with the dependent variable PLoS on the right. PLoS, prolonged length of stay.

with a LoS of <10 minutes were excluded to minimize the risk of information bias caused by inaccuracy in time registration.

VARIABLES

The data set contained demographic characteristics regarding patients' sex and age and organizational characteristics regarding arrival time, triage, specialty service, LoS, and disposition.

We have included the sex dimension in our study because the number of acute hospital contacts has increased over time for women in Denmark, especially from 2013 to 2014.²²

The participating emergency department handles daily care and treatment for patients by 3 teams: medical, surgical, and injury team. Patients are admitted based on their primary diagnoses assigned by the specialty who will treat them, and each specialty belongs to a team that performs treatment and care. To minimize variation in specialties, they were categorized by team in the study (Table 1).

Triage is the variable defining a maximum time limit for medical assessment, and the Danish Emergency Process Triage system²³⁻²⁵ (Table 1) is the priority tool used to triage patients.

Arrival time was grouped into 3 categories to distinguish among daytime, evening time, and nighttime: 7 AM to 3 PM, 3 PM to 1 AM, and 1 AM to 7 AM, respectively. These time groupings do not reflect shift times of ED staff. Age was grouped into 3 categories to minimize variation: <56, 56 to 80, and >81 years; we age adjusted to control for the impact of age as a potential confounder. Disposition was the variable specifying whether a patient was admitted

to a specialty department from the emergency department or was discharged. Discharge includes all patients having left the emergency department.

Variables included in this study relate to the components of the conceptual model²⁰ (Figure 1).

OUTCOME MEASURES

LoS was measured as time in minutes from patients' arrival to ED departure. PLoS was defined as stays for >6 hours and categorized into the following time intervals: <6 hours (<360 minutes) and ≥6 hours (≥360 minutes).

STATISTICS ANALYSIS

Information on exposure and outcome was collected simultaneously. Data were collected from the electronic health record system report and exported to the statistical program Stata version 15.1 (StataCorp LLC, College Station, TX) for analysis. Descriptive statistics were used to explain the study population in relation to relevant variables. Clopper-Pearson interval was used as a method for calculating the 95% confidence interval (CI) in the descriptive statistics. Chi-square test was used to identify significances in between 2 categorical variables. Unadjusted logistics regression, crude model, was performed to calculate the odds ratio (OR) with 95% CI and to identify associations between PLoS and independent variables. Adjusted logistic regression was performed to control for confounders. Results were accepted as statistically significant when the *P* value was < .05. For the variables specialty and triage, missing data were excluded from the analysis.

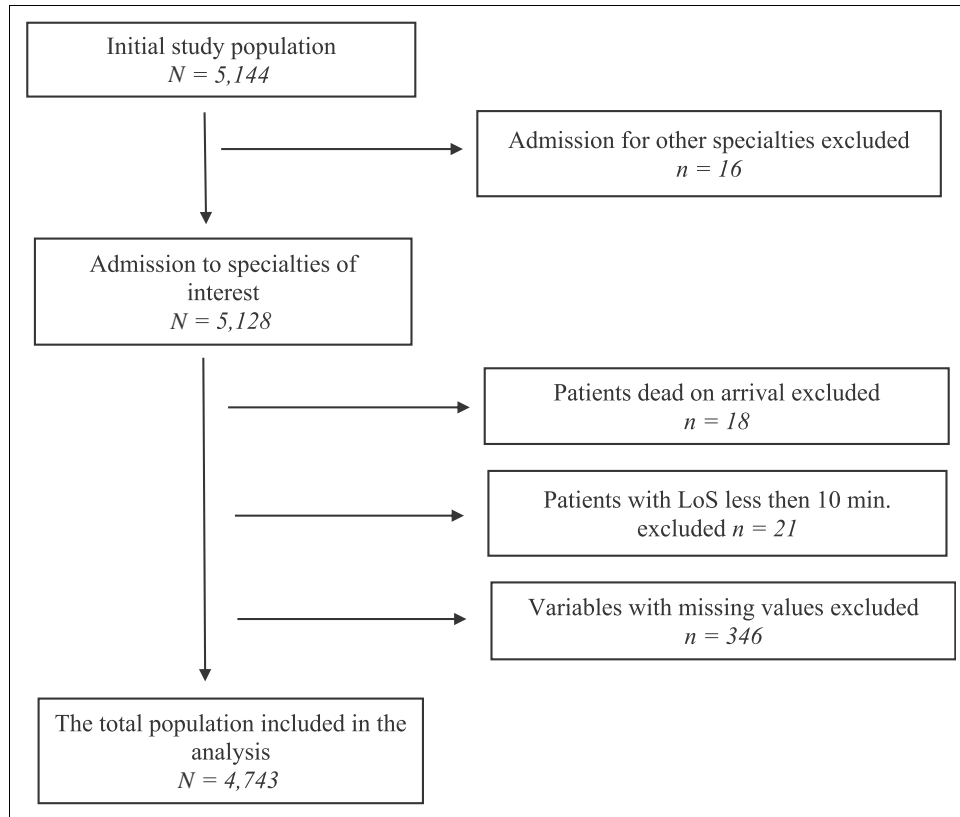


FIGURE 2
Flowchart.

Results

POPULATION

The initial study population included 5144 patients, of whom 5128 were admitted to specialties of interest. Sixteen admissions were for other specialties and were excluded. Eighteen patients were excluded because of death in the emergency department or were dead upon ED arrival. Twenty-one patients had a LoS of

<10 minutes and were excluded. Owing to missing values for variables specialty or triage, 346 participants were excluded. A total of 4743 patients were included in the analysis (Figure 2).

Of all patients admitted to the emergency department during the study period, 31% had a PLoS of ≥6 hours.

The average age was 61 years (standard deviation 22), and the average LoS was 348.57 minutes, which is approximately 5.8 hours. Patients seen by medical team had the

TABLE 2
Distribution of continuous variables (age and LoS)

Variables	Mean	SD	95% CI	Minimum	Maximum
Age	61.53 y	22.02	60.90-62.16	1	103
LoS (min)	348.57	297.78	340.90-357.05	10	4480

CI, confidence interval; LoS, length of stay; SD, standard deviation.

TABLE 3
Prevalence of PLoS by variables

Variables	n	Proportion (%)	95 % CI
Sex			
Female	2344	34	0.32-0.36
Male	2399	28	0.27-0.30
Team			
Surgical	1776	19	0.17-0.21
Medical	1797	51	0.49-0.54
Injury	1170	18	0.16-0.21
Triage			
5 Blue	159	8	0.04-0.13
4 Green	1176	26	0.23-0.28
3 Yellow	2132	34	0.32-0.36
2 Orange	1123	35	0.33-0.38
1 Red	153	29	0.22-0.37
Arrival			
7 AM-3 PM	2203	27	0.25-0.29
3 PM-12:01 AM	1982	32	0.31-0.35
12:01 AM-7 PM	558	42	0.38-0.46
Age			
<56	1747	22	0.21-0.25
56-80	1907	33	0.31-0.36
>81	1089	40	0.38-0.44
Disposition			
Hospitalized	1964	37	0.35-0.39
Discharged	2779	26	0.25-0.29

CI, confidence interval; PLoS, prolonged length of stay.

highest maximum LoS (4480 minutes or 74 hours) (Table 2).

The study population included in total 2344 females (49%). Most patients 2203 (46%) arrived in the time period from 7 AM to 3 PM, and the largest number of patients, that is, 1907 (40%), was in the age group 56 to 80 years (Table 3). A statistically significantly higher prevalence of PLoS was observed in females (34%) than in males (28%). The prevalence of PLoS was 51% in patients who had a stay in the medical team and was significantly higher than in the other teams. Patients triaged as level 2-Orange accounted for 35% of PLoS, making up the largest proportion of patients with PLoS in the 5 categories.

The prevalence of PLoS was significantly higher upon arrival at nighttime (42%) than among patients who arrived in daytime (27%) and evening time (32%). For the

>81-year age group (40%), the prevalence of PLoS was significantly higher than in the groups aged 56 to 80 (33%) and <56 years (22%). Patients admitted to a specialty department for further treatment accounted for 37% and had a significantly higher proportion of PLoS than patients discharged (26%) (Table 3).

The OR for medical team was 4.47 (95% CI, 3.85-5.20) and showed a significantly increased risk of PLoS for patients in medical team. Patients triaged level 3-Yellow had an OR of 1.50 (95% CI, 1.28-1.76); patients triaged level 2-orange had an OR of 1.59 (95% CI, 1.33-1.90). Thus, the OR for PLoS was significant and increased with higher acuity to triage level 2 (Table 4).

Arrival in the evening (3 PM to 1 AM) was associated with a significant OR of 1.32 (1.16-1.51); the OR increased upon arrival at night (1 AM to 7 AM) with an OR of 1.97 (95% CI, 1.63-2.39).

In the age group 56 to 80 years, the OR was estimated at 1.70 (95% CI, 1.47-1.97). The OR increased to 2.33 (95% CI, 1.97-2.75) in the age group >81 years. When adjusted for age, age was identified as a potential confounder of the association between PLoS and arrival at 1:00 AM to 7:00 AM and the association between PLoS and disposition. Team, triage, and time of arrival were assumed to be intermediate factors because they cannot be excluded as part of the causal chain according to professional judgment (Table 4).

A statistically significant association was identified between PLoS and admission to a specialty department from the emergency department with an OR of 1.60 (95% CI, 1.41-1.81). All associations were found to increase the risk of PLoS and were persistently significant, even after adjusting for other variables in the subsequent models (Table 4).

Discussion

This study aimed to estimate the prevalence of PLoS (≥ 6 hours) in an urban Denmark emergency department and to identify variables and predictors potentially affecting LoS for ED patients. A significantly higher prevalence of PLoS and OR was associated with being female, admissions to a specialty department, assignment to medical team, triage levels 2 and 3, arrival during evening and nighttime, and increasing age. These identified associations increased the odds of PLoS.

Previous studies have shown that patients with a LoS in an emergency department of 6, 12, and 24 hours have significantly increased hospitalization LoS and higher mortality risk.^{4-6,8} Of all patients arriving during the study

TABLE 4
Logistics regression models for factors associated with emergency length of stay of ≥6 hours

Variables	OR crude* (CI)	OR m-1† (CI)	OR m-2† (CI)	OR m-3† (CI)	OR m-4† (CI)	OR m-5† (CI)
Sex						
Female	1	1	1	1	1	1
Male	0.77 (0.68-0.87)	0.76 (0.67-0.87)	0.84 (0.73-0.95)	0.85 (0.75-0.98)	0.85 (0.74-0.97)	0.86 (0.75-0.98)
Team						
Surgical	1		1	1	1	1
Medical	4.47 (3.85-5.20)		4.31 (3.70-5.02)	4.31 (3.68-5.03)	4.36 (3.73-5.11)	4.25 (3.63-4.98)
Injury	0.95 (0.79-1.15)		0.95 (0.78-1.15)	0.97 (0.79-1.19)	0.98 (0.81-1.21)	0.88 (0.71-1.08)
Triage						
5-blue	0.24 (0.13-0.43)			0.45 (0.24-0.84)	0.48 (0.25-0.89)	0.47 (0.26-0.89)
4-Green	1			1	1	1
3-Yellow	1.50 (1.28-1.76)			1.42 (1.19-1.68)	1.45 (1.22-1.72)	1.47 (1.23-1.75)
2-Orange	1.59 (1.33-1.90)			1.42 (1.16-1.73)	1.44 (1.18-1.77)	1.45 (1.18-1.78)
1-Red	1.18 (0.81-1.71)			0.73 (0.48-1.08)	0.72 (0.48-1.08)	0.71 (0.47-1.07)
Arrival						
7 AM-3 PM	1				1	1
3 PM-12:01 AM	1.32 (1.16-1.51)				1.39 (1.21-1.60)	1.44 (1.24-1.66)
12:01 AM-7 AM	1.97 (1.63-2.39)				2.14 (1.74-2.63)	2.36 (1.91-2.91)
Age						
<56	1					1
56-80	1.70 (1.47-1.97)					1.79 (1.52-2.11)
>81	2.33 (1.97-2.75)					2.40 (1.99-2.88)
Disposition						
Discharged	1	1	1	1	1	1
Admitted	1.60 (1.41-1.81)	1.60 (1.41-1.81)	1.45 (1.27-1.66)	1.36 (1.19-1.57)	1.41 (1.23-1.62)	1.19 (1.04-1.38)
Pseudo R2		0.0123	0.0991	0.1064	0.1159	0.1320

CI, confidence interval; OR, odds ratio.

* Crude model.

† M1 to M5 models gradually build on and adjust for other variables.

period, 31% had a PLoS. The beds in the new emergency departments are typically intended for a 24- to 48-hour stay, and the number of beds varies from 16 to more than 50 at some of the largest emergency departments.^{16,26} Emergency nurses often face a dilemma of simultaneously providing quality care to acute or critically ill patients and boarding patients alike. By providing the estimated prevalence of PLoS of ≥6 hour and identifying predictors that increase the risk of PLoS, we provide knowledge of which patient groups need managers' and staff's attention to strengthen patient safety in acute patient pathways. As shown by Jones et al,¹¹ in New Zealand, the 6-hour target led to a 47.3% decrease in deaths in the emergency department and a 30% decrease in hospital deaths as well. The most widely used metrics to identify ED crowding is the to-

tal number of patients.²⁷ However, no guidelines specify at what particular times treatment and care initiatives should be taken during the patient's stay. This lack of guidelines could have negative consequences in the form of failure to respond to a patient's PLoS if the maximum occupancy threshold of the beds in the emergency department has not been reached. This guideline gap is problematic given the potential for patient harm.^{1,3-9}

DEMOGRAPHIC CHARACTERISTICS

We observed a significantly higher prevalence for the >81-year age group; hence, the prevalence of PLoS in this group was significantly higher than for the groups aged 56 to 80

and <56 years. The association between PLoS and age was significant with increasing OR for the age group >81 years. This association indicates that, with increasing age, the odds for PLoS in the emergency department increase significantly. Previous studies have found that the number of acute hospital contacts has increased over time among the elderly population in Denmark, especially from 2013 to 2014,²² and the LoS increases significantly with older age.²⁸

A significantly higher prevalence of PLoS was observed among females (34%) than among males (28%). In a Swedish study, the health care costs were 20% higher for women than for men.²⁹ Women generally report more health problems, have higher morbidity, more hospital contacts, and different biological structures than men.³⁰ The main causes of ill health among women differ across life stages and countries; physical health conditions dominate early in life, depressive and anxiety disorders can disproportionately develop among young women, and low-back pain, ischemic heart disease, and cancers are more prevalent in older age.³¹ Women and men have similar symptoms during an episode of unstable angina; however, a higher proportion of women have less typical symptoms.³² Women are more likely to experience indigestion, palpitations, nausea, numbness in the hands, and unusual fatigue. These symptoms are considered atypical because they are common to many less serious health problems. These symptom clusters put women at risk of delayed diagnosis and treatment and poorer outcomes if they do not experience typical symptoms with chest pain.^{33,34} Many factors influence women's health; thus, levels of gender equality, education, employment, working conditions, economic resources, and rural or urban residence are social determinants that may affect emergency care gender disparities.³¹ The most striking imbalance between women and men in the European region is the presence of violence against women. Violence has serious and long-term effects on women's health leading to physical and psychological trauma, stress, and fear that may affect emergency care processes.³⁵

CONCEPTUAL FRAMEWORK

As depicted in [Figure 1](#), our study was based on the input-throughput-output model. Input components refer to any state, event, or system characteristic that contributes to the demand for ED services.²⁰ Arrival time was included as an input component of our study. The proportion of patients who arrived during the day shift was highest, but the prevalence of PLoS was significantly higher for patients who arrived during the evening and night. Duvald et al³⁶ observed a significant association with admissions in the

evening and increased 30-day mortality rate. Our study demonstrates that ED PLoS may be one factor to consider in mortality rate differences.

The throughput component highlights the importance of looking at ED processes²⁰ such as triage, which was a variable included in this study. Our results showed a statistically significant association between triage level 3-Yellow and 2-Orange and ED PLoS, which remained significant after adjusting for other variables. The triage score has also been directly associated with a 30-day mortality rate by Duvald et al.³⁶ Finally, our results showed that ED PLoS was related to the output components²⁰ because the prevalence of ED PLoS was significantly higher in patients admitted to a specialty department from the emergency department than in patients discharged directly.

STRENGTHS

The strength of this study lies in consistency among multiple studies³⁷⁻³⁹ given that our results corroborate those of previous studies. Thus, Salehi et al⁴ found that a prolonged ED stay was significantly associated with being an elderly medical patient, and Eriksson et al² identified elderly patients as a vulnerable group and found that nurses expressed personal frustration and sympathy for this group.² Vest-Hansen²⁸ observed that LoS increased with increasing age.

The size of the sample of our study was also a strength.³⁷⁻³⁹ The large size of the sample strengthens the precision of our estimates and allows us to draw conclusions. The findings could be replicated in other ED settings, which strengthens the internal validity of the present study.^{37,38}

LIMITATIONS

Some limitations of the study should also be addressed. With a mean LoS of 5.8 hours, it cannot be ruled out that time of registration in electronic health record is subject to some inaccuracy in the form of delays in entering patient arrival and discharge/admission time. Furthermore, the dichotomous outcome below or above 6 hours could lead to misclassification^{37,38} and cause either overestimation or systematic underestimation of the estimated prevalence, which could affect the reliability and lead to bias.

The unmeasured confounding and potential interaction of age and arrival time 1 AM to 7 AM on ED PLoS may have been a limitation. Elderly patients may be prevented from being discharged from the emergency department during the nighttime if the patient receives home care or lives in a nursing home or if staff nurses are

unsure whether the patient can be safely discharged home. These factors may contribute to PLoS in the emergency department. Furthermore, a policy at the participating emergency department does not trigger the automatic transfer of patients between 10 PM and 8 AM as it does during the daytime, which can contribute to an increase in the LoS in the emergency department. We did not include the nurse-to-patient ratios on the admission specialty departments in this study, so it is unknown whether that was a factor that influenced our results. Age was also identified as a potential confounder between disposition and PLoS. However, it was considered whether the variables were real predictors and not consequences,³⁸ and it cannot be ruled out that PLoS is a consequence of disposition, given that capacity in the receiving specialty department was not included in this study.

The study cannot provide sufficient evidence of causality concerning PLoS in emergency departments and its associated factors.³⁹ We obtained data from a single data source at a certain point of time; therefore, our results show no changes over time, and we cannot deduce if the prevalence of PLoS is higher in other hospital settings, which limits the generalizability of our study.³⁸

Another factor that should also be addressed is the season of the year. The study was conducted during January, which is winter season in Denmark. Cold climate could increase ED patient volume and impact throughput time. Hence, it cannot be ruled out that the prevalence is affected by that, and season should therefore be considered a potential confounder.

The results showed a higher prevalence of PLoS in the organizational characteristics that are connected to output components. According to the conceptual model,²⁰ the factors shaping this incidence are partly because of organizational issues such as staffing, hospital capacity, nurse-patient ratios, delays in cleaning, and isolation measures. The conceptual model emphasizes the importance of looking at all processes within an emergency department.²⁰ We observed that selected individual components and other possible factors that could affect the PLoS were not included in this study, and this must be considered as a limitation.

IMPLICATIONS FOR EMERGENCY CLINICAL PRACTICE

International studies describe increased mortality, pressure ulcers, medication errors, and increased hospitalization for patients with PLoS and a need to focus on patient safety among older adults in emergency departments.^{1,3-9} This study identified at-risk groups for PLoS and found that

female and elderly medical patients were at an increased risk of PLoS, which is an issue of serious concern. We recommend development of guidelines and interventions at the system level and modifications of policies to allow for night admissions to prevent negative outcomes in the acute patient pathway. Furthermore, we suggest that protocols and guidelines are available specifying at which time particular treatment and care initiatives should be taken by emergency nurses during a patient's stay to ensure consistent and quality patient care.

Conclusion

PLoS in the emergency department contributes to negative patient outcomes such as increased mortality risk, increased hospitalization, medication errors, and risk of pressure ulcers. We estimated nearly one-third of patients in our Danish emergency department experienced PLoS. Factors associated with PLoS included being female, medical service, hospital admission, age, and evening or night arrival. Our results indicate that acute patient care pathways to standardize and optimize emergency care arrival to hospital admission are needed, focused on the care needs unique to female, medical, and elderly patients who arrive for emergency care in the evening or night hours. We recommend further research and larger multicenter, international studies, conducted in different regions and including measures of organizational characteristics such as staffing, nurse-to-patient ratios, and hospital inpatient capacity.

Author Disclosures

Conflicts of interest: none to report.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. Competing interests had no relevance in this study, neither patient consent for publication.

Supplementary materials

Supplementary material associated with this article can be found in the online version at [doi:10.1016/j.jen.2021.08.005](https://doi.org/10.1016/j.jen.2021.08.005).

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A FRAMEWORK FOR STANDARDIZING EMERGENCY NURSING EDUCATION AND TRAINING ACROSS A REGIONAL HEALTH CARE SYSTEM: PROGRAMMING, PLANNING, AND DEVELOPMENT VIA INTERNATIONAL COLLABORATION



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Abstract

Introduction: The challenges related to providing continuing education and competence management for emergency nurses are not unique to any one organization, health system, or geographic location. These shared challenges, along with a desire to ensure high-quality practice of emergency nursing, were the catalyst for an international collaboration between emergency nurse leaders in Region Zealand, Denmark, and nurse leaders and educators from a large academic medical center in Boston, Massachusetts. The goal of the collaboration was to design a competency-based education framework to support high-quality emergency nursing care in Region Zealand. The core objectives of the collaboration included the following: (1) elevation of nursing practice, (2) development of a sustainable continuing education framework, and (3) standardization of training and nursing practice across the 4 emergency departments in Region Zealand.

Methods: To accomplish the core objectives, a multi-phased strategic approach was implemented. The initial phase, the needs assessment, included semi-structured interviews, a self-evaluation of skills of all regional emergency nurses, and a survey regarding nursing competency completed by emergency nurse leadership. Two hundred ninety emergency nurses completed the self-evaluation. The survey results were utilized to inform the strategic planning and design of a regional competency-based education framework.

Results: In 18 months, and through an international collaboration, emergency nursing education, training, and evaluation tools were developed and integrated into the 4 regional emergency departments. Initial feedback indicates that the education has had a positive impact. The annual competency day program has

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continued through 2021 and is now fully institutionalized within the regional emergency nursing continuing education program. Furthermore, use of this innovative education framework has expanded beyond the emergency department to other regional nursing specialties.

Discussion and Conclusion: Through this unique collaboration with regional and international participants, a sustainable, regional emergency nursing education program was

developed that has elevated and standardized the practice of emergency nurses in Region Zealand, Denmark. This program development can serve as a model for region-wide or health care system-wide collaborations in other countries.

Key words: Educational framework; Competency-based education; Needs assessment

Introduction

The complexity of care and demand placed on emergency care practitioners continues to increase globally. Emergency nurses, like other health care providers, face many challenges to remain current and competent in the skills and knowledge required to manage increasingly complex patient populations.¹ A qualified emergency nurse is expected to be competent in the management of emergent, urgent, and nonurgent patients across the health and age continuum.² Maintenance of competence in an evolving practice requires the astute emergency nurse to engage in lifelong learning, knowledge acquisition, and skills refinement.² In 2011, the Institute of Medicine released a report, *Future of Nursing: Leading Change, Advancing Health*, recommending that all nurses adopt a framework of continuous lifelong learning and ongoing competence evaluation.³ The Institute of Medicine report also highlighted an urgency for health care organizations and administrators to foster an environment and a culture that is supportive of the nursing professional's lifelong learning needs.³

Despite growing evidence supporting the need for continuing education and competence evaluation, nurse education is often cited as being inadequate relative to the evolving complexity of patient care.⁴ Globally, in both rural and community settings, these effects are frequently compounded by restricted finances and limited resources.⁵ The challenges related to continuing education and competence management in nursing are not unique to any one organization, health system, or geographic location. These shared challenges, in addition to concerns related to its impact on the quality and practice of emergency nursing, were the catalyst for an international collaboration between emergency nurse leaders in Region Zealand, Denmark, and nurse leaders and educators from Harvard Medical Faculty Physicians at Beth Israel Deaconess Medical Center in Boston, Massachusetts.

Setting

Denmark is located in northern Europe and has a population of approximately 5.8 million. Located in the southeast of Denmark is Region Sjælland (Region Zealand), a region with 821 000 inhabitants and an area of 7273 km.²⁶ Region Zealand has 7 hospitals, 4 of which have emergency departments: Zealand University Hospital in Køge, Nykøbing Falster Hospital, Holbæk Hospital, and Slagelse Hospital (Figure 1).⁷ The emergency departments are distributed throughout the region and form the center of emergency care delivery in Zealand. Because it is a publicly funded system, health care services are available to all residents.

Zealand Nursing Education: Background

In Region Zealand, emergency nurse education, training, and scope of practice are primarily determined by local leaders. In addition to local programs, education of regional emergency nurses has historically consisted primarily of the completion of a theory-based national education program designed to address the training and competence needs. However, over time, leaders found that the program length, cost, and associated staffing logistics created significant barriers to individual completion, rendering it impractical as the primary source of training and competence assessment for emergency nurses (the national program continues in parallel to this project).

In addition, in 2015, Zealand emergency nursing leaders and regional health care administrators identified several internal inconsistencies in regional training and education leading to significant variability in practice and quality of care. Nurse leaders also reported that general staff satisfaction and retention were negatively impacted by these practice and education inconsistencies.

The Project

To address these identified issues, regional leadership engaged in a unique international collaboration, leveraging an existing relationship with the Department of Emergency Medicine at Beth Israel Deaconess Medical Center. The primary goal of the collaboration was to elevate and standardize emergency nursing practice across Region Zealand. Central to achieving the goal was the development of a sustainable regional education framework, which focused on strategies to align and standardize educational priorities, delivery methods, and tools through the use of existing regional staff and resources. A logic model describing the project is found in [Table 1](#).⁸

Project Funding

The regional health care system of Region Zealand provided strategic funding for the initial development of the program. This funding covered, among other things, the costs of the international collaboration, including consultancy services from the United States partner, the first train-the-trainer course, and travel expenses for Danish and US participants to attend the various program planning initiatives. The majority of the program costs, however, including staff time for initial and ongoing program development, ongoing train-the-trainer courses, and the skills stations themselves, were incurred by the individual emergency departments. While it is logical that this project provided an overall regional cost savings through leveraging system resources, such as equipment, program development, and educator training, this saving has not been quantified.

Methodology

A comprehensive plan was designed to achieve the goals of the collaboration and included 5 distinct phases: (1) needs assessment, (2) regional strategic planning, (3) curriculum/tools development, (4) staff development (train-the-trainers course), and (5) project launch/implementation. These phases resulted in the initial project milestones depicted in [Figure 2](#). The collaboration was coordinated and overseen by a designated regional steering committee consisting of nurse leaders and educators from the 4 emergency departments, an administrative program director from the regional health system, and US nurse educators. Throughout the project planning and implementation phase, the steering committee met monthly to review

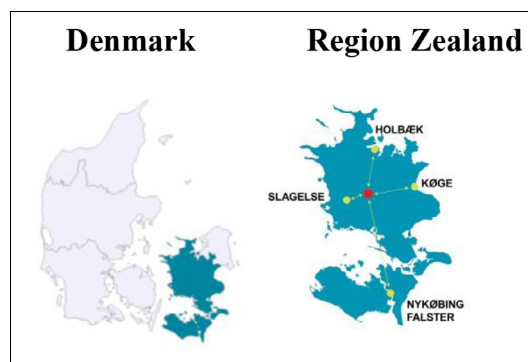


FIGURE 1

Maps of Denmark and Region Zealand emergency departments.

progress and make key project decisions. The 5 project phases are described in the sections below.

PHASE I: NEEDS ASSESSMENT

Needs assessments, specifically in the context of international emergency specialty collaborations, provide clarity on the development of specific achievable education objectives and have been determined to be essential to program success.^{9,10} To inform educational planning, a needs assessment of regional emergency nursing education was conducted by the US nursing team. The assessment included the use of an electronic self-assessment tool designed to capture both emergency nurses' and leaders' perceptions of practice and competence. In addition, semistructured interviews with nurse leaders at each hospital were conducted via telephone.

The data collected were originally in the interest of the project and program development and were not collected specifically for this paper or study. In addition, none of the authors or individuals who contributed to the project had access to any subject identifiers linked to our surveys. Therefore, our paper does not fall within the category of human subjects research.¹¹

The electronic self-assessment tool distributed to regional nurses was a multi-part, self-reported questionnaire. A 5-point scale (0-4) was used to measure nurses' perceived competency experience levels, with proficient being a score of 3 or greater. The 202 skills and assessments represented on the questionnaire were informed by the Emergency Nurse Core Curriculum¹² and modified to reflect the Danish emergency nurses' scope of practice. The questionnaire was distributed electronically to 290 nurses from the 4 regional emergency departments, with an 82.8% response rate (see [Supplementary Appendix 1](#)).

TABLE 1
Project logic model, based on McCoy & Castner’s logic models for program evaluation in emergency nursing.⁸

Input	Activities	Measures	Outcomes	Impact
<ul style="list-style-type: none"> - Advisory board / steering committee - International expert/partner - Dedicated nurse educator time - Dedicated learner/staff paid time - Regional administration - Regional funding - Hospital funding - Self-assessment questionnaire - Semi-structured interviews - Emergency Nursing Scope and Standards of Practice - Danish and Zealand practice guidelines 	<ul style="list-style-type: none"> -Needs assessment - Regional strategic planning - Development of curriculum and teaching tools - Staff development (train the trainers) - Regular steering committee meetings -Regular regional nursing educators meetings - Internal and external project communication strategies 	<ul style="list-style-type: none"> - Attendance targeting 100% of regional nurses -Completion of all skills stations per year (5 hrs) + study/ prep time - Participants perception of increased competence/ comfort level on self-assessment - Participant satisfaction levels with program 	<ul style="list-style-type: none"> - Number of regional nurses completing program -Continued planning of annual competency days -Expansion of concept into other departments -Satisfaction of leadership -Satisfaction of region -Improvement in comfort level of nurse skills 	<ul style="list-style-type: none"> -Long term consistent evidence-based nursing practice across region Zealand - Reduction in errors and adverse patient outcomes related to nursing practice -Nursing retention -Reduced cost of educational resources -Increased sharing of resources and expertise across departments -Increased collaboration between regional hospitals related to nursing professional development activities -Improved change in learning culture

The electronic assessment distributed to nurse leadership was a similar multipart questionnaire intended to capture leaders’ perceptions of staff competence. Nursing leadership teams from the 4 emergency departments completed the assessment by hospital group. Leaders were instructed to respond on the basis of their

knowledge of incident reports, patient feedback, and direct observation experience. Participants were given 5 weeks to complete the survey. The electronic questionnaires were tested, and content validity established, by educators and leaders from each hospital before implementation.



FIGURE 2
 Project milestones.

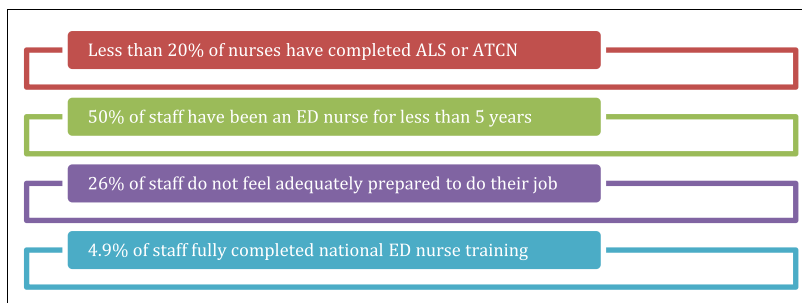


FIGURE 3 Visible gaps in regional emergency nurse education or experience. ALS, advanced life support; ATCN, advanced trauma care for nurses.

The results of the needs assessment informed the educational program goals and learning objectives, which were developed in subsequent project phases. The nurse self-assessment questionnaire offered the majority of insight, and its results underscored the need for improved education. Relevant supporting results are displayed in Figures 3 and 4. A 42-page needs assessment report was generated to serve as a basis for the subsequent strategic planning phase.

Of note, in the survey, it was not our intention to make direct comparisons between the skills-based training of the newly developed program with the largely theory-based training of the national emergency nurse training program, but simply to understand what type of education was being received by the emergency nursing staff. The newly developed program includes both theory and skills-based learning.

PHASE II: STRATEGIC PLANNING

After the needs assessment, the second phase of the collaboration began. In this phase, 12 Danish nurse leaders and educators attended a weeklong strategic planning session in Boston, Massachusetts. During this week, leaders utilized

the needs assessment report and leveraged new knowledge obtained from on-site education and observations in Boston in order to design a framework and roadmap for the implementation of a regional emergency nurse competency-based education, training, and assessment program.

The strategic planning program was designed and led by US nurse leaders and educators and included didactics, clinical observations, and expert-led discussion related to the following topics: emergency nursing scope and standards of practice, curriculum development, competency assessment, competency validation, and trainer development strategies. In addition, the US project team facilitated strategic discussions regarding program decision-making. These outcomes are described below.

The decision to host the planning session in Boston versus Denmark was twofold: (1) to provide a supportive environment with dedicated time for emergency nurse leaders to build relationships with one another, parallel to the collaborative development of the regional strategic plan, and (2) to provide inspiration and share best practices through direct observation of emergency nursing practice and delivery of competency-based education.

Nurses rated themselves <u>least proficient</u> in these emergency care categories		Leaders rated nurses <u>least proficient</u> in these emergency care categories	
NURSES		LEADERS	
OB/GYN	1.33	OB/GYN	1.46
Maxillofacial	1.67	Cardiovascular	1.86
Cardiovascular	2.01	Orthopedic	2.07
Environmental	2.15	Maxillofacial	2.07
Discharge, Legal, Ethical	2.27	Airway	2.11

FIGURE 4 Perceived skills competency, according to staff and leadership, top categories. OB/GYN, obstetrics and gynecology.

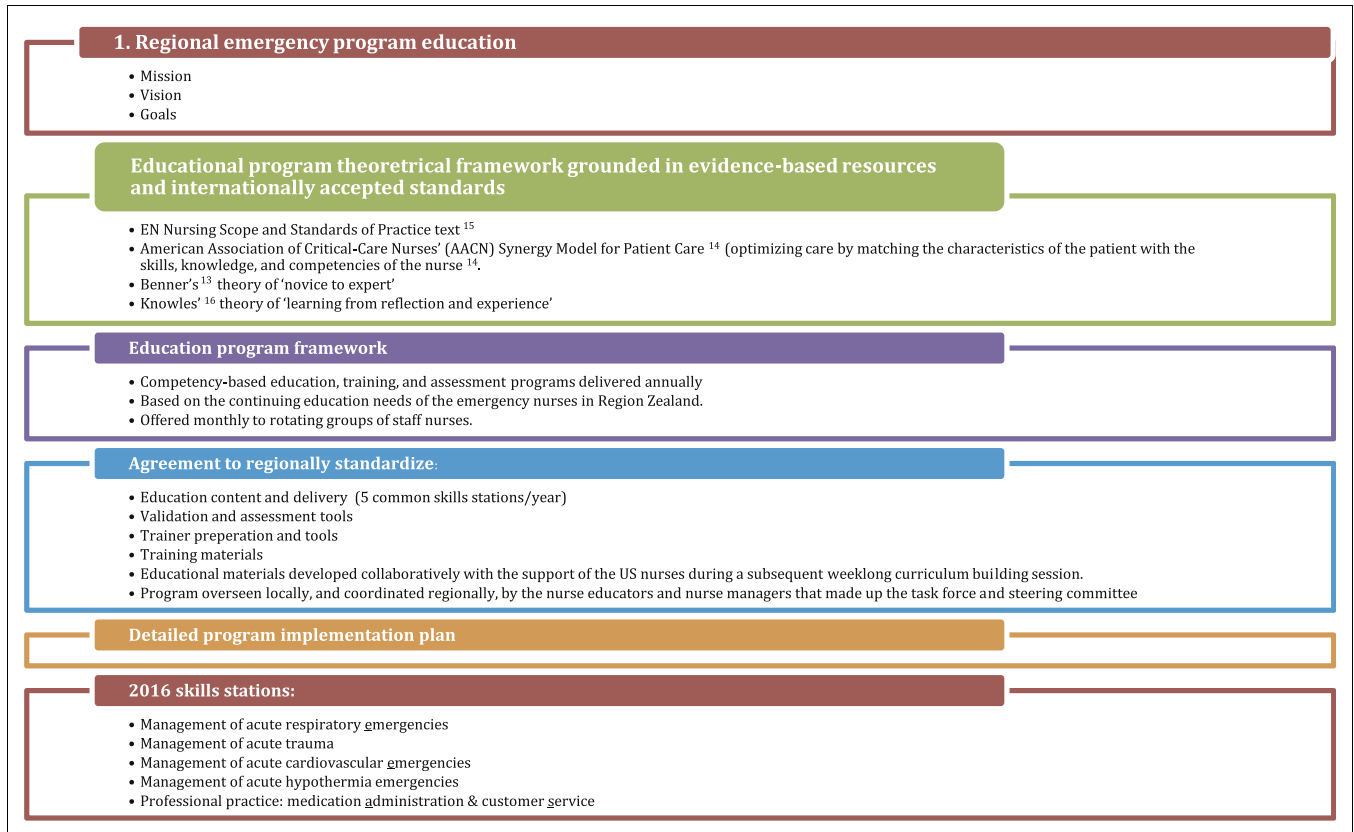


FIGURE 5
Strategic planning outcomes and decisions. EN, emergency nursing.

During strategic planning sessions, expert consensus was used to drive decision making, and this was informed by (1) the assessment results, (2) leadership knowledge of critical areas, and (3) the US partner's shared experience. Arriving at consensus among all 4 hospital leadership teams was a priority. Disagreements were analyzed and discussed until consensus was achieved. Decisions, once made, were written on a whiteboard throughout the sessions and finalized with a report at the end of the week for distribution. Strategic discussion led to the development of outcomes detailed in [Figure 5](#) and [Table 2](#).

In addition to the key strategic decisions described above, the group, facilitated by US nurse collaborators and project managers, developed a detailed project plan that includes a project timeline, tasks, roles, and responsibilities. The project plan guided project implementation as the group moved through the subsequent phases of curriculum development, trainer development, and project launch.

PHASE III: CURRICULUM DEVELOPMENT

In September 2015, shortly after the strategic planning workshop in Boston, 15 nurse educators from Region Zealand and 2 US nurse leaders convened for 5 days in Denmark. The goal of was twofold: first, to identify a transferable method for the development and delivery of competency-based emergency nursing education and, second, to apply this new knowledge and process in the development of the 2016 competency-based education program. The deliverable of the weeklong process was a comprehensive evidence-based education toolkit for each of the 5 identified skills stations, in addition to standardized documents to support nurse trainers and leaders in program delivery. See [Supplementary Appendix 2](#) for a toolkit sample and [Figure 6](#) for a brief description of the toolkit contents.

Before the curriculum development session, applicable pre-existing training and educational materials were collated

TABLE 2

2016 skills stations and competencies. ABG, arterial blood gases; CPAP, continuous positive airway pressure; ISBAR, introduction, situation, background, assessment and recommendation.

Clinical Focus	Assessments and Equipment Covered
Management of acute respiratory emergencies	Respiratory Assessment, ABG collection and interpretation, CPAP, transfer of care using ISBAR
Management of acute trauma	Primary and secondary trauma survey, airway management including suction, placement of naso/oral airway. fluid/blood resuscitation transfer of care using ISBAR
Management of acute cardiovascular emergencies	Cardiovascular assessment including basic rhythm interpretation defibrillation, cardioversion, external pacing, transfer of care using ISBAR
Management of acute hypothermia emergencies	Hypothermia assessment, medications, application of a thermo catheter, fluid warmer, bear hugger, transfer of care using ISBAR
Professional practice: medication administration & customer service	Medication administration high risk time sensitive discharge planning and teaching

from the 4 hospitals and reviewed for transferability to the 2016 skills stations. US nurse leaders provided educational and academic input to the work process, as well as an updated project plan for competency development in Region Zealand. The curriculum was grounded in internationally recognized standards and theories identified during strategic planning.¹³⁻¹⁶ Published research suggests that implementing emergency medicine education programs that adhere to internationally recognized standards will lead to successful education programs.^{9,17-21}

PHASE IV: TRAINER DEVELOPMENT AND TRAIN-THE-TRAINER

After curriculum development and translation of materials, 32 Zealand nurses were selected to be trainers for the 2016 regional “competency day.” Trainers were selected on the basis of their adherence to emergency nursing standards of practice, in addition to their ability to evaluate competence and provide peer feedback. In addition, trainers were generally viewed as professional role models or ambassadors of excellence in emergency nursing. A regional train-the-trainers workshop was then scheduled for November 2015. The workshop was designed to prepare these trainers

for program launch through a series of didactic and hands-on training delivered by the US nurse educator team.

The project task force had determined that the train-the-trainers model would be the most efficient and effective model for rapid program implementation. The use of the train-the-trainers model for international emergency medicine projects has been discussed in the literature as being a scalable and instrumental component to program success and long-term sustainability.²² In fact, train-the-trainers programs have been used to develop physician, nurse, and prehospital emergency medicine education throughout the world in many countries,²³ including China,^{24,25} Turkey,²² India,²² Italy,^{22,26-28} Poland,²⁹ Armenia,³⁰ Ethiopia,³¹ Costa Rica,^{32,33} Rwanda,³⁴ Ghana,³⁵ Estonia, Armenia, Kazakhstan, Russia, Moldova, Georgia, Ukraine, Turkmenistan, Uzbekistan, Belarus, Tajikistan, and Albania.³⁶

Backed by strong evidence, a train-the-trainers session was scheduled, in which each trainer received 22 hours of training (see Figure 7) as follows: first, a 7-hour training workshop, facilitated by the US nurse educators, was held for the entire regional trainer group. The workshop included a series of lectures and breakout sessions for application and return demonstration, incorporating adult learning theory and best practices for teaching in a flipped

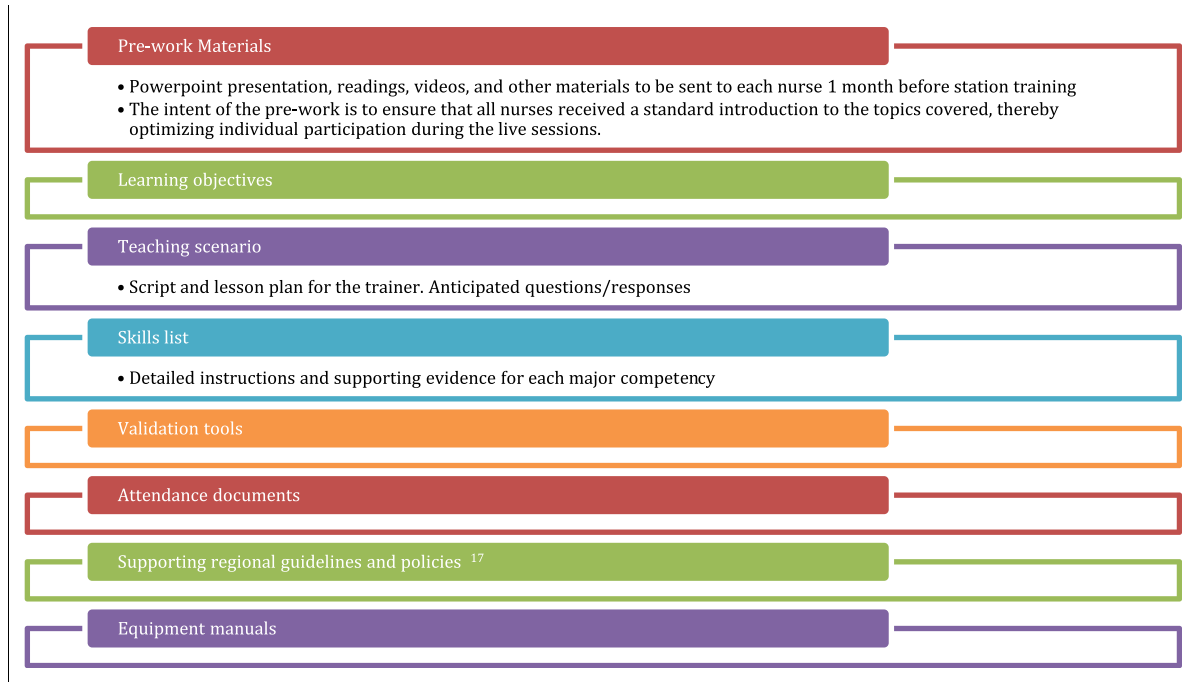


FIGURE 6
Toolkit Contents.

classroom setting. Upon completion of this workshop, trainers were presented with individual binders filled with the above described curriculum materials, and regional leadership set expectations on their roles and responsibilities during the upcoming annual training. Printing materials and collating them into binders, which are consistently updated throughout the year, is invaluable to the trainers. During a competency day the curriculum binders enable the trainers to have all of the materials and resources at their fingertips. They are able to use the detailed scripts, scenarios,

and detailed clinical rationales to more easily respond to trainee questions. In the event of a trainer's absence, a substitute trainer can more easily step into the role with minimal preparation, using the curriculum binder resource.

After completion of the workshop, each trainer participated in 7.5 hours of skills station practice at their own hospitals and 7.5 hours at a partner hospital. Trainers had the opportunity to trial their skills station by presenting it to 2 US nurse educators for feedback. Present at these practice sessions were colleague trainers from the same hospital and a selected regional partner hospital. The colleagues served in the role of mock trainee during the station practice sessions or served as observers contributing to the poststation feedback sessions.

The trainers also had the opportunity to discuss their roles and responsibilities with the US team and the Zealand hospital leadership during these practice sessions. Leaders highlighted the importance of the trainer role as ambassadors for excellence in emergency nursing practice and as essential leaders in the journey of emergency nursing from "good to great," a previously articulated goal of the educational program. After completion of the train-the-trainer program, leaders and trainers at each hospital focused on a logistical preparation of the annual competency day program, determining schedules and internal education policies.

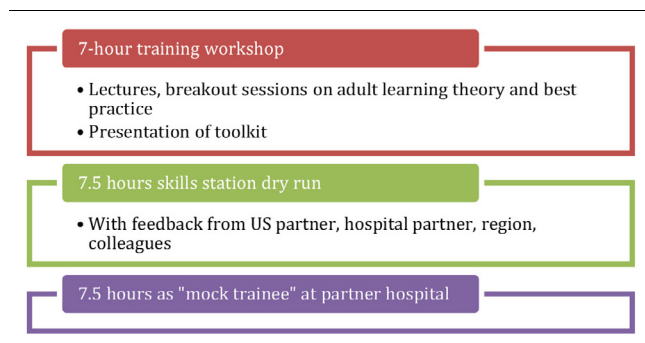


FIGURE 7
Train the trainers educational program.

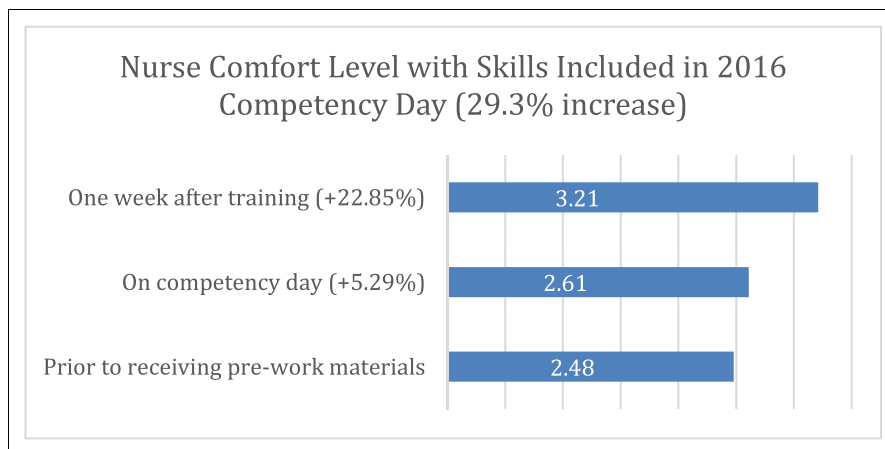


FIGURE 8

Improvement in nurse comfort level with skills taught in 2016 competency day.

Outcomes

In January 2016, the Region Zealand emergency nurse education program was launched, and the first competency days were held in each of the 4 emergency departments. During the first month of project launch, each department had 10 to 15 nurses participate in 5 competency-based skill stations, each containing critical concepts and skills related to emergency nursing. Regional emergency nurse competency days launched in January 2016, and by December over 270 regional nurses had successfully completed the training program.

To evaluate the program and measure the impact of education on emergency nurse education, the project group identified 2 tools: (1) postprogram evaluation, and (2) a self-assessment tool (see [Supplementary Appendices 3 and 4](#)). The postprogram evaluation tool was distributed to participants at the completion of the competency day to solicit participant feedback on individual trainer performance, individual skills station educational value, and logistical aspects of the day. Relevant improvements were made after each competency session, based on learner feedback, and were agreed upon region-wide, communicated by change management form (see [Supplementary Appendix 5](#)). In general, feedback was positive in all 4 hospitals, and educators reported that their staff nurses were working enthusiastically and inquisitively with the material.

Second, participants were asked to complete a modified version of the original needs assessment survey. As discussed above, the original needs assessment survey was designed to measure nurses' perceived competency experience levels for 202 identified emergency nurse skills and competencies.

The modified survey was designed to measure nurses' perceived competency specifically related to the skills and competencies validated during the 2016 competency days. This survey was administered at 3 separate intervals: before receiving their prework material, on the day of competency skill training, and 1 week after training.

Results of the first 4 competency days showed a significant increase in nurses' perceived competency with those skills practiced during the 2016 competency day. Averaged across all practiced skills, regional emergency nurses' perceived competency levels showed a percentage increase of 5.29% and 22.85%, respectively ([Figure 8](#)), and 29.34% overall. A total of 27 of 34 skills showed an increase between the first and second survey, whereas 34 of 34 skills showed an increase in comfort level between the second and third survey. Whereas only the first 4 competency days were evaluated, results indicated an increase in perceived competence due to skills station training.

Competency Day Rollout

One month before each competency day, staff nurses received an email with the prework materials for all 5 stations and were asked to review these materials before competency day. Time was provided within the staff's schedule to study the materials. Leadership regularly communicated with staff regarding the importance of preparing for competency day.

Those staff nurses who were unable to perform the skills on competency day were assisted with station completion by

the trainers. Trainers were not involved in any improvement or learning plan discussions with staff nurses. Station trainers made note of staff performance and, at the end of the competency day, leadership met with the trainers to receive feedback and to develop a list of staff members who needed additional follow up. Nurse leaders addressed these issues directly with staff and nurse educators after competency day.

Project Institutionalization and Expansion

The first regional competency days began in January 2016, and annual competency day programs have been launched each year from 2017 to 2021, with plans to continue; the program has been institutionalized within the regional emergency nursing education system. (We define institutionalization as the stage in the organizational change process at which an educational program has taken hold in the host culture's medical system and is described by local organizational members as a fully ingrained part of their medical/nursing education system).²³ In addition, the Zealand nurse educators have recently been consulted by other hospital departments and have served as a reference for the creation of standardized nurse education programs in other specialty areas. The 5 regional internal medicine departments created a similar annual competency day program, therein standardizing internal medicine nurse education, using the ED project as a point of reference. Regional nursing education programs have also been replicated in internal medicine (2017), abdominal surgery (2018), orthopedic surgery (2019), and pediatric departments (2020).

Discussion

The rapidly evolving landscape and required skill set for emergency nurses requires organizations to identify unique and innovative solutions for lifelong learning. The Region Zealand emergency nursing education collaboration demonstrates a unique approach to a common challenge faced by nurses globally. Utilizing a strategic approach, which incorporated regional stakeholders and international partners into a collaborative project leadership structure, Zealand was able to develop a sustainable competency-based education framework designed and implemented to support emergency nurses, trainers, and leaders in the delivery of high-quality evidence-based care.

The education collaboration had 3 core objectives: (1) to elevate nursing practice, (2) to develop a sustainable continuing education framework, and (3) to standardize training and nursing practice across the 4 Zealand emergency departments. It achieved these goals via an international collaboration and a multi-phased strategic approach to project implementation.

The international collaborative strategic approach that guided the program development used best practices to achieve these goals. A literature search of international emergency medicine project literature identified 3 recommended best practices for program success and institutionalization.²³ These 3 best practices are the following: the use of the train-the-trainers model in program design,²² use of standardized educational content as a basis for curriculum planning,²¹ and use of preprogram needs assessments as a basis for program design and implementation.¹⁰ As demonstrated in the sections above, this collaboration incorporated all 3 of these best practices, and the result was project success and institutionalization. It is reasonable to conclude that international collaborations that use the aforementioned best practices may be a beneficial model to facilitate and expedite the development of emergency nursing education programs.

Also critical to achieving the above-noted outcomes was the use of a multi-phased strategic approach to project implementation, which included a needs assessment, curriculum development, train-the-trainer, and supported project launch. In addition, regional alignment and early stakeholder engagement were critical to gaining overall momentum and support for the project.

In terms of benefits of a standardized regional program, through this collaboration, project leadership saw that an initial investment offered by a regional health care system subsequently yielded efficiency and economy. The collaboration between the 4 hospitals allowed them to share resources, thereby reducing the workload of any 1 hospital bearing the burden of developing independent education. Sharing equipment, curriculum, trainers, and educational materials can reduce combined spending and workload; it can also result in high-quality nursing education and lead to program success.

The identification and dissemination of best practices to address nurses' continuing education and competency needs are critical to the advancement of the profession and the patients and communities that the emergency nurses serve. The outcome of this collaboration was the design and implementation of a sustainable competency-based education framework that included key education, training, and evaluation tools to support both emergency nurses and leaders in the pursuit of high-quality care across Zealand. Given the adoption

and success of this program, the authors strongly believe in the transferability of this regional project to similar projects in other countries, regions, or health care systems. As already demonstrated with the replication of this model leading to the creation of 4 other regional nursing education programs in Zealand (internal medicine [2017], abdominal surgery [2018], the orthopedic surgery [2019] and the pediatric departments [2020]), the transferability of the described program is high.

The 5-phase approach outlined above provides emergency nursing colleagues, working within a health care system with a generalizable strategic approach to collaborative educational program development, from assessment to implementation. The framework was designed and outlined in detail for easy replication. The authors believe that the process, collaborative and consensus-based in nature, which takes advantage of existing system resources, would function in other environments that share similar challenges related to continuing education and competence management.

Implications for Emergency Clinical Practice

Recommendations for translating the findings of this paper into emergency clinical practice include the following:

- Innovative and collaborative approaches to standardizing emergency nursing education across a health care system or region can result in high-quality nursing education and can lead to program success.
- Investment in training and education for emergency nurses across a region or system ensures that consistent high-quality nursing care is available to all patients.
- Leveraging system or regional resources, such as equipment and trainers, may reduce the overall burden and challenges both fiscally and operationally associated with independent education programs.
- International collaborations that use best practices such as use of standardized, internationally recognized educational content, use of a train-the-trainers model throughout program implementation, and use of a comprehensive preprogram needs assessment may be a beneficial model to facilitate and expedite the development of emergency nursing education programs.
- The transferability of the described program is high and has been found to be easily replicable. The program model can be used for future regional or system-wide collaborations.

Conclusion

The challenges related to providing continuing education and competence management for emergency nurses are not unique to any 1 organization, health system, or geographic location. These shared challenges, in addition to a desire to ensure high-quality practice of emergency nursing, were the catalyst for an international collaboration to design a competency-based education framework to support high-quality emergency care in Region Zealand. In 18 months and through an international collaboration, emergency nurse education, training, and evaluation tools were developed and integrated into 4 regional emergency departments. The annual competency day program has continued through 2021 and, now fully institutionalized within regional emergency nursing education, has expanded to include education in other regional nursing specialties. Through this unique collaboration with regional and international participants, a sustainable education program was developed that has elevated and standardized the practice of emergency nurses in Region Zealand. This collaboration and project can also be used as a model for future nurse education development projects across multiple departments.

Author Disclosures

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.jen.2021.08.006](https://doi.org/10.1016/j.jen.2021.08.006).

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