Nursing Research Priorities in the Pediatric Emergency Care Applied Research Network (PECARN): Reaching Consensus Through the Delphi Method

Authors: Warren D. Frankenberger, PhD, RN, CCNS, Amy Pasmann, MSN, RN, Jackie Noll, MSN, RN, CEN, Mary Kate Abbadessa, MSN, RN, CPEN, RN-BC, Rupinder Sandhu, MSHA, BSN, RN, Darcy Brodecki, BA, and Elizabeth Ely, PhD, RN, Philadelphia and Ambler, PA; Salt Lake City, UT; and Sacramento, CA

CE Earn Up to 8.0 Hours. See page 730.

Contribution to Emergency Nursing Practice

- The current literature on pediatric emergency nursing indicates that nursing research priorities have not been identified.
- This article contributes clinical and workforce priorities that PECARN nurses endorsed as a priority to be addressed through research.
- Key implications for emergency nursing practice found in this article can guide nurse leaders and researchers to address clinical and workforce challenges identified by emergency nurses.

Abstract

Introduction: Pediatric emergency nurses who are directly involved in clinical care are in key positions to identify the needs and concerns of patients and their families. The 2010 Institute of Medicine report on the future of nursing supports the active participation of nurses in the design and implementation of solutions to improve health outcomes. Although prior efforts have assessed the need for research education within the Pediatric Emergency Care Applied Research Network (PECARN), no systematic efforts have assessed nursing priorities for research in the pediatric ED setting.

Methods: The Delphi technique was used to reach consensus among emergency nurses in the PECARN network regarding research priorities for pediatric emergency care. The Delphi technique uses an iterative process by offering multiple rounds of data collection. Participants had the opportunity to provide feedback during each round of data collection with the goal of reaching consensus about clinical and workforce priorities.

Results: A total of 131 nurses participated in all 3 rounds of the survey. The participants represented the majority of the

PECARN sites and all 4 regions of the United States. Through consensus 10 clinical and 8 workforce priorities were identified.

Discussion: The PECARN network provided an infrastructure to gain expert consensus from nurses on the most current priories that researchers should focus their efforts and resources. The results of the study will help inform further nursing research studies (for PECARN and otherwise) that address patient care and nursing practice issues for pediatric ED patients.

Introduction

Pediatric emergency nurses who are directly involved in clinical care are in key positions to identify both the clinical needs of the patients and the workforce issues that affect their ability to provide care. The 2010 Institute of Medicine (IOM) report on the future of nursing supports the active participation of nurses in the design and implementation of solutions to improve health outcomes.[1] According to the report, nurses bring unique perspectives to patient care when participating in the redesign of our nation's rapidly changing health care system. In 2004, the Emergency Nurses Association (ENA) used the Delphi method to identify research priorities among nursing leaders.[2] Although previous efforts have assessed the need for educational research and research education needs of emergency nurses within the Pediatric Emergency Care Applied Research Network (PECARN), no systematic effort to date has assessed clinical and workforce nursing priorities for research in the pediatric ED setting.[3]

PECARN is the first federally funded research network in the United States dedicated to generating multi-institutional research on emergency medical services for children. The PECARN sites include 18 hospitals and 3 Emergency Medical Service (EMS) affiliates. The PECARN hospitals are all pediatric academic centers, and 12 of the 18 hospitals have level-1 trauma designations for pediatrics. Most are in urban areas, and all but 1 are freestanding children's hospitals. Although nurses in PECARN fully support physician-led research, this was the first study approved by PECARN to identify nursing research priorities.

In 2008, PECARN created a physician-focused research agenda for its participating institutions by Nominal Group Process and Hanlon Process of Prioritization.[3] The 3 physician priorities identified for pediatric emergency care research were respiratory illnesses/asthma, prediction rules for high stake/low likelihood diseases, and medication-error reduction. Although nursing and physician care in the emergency department is highly collaborative, the 2008 study included only physicians.

The purpose of the current research was to augment the research priorities identified in the 2008 study by involving emergency nurses in identifying and ranking clinical research issues from their frontline nursing caregiver and leadership perspective. Furthermore, the results may identify research priorities that specify the effect of nursing care on patient outcomes. The aim of our study was to determine clinical and workforce research priorities generated from pediatric emergency nurses in the PECARN network.

Methods

The Delphi technique was used to reach consensus among emergency nurses regarding research priorities for pediatric emergency care. The research team applied to the executive committee of PECARN to conduct this Delphi study on nursing research priorities to further nursing science and to increase interdisciplinary collaboration. The RAND Corporation developed the Delphi technique in the 1950s to reach consensus among a group of experts.[4] The technique uses an iterative process through multiple rounds of data collection. Participants have the opportunity to provide feedback during each round of data collection with the goal of reaching consensus. The Delphi technique is a commonly used method in nursing research studies.[5-7] Many organizations have also used the Delphi method to set priorities for research agendas.[8-10] The Delphi method has also been used to engage an identified group to generate consensus beyond a narrow definition of expert, which focuses on individuals with specific knowledge and/or experience.[11-17] We applied the Delphi method to build consensus among nurses who work in PECARN-designated emergency departments. The Delphi method was also chosen for its ease of use and ability to collect a large number of data both efficiently and in a cost-effective manner over a large geographic area.[18] Three rounds of surveys were used for data collection to meet study aims. Previous studies suggest that 3 rounds are sufficient to reach consensus while decreasing subject burden and attrition.[18]

ETHICAL CONSIDERATIONS

This study protocol was deemed exempt by the Children's Hospital of Philadelphia Institutional Review Board. The initial invitation to participate in the study was forwarded to key contacts at each PECARN site. The Delphi survey was made available via REDCap (Vanderbilt University Medical Center, Nashville, TN), a confidential, secure on-line platform.[19] Both initial and subsequent questionnaires were sent using this online tool. Instructions were provided, and subjects were informed that completion of the online survey constituted consent to participate in the study.

STUDY PARTICIPANTS

The initial survey was forwarded to 1,600 nurses who work in PECARN-designated emergency departments. The following inclusion criteria were used: RNs who work in a PECARN hospital and nursing leaders (supervisors, managers, unit-based educators, and clinical nurse specialists) who directly oversee nursing practice in pediatric emergency departments. Exclusion criteria were non-RN staff (physicians, advanced practice nurses [APNs] who are not clinical nurse specialists, support staff). We excluded APNs who function in the role of frontline prescribing providers, as their priorities may more closely align with physicians rather than direct-care nurses.

DATA COLLECTION INSTRUMENT

Three rounds of data collection were planned to elucidate research priorities of emergency nurses. Round 1 included 2 open-ended questions designed to identify nursing research priorities. Our team modeled our approach from the 2008 study by Green et al in the design of our initial questions.[8] The questions were developed by the research team, which consisted of nurse scientists, emergency nursing directors, and emergency nursing clinical experts (with greater than 5 years of direct clinical experience). Consensus was reached on wording and content. For clarity, questions were also vetted by a group of nurses not in the subject target audience.

Each nurse subject was asked to list 3 priorities for each question. The questions were as follows:

- Please think about your everyday clinical practice and the patients and families for whom you care. What are the most important clinical issues that you would like to see addressed through nursing research?

- There are workforce factors (examples: staffing, scheduling, environment) that affect your clinical care. What are most important workforce issues that you would like to see addressed through nursing research?

ROUND 1 PROCEDURE AND ANALYSIS

At the conclusion of the first round, each response was analyzed independently by 2 researchers. The researchers coded each line for similar content. The research team then compared results while eliminating redundant responses. The items generated for the second round contained specific wording and examples/definitions provided by the respondents. For example, care of the septic patient was a frequent theme identified in the first round. Key words related to sepsis were provided by the respondents. We sorted these words into 2 distinct categories: recognition of sepsis and nursing interventions related to sepsis. In the category of recognition of sepsis, the words "alerts," "triggers," and "recognition" are taken verbatim from the respondents. The themes and terms were used to generate a list of research priorities for the second round. The list of priorities was then shared with the rest of the research team to review for readability and clarity and to build final consensus that items accurately reflected the original responses.

ROUND 2 PROCEDURE AND ANALYSIS

For the second round, nurses were sent the items generated from analysis of data in the first round. They were asked to indicate how important each item was to their own nursing practice using a 5-point Likert scale, with 1 being the least important and 5 being the most important. Duplicate responses from the same e-mail address were noted in the second round. We deleted duplicate responses from the sample subjects who responded more than once and if their responses differed, as there was no way to be sure what response was accurate. Before reviewing the data, the team made an *a priori* decision before analysis that topics scored by more than any item with a mean score of ≥50% as very important would be retained for the third and final round.

ROUND 3 PROCEDURE AND ANALYSIS

Following analysis of data from the second round, a list of research priorities was created for the third and final round. In round three, participants were asked to rank order each

TABLE 1
Demographics

	Round 1 (N = 317) N (%)	Round 2 (N = 181) N (%)	Round 3 (N = 133) N (%)	χ^2 (degrees of freedom)	P value[††]
Region[*,†]				5.44 (6)	0.489
Northeast	76 (24.0)	52 (28.7)	42 (31.6)		
South	66 (20.8)	30 (16.6)	18 (13.5)		
Midwest	122 (38.5)	68 (37.6)	50 (37.6)		
West	53 (16.7)	31 (17.1)	23 (17.3)		
Years of experience in the emergency department[‡,§]				2.39 (12)	0.999
0 to 2 years	63 (19.9)	35 (19.3)	26 (19.5)		
3 to 5 years	84 (26.5)	47 (26.0)	29 (21.8)		
6 to 10 years	65 (20.5)	38 (21.0)	29 (21.8)		
11 to 15 years	45 (14.2)	23 (12.7)	21 (15.8)		
16 to 20 years	29 (9.1)	19 (10.5)	12 (9.0)		
21 to 25 years	15 (4.7)	8 (4.4)	7 (5.3)		
>25 years	16 (5.0)	11 (6.1)	9 (6.8)		
Role[¶,‖]				3.74 (10)	.958
Staff nurse	261 (82.3)	145 (80.1)	108 (81.2)		
Supervisor	16 (5.0)	12 (6.6)	7 (5.3)		
Manager	7 (2.2)	4 (2.2)	2 (1.5)		
Director	6 (1.9)	6 (3.3)	5 (3.8)		
Clinical Nurse Specialist	9 (2.8)	3 (1.7)	2 (1.5)		
Other	18 (5.7)	11 (6.1)	9 (6.8)		
Gender[#,**]				2.17 (6)	.903
Female	275 (86.8)	150 (82.9)	111 (83.5)		
Male	37 (11.7)	26 (14.4)	19 (14.3)		
Transgender	1 (0.3)	1 (0.6)	1 (0.8)		
Prefer not to answer	4 (1.3)	4 (2.2)	2 (1.5)		

* No significant difference between rounds 1 and 2 demographics. $\chi^2 = 2.13$ (3), $P = 0.55$
† No significant difference between rounds 2 and 3 demographics. $\chi^2 = 0.67$ (3), $P = 0.88$
‡ No significant difference between rounds 1 and 2 demographics. $\chi^2 = 0.70$ (6), $P = 0.995$
§ No significant difference between rounds 2 and 3 demographics. $\chi^2 = 1.43$ (6), $P = 0.964$
¶ No significant difference between rounds 1 and 2 demographics. $\chi^2 = 2.25$ (5), $P = 0.814$
‖ No significant difference between rounds 2 and 3 demographics. $\chi^2 = 0.56$ (5), $P = 0.990$
No significant difference between rounds 1 and 2 demographics. $\chi^2 = 1.67$ (3), $P = 0.644$
** No significant difference between rounds 2 and 3 demographics. $X^2 = 0.25$ (3), $P = 0.969$
†† Nonsignificant indicates no difference in demographics among all 3 rounds.

item in order of importance from 1 to 10 (with 1 being the highest priority) for the final clinical priorities, and from 1 to 8 for the final workforce priorities. Asking nurses to rank order the items in each group provided the opportunity for each nurse to identify their most important priorities carefully.

Past studies using the Delphi technique to gain consensus identified respondent attrition as a potential limitation for this process.[18] As our team anticipated a decrease of participation in each subsequent round, the PECARN sites were organized into regions (Northwest, South, Midwest and West [Table 1]). To ensure representation of the sample by region,

TABLE 2

Final priorities ranked in order of importance

Final clinical priorities	**Final workforce priorities**
1. Sepsis care: alerts, assessments, triggers, recognition	1. Ratio and patient outcomes: safety, errors, throughput, length of stay
2. Triage: accuracy, consistency, pediatric emergency severity index, workflow, and direct bedding practices	2. Staffing/scheduling: nursing outcomes (health, shift, work-life balance, stress, and burnout)
3. Sepsis care: nurse management, including door-to-treatment times; age-related differences in treatment	3. Nursing satisfaction and retention
4. Trauma/resuscitation: nursing care and interventions	4. Staffing/scheduling: patient outcomes and patient volume
5. Staff safety: violent patients, families, gun violence	5. Workload: patient outcomes
6. Mental/behavioral health/psych care: best practices, care models, patient/staff safety, violent patients	6. Leadership effect on nursing staff (eg, satisfaction, retention)
7. Development of nurse protocols: care of specific diseases, conditions	7. Ratio and nursing care: stress, job satisfaction
8. Asthma care in the emergency department: care models, medication, protocols	8. Burnout/stress: effects on nurses
9. Asthma care home management: discharge teaching, home management, prevention of return to the emergency department	
10. Discharge education: effect on ED utilization, readmission rates, and patient outcomes	

we conducted a χ^2 analysis comparing the number of responses from each region between the subsequent rounds.

Results

Three rounds of questionnaires were sent to participants between August 2017 and May 2018. The first round generated responses from 317 nurses. From round 1 to round 2, we retained 181 nurse respondents: 57% of the original sample. Between the second and third rounds, we retained 133 nurses: 41% of the original sample. Table 1 shows the respondent demographic from each round. The nurses who completed all 3 rounds were mostly female (85%) and had practiced in emergency departments for 3 years or more (80%). Eighty-one percent of the final sample comprised bedside nurses.

ROUND 1 RESULTS

When the research team analyzed the responses, there was unanimous agreement that no new priorities were identified after 275 participants; therefore, the final sample of 317 nurses was deemed sufficient for the first round. As noted, the priorities generated by nurses fell into 1 of 2 predefined categories: clinical research questions related to their nursing practice (eg, understanding best practice for assessing sepsis)

and workforce issues (eg, safe ways to deal with violence, behavioral outbursts from patients and families). The clinical topics fell into 5 major areas: diseases and clinical management, clinical protocols, nursing care and procedures, patient/family education, and environment. The major topics for workforce priorities included staffing and scheduling, nurse satisfaction, and care for the caregiver. Round 1 generated 63 items (38 clinical and 25 workforce).

ROUND 2 RESULTS

In the second round, 181 nurses responded (57% of the original respondents). Ten clinical items, in a range from 50.3% to 64.6% of respondents, scored as very important. Eight workforce items, in a range from 51.9% to 58.6% of respondents, scored as very important. A total of 45 items were eliminated in the second round. The participants from rounds 1 and 2 did not differ statistically by region (χ^2 2.13 [3], $P = 0.55$), years of experience (χ^2 0.70 [6], $P = 0.995$), role (χ^2 2.25 [5], $P = 0.814$), or gender (χ^2 1.67 [3], $P = 0.644$ [Table 1]).

ROUND 3 RESULTS

In the final round, the nurses ranked each item from 1 to 10: 1 as most important, 2 as second most important, and so forth. The final scores were averaged, and the reverse score

(lowest to highest) identified the final list of research priorities. Sepsis care and nurse ratio-to-patient outcomes ranked as the most important clinical and workforce priorities, respectively. Table 2 provides the final list of nursing research priorities. The participants from rounds 2 and 3 did not differ statistically by region (χ^2 0.67 [3], $P = 0.88$), years of experience (χ^2 1.43 [6], $P = 0.964$), role (χ^2 0.56 [5], $P = 0.990$), or gender (χ^2 0.25 [3], $P = 0.969$ [Table 1]).

Discussion

Emergency nurses are in a key position to inform leaders and researchers about the most current pressing issues they encounter in clinical practice. Emergency departments are an essential component of health care in the United States, providing seriously ill and injured patients with the most immediate access.[20] Often, the emergency department serves as the sole health care provider for many patients, owing to their socioeconomic and/or health care status. The voice of the nurse in shaping the direction of health care delivery is key to improving patient outcomes.[21] One hundred thirty-three nurses, representing 17 hospitals across the United States, provided their insights on clinical and workforce research priorities.

The research priorities identified by emergency nurses in this study clustered around several clinical and workforce themes, directed, in part, by the initial questions. The most pressing clinical issues endorsed by the respondents centered on identification and care of the pediatric septic patient, as well as triage practices. Among the clinical priorities identified by our participants, the recognition and care of the patient with sepsis is also reflected in national priorities identified in recent studies.[22,23] The Society of Critical Care Medicine is part of an international consortium that has identified this topic as a research priority, including pediatric patients who present with suspected or diagnosed sepsis.[24] In the United States, more than 75,000 children are treated for severe sepsis annually.[25,26] A key component of nursing care for the patient with suspected sepsis is rapid identification and immediate treatment. There has been considerable attention—in both nursing and non-nursing studies—given to recognition and care of sepsis and the challenges of implementing sepsis-care bundles in the emergency setting.[25,27,28] Yet, despite the availability of sepsis-alert systems and care protocols in the current literature, our participants identified sepsis as a top priority to be addressed, pointing to the possibility that utilization and implementation of existing evidence may be a barrier for them. This challenge highlights the complexity of achieving the ENA's strategic goal of the translation of best evidence into practice.[29]

Our participants identified triage practices as the second most significant priority. Although triage is often the first and most-often performed nursing skill, there continues to be a need for a standardized education and standardized implementation of the Emergency Severity Index (ESI), the ENA-endorsed triage system.[30,31] The ENA and the College of Emergency Physicians both support continued research to "further refine patient acuity assignment."[32] These 2 clinical priorities also highlight the need for further investigation into the translation of research and evidence-based practice into patient care. Implementation science methods are available to study the uptake and translation of evidence to practice.[33] The use of implementation science may address the gap between available evidence and how to embed it at the point of care.[34]

The top workforce priorities identified in this study focused on issues of staffing and nurse-to-patient ratios and their effect on patient care and nursing outcomes. Seminal work in the early 2000s—as well as more recent studies—concludes that staffing, workload, and work environment affect patient outcomes, nurses' ability to function at their highest scope of practice, and overall nursing satisfaction.[35-38] With nearly 2 decades of research, it is noteworthy that PECARN nurses continue to identify staffing, nurse-to-patient ratios, and scheduling as priorities for research. Furthermore, the 2004 ENA Delphi study listed staff-to-patient ratio as a top priority,[2] as reflected in our current study. Patient volumes and acuity are increasing annually, and the demands on nurses often outweigh the available resources in the emergency department.[39] Although this trend is expected to continue, the ENA acknowledges the complexity of appropriate staffing, provides staffing guidelines, and supports continued research on staffing models and the impact on nursing and patient outcomes.[40]

Implications for Emergency Nurses

The results of the study will help inform further nursing research studies that address patient care and nursing practice issues of critically ill and injured patients. The American Nurses Association code of ethics states, "All nurses must participate in the advancement of the profession through knowledge development, evaluation, dissemination, and application to practice. Knowledge development relies chiefly, though not exclusively, upon research and scholarly inquiry."[41] Nurses' participation in the generation of research questions is critical to their

engagement in scholarly inquiry. The data from this study identify the highest research priorities of emergency nurses in PECARN-designated hospitals, which are also reflected in national trends in patient care and workforce issues. PECARN, along with other organizations, such as the ENA, may be leveraged to plan and execute multi-institutional nursing research that is informed by priorities identified from our study.

Limitations

First, although the study involved nurses within PECARN, most PECARN hospitals are large academic pediatric facilities, which may not reflect many nursing challenges faced in different facilities, including rural and critical-access hospitals. Second, the Delphi method has inherent limitations. For example, during the first round, the research team had to interpret sometimes ambiguous or unclear responses provided by the nurses. Although we used precise quotations as much as possible, there is a possibility of misrepresentation of respondents' meanings. Third, although a low response is acceptable in Delphi studies, there is a possibility that a greater number of participants would have identified other clinical and workforce priorities. Furthermore, we did not elicit responses from part-time or *per-diem* staff. In addition, our decision to exclude nurse practitioners may have limited our ability to identify important clinical and workforce priorities, as neither the 2008 PECARN study nor the current study solicited feedback from this group.

Conclusions

This study was the first nursing survey that used PECARN-designated emergency departments to build consensus regarding research priorities among nurses who care for ill and injured children in pediatric emergency departments across the United States. The clinical and workforce research priorities may provide guidance as to where resources should be directed and nursing questions addressed through nursing research and implementation science. These priorities may also inform studies outside of PECARN-designated emergency departments. Future studies may consider focusing on priorities of nurse practitioners who work in emergency departments.

Author Disclosures

Conflict of interest: none to report.

REFERENCES

1. Institute of Medicine. *The Future of Nursing: Leading Change, Advancing Health*. Washington, DC: National Academies Press; 2011.

2. Bayley EW, MacLean SL, Desy P, McMahon M, Emergency Nurses Association. ENA's Delphi study on national research priorities for emergency nurses in the United States. *J Emerg Nurs*. 2004;30(1):12-21. https://doi.org/10.1016/j.jen.2003.10.009.

3. Miller SZ, Rincon H, Kuppermann N. Pediatric Emergency Care Applied Research Network. Revisiting the emergency medicine services for children research agenda: priorities for multicenter research in pediatric emergency care. *Acad Emerg Med*. 2008;15(4):377-383. https://doi.org/10.1111/j.1553-2712.2008.00072.x.

4. Dalkey N, Helmer O. An experimental application of the Delphi method to the use of experts. *Manag Sci*. 1963;9(3):458-467. https://doi.org/10.1287/mnsc.9.3.458.

5. Connor JA, LaGrasta C, Hickey PA. Complexity assessment and monitoring to ensure optimal outcomes tool for measuring pediatric critical care nursing. *Am J Crit Care*. 2015;24(4):297-308. https://doi.org/10.4037/ajcc2015230.

6. Jeon YH, Conway J, Chenoweth L, Weise J, Thomas TH, Williams A. Validation of a clinical leadership qualities framework for managers in aged care: a Delphi study. *J Clin Nurs*. 2015;24(7-8):999-1010. https://doi.org/10.1111/jocn.12682.

7. Hewitt CM, Roye C, Gebbie KM. Core competency model for the family planning public health nurse. *Public Health Nurs*. 2014;31(5):472-479. https://doi.org/10.1111/phn.12133.

8. Green A, Gance-Cleveland B, Smith A, Toly VB, Ely E, McDowell BM. Charting the course of pediatric nursing research: the SPN Delphi study. *J Pediatr Nurs*. 2014;29(5):401-409. https://doi.org/10.1016/j.pedn.2014.03.026.

9. Sawin KJ, Butz A, Brady MA, et al. The development of the NAPNAP research agenda: priorities for evidence in pediatric practice 2008-2013. *J Pediatr Health Care*. 2008;22(3):208-210. https://doi.org/10.1016/j.pedhc.2008.02.003.

10. Hartshorn S, O'Sullivan R, Maconochie IK, et al. Establishing the research priorities of paediatric emergency medicine clinicians in the UK and Ireland. *Emerg Med J*. 2015;32(11):864-868. https://doi.org/10.1136/emermed-2014-204484.

11. Cooper E, Spilsbury K, McCaughan D, Thompson C, Butterworth T, Hanratty B. Priorities for the professional development of registered nurses in nursing homes: a Delphi study. *Age Ageing*. 2017;46(1):39-45. https://doi.org/10.1093/ageing/afw160.

12. Kelly CA, Kirkcaldy AJ, Pilkington M, et al. Research priorities for respiratory nursing: a UK-wide Delphi study. *ERJ Open Research*. 2018;4(2):00003-02018. https://doi.org/10.1183/23120541.00003-2018.

13. Lambert SD, Brahim LO, Morrison M, et al. Priorities for caregiver research in cancer care: an international Delphi survey of caregivers,

clinicians, managers, and researchers. *Support Care Cancer*. 2019;27(3):805-817. https://doi.org/10.1007/s00520-018-4314-y.

14. Roth C, Brewer M, Wieck KL. *Using a Delphi Method to Identify Human Factors Contributing to Nursing Errors.* Paper presented at Nursing Forum. 2017.

15. Wielenga JM, Tume LN, Latour JM, van den Hoogen A. European neonatal intensive care nursing research priorities: an e-Delphi study. *Arch Dis Child Fetal Neonatal Ed*. 2015;100(1):F66-F71. https://doi.org/10.1136/archdischild-2014-306858.

16. Zeigler VL, Decker-Walters B. Determining psychosocial research priorities for adolescents with implantable cardioverter defibrillators using Delphi methodology. *J Cardiovasc Nurs*. 2010;25(5):398-404. https://doi.org/10.1097/JCN.0b013e3181d817b0.

17. Hsu C-C, Sandford BA. The Delphi technique: making sense of consensus. *Pract Assess Res Eval*. 2007;12(10):1-8. https://doi.org/10.1016/S0169-2070(99)00018-7.

18. Keeney S, McKenna H, Hasson F. *The Delphi Technique in Nursing and Health Research*. Hoboken, NJ: John Wiley & Sons; 2010.

19. Harris PA. Research Electronic Data Capture (REDCap): *Planning, Collecting and Managing Data for Clinical and Translational Research.* Paper presented at BMC Bioinformatics. 2012.

20. Hooker EA, Mallow PJ, Oglesby MM. Characteristics and trends of emergency department visits in the United States (2010-2014). *J Emerg Med*. 2019;56(3):344-351. https://doi.org/10.1016/j.jemermed.2018.12.025.

21. Anderson BA. Facing the nursing workforce shortage: policies and initiatives to promote a resilient healthcare system. In: de Chesnay M, Anderson B, eds. *Caring for the Vulnerable*. Burlington, MA: Jones and Bartlett Learning; 2019:363.

22. Hoffman JM, Keeling NJ, Forrest CB, et al. Priorities for pediatric patient safety research. *Pediatrics*. 2019;143(2), e20180496.. https://doi.org/10.1542/peds.2018-0496.

23. Stoner MJ, Mahajan P, Bressan S, et al. Pediatric emergency care research networks: a research agenda. *Acad Emerg Med*. 2018;25(12):1336-1344. https://doi.org/10.1111/acem.13656.

24. Coopersmith CM, De Backer D, Deutschman CS, et al. Surviving sepsis campaign: research priorities for sepsis and septic shock. *Crit Care Med*. 2018;46(8):1334-1356. https://doi.org/10.1097/ccm.0000000000003225.

25. Balamuth F, Alpern ER, Abbadessa MK, et al. Improving recognition of pediatric severe sepsis in the emergency department: contributions of a vital sign-based electronic alert and bedside clinician identification. *Ann Emerg Med*. 2017;70(6):759-768.e752.

26. Balamuth F, Carr B, Kallan M. *Epidemiology and outcomes of pediatric sepsis in the United States*. Paper presented at: Pediatric Academic Societies. Canada: Vancouver, British Columbia; 2014.

27. Balamuth F, Alpern ER, Grundmeier RW, et al. Comparison of two sepsis recognition methods in a pediatric emergency department. *Acad Emerg Med*. 2015;22(11):1298-1306. https://doi.org/10.1111/acem.12814.

28. Reich EN, Then KL, Rankin JA. Barriers to clinical practice guideline implementation for septic patients in the emergency department. *J Emerg Nurs*. 2018;44(6):552-562. https://doi.org/10.1016/j.jen.2018.04.004.

29. ENA. *Five-Year Strategic Plan*. Des Plaines, IL: Emergency Nurses Association; 2019. Accessed May 17, 2019.

30. Recznik CT, Simko LM. Pediatric triage education: an integrative literature review. *J Emerg Nurs*. 2018;44(6):605-613.e609. https://doi.org/10.1016/j.jen.2018.01.003.

31. Wolf LA, Delao AM, Perhats C, Moon MD, Zavotsky KE. Triaging the emergency department, not the patient: United States emergency nurses' experience of the triage process. *J Emerg Nurs*. 2018;44(3):258-266. https://doi.org/10.1016/j.jen.2017.06.010.

32. ENA. *Joint Position Statement: Triage Scale Standardization*. Des Plaines, IL: Emergency Nurses Association; 2017. Accessed May 17, 2019.

33. de Wit K, Curran J, Thoma B, et al. Review of implementation strategies to change healthcare provider behaviour in the emergency department. *Can J Emerg Med*. 2018;20(3):453-460. https://doi.org/10.1017/cem.2017.432.

34. Taenzer A, Kinslow A, Gorman C, et al. Dissemination and implementation of evidence based best practice across the High Value Healthcare Collaborative (HVHC) using sepsis as a prototype: rapidly learning from others. *EGEMS*. 2017;5(3). https://doi.org/10.5334/egems.192, 5-5.

35. Aiken LH, Clarke SP, Cheung RB, Sloane DM, Silber JH. Educational levels of hospital nurses and surgical patient mortality. *JAMA*. 2003;290(12):1617-1623. https://doi.org/10.1001/jama.290.12.1617.

36. Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA*. 2002;288(16):1987-1993. https://doi.org/10.1001/jama.288.16.1987.

37. Cimiotti JP, Aiken LH, Sloane DM, Wu ES. Nurse staffing, burnout, and health care–associated infection. *Am J Infect Control*. 2012;40(6):486-490. https://doi.org/10.1016/j.ajic.2012.02.029.

38. Olds DM, Aiken LH, Cimiotti JP, Lake ET. Association of nurse work environment and safety climate on patient mortality: a cross-sectional study. *Int J Nurs Stud*. 2017;74:155-161. https://doi.org/10.1016/j.ijnurstu.2017.06.004.

39. Carlson K. Crowding in the emergency department. *J Emerg Nurs*. 2016;42(2):97-98. https://doi.org/10.1016/j.jen.2016.02.011.

40. Leaver S. *ENA Position Statement: Staffing and Productivity in the Emergency Department*. Emergency Nurses Association; 2018. Accessed May 17, 2019.

41. ENA. *Code of Ethics for Nurses*. Des Plaines, IL: American Nurses Association; 2015.