Research Ideas for the EMS Graduate Thesis or Dissertation

Megan Corry, EdD, EMTP, CHSE
This time last year…

DISSERTATION
DISCOURSE & THESIS
THERAPY

Megan, Heather, Dave, Kim & Gordy

Megan Corry, PhD, RN, NRP
Kim McKenna, PhD(c), NRP
Heather Davis, EdD, NRP
Gordy Kokx, PhD, NRP

National Association of EMS Educators
GIFTS!

• Great Ideas For These S

YAY!!

GRAD SCHOOL
Developing a Research Question

- Topics of study
- Literature reviews
So much research, so little time
Objectives

• Discuss priorities in EMS educational research
• Explore topics in education research that are relevant to your interest and practice
• Identify opportunities for EMS graduate students to develop from concept to protocol
Sources

- Past two years of PCRF Education Research Journal Club webinars
- Conferences: NAEMSE, EMS World ISS, International Conference-a-thon, NAEMSP, IMSH, ACCREDITCON
- Publications: PEC Position statements
Frame

- Align with future directions of EMS
- Include higher education research
- Equity pedagogy
- Methodological novelty
COVID-19 Impact

Emergency medical services education research priorities during COVID-19: a modified Delphi study

Rebecca E. Cash, PhD, MPH; William J. Leggio EdD; Jonathan R. Powell, MPA; Kim McKenna, PhD; Paul Rosenberger, EdD; Eliot Carhart, EdD; Andrienne Kramer, PhD; Juan A. March, MD; Ashish R. Panchal for the Pandemic Educational Effects Task Force. JACEP Open, August 2021
### Research Priorities

**TABLE 2** Ranking of research priorities by weighted importance score

<table>
<thead>
<tr>
<th>Research priority</th>
<th>Weighted importance score</th>
<th>Mean importance score</th>
<th>Mean feasibility score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prehospital internship access</td>
<td>3.56</td>
<td>3.75</td>
<td>3.17</td>
</tr>
<tr>
<td>EMS education program availability and accessibility</td>
<td>3.50</td>
<td>3.58</td>
<td>3.33</td>
</tr>
<tr>
<td>Impact of lack of field and clinical experience</td>
<td>3.50</td>
<td>3.67</td>
<td>3.17</td>
</tr>
<tr>
<td>Student health and safety</td>
<td>3.47</td>
<td>3.58</td>
<td>3.25</td>
</tr>
<tr>
<td>Cognitive competency outcomes during COVID</td>
<td>3.42</td>
<td>3.50</td>
<td>3.25</td>
</tr>
<tr>
<td>Psychomotor competency outcomes during COVID</td>
<td>3.36</td>
<td>3.58</td>
<td>2.92</td>
</tr>
<tr>
<td>Hospital/ambulatory site access</td>
<td>3.36</td>
<td>3.50</td>
<td>3.08</td>
</tr>
<tr>
<td>Keeping EMS education accessible for all students</td>
<td>3.33</td>
<td>3.58</td>
<td>2.83</td>
</tr>
<tr>
<td>Simulation accessibility</td>
<td>3.32</td>
<td>3.25</td>
<td>3.45</td>
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<tr>
<td>Recruitment/enrollment</td>
<td>3.31</td>
<td>3.50</td>
<td>2.92</td>
</tr>
<tr>
<td>Program instruction changes because of COVID</td>
<td>3.25</td>
<td>3.33</td>
<td>3.08</td>
</tr>
<tr>
<td>Future of EMS education after the pandemic</td>
<td>3.25</td>
<td>3.42</td>
<td>2.91</td>
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<tr>
<td>Substitution of simulation for clinical/field contacts</td>
<td>3.22</td>
<td>3.50</td>
<td>2.67</td>
</tr>
<tr>
<td>Faculty health and safety</td>
<td>3.19</td>
<td>3.25</td>
<td>3.08</td>
</tr>
<tr>
<td>How is and how much simulation is being used</td>
<td>3.19</td>
<td>3.33</td>
<td>2.92</td>
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<tr>
<td>Affective competency outcomes during COVID</td>
<td>3.06</td>
<td>3.17</td>
<td>2.83</td>
</tr>
<tr>
<td>Medical director involvement</td>
<td>3.06</td>
<td>3.00</td>
<td>3.17</td>
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<tr>
<td>Alternatives to clinical rotations</td>
<td>2.94</td>
<td>3.08</td>
<td>2.67</td>
</tr>
<tr>
<td>Faculty stress and anxiety</td>
<td>2.94</td>
<td>2.92</td>
<td>3.00</td>
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<tr>
<td>Impact of program changes on future employment</td>
<td>2.89</td>
<td>3.17</td>
<td>2.33</td>
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<tr>
<td>Pandemic-specific topics of education</td>
<td>2.87</td>
<td>2.64</td>
<td>3.33</td>
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<tr>
<td>Student stress and anxiety</td>
<td>2.86</td>
<td>2.91</td>
<td>2.75</td>
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<tr>
<td>Faculty availability, structure and size</td>
<td>2.85</td>
<td>3.00</td>
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<tr>
<td>Regulatory body requirements</td>
<td>2.75</td>
<td>2.75</td>
<td>2.75</td>
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<tr>
<td>Program funding</td>
<td>2.68</td>
<td>2.75</td>
<td>2.55</td>
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<tr>
<td>Student perception of competency</td>
<td>2.61</td>
<td>2.58</td>
<td>2.67</td>
</tr>
<tr>
<td>Changes in student characteristics</td>
<td>2.42</td>
<td>2.42</td>
<td>2.42</td>
</tr>
</tbody>
</table>

Abbreviation: EMS, emergency medical services.

*Weighted importance score calculated as \( \frac{2}{3} \times \text{mean importance} + \frac{1}{3} \times \text{mean feasibility}. \)
Research!

**Table 3** Final ranking of the top 8 research priorities

<table>
<thead>
<tr>
<th>Priority</th>
<th>Frequency of occurrence for each rank*</th>
<th>Total score</th>
<th>Rank order</th>
<th>% in top 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prehospital internship access</td>
<td>5 2 0 0 2 0 1 1 0 1 0 0 112 (1)</td>
<td>1 58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact of lack of field and clinical experience</td>
<td>0 4 2 1 1 1 0 0 0 2 0 98 (2.5)</td>
<td>2 58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student health and safety</td>
<td>1 3 0 1 1 2 2 2 0 0 0 0 98 (2.5)</td>
<td>3 42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMS education program availability and accessibility</td>
<td>4 0 3 0 0 0 0 2 1 2 0 93 (4)</td>
<td>4 58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychomotor competency outcomes during COVID</td>
<td>0 0 2 2 0 4 1 0 2 0 0 1 81 (5)</td>
<td>5 33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital/ambulatory site access</td>
<td>0 1 2 0 1 0 3 3 1 0 1 0 78 (6)</td>
<td>6 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive competency outcomes during COVID</td>
<td>1 1 0 2 1 0 1 2 1 1 2 0 76 (7)</td>
<td>7 42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keeping EMS education accessible for all students</td>
<td>1 0 1 2 1 1 0 0 3 2 0 1 74 (8)</td>
<td>8 33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Each number represents the number of participants that selected a particular rank for that priority.*

Abbreviation: EMS, emergency medical services.
Public Health & Policy Research

• Addressing the data gap
• Educational infrastructure issues
• Shutdown of healthcare programs and impact on workforce pipeline
Simulation Research

• What is the ratio of clinical-to-simulation for procedural skills, patient contacts, team leads?
• Which patient contacts can be substituted for using simulation?
• Can virtual simulation be used to teach and assess students’ clinical reasoning skills?
Simulation Research *(continued)*

- What resources are needed in EMS education programs to run effective simulations?
- Application of evidence-based practices from medical education literature to EMS simulations?
- Defining cognitive load of learners through “levels” of simulation difficulty. *(instructional design)*
- Does cultural humility in simulation-based education reduce disparities in prehospital care? *(translational science)*
Equity & Diversity

• EMS student population: access and opportunity for all?
  • Examining disaggregated student outcomes data for the gatekeeper courses
  • Implementing teaching practices that promote equity and reduce disparities
  • Do institutional policies or instructor bias negatively impact student outcomes?
EMS Curriculum Should Educate Beyond a Technical Scope of Practice: Position Statement and Resource Document

William J. Leggio, EdD, NRP, Tom Grawey, DO, Joshua Stilley, MD, Maia Dorsett, MD, PhD, and on behalf of the Education Committee of the National Association of EMS Physicians

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Social Determinants of Health

[Diagram showing Social Determinants of Health: Education, Access and Quality, Economic Stability, Social and Community Context, Neighborhood and Built Environment, Health Care Access and Quality]
Pedagogy

- Deliberate practice and mastery learning
- Simulation-based mastery learning
Research methods

- Natural language processing
  - Qualitative data
  - Machine learning

Improving prehospital stroke diagnosis using natural language processing of paramedic reports

Anoop Mayampurath, Zahra Parnianpour, Christopher Thomas Richards, William J. Meurer, Jungwha Lee, Bruce Ankenman, Ohad Perry, Scott J. Mendelson, Jane Louise Holl, Shyam Prabhakaran*

*Corresponding author for this work
Natural language processing

Simulation

Debriefing

Classroom teaching

Feedback to students
Ethics

- Simulation fiction contract
- IRB review for exemption
Opportunities

Developing educator-researchers
National Registry Research Department

- REQUEST DATA OR WORK WITH US
- THE NATIONAL REGISTRY EMS RESEARCH FELLOWSHIP
EMS Educators Collaborative

A Longitudinal Professional Development Opportunity in EMS Education
Sponsored by NAEMSP and NAEMSE
Questions?

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