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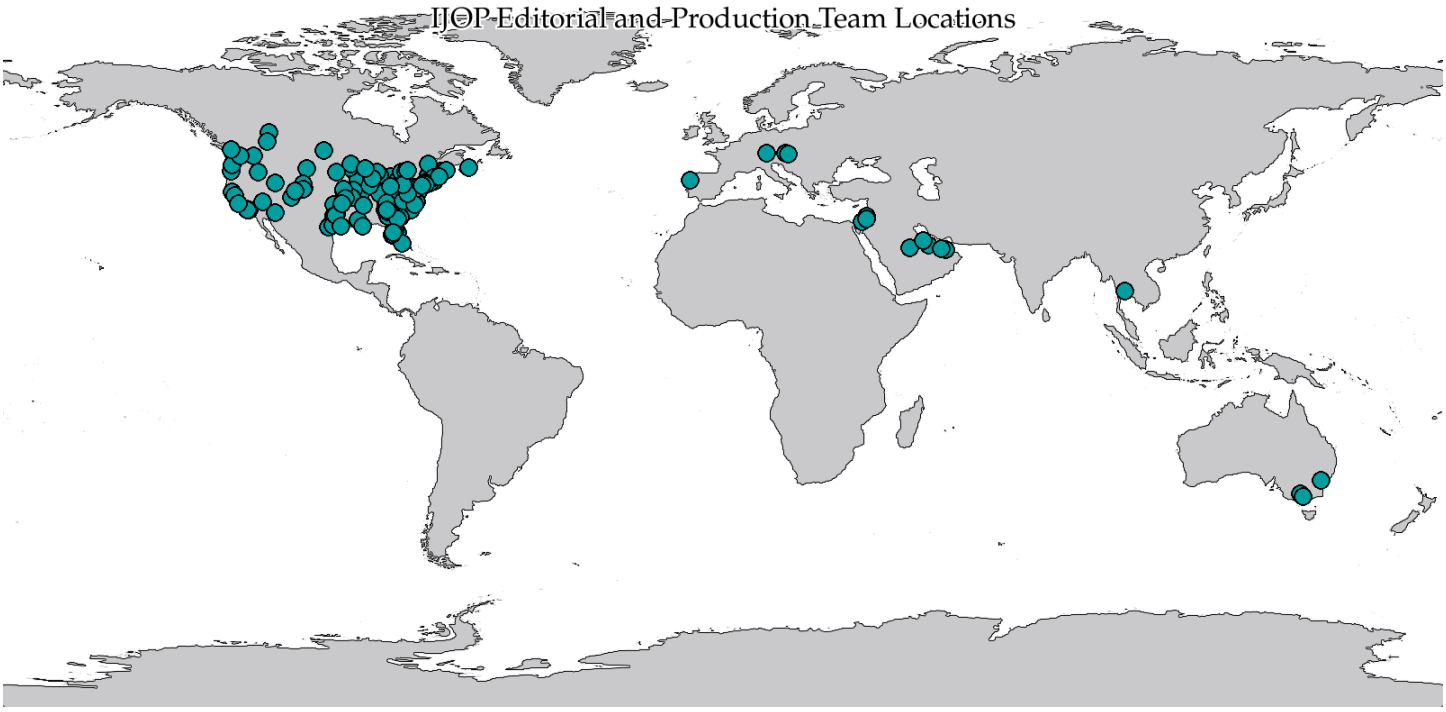
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International Journal of Paramedicine

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Table of Contents

April-June, 2026 *Number 14*

RESEARCH REPORTS

Longitudinal Evaluation Use of a Multi-Modal Toolkit to Support Prehospital Pediatric Readiness 10
Jaeger L, Runkle A, Dorosz E, Dietrich A, Cheng T, Alter R, Saucedo J, & Adelgais K

Peer-to-Peer Feedback Among Ambulance Clinicians: A Cross-Sectional Study in the Out-of-Hospital Setting 22
Foster J & Williams B

Evaluating Auditory Feedback for Accurate Compression Rates 44
Horan Jr P, Breneman K, & Martin V

Assessing Australian and New Zealand Prehospital Clinicians' Training, Experience, and Confidence with Out-of-Hospital Childbirths: A Mixed Methods Online Questionnaire 50
Hill M, Flanagan B, Hansen S, Hopper L, & Mills B

Educating for the Paramedicine of Today: Exploratory Findings Related to Primary Care Paramedic Training in Northern Ontario 71
Starkes A & Møller H

Zoom Fatigue Among Paramedicine Students: A Cross-Sectional Study 87
AlShammari T, King C, Oteir A, Alqahtani S, Chang Y, Aldossary S, & Williams B

Attitudes of First Responders Towards Supervised Consumption Services 98
Pijl E, McDonald N, Weldon E, Dryden R, Golding M, Fries C, Serieux J, Shaw S, Souleymanov R, Guest C, & Mexico J

Self-Reported ADHD in a Convenience Sample of EMS Clinicians 113
Hansen N & Foat C

REVIEWS

The Evolving Professionalization of Paramedicine: A Scoping Review 128
Feerick F, Coughlan E, Knox S, Murphy A, O'Grady I, & Deasy C

CONCEPTS

Implementation of Mental Health Supports for Canadian Paramedic Students During Practicum Placements 150
Newman S, Kayanja J, Rimstad C, & Violato E

Mass Opioid Exposure: Enhancing Medical Countermeasure Preparedness 159
Lord G, Byun N, & Laney

LITERATURE SURVEILLANCE

Paramedicine Contents: December 2025 - March 2026 ..... **166**
McAdams J & Buck B

Paramedicine Literature Search: December 2025 - February 2026 ..... **175**
Maxwell S & Morrissey B

GUIDELINES

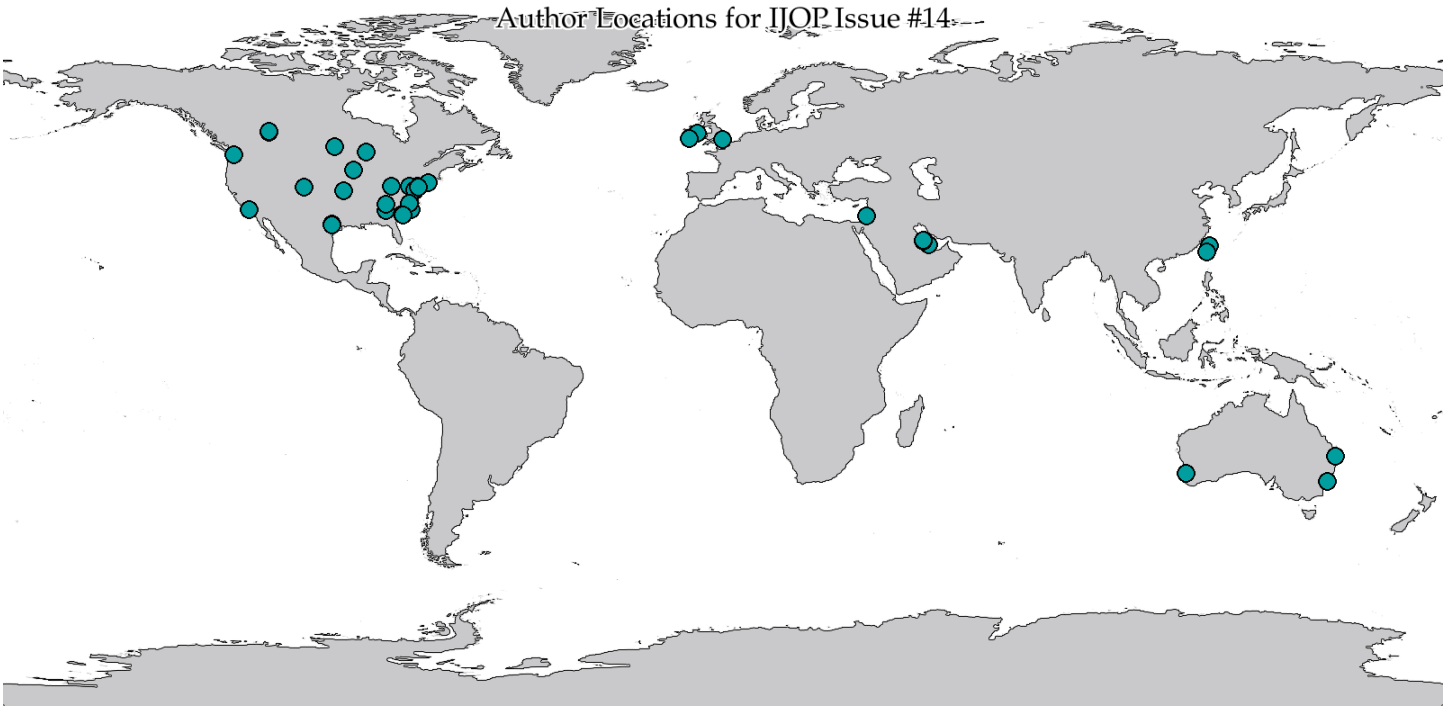
Guidelines for Authors **268**

CORRESPONDENCE

Dialogs **231**

ADDENDUM, CORRIGENDUM, AND ERRATUM

Addendum, Corrigendum, and Erratum **279**



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RESEARCH REPORTS

LONGITUDINAL EVALUATION USE OF A MULTI-MODAL TOOLKIT TO SUPPORT PREHOSPITAL PEDIATRIC READINESS

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ABSTRACT

Objective: The National Prehospital Pediatric Readiness Project (PPRP) supports emergency medical services (EMS) efforts to deliver high-quality care to acutely ill and injured children through dissemination of best practices. Toolkits are essential for implementing new initiatives for system improvement. Central to this effort is a toolkit developed by the PPRP to guide EMS agencies in pediatric readiness improvements. The perceived utility of the PPRP Toolkit by end-users is unknown. This study aimed to evaluate end-user analytics and satisfaction with this Toolkit to inform future enhancements.

Methods: We present a descriptive case study examining the development, dissemination, and evaluation of the Toolkit. Website analytics from April 2021 to June 2023 were reviewed to assess engagement, including total page views and time spent per page. We conducted a snowball sampling frame to recruit pediatric emergency care coordinators and EMS educators to complete a structured survey evaluating the Toolkit. Respondents rated the usefulness and ease of resource navigation using a 5-point Likert scale.

Results: The Toolkit generated 193,500 page views, with users spending an average of 11 minutes per page. The most frequently accessed domains were Education and Competencies, Equipment and Supplies, and Policies, Procedures, and Protocols. The median score for both ease of access and resource usefulness was 4/5. Quality Improvement/Process Improvement received the lowest median score (ease: 2, helpfulness: 3) and Interactions with Systems of Care were the highest (ease: 5, helpfulness: 5).

Conclusion: The Toolkit is a well-utilized and valued resource for enhancing pediatric readiness in EMS systems. While overall feedback was positive, lower ratings for the QI/PI category suggest opportunities for targeted improvement. Continued refinement, guided by end-user feedback and usage patterns, will be critical to ensure the Toolkit remains effective, relevant, and responsive to the evolving needs of prehospital pediatric readiness.

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INTRODUCTION

Ensuring the health and safety of our youngest and most vulnerable patients is an important concern in emergency medical services (EMS). Acutely ill and injured children present unique challenges and require specialized care distinct from adults (Institute of Medicine, 2007). Of the over 53 million annual EMS 911 activations in 2022, only 5.6% were for children (National EMS Information System [NEMSIS], 2023). Despite this small percentage, children transported to the emergency department (ED) by EMS have higher-acuity illnesses and injuries than those arriving via private vehicle (Diggs et al., 2016). With children representing only 5–10% of EMS 911 activations and 39% of EMS agencies seeing less than one child per month, maintaining pediatric-specific cognitive and procedural skills among EMS clinicians is challenging (Owusu-Ansah et al., 2020; EMS for Children (EMSC) Data Center, 2022).

In 2020, the American Academy of Pediatrics, American College of Emergency Physicians, Emergency Nurses Association, National Association of EMS Physicians (NAEMSP), and National Association of Emergency Medical Technicians authored a joint policy statement, "Pediatric Readiness in Emergency Medical Services Systems" outlining pediatric readiness best practices for prehospital care (Moore et al., 2020), with details supporting the recommendations published separately in a technical report (Owusu-Ansah et al., 2020) to address the challenges faced by EMS. To advance these recommendations, the National Prehospital Pediatric Readiness Project (PPRP) was formed in 2019 and is led by a Steering Committee composed of 30 partners with the primary goal to support EMS and fire-rescue agencies with resources that include a pediatric readiness Checklist and a multimedia Toolkit.

Before the PPRP, no comprehensive prehospital pediatric readiness resource existed. Similar to previous efforts to recruit and support pediatric emergency care coordinators (PECCs) and promote statewide prehospital guidelines, the Prehospital Pediatric Readiness Toolkit was developed as a multi-modal resource for EMS clinicians, educators, and agency leadership (Tsao et al., 2023; Adelgais et al., 2019; Williams et al., 2009). Following best practices in program implementation, we sought to obtain user feedback and analytics to inform future iterations of the toolkit (Buckingham et al., 2023; Maltby et al., 2020). The goal of this study is to describe the development of the Toolkit and report on user analytics and end-user feedback with implications for refinement.

METHODS

Design

We describe the development and evaluation of a national Toolkit for prehospital pediatric readiness intended for EMS clinicians, educators, and PECCs. Project team members curated and disseminated resources and conducted a follow-up survey of targeted stakeholders to evaluate the Toolkit's organization, content, and usability.

Toolkit Development

The PPRP Steering Committee established the Toolkit Workgroup with representatives from 18 organizations [Appendix A] tasked with curating open access materials aligned with a readiness Checklist developed from recommendations in the joint policy state-

Domain	Purpose of tools
Education and Competencies	Enhance EMS pediatric education along with tools to objectively evaluate prehospital pediatric competency
Equipment and Supplies	Provide national recommendations on equipment and supplies to support the delivery of quality prehospital pediatric care
Patient and Medication Safety	Support reduction of common medication errors and provide information for the safe transport of children in ambulances
Patient and Family-Centered Care	Assist EMS agencies with incorporating patient and family-centered principles into policies and procedures
Policies, Procedures, and Protocols	Provide guidance on creating and incorporating pediatric considerations into policies, procedures, and protocols
Quality Improvement/Process Improvement (QI/PI)	Support prehospital pediatric quality improvement and guide the implementation of effective process improvement strategies
Interactions with Systems of Care	Facilitate collaboration among partner organizations and systems of care to enhance coordination and continuity for pediatric patients across the care continuum

Table 1. Toolkit domains and their respective resource purposes for pediatric prehospital care.

ment and technical report (Owusu-Ansah et al., 2020; Moore et al., 2020). The PPRP Toolkit Workgroup modeled best practices in toolkit creation (Thoele et al., 2020), meeting quarterly to share and review resources corresponding to items on the Prehospital Pediatric Readiness Checklist, organized into readiness domains (Table 1). The Toolkit was launched in April 2021.

The PPRP Toolkit includes videos, documents, interactive modules, position statements, white papers, sample policies, and training curricula that are reviewed and updated quarterly. The toolkit, accessible on the EMSC Innovation and Improvement Center (EIIC) website (EIIC, n.d.), features a search bar, filters, and an introductory video. Top resources are 'pinned' for easy access. A "Contact Us" option for submitting materials is available and submissions undergo review for alignment with Checklist recommendations.

User Analytics

Website usage data were obtained from Google Analytics for the period April 1, 2021, to June 30, 2023, prior to a platform upgrade in July 2023, to ensure consistency in analyses. A cross-sectional assessment of user engagement metrics was conducted using data from the original Google Analytics platform. Metrics included page views, time spent per domain, and most frequently visited resources. Page views reflected total content views, while unique page views represented aggregated views by the same user within a single browsing session.

User Centered Feedback

We solicited targeted feedback in September 2023 from end-users representing diverse prehospital roles and settings (Table 2) via an online survey [Appendix B]. For recruitment, we employed a snowball sampling approach to recruit Pediatric Emergency Care Coordinators (PECCs) and EMS educators to complete a structured survey evaluating the Toolkit. This method involved initially contacting a small group of eight EMSC program managers who were then asked to refer additional participants. Ultimately, we obtained contact information for 31 additional PECCs and EMS educators, as well as 3 members of the PPRP Steering Committee. This resulted in a total of 42 individuals who were contacted via email, of whom 37 responded. Outcomes of interest included previously reported user-centered metrics essential for successful Toolkit implementation: the toolkit's

organization, usability, and overall value (Barac et al., 2014; Yamada et al., 2015; Hempel et al., 2019). Participants reviewed toolkit domains and rated the helpfulness of the resource and ease of navigation on a 1 (worst) to 5 (best) Likert scale. Additional qualitative feedback was obtained, especially from those rating domains poorly (score 1-2). Given that the intent of the survey was to glean key information about the toolkit, pilot testing and follow up cognitive interviews to evaluate the survey itself were not performed.

Ethical Consideration

This project does not involve human subjects or identifiable patient health information and therefore did not require Institutional Review Board (IRB) oversight.

Professional Role Type	N (%)
EMS Clinician[1]	18 (49%)
EMS Educator	13 (35%)
PECC/Pediatric Champion	12 (32%)
EMS Program Manager/Project Director	6 (16%)
PPRP Steering Committee Member[2]	4 (11%)
EMS Medical Director[3]	0 (0%)
Other • EMS for Children Advisory Committee Member (2) • Disaster Preparedness Expert (3) • Deputy Chief of EMS • Operations Officer • Continuous Quality Improvement Supervisor	8 (22%)
1 - Includes emergency medical technicians and paramedics 2 - Includes only those members not participating in the Toolkit Work Group 3 - Physicians who commonly have additional training in EMS and/or emergency medicine	

Table 2. Professional roles and number (percentage) of respondents to the feedback survey.

RESULTS:

Since August 2020, 172 resources were curated into seven Checklist domains (Table 3).

User Analytics

The Toolkit received 193,500 page views and 23,554 unique page views. Quarterly visits increased from 13,609 to 28,335 by mid-2023, peaking at 32,861 in early 2023 (Figure 1). The most visited domain was Education and Competencies with 22,130 page views, followed by Equipment and Supplies with 7,416 (Table 3). Users spent an average of 10.76 minutes per domain, ranging from 3.6 minutes on Education and Competencies to 12.48 minutes on Quality Improvement (QI)/Process Improvement (PI).

Subdomain analysis inferred by the number of unique page views showed strong engagement in all three subdomains within Education and Competencies, . ,in the "Pediatric Protocols and Guidelines" and "Dispatch and Prearrival Instructions" subdomains of Policies, Procedures and Protocols, "Safe Medication Dosing" within the Patient and Medication Safety domain, and "Guidelines and General Resources" under the Patient- and Family-Centered Care domain (Table 3). The PECC Roles subdomain within Interactions with Systems of Care also saw notable interest inferred from the number of unique page views. Top resources included SimBox EMS, Autism First Responder Training Video, and Equipment Checklist Examples and Grant Opportunities (Table 4).

Feedback Survey

Out of 42 reviewers surveyed, 37 responded (88%), with between four to seven responses per domain (Figure 2). Respondents included various geographic and agency types of EMS clinicians, educators, PECCs, EMS for EMSC State Partnership program managers/



Figure 1. Page visits by quarter.

PPRP Toolkit Domain	Page Views (Unique)	Average Time (Min)
Total Resources (n=172)	**193500 (23554)**	**10.76**
Education and Competencies (n=44)	22130 (2411)	3.60
• Psychomotor (Procedural) Skills	• 6793 (838)	• 19.48
• Cognitive Skills	• 4434 (526)	• 11.59
• Behavioral (Communication) Skills	• 2606 (332)	• 13.81
Equipment and Supplies (n=3)	7416 (878)	7.67
Policies, Procedures, and Protocols (n=50)	5742 (529)	7.11
• Pediatric Protocols and Guidelines	• 3093 (350)	• 18.24
• Dispatch and Pre-arrival Instructions	• 1232 (147)	• 14.45
• Policy/Position Statements	• 910 (108)	• 22.61
• Medical Direction/Oversight Resources	• 515 (65)	• 17.81
Patient and Medication Safety (n=15)	4443 (462)	5.32
• Safe Medication Dosing	• 2112 (256)	• 22.08
• Safe Transport of Children	• 1016 (132)	• 10.08
Quality and Process Improvement (n=8)	4011 (504)	12.48
Patient- and Family-Centered Care (n=15)	3908 (373)	6.5
• Guidelines and General Resources	• 1342 (155)	• 19.16
• Communication Tools	• 998 (118)	• 6.53
• Disaster Preparedness	• 490 (61)	• 15.33
• Assessments	• 477 (56)	• 6.17
Interactions with Systems of Care (n=37)	2758 (292)	12.4
• PECC Roles/Job Descriptions	• 1083 (136)	• 23.93
• Mental/Behavioral Health	• 822 (98)	• 18.79
• Disaster Preparedness	• 621 (89)	• 24.00
• Handoffs/Transfer of Care	• 378 (50)	• 15.07
• Human Trafficking	• 279 (37)	• 13.24

Table 3. User engagement metrics by toolkit domain and subdomains: total page views, unique page views, and average time spent per page.

Top Resources	Page Views (Unique)	Average Time (Min)
Education and Competencies		
SimBox EMS	4166 (538)	15.67
Autism First Responder Training Video	2110 (341)	11.76
School Shooting Simulation (PRIDE)	1212 (160)	10.84
Equipment and Supplies		
Equipment Checklist Examples	2444 (346)	14.92
Grant Opportunities	2209 (272)	20.98
Patient- and Family-Centered Care		
Communication Cards	705 (79)	13.55
Family Assessment of Medical Interventions & Liaisons with the Young (FAMILY) EMS Instrument	552 (70)	6.98
Quality and Process Improvement		
NEMSQA Pediatric Measures	820 (115)	21.22
Institute for Healthcare Resources	563 (75)	9.71

Table 4. User engagement metrics for top resources by domain: total page views, unique page views, and average time spent per page.

directors, PPRP Steering Committee members, among others (Table 2). Median ratings for ease of locating resources and usefulness were above 3.5 for six of seven domains (Figure 3). Interaction with Systems of Care scored highest (5/5) followed by Education and Competencies (helpfulness 4.75, ease 4). Equipment and Supplies and Policies, Procedures, and Protocols scored a 4 in both categories. Patient- and Family-Centered Care scored 3.5 for helpfulness and 4 for ease of use. QI/PI scored lowest with 3 for helpfulness and 2 for ease of use.

DISCUSSION

Toolkits are effective knowledge translation tools that help disseminate information, increase awareness, and support new initiatives in healthcare (Barac et al., 2014). Since August 2020, the Prehospital Pediatric Readiness Project Toolkit is the most comprehensive open-access resource available to support prehospital pediatric readiness. With over 170 resources, there is no other publicly available resource with the breadth of information and tools currently available for the EMS community to support the care of children.

Since its implementation, the Toolkit's sustained and growing usage highlights its importance within the EMS community. The Education and Competencies domain has emerged as the most accessed, signaling an interest in pediatric education resources within EMS. While feedback indicates that the Toolkit is highly rated and easy to use, a deeper examination into subdomain utilization reveals that Psychomotor Skills and Safe Medication Dosing further indicate prioritized areas, and the popularity of practical tools like SimBox EMS and the Autism First Responder Training video underscores the need for hands-on, condition-specific resources. Of note, the EMSC program has been measuring skills assessment with pediatric equipment annually since 2017, with little improvement over the last few years (Hewes, Ely, et al., 2019; Hewes, Genovesi, et al., 2022), suggesting that further promotion of Toolkit resources may enhance readiness.

User feedback confirms that the Toolkit is highly valued and user-friendly, described as a "living document" incorporating continuous updates. However, the lower QI/PI and

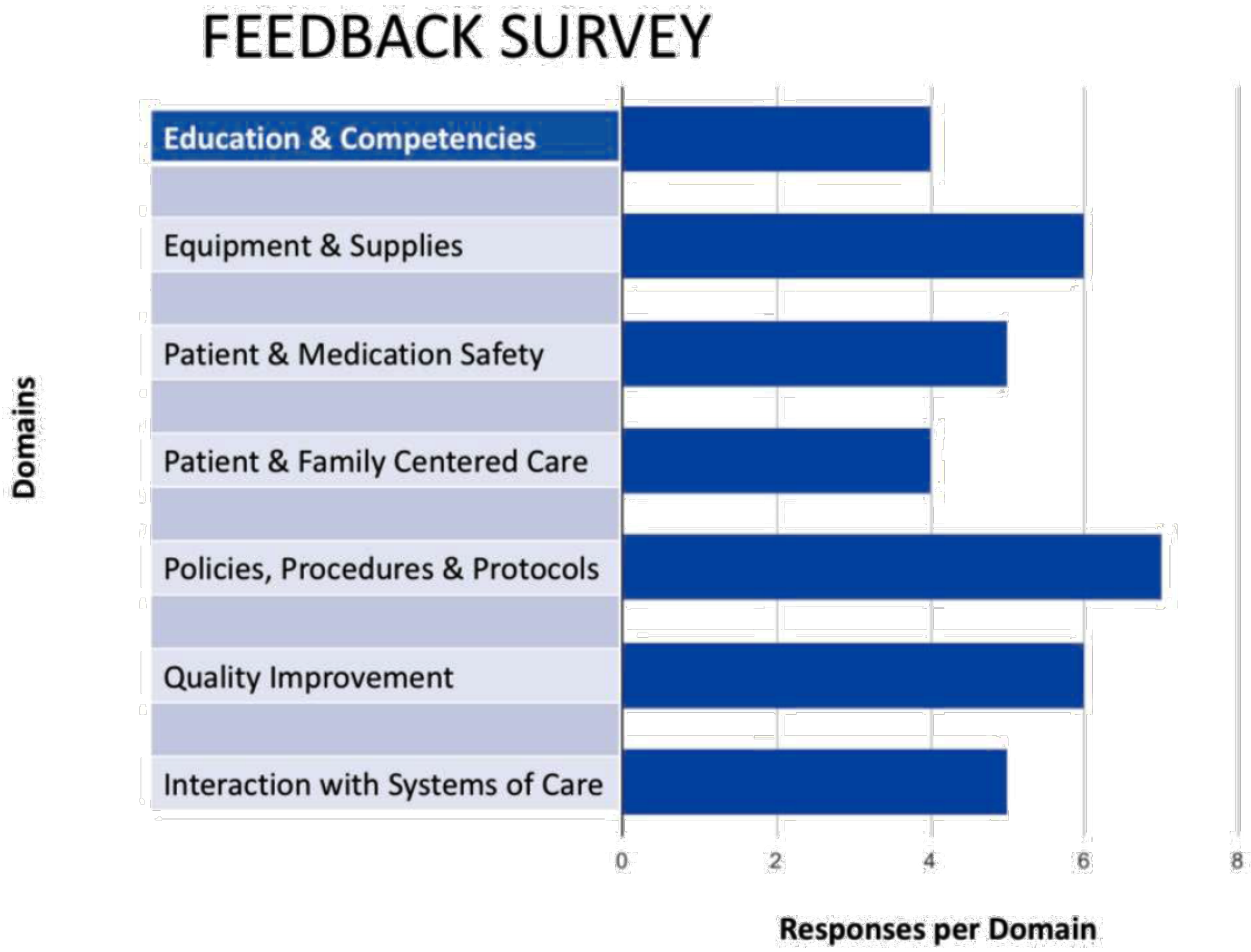


Figure 2. Feedback survey responses per domain.

Patient Medication Safety domains ratings indicate challenges with content complexity, quality, organization, and resource accessibility. This aligns with the inherent difficulties in QI and medication safety practices, suggesting a need for more targeted resources and training materials that address these specific concerns. Notably, NAEMSP has developed a quality committee that evaluates QI/PI initiatives. Furthermore, the National EMS Quality Alliance (NEMSQA) is leading multiple national QI projects such as the Lights and Siren Collaborative to improve the safety of EMS response and transport. While user analytics demonstrate that the NEMSQA resources are widely used, current NEMSQA quality measures lack pediatric focus, with only two out of 20 measures specific to children.

To address these gaps, ongoing collaborations with the Institute for Healthcare Improvement, NEMSQA, and the National EMS Information System (NEMSIS) Technical Assistance Center aim to produce more pediatric-specific, user-friendly QI resources. NEMSIS now hosts a set of prehospital pediatric readiness quality measures (NEMSIS, n.d.) developed through a consensus process by a technical expert panel with 7 core clinical process and outcome-based measures covering a range of common pediatric prehospital conditions. The dashboard includes filters by urbanicity, EMS organizational type, patient volume, and level of care. It is anticipated that future iterations of the dashboard may include a filter by a readiness score from the 2024 National PPRP Assessment (Ward, 2024).

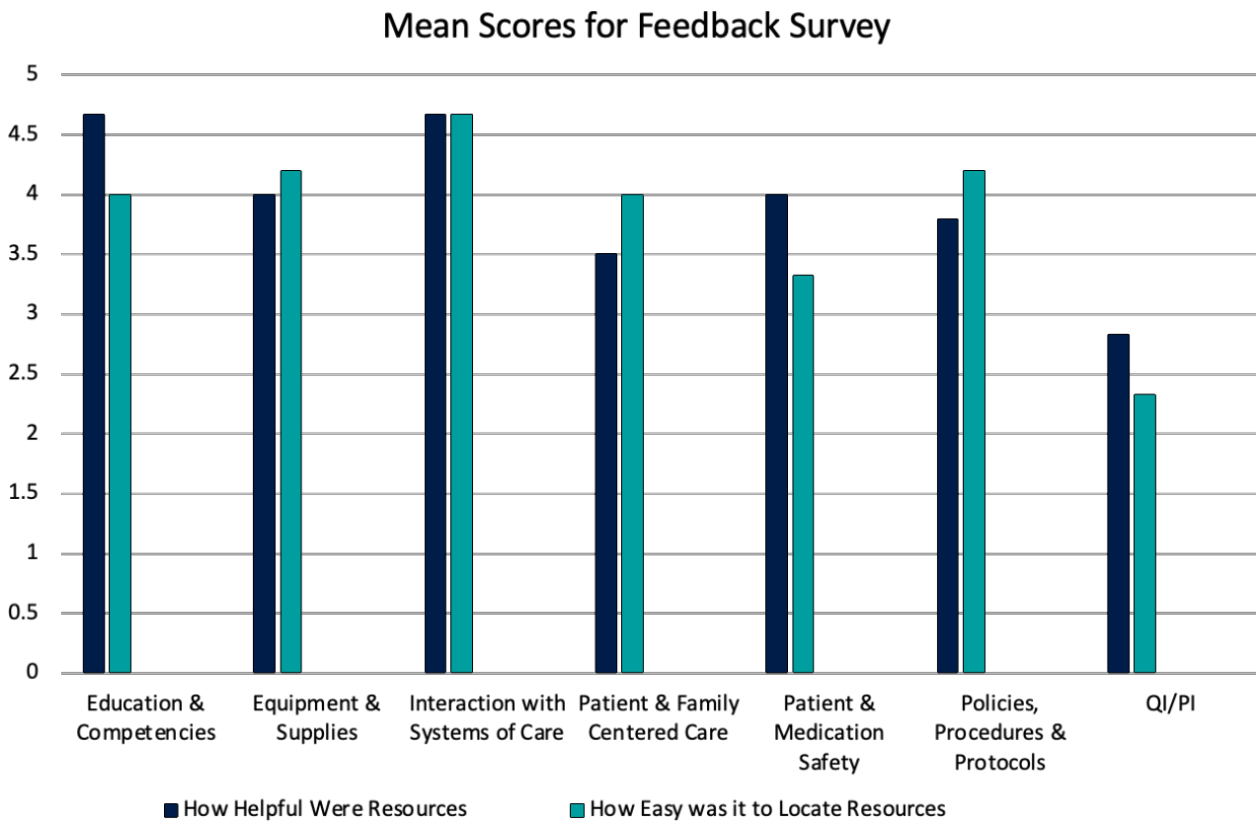


Figure 3. Median scores (IQR) of end-user feedback survey.

Other established toolkits, such as the National Pediatric Readiness Project (NPRP) Toolkit, focus on pediatric ED care and readiness and have been successfully integrated into quality improvement initiatives, including two national collaboratives (Pediatric Readiness Quality Collaborative 1.0 and 2.0 and one established QI registry (National Pediatric Readiness Quality Initiative [NPRQI], n.d.). Like the process for the NPRP Toolkit for EDs, the PPRP Toolkit will be integrated into quality initiatives and collaborative efforts. Data from the national PPRP Assessment (completed in July 2024) will identify gaps in prehospital readiness which will inform which resources are critically needed (EMSpedsReady, n.d.). Using feedback from the end-users, future directions are to develop a tailored curriculum or user-guide to improve navigation and resource comprehension which can facilitate efficient use of the Toolkit and support EMS agencies' pediatric readiness goals to provide high quality care to children. Ultimately, EMS agencies will be able to use their pediatric readiness scores to identify areas for improvement and turn to the PPRP Toolkit for necessary and optimal resources.

LIMITATIONS

Our report has several limitations. Google Analytics data could not isolate unique visitors, so views from content creators may inflate totals. However, the steady increase in page views suggests growing unique user engagement. Additionally, analytic limitations prevented assessment of user return rates or repeated visits to specific resources. We acknowledge that our survey respondents may not be nationally representative of all EMS personnel, but our goal was to focus on engaged users from diverse roles and settings to capture relevant perspectives. Our feedback survey serves as a proxy to provide valuable information on the usability of the toolkit. Finally, Toolkit data collection ended in June

2023 and we were unable to provide IQRs for the summary statistics displayed in Tables 3 and 4 due to changes in the Google Analytics reporting mechanism and upgrades to a different platform in July 2023, limiting longitudinal comparisons. Despite these constraints, the data provides useful insights into toolkit usage and usability during its rollout and early adoption phase.

Future Directions

Prospective study on the effectiveness of the toolkit is needed. A comparison of EMS agencies that use the Toolkit with those relying on standard resources will provide valuable information to support future refinements to the resources and exploration into outcome measures linking Toolkit usage to pediatric readiness scores and patient outcomes would provide valuable insight into its impact. Finally, based on survey feedback, the creation of additional QI/PI resources is a critical next step.

CONCLUSION

User analytics and feedback on the Toolkit demonstrate strong engagement and that it provides valuable, curated resources to enhance pediatric readiness in EMS. The domains Education and Competencies and Equipment and Supplies are the most accessed and highly rated domains. The QI/PI domain requires the addition of user-friendly content and pediatric-specific quality measures. The Toolkit's continued evolution, guided by end-user feedback and usage patterns, will ensure that it remains a relevant and effective tool in advancing the quality of prehospital pediatric readiness.

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RESEARCH REPORTS

PEER-TO-PEER FEEDBACK AMONG AMBULANCE CLINICIANS: A CROSS-SECTIONAL STUDY IN THE OUT-OF-HOSPITAL SETTING

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ABSTRACT

Feedback is a well-researched and broad concept within healthcare, however, there is a contextual gap concerning peer-to-peer provision in the out-of-hospital environment. Current literature suggests that emergency ambulance clinicians most often receive feedback from their operational peers. Recent literature has identified that out-of-hospital feedback initiatives face long-term implementation and sustainability challenges. Further research is required to support the design and evaluation of feedback interventions.

This study aimed to describe how often emergency ambulance clinicians provided peer-to-peer feedback and its association with various factors.

A 10-question survey was distributed to London Ambulance Service members. Participants were eligible if they were registered or non-registered clinicians working on a frontline operational ambulance vehicle. A Fisher's exact test using Monte Carlo simulations was performed using SPSS for statistical analysis. This research followed STROBE reporting guidelines for observational studies.

A total of 143 responses were included for analysis. Clinicians provided positive feedback more often than constructive or any other type of feedback. There was statistical significance between feedback provision and training (positive feedback $p = 0.006$), organizational culture (positive feedback $p = 0.001$), clinician comfort in provision (constructive feedback $p = <0.001$) and self-rated quality of feedback (any feedback $p = <0.001$). Factors such as experience, clinical grade or gender were not statistically significant.

Out-of-hospital emergency ambulance clinicians provided more positive peer-to-peer feedback and rarely provided no feedback. Clinicians should receive feedback training within curricula to increase exposure and engagement with feedback processes. Training should emphasize the role and benefits of constructive feedback. There is an organizational incentive to promote an honest feedback culture to facilitate learning opportunities. Clinicians felt comfortable and rated their quality of feedback as adequate. Standardizing feedback models in the out-of-hospital environment will reduce feedback inequalities.

Feedback is a broad concept widely researched in healthcare, but research has been limited in the out-of-hospital environment (Wilson, Janes, Lawton, & Benn, 2023b). Early foundational work within medical education describes feedback as necessary, valuable, and requires practice and planning (Ende, 1983). Feedback

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is seen as a valuable tool aimed at promoting staff development and learning in contrast to assessment, which focuses on judgement and decision-making (Watling & Ginsburg, 2019). Feedback is flexible as it can occur anywhere, differing from other information transfer processes such as debriefing, which is employed post-incident under specific and controlled circumstances (Tavares et al., 2020). Literature reviews within medicine on feedback and audit suggest it can lead to small but potentially significant improvements in professional practice, however, the effects vary greatly depending on context (Ivers et al., 2012). This is comparable to the limited number of out-of-hospital literature reviews on feedback, which suggest feedback mechanisms for ambulance clinicians often improve clinical performance, although the subsequent benefits to patient outcomes are unknown (Eaton-Williams, Mold, & Magnusson, 2020a; Wilson et al., 2023b). A recent review has suggested that within emergency ambulance services, feedback initiatives are motivated by various factors, but face challenges in long-term implementation and sustainability (Wilson, Janes, Lawton, & Benn, 2023a). Current literature has also highlighted the need for further research to provide the foundations supporting the design and evaluation of feedback interventions in the out-of-hospital environment (Wilson et al., 2023b).

The benefits of feedback translate into the out-of-hospital setting, as it can meet the emotional and professional requirements of emergency ambulance clinicians (Eaton-Williams, Mold, & Magnusson, 2020b; McGuire et al., 2021). Additional benefits include clinical education, clinician self-reflection leading to autonomous practice and motivating clinicians to improve patient care (Cash, Crowe, Rodriguez, & Panchal, 2017; Persse, Key, & Baldwin, 2002). Emergency ambulance clinicians are highly receptive to feedback and may reflect the determination of this group of healthcare professionals to improve colleague and patient outcomes (Eaton-Williams et al., 2020a). It is an essential component of practice, professional identity formation, and actively engaging in feedback processes is included in registered paramedics' professional standards (Health & Care Professions Council, 2023). At a time when emergency ambulance clinicians are in high demand, providing effective feedback mechanisms represents a pathway to improving staff wellbeing and reduce burnout (Morrison, Cassidy, Welsford, & Chan, 2017). Despite the importance of feedback within the out-of-hospital environment, its use and implementation remains poor (Eaton-Williams et al., 2020b). Emergency ambulance staff perceive current feedback mechanisms, particularly through formal routes, as infrequent and of inadequate quality, leading to unresolved personal and professional closure (Wilson, Howell, Janes, & Benn, 2022). There are also existing barriers to feedback provision in the out-of-hospital environment, such as information governance, clinical isolation from the broader healthcare system, and clinical grade (Morrison et al., 2017). These factors are why emergency ambulance clinicians seek alternative sources for their feedback requirements.

Existing literature suggests the most common type of feedback for emergency ambulance clinicians is informal, verbal, and provided by their peers (Cash et al., 2017; McGuire et al., 2021). This source represents an easily accessible and usually trusted source of feedback (Cash et al., 2017; McGuire et al., 2021). Peer-to-peer feedback is underutilized within the in-hospital environment despite being a low-resource method for improving clinical performance (Stockdill, Hendricks, Barnett, Bakitas, & Harada, 2023). As a result, the concept of peer-to-peer feedback amongst emergency ambulance clinicians should be

explored, as it represents the most common source of feedback amongst this group. This is also supported by recent literature, suggesting that further research in this setting should explore the culture around feedback provision, including the prevalence, predictors and effects of feedback using quantitative methods (Wilson et al., 2023a).

Research Questions

- What is the frequency of emergency ambulance clinicians providing peer-to-peer feedback within the last 30 days
- Do factors such as experience, clinical grade, training in feedback provision, comfort in providing feedback or self-rated capability, perceptions of organizational culture or gender affect the provision of peer-to-peer feedback?

Aims

- To describe the frequency of peer-to-peer feedback provided by emergency ambulance clinicians of the London Ambulance Service in the past 30 days
- To determine the statistical significance between the frequency of peer-to-peer feedback provision and experience, clinical grade, training in feedback provision, comfort in providing feedback or self-rated capability, perceptions of organizational culture or gender of emergency ambulance clinicians from the London Ambulance Service in the past 30 days.

Hypothesis

- Most emergency ambulance clinicians will have provided some form of peer-to-peer feedback within the last 30 days
- The provision of peer-to-peer feedback provision will be statistically significant with experience, clinical grade and provision of feedback training.

METHODS

Setting

Participants were recruited from the London Ambulance Service (LAS), United Kingdom. The LAS is a large metropolitan-based emergency ambulance service and is the busiest UK ambulance service answering around two million emergency calls per year. Clinical grades range from registered healthcare professionals including paramedics to a wide range of non-registered roles including non-emergency transport clinicians to emergency medical technicians. These emergency ambulance clinicians work on either double-crewed emergency ambulances or as solo responders responding to emergency or urgent calls.

Study Design

This was a cross-sectional study and followed STROBE reporting guidelines for reporting observational studies (von Elm et al., 2007).

Survey

An anonymous online survey was distributed to all operational staff in the internal weekly employee bulletin for the LAS. The QualtricsXM platform was used to design and collect the data. An anonymous link was generated to distribute the survey and a front-matter page provided participants with study details which required confirmation

of informed consent. Participant recruitment lasted a total of four weeks and started on the 25th July 2023. The survey was advertised once per week for three weeks in the weekly internal LAS employee bulletin. Participant recruitment ceased one week after the third bulletin was published.

The survey contained a total of 10 questions, including six Likert-style questions, three demographic capture questions, and one dichotomous question. The survey was modelled on the previous work of McGuire (McGuire et al., 2021). This study was chosen as its aims involved emergency ambulance staff receiving feedback and their associating influencing factors. These were similarly aligned with our study however this study explores the concept of emergency ambulance clinicians as feedback providers. Additionally, their sample contained emergency medical staff with comparable clinical grades to UK emergency ambulance services. The survey questions were modified to ask participants to provide feedback instead of receiving it. Questions six, seven, eight, and nine were developed based on the research aims of this paper and areas that literature has identified for future research (Wilson et al., 2023a). The survey underwent one pilot round with a focus group of 10 emergency ambulance clinicians of varying clinical grades and experience. The survey also underwent review from the LAS Clinical Audit and Research Unit. Appendix 1 displays the survey questions.

Eligibility

Participants were eligible to complete the survey if they were a registered or non-registered clinician working on a frontline operational vehicle as part of their job role. Within the LAS, this included double-crewed ambulances or various forms of solo-response such as fast-response vehicles.

Study Size

A G-power calculation was used to calculate the minimum required sample size for contingency tables. We calculated a minimum of 133 participants were required to achieve a power level >0.8 with a P value = 0.05 and an effect size = 0.3. To achieve this sample the survey was kept active for a total of four weeks which was similar to existing studies (Cash et al., 2017; McGuire et al., 2021). There was no upper limit on recruitment numbers.

Statistical Methods

Statistical analysis was completed with SPSS version 29. A Fisher's exact test was performed instead of a chi-square as the data did not reach the required minimum cell counts. It follows the methods of McGuire et al. and is also appropriate for smaller sample sizes (Kim, 2017; McGuire et al., 2021). A Monte Carlo simulation with a 99-percent confidence interval and 10000 simulations was used due to SPSS limitations. The tests were significant if the p-value was <0.05.

Ethics

Ethics approval was acquired through the Monash University Human Research and Ethics Committee (Project ID 38330) and Trust research approval was through the LAS Clinical Audit and Research Unit.

Data Protection

Data was managed in accordance with The National Health and Medical Research Council Management of Data and Information in Research and Monash University guidelines. Data collected through the online survey was stored on the Monash University network (LabArchives) cloud-based storage and password protected. Only the researchers involved had access to these data. Records and data were kept until project completion and files deleted afterwards.

RESULTS

Participants

A total of 148 responses were received for this survey. A total of five responses were removed for being incomplete at various stages in the survey. This resulted in 143 responses included in the statistical analysis. The Table 1 displays the participant demographics in frequency counts and percentages. Table 2 displays the remaining survey responses in frequency counts and percentages. Tables 3, 4, and 5 display the statistical analysis between providing peer-to-peer feedback and survey responses.

Please indicate the years you have worked as an ambulance service clinician.	
2 years or less	24 (16.8)
3 years -10 years	78 (54.5)
11 years -15 years	22 (15.4)
16 years or more	19 (13.3)
Please indicate your current clinical grade.	
ER/FPOS	1 (0.7)
T/AAP	2 (1.4)
AAP	3 (2.1)
T/EMT	6 (4.2)
EMT	31 (21.7)
NQP1	7 (4.9)
NQP2	10 (7.0)
Band 6 Paramedic^	72 (50.3)
Band 7 Paramedic^	11 (7.7)
What is your gender?	
Woman	71 (49.7)
Man	71 (49.7)
Non-binary/gender diverse	1 (0.7)
Key ER/FPOS = Emergency Responder/ First Person On Scene, T/ = Trainee, AAP = Associate Ambulance Practitioner, EMT = Emergency Medical Technician, NQP1 = Newly Qualified Paramedic Grade 1, NQP2 = Newly Qualified Paramedic Grade 2. ^ = Registered paramedic grades post NQP consolidation period.	

Table 1. Survey demographic responses (n = 143).

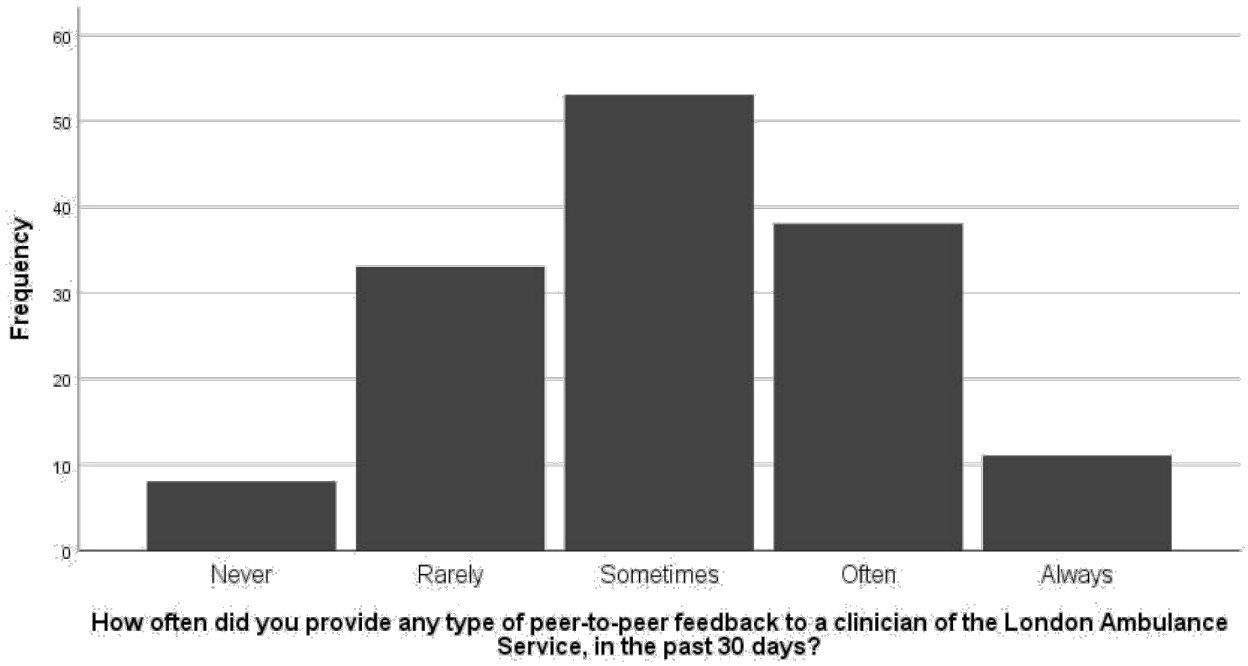


Figure 1. Frequency of providing any peer-to-peer feedback.

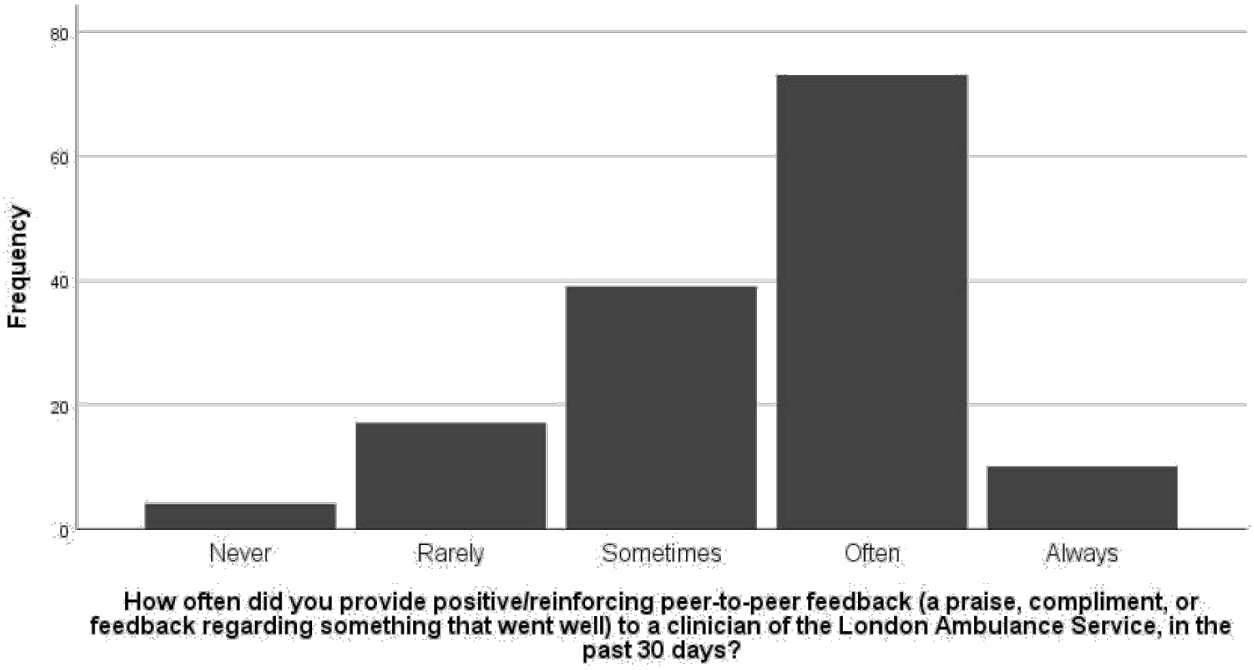


Figure 2. Frequency of providing positive/reinforcing peer-to-peer feedback.

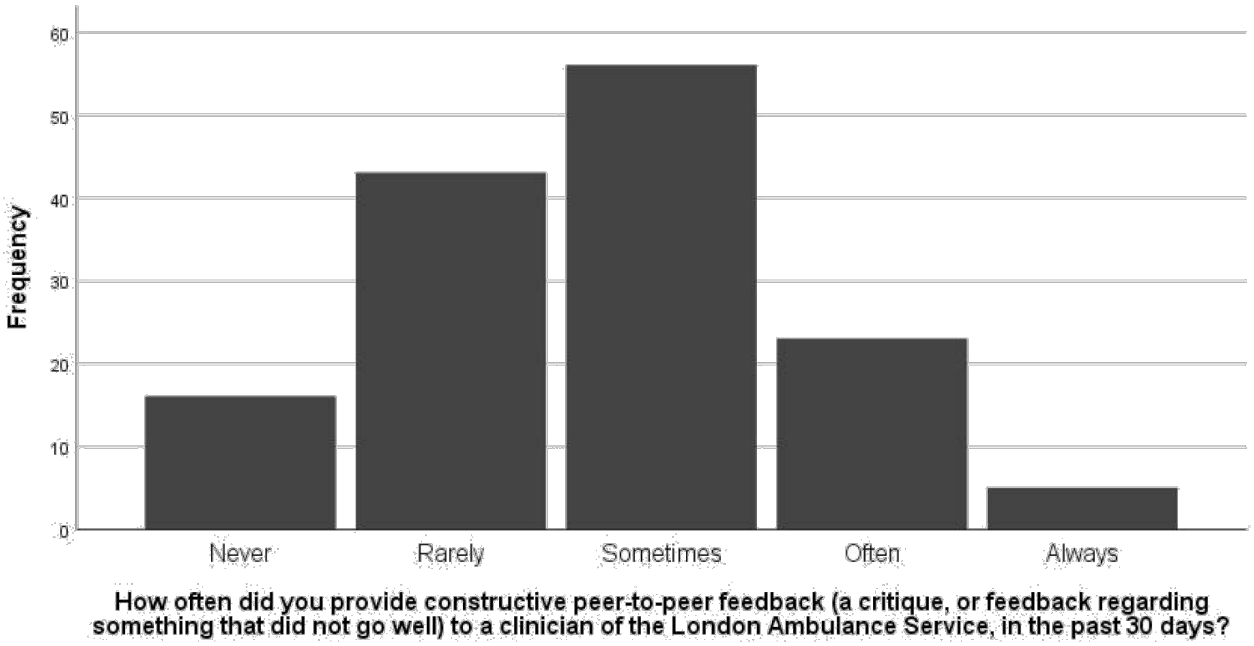


Figure 3. Frequency of providing constructive peer-to-peer feedback.

Clinical Grade Influence on Peer-to-Peer Feedback Provision

There was no statistical significance found between clinical grade and providing any feedback (p-value = 0.073), positive feedback (p-value = 0.497), or constructive feedback (p-value = 0.762).

Years of Experience Influence Peer-to-Peer Feedback Provision

There was no statistical significance between years of experience and providing any feedback (p-value = 0.191), positive feedback (p-value = 0.465), or constructive feedback (p-value = 0.113).

Feedback Training Influence on Peer-to-Peer Feedback Provision

Providing Any Feedback

A higher percentage (47%, n = 32) of clinicians with feedback training provided any form of feedback often or always compared to clinicians without training (23%, n = 17). A higher percentage (37%, n = 28) of clinicians without feedback training provided any feedback rarely or never compared to 19% (n = 12) of clinicians with feedback training. A higher percentage of clinicians without feedback training (40%, n = 30) provided any feedback sometimes compared to clinicians with training (34%, n = 23). P-value = 0.006.

Providing Positive Feedback

A higher percentage of clinicians with feedback training (68%, n = 46) provided positive feedback often or always compared to clinicians with no feedback training (49%, n = 37). More clinicians with no feedback training (n = 17) provided positive feedback rarely or never compared to four clinicians with training. A similar percentage of clinicians with feedback training provided any feedback sometimes (27%, n = 18) compared to clinicians without training (28%, n = 21). P-value = 0.027.

Providing Constructive Feedback

There was no statistical significance between feedback training and providing constructive feedback (p-value = 0.104).

How often did you provide any type of peer-to-peer feedback to a clinician of the London Ambulance Service, in the past 30 days?	
Never	8 (5.6)
Rarely	33 (23.1)
Sometimes	53 (37.1)
Often	38 (26.6)
Always	11 (7.7)
How often did you provide positive/reinforcing peer-to-peer feedback (a praise, compliment, or feedback regarding something that went well) to a clinician of the London Ambulance Service, in the past 30 days?	
Never	4 (2.8)
Rarely	17 (11.9)
Sometimes	39 (27.3)
Often	73 (51)
Always	10 (7.0)
How often did you provide constructive peer-to-peer feedback (a critique, or feedback regarding something that did not go well) to a clinician of the London Ambulance Service, in the past 30 days?	
Never	16 (11.2)
Rarely	43 (30.1)
Sometimes	56 (39.2)
Often	23 (16.1)
Always	5 (3.5)
Have you received any form of training in providing peer-to-peer feedback?	
Yes	68 (47.6)
No	75 (52.4)
How comfortable do you feel in providing peer-to-peer feedback to a clinician of the London Ambulance Service?	
Very uncomfortable	7 (4.9)
Somewhat uncomfortable	24 (16.8)
Neutral	35 (24.5)
Somewhat comfortable	56 (39.2)
Very uncomfortable	21 (14.7)
How would you rate the quality of peer-to-peer feedback you provide to a clinician of the London Ambulance Service, in relation to improving the recipient's performance?	
Very poor	2 (1.4)
Poor	12 (8.4)
Acceptable	64 (44.8)
Good	52 (36.4)
Very good	9 (6.3)
I have not provided any peer-to-peer feedback	4 (2.8)
How satisfied are you with the overall feedback culture within the London Ambulance Service?	
Very dissatisfied	11 (7.7)
Dissatisfied	57 (39.9)
Neither satisfied or dissatisfied	52 (36.4)
Satisfied	22 (15.4)
Very satisfied	1 (0.7)

Table 1. Remaining survey responses (n = 143).

How often did you provide any type of peer-to-peer feedback to a clinician of the London Ambulance Service, in the past 30 days?	Never	Rarely	Sometimes	Often	Always	p Value
Please indicate the years you have worked as an ambulance service clinician.						
2 years or less	2	4	13	3	2	0.191
3 years -10 years	4	24	26	19	5	
11 years -15 years	0	2	8	10	2	
16 years or more	2	3	6	6	2	
Please indicate your current clinical grade.						
Non-paramedic	4	15	12	8	4	0.073
Paramedic	4	18	41	30	7	
Have you received any form of training in providing peer-to-peer feedback?						
Yes	1	12	23	27	5	**0.006**
No	7	21	30	11	6	
How comfortable do you feel in providing peer-to-peer feedback to a clinician of the London Ambulance Service?						
Very uncomfortable	0	4	1	2	0	**<0.001**
Somewhat uncomfortable	1	12	9	1	1	
Neutral	5	6	19	5	0	
Somewhat comfortable	2	10	21	17	6	
Very comfortable	0	1	3	13	4	
How would you rate the quality of peer-to-peer feedback you provide to a clinician of the London Ambulance Service, in relation to improving the recipient's performance?						
Very poor	0	1	1	0	0	**<0.001**
Poor	2	4	4	2	0	
Acceptable	3	19	29	12	1	
Good	1	7	16	20	8	
Very good	0	1	2	4	2	
I have not provided any peer-to-peer feedback	2	1	1	0	0	
How satisfied are you with the overall feedback culture within the London Ambulance Service?						
Very dissatisfied	1	2	5	2	1	0.057
Dissatisfied	2	16	25	13	1	
Neither satisfied nor dissatisfied	3	13	18	14	4	
Satisfied	2	1	5	9	5	
Very satisfied	0	1	0	0	0	
What is your gender?						
Woman	3	21	23	17	7	0.431
Man	5	12	29	21	4	
Non-binary/gender diverse	0	0	1	0	0	

Table 3. Statistical analysis of providing any feedback.

Clinician Comfort in Providing Feedback Influences Peer-to-Peer Feedback Provision

Providing Any Feedback

A higher percentage of clinicians (28%, n = 40) who were somewhat or very comfortable in providing feedback, provided any feedback often or always compared to 9% (n = 13) of clinicians who rarely or never provided any feedback. A total of 12% (n = 17) of clinicians who were very or somewhat uncomfortable rarely or never provided any feedback and 3% (n = 4) provided any feedback often or always. A higher percentage of clinicians who sometimes provided any feedback were somewhat or very comfortable (17%, n = 24) compared to very or somewhat uncomfortable (7%, n = 10). A total of 13% (n = 19) of clinicians who felt neutral provided any feedback sometimes compared to rarely or never (8%, n = 11) or often or always (4%, n = 5). P-value = <0.001.

How often did you provide positive/reinforcing peer-to-peer feedback (a praise, compliment, or feedback regarding something that went well) to a clinician of the London Ambulance Service, in the past 30 days?	Never	Rarely	Sometimes	Often	Always	p Value
Please indicate the years you have worked as an ambulance service clinician.						
2 years or less	0	2	8	10	4	0.465
3 years -10 years	2	13	20	39	4	
11 years -15 years	1	0	6	14	1	
16 years or more	1	2	5	10	1	
Please indicate your current clinical grade.						
Non-paramedic	2	7	9	23	2	0.497
Paramedic	2	10	30	50	8	
Have you received any form of training in providing peer-to-peer feedback?						
Yes	0	4	18	42	4	**0.027**
No	4	13	21	31	6	
How comfortable do you feel in providing peer-to-peer feedback to a clinician of the London Ambulance Service?						
Very uncomfortable	1	3	0	3	0	**0.002**
Somewhat uncomfortable	0	5	9	10	0	
Neutral	3	6	12	13	1	
Somewhat comfortable	0	3	15	32	6	
Very comfortable	0	0	3	15	3	
How would you rate the quality of peer-to-peer feedback you provide to a clinician of the London Ambulance Service, in relation to improving the recipient's performance?						
Very poor	0	0	1	1	0	**0.009**
Poor	1	4	5	1	1	
Acceptable	2	8	20	33	1	
Good	1	3	10	32	6	
Very good	0	0	2	5	2	
I have not provided any peer-to-peer feedback	0	2	1	1	0	
How satisfied are you with the overall feedback culture within the London Ambulance Service?						
Very dissatisfied	2	2	6	1	0	**0.001**
Dissatisfied	1	8	19	27	2	
Neither satisfied nor dissatisfied	0	6	12	29	5	
Satisfied	1	1	1	16	3	
Very satisfied	0	0	1	0	0	
What is your gender?						
Woman	1	11	18	36	5	0.781
Man	3	6	21	36	5	
Non-binary/gender diverse	0	0	0	1	0	

Table 4. Statistical analysis of providing positive/reinforcing feedback.

Providing Positive Feedback

A higher percentage of clinicians who were somewhat or very comfortable provided positive feedback often or always (39%, n = 56) compared to never or rarely (2%, n = 3). A lower percentage of clinicians who were very or somewhat uncomfortable rarely or never provided positive feedback (6%, n = 9) compared to often or always (9%, n = 13). A higher percentage of clinicians who sometimes provided positive feedback were somewhat or very comfortable (13%, n = 18) compared to very or somewhat uncomfortable (6%, n = 9). A total of 8% (n = 12) of clinicians who felt neutral provided any feedback sometimes compared to rarely or never (6%, n = 9) or often or always (10%, n = 14). P-value = 0.002.

How often did you provide constructive peer-to-peer feedback (a critique, or feedback regarding something that did not go well) to a clinician of the London Ambulance Service, in the past 30 days?	Never	Rarely	Sometimes	Often	Always	p Value
Please indicate the years you have worked as an ambulance service clinician.						
2 years or less	3	8	10	2	1	0.113
3 years -10 years	8	28	31	8	1	
11 years -15 years	1	3	10	8	0	
16 years or more	4	4	5	5	1	
Please indicate your current clinical grade.						
Non-paramedic	6	12	15	9	1	0.752
Paramedic	10	31	41	14	4	
Have you received any form of training in providing peer-to-peer feedback?						
Yes	4	17	33	12	2	0.104
No	12	26	23	11	3	
How comfortable do you feel in providing peer-to-peer feedback to a clinician of the London Ambulance Service?						
Very uncomfortable	2	2	2	1	0	**<0.001**
Somewhat uncomfortable	3	13	7	1	0	
Neutral	8	12	12	3	0	
Somewhat comfortable	2	14	29	9	2	
Very comfortable	1	2	6	9	3	
How would you rate the quality of peer-to-peer feedback you provide to a clinician of the London Ambulance Service, in relation to improving the recipient's performance?						
Very poor	1	1	0	0	0	**<0.001**
Poor	2	8	2	0	0	
Acceptable	9	23	28	4	0	
Good	2	9	22	16	3	
Very good	0	0	4	3	2	
I have not provided any peer-to-peer feedback	2	2	0	0	0	
How satisfied are you with the overall feedback culture within the London Ambulance Service?						
Very dissatisfied	3	3	3	2	0	0.281
Dissatisfied	6	20	24	6	1	
Neither satisfied nor dissatisfied	5	15	21	10	1	
Satisfied	1	5	8	5	3	
Very satisfied	1	0	0	0	0	
What is your gender?						
Woman	7	25	27	9	3	0.745
Man	9	18	28	14	2	
Non-binary/gender diverse	0	0	1	0	0	

Table 5. Statistical analysis of providing constructive feedback.

Providing Constructive Feedback

A higher percentage of clinicians who were somewhat or very uncomfortable never or rarely provided constructive feedback (14%, n = 20) compared to often or always (1%, n = 2). A higher percentage of clinicians who were somewhat or very comfortable provided constructive feedback often or always (16%, n = 23) compared to never or rarely (13%, n = 19). A higher percentage of clinicians who sometimes provided constructive feedback were somewhat or very comfortable (24%, n = 35) compared to very or somewhat uncomfortable (6%, n = 9). A total of 8% (n = 12) of clinicians who felt neutral provided constructive feedback sometimes compared to rarely or never (14%, n = 20) or often or always (2%, n = 3). P-value = <0.001.

Self-rated Quality of Feedback Influence on Peer-to-Peer Feedback Provision

Providing Any Feedback

A higher percentage of clinicians who rated their quality of feedback provision as good or very good provided any feedback often or always (24%, n = 34) compared to rarely or never providing any feedback (6%, n = 9). A higher percentage of clinicians who rated their quality of feedback provision as poor or very poor provided any feedback rarely or never (5%, n = 7) compared to often or always (1%, n = 2). A higher percentage of clinicians who sometimes provided any feedback rated their feedback quality as good or very good (13%, n = 18) compared to poor or very poor (4%, n = 5). A total of 20% of clinicians (n = 29) that rated their quality of feedback as acceptable gave any feedback sometimes compared to rarely or never (15%, n = 22) or often or always (9%, n = 13). P-value = 0.002.

Providing Positive Feedback

A higher percentage of clinicians who rated their quality of feedback provision as good or very good provided positive feedback often or always (31%, n = 45) compared to never or rarely (3%, n = 4). A similar percentage of clinicians who rated their quality of feedback provision as poor or very poor provided positive feedback rarely or never (3%, n = 5) or often or always (2%, n = 3). A higher percentage of clinicians who sometimes provided positive feedback rated their feedback quality as good or very good (8%, n = 12) compared to poor or very poor (4%, n = 6). A total of 14% of clinicians (n = 20) that rated their quality of feedback as acceptable gave positive feedback sometimes compared to rarely or never (7%, n = 10) or often or always (24%, n = 34). P-value = 0.009.

Providing Constructive Feedback

A higher number of clinicians who rated their quality of feedback provision as very poor or poor provided constructive feedback rarely or never (8%, n = 12) compared to zero clinicians (n = 0) providing it often or always. A higher percentage of clinicians who rated their quality of feedback as good or very good provided constructive feedback (17%, n = 24) compared to never or rarely (8%, n = 11). A higher percentage of clinicians who sometimes provided constructive feedback rated their feedback quality as good or very good (18%, n = 26) compared to poor or very poor (1%, n = 2). A total of 20% of clinicians (n = 28) that rated their quality of feedback as acceptable gave constructive feedback sometimes compared to rarely or never (22%, n = 32) or often or always (3%, n = 4). P-value = < 0.001.

Satisfaction With Feedback Culture Influence on Peer-to-Peer Feedback Provision

Providing Any Feedback

There was no statistical significance between satisfaction with feedback culture and providing any feedback (p-value = 0.057).

Providing Positive Feedback

A higher percentage of clinicians who were satisfied or very satisfied with the organizational feedback culture provided positive feedback often or always (13%, n = 19) compared to rarely or never (1%, n = 2). A higher percentage of clinicians who were

dissatisfied or very dissatisfied provided positive feedback often or always (21%, n = 30) compared to rarely or never (9%, n = 13). A higher percentage of clinicians who provided positive feedback sometimes were dissatisfied or very dissatisfied with the organizational feedback culture (18%, n = 25) compared to satisfied or very satisfied (1%, n = 2). A total of 8% of clinicians (n = 12) that were neither satisfied or dissatisfied with the organizational feedback culture gave positive feedback sometimes compared to never or rarely (4%, n = 6) or often or always (24%, n = 34). P-value = 0.001.

Providing Constructive Feedback

There was no statistical significance between satisfaction with feedback culture and providing constructive feedback (p-value = 0.281).

Gender Influence on Peer-to-Peer Feedback Provision

There was no statistical significance between gender and providing any feedback (p-value = 0.431), positive feedback (p-value = 0.781), or constructive feedback (p-value = 0.745).

DISCUSSION

Our results add to the out-of-hospital literature base by describing how often emergency ambulance clinicians provided peer-to-peer feedback and the statistical significance between various factors. Emergency ambulance clinicians provided positive peer-to-peer feedback more frequently than constructive or other types. The frequency of peer-to-peer feedback was associated with factors such as training, perceptions of organization culture, quality of feedback provided, and how comfortable emergency ambulance clinicians felt in providing feedback. Our results show no statistical significance between the frequency of emergency ambulance clinicians providing peer-to-peer feedback and experience, clinical grade, or gender.

Although over half of our sample set did not receive any training in providing peer-to-peer feedback, this is comparable to other healthcare settings where most clinical teachers in medicine receive little or no instruction in providing feedback (Cantillon & Sargeant, 2008; Joyce, Cantillon, & Geoghegan, 2022). Having trained feedback facilitators promotes active engagement from clinicians and is heavily integrated as part of Crew Resource Management to increase system safety (Hunter, 2016). Peer-to-peer feedback is not emphasized in training programs, leaving staff underequipped to provide or recognize feedback, and engage with feedback processes (Joyce et al., 2022). Feedback training is primarily aimed at managers or mentoring staff to deliver feedback through formal mechanisms such as performance reviews. However, there should be consideration for not limiting feedback training to managerial levels, as all emergency ambulance clinicians commonly desire feedback (Eaton-Williams et al., 2020b; McGuire et al., 2021; Morrison et al., 2017; Wilson et al., 2022). Clinicians perceive existing formal feedback mechanisms as inadequate and providing them with effective training on giving peer-to-peer feedback represents an opportunity for organizations to reduce this perceived feedback gap by increasing rates through informal means (Cash et al., 2017; Persse et al., 2002). This clinician curiosity for this domain should prompt organizations or education providers to include training in feedback provision within the hard curricula for personal and professional development. This should emphasize the wider contextual benefits before clinicians engage with professional normalization and integration of the hidden

curricula. Our results indicate that in the absence of feedback training, rates of constructive feedback decrease. When constructive feedback is not provided to correct behaviors, clinicians often rely on guesswork, potentially at the expense of patients, thus creating a risk to patient safety (Cantillon & Sargeant, 2008). However, providing peers with constructive feedback contains barriers and risks to the provider and recipient if not appropriately delivered.

Training in feedback provision should emphasize the provision of constructive feedback to remove some of the personal discomfort experienced (Kelly & Richards, 2019). Peer-to-peer feedback is often positively skewed, which is also reflected in our results, and is attributed to a reasonable unwillingness of clinicians to upset colleagues (Joyce et al., 2022; Subha Ramani et al., 2017; Stockdill et al., 2023; Tham, Burr, & Boohan, 2017). A clear position of positive intent should be established early in any feedback process to reduce the likelihood of constructive feedback being interpreted as a personal attack, or not being recognized as feedback (Cantillon & Sargeant, 2008; Joyce et al., 2022; Kelly & Richards, 2019). This is relevant in the out-of-hospital environment as emergency ambulance clinicians often work in close-knit teams and upsetting the crew dynamic by incorrectly providing constructive feedback could reduce the ability to form cohesive teams in high-stress environments (Patterson et al., 2012). There is a balance of providing constructive feedback based on context because clinicians often have a finite capacity to deal with feedback, and not all events require feedback (Brown et al., 2019). Our results indicate that emergency ambulance clinicians rarely provide no feedback at all, reinforcing the existing literature they are supportive of their peers and want to provide at least some degree of feedback or support (Eaton-Williams et al., 2020b; Wilson et al., 2022). This study did not explore the delivery methods of how clinicians provided peer-to-peer feedback. However, existing methods may not be suitable in the out-of-hospital environment.

Within healthcare, some well-rehearsed examples of feedback models include informal feedback, the feedback sandwich, the Pendleton model, and reflective feedback conversations (Cantillon & Sargeant, 2008; Pendleton, 1984; Sargeant, Mann, van der Vleuten, & Metsemakers, 2009). These feedback methods have been widely implemented across other healthcare settings and often form feedback frameworks in the out-of-hospital environment. However, they were developed within a medical education context and may not fully address the needs of the unique out-of-hospital environment (Wilson et al., 2023b). Providing a standardized feedback process has been shown to improve emergency ambulance clinician compliance with documentation and interventions through modifying behaviors (Choi et al., 2014; Landman et al., 2013; O'Connor & Megargel, 1994; Persse et al., 2002). As a result, either a bespoke or tailored model based on existing frameworks for the out-of-hospital environment should be implemented to improve consistency and reduce the feedback inequalities commonly experienced by emergency ambulance clinicians (Eaton-Williams et al., 2020b; Tham et al., 2017; Wilson et al., 2022). Our results also indicate that emergency ambulance clinicians generally feel comfortable and perceive their feedback as adequate quality. However, the feedback content and model used, if any, were not explored in this study. It is recognized that feedback should be delivered promptly in a controlled setting, however, this is only sometimes possible due to the unique out-of-hospital environment (Eaton-Williams et al., 2020b; Kelly & Richards, 2019). Appropriate content compliments the timing of feedback and should be

specific, describe actions, and prompt self-reflection of the recipient to improve future performance (Cantillon & Sargeant, 2008; Lyon, Clarke, Milligan, & Clegg, 2012; Watling & Ginsburg, 2019). The credibility of the person providing the feedback is essential, as senior paramedic training officers highly value structured feedback from higher sources of clinical authority (Avery, Thompson, & Cowburn, 2023; Bing-You et al., 2017). However, this historic top-down feedback approach within healthcare should be challenged. Feedback frameworks should encourage a bi-directional system where all grades and experience levels are encouraged to engage in peer-to-peer feedback and share individual perspectives of an event (Joyce et al., 2022). Alongside appropriate content and feedback models, the underlying organizational culture can influence how feedback frameworks are developed (Berger, Stalmeijer, Marty, & Berendonk, 2023).

Organizations should be encouraged to establish their feedback culture aligned with the institutional and staff needs (Brown et al., 2019). Our results show that most clinicians are dissatisfied with the organizational feedback culture despite high peer-to-peer feedback rates. Interestingly, there was a statistically significant association between dissatisfaction with organizational culture and providing positive feedback. This suggests emergency ambulance clinicians still wish to provide higher rates of positive feedback because of the sheer willingness regardless of factors, or clinicians are frustrated with the culture and wish to invoke positive changes from within their practice. However, promoting a culture of niceness does not always facilitate honest feedback and being overly polite tends to avoid peers providing constructive feedback, which may be reflected in this study (S. Ramani, Könings, Ginsburg, & van der Vleuten, 2019; Subha Ramani et al., 2017). Consequently, there is an opportunity for organizations to promote an open and honest feedback culture where each instance of feedback is reinforced as an everyday learning opportunity (Hunter, 2016; Stretton, 2020; Tham et al., 2017). This honest or 'just' culture should also emphasize an underlying principle of trust between peers because clinicians should feel safe in their environment to proactively seek feedback from their peers without fear of reprimand (S. Ramani et al., 2019). Organizations, however, generally provide quantitative feedback with varying success when staff are not meeting expected performance against expected quality assurance benchmarks (O'Connor & Megargel, 1994; Persse et al., 2002). There is an opportunity for a cultural shift to increase the availability of personalized qualitative feedback developed around the recipient and provided with context (Brown et al., 2019). This is supported by out-of-hospital qualitative studies that identified emergency ambulance clinicians strongly value targeted feedback despite its labor-intensive process and describe it as an essential aspect of personal, emotional, and professional development (Eaton-Williams et al., 2020b; Morrison et al., 2017; Wilson et al., 2022). Modern healthcare systems now employ a diverse range of staff and the effects of demographics on feedback provision should not be discounted.

Although we found no statistical significance in this study, the role of experience, skill grade, and gender may still influence feedback provision. Higher clinical grades often provide more feedback as they are more likely to receive feedback and have higher exposure to feedback processes (Cash et al., 2017). Consequently, the importance of implementing feedback systems for all clinicians, and not ones limited to having clinical responsibility should be emphasized. Our results indicated that experience was not an associated factor in providing peer-to-peer feedback and contrasted existing out-of-hospital feedback literature where clinicians with less than two years of experience or with

higher clinical grades were more likely to receive feedback (Cash et al., 2017; McGuire et al., 2021). Senior emergency ambulance clinicians are often overlooked, however, it is noted that this group of staff may not recognize when feedback is being delivered due to their experience and seniority (Cash et al., 2017). Most clinicians in our study had similar years of experience and clinical grade and were perhaps more comfortable in providing feedback to their equivalent peers. At a professional and organizational level, it should be emphasized that feedback is a continuum provided throughout the clinician's career rather than condensing into key learning or consolidation periods (van de Ridder, McGaghie, Stokking, & ten Cate, 2015). In contrast to previous studies, we had an equal gender split, while similar studies had higher male response rates (Cash et al., 2017; McGuire et al., 2021). Although we did not examine the exact recipient of peer-to-peer feedback, the role of biases could have influenced the type of feedback amongst peers because there is a documented negative bias against women and non-white staff within healthcare (Gopal, Chetty, O'Donnell, Gajria, & Blackadder-Weinstein, 2021). Additionally, each clinician's interpretation of feedback and their own beliefs and experiences would have influenced any peer-to-peer feedback provided.

LIMITATIONS

The study has a low response rate of approximately three percent, which may limit the generalizability of results. However, this aligns with previous research, where a national EMS feedback study in the USA yielded a five percent response rate (Cash et al., 2017). A higher proportion of experienced, qualified paramedics participated in this survey, which is comparable to existing studies and may not represent the broader emergency ambulance service (McGuire et al., 2021). This study was conducted in a busy metropolitan ambulance service that may have different feedback requirements from other emergency ambulance settings. Participants may have experienced recall bias because the survey asked about feedback provision within the last 30 days. Self-selection bias may be present as those who were more interested in feedback would respond. This paper only reports if the results were significant and further analysis including effect sizes, odds-ratio or relative-risks, would have strengthened the results. The term 'feedback' is a broad topic within healthcare and was not defined in this study. As a result, it relied on the clinician's interpretation of what feedback entailed and may not capture all feedback instances.

PRACTICAL IMPLICATIONS

While individualized feedback is often resource-intensive, peer-to-peer feedback represents a low resource and practical method to promote on-the-job learning opportunities. Organizations and education providers should provide feedback provision training within the hard curricula to all clinical grades and experience brackets to improve recognition and engagement with feedback processes. The negative connotations of constructive feedback should be addressed as this type of feedback is essential for patient safety and personal and professional development. A standardized feedback framework will improve consistency and help reduce feedback inequalities.

FUTURE RESEARCH

Future longitudinal studies should explore the effects of providing emergency ambulance clinicians with training in peer-to-peer feedback provision. Further studies should

also acquire the method and content of peer-to-peer feedback provision alongside the specific requirements desired from feedback. Emergency ambulance clinicians' input should be gathered to develop an out-of-hospital feedback framework.

CONCLUSION

Out-of-hospital emergency ambulance clinicians tended to give higher rates of positive peer-to-peer feedback compared to other types of feedback and scarcely provided no feedback at all. There was a statistical significance between feedback provision and training, organizational culture, clinician comfort in the provision, and self-rated quality of feedback. There is an organization incentive to promote an honest feedback culture to address personal and professional feedback requirements. All emergency ambulance clinicians should receive feedback training to increase engagement with the feedback process and there is opportunity for training to be built into education curricula to increase awareness of the benefits of constructive feedback. Clinicians felt comfortable providing peer-to-peer feedback and rated their quality of feedback as adequate. Developing a standardized out-of-hospital feedback framework should reduce feedback inequalities. Associated factors for peer-to-peer feedback, such as experience, clinical grade, or gender, were not statistically significant.

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APPENDIX

Survey questions

1. How often did you provide any type of peer-to-peer feedback to a clinician of the London Ambulance Service, in the past 30 days?
   A. Never
   B. Rarely
   C. Sometimes
   D. Often
   E. Always
2. How often did you provide positive/reinforcing peer-to-peer feedback (a praise, compliment, or feedback regarding something that went well) to a clinician of the London Ambulance Service, in the past 30 days?
   A. Never
   B. Rarely
   C. Sometimes
   D. Often
   E. Always
3. How often did you provide constructive peer-to-peer feedback (a critique, or feedback regarding something that did not go well) to a clinician of the London Ambulance Service, in the past 30 days?
   A. Never
   B. Rarely
   C. Sometimes
   D. Often
   E. Always
4. Please indicate the years you have worked as an ambulance service clinician
   A. 2 years or less
   B. 3 years – 10 years
   C. 11 years – 15 years
   D. 16 years or more
5. Please indicate your current clinical grade
   A. ER/FPOS
   B. NETS
   C. T/AAP
   D. AAP
   E. T/EMT
   F. EMT
   G. NQP1
   H. NQP2
   I. Band 6 paramedic
   J. Band 7 paramedic
   K. Other: please specify
6. Have you received any form of training in providing peer-to-peer feedback?
   A. Yes
   B. No

7. How comfortable do you feel in providing peer-to-peer feedback to a clinician of the London Ambulance Service?
   A. Very uncomfortable
   B. Somewhat uncomfortable
   C. Neutral
   D. Somewhat comfortable
   E. Very comfortable
8. How would you rate the quality of peer-to-peer feedback you provide to a clinician of the London Ambulance Service, in relation to improving the recipient's performance?
   A. Very poor
   B. Poor
   C. Acceptable
   D. Good
   E. Very good
   F. I have not provided any peer-to-peer feedback
9. How satisfied are you with the overall feedback culture within the London Ambulance Service?
   A. Very dissatisfied
   B. Dissatisfied
   C. Neither dissatisfied nor satisfied
   D. Satisfied
   E. Very satisfied
10. What is your gender?
    A. Woman
    B. Man
    C. Non-binary / gender diverse
    D. My gender isn't listed. I identify as (please type below):
    E. Prefer not to say



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RESEARCH REPORTS

EVALUATING AUDITORY FEEDBACK FOR ACCURATE COMPRESSION RATES

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ABSTRACT

The American Heart Association (AHA) updated its recommendations for resuscitation science in 2015. Among several updates, the use of audiovisual feedback during real-time CPR was considered reasonable, receiving a Class IIb recommendation based on weak clinical evidence (Saving American Hearts, Inc., 2020). Evidence regarding the effectiveness of audio feedback in improving chest compression rate has been mixed, with disparities observed between lay persons, hospital personnel, and professional rescuers (Kleinman et al., 2015).

This study investigated whether different forms of auditory feedback influence chest compression rates among professional rescuers. Participants were screened and randomized into four groups: A control with no feedback, a metronome at 110 beats per minute (BPM), a music track at 104 BPM, and a music track at 114 BPM. Music selections were chosen for tempo, recognizability, and prior association with AHA training materials. Chest compression rates were measured using a Laerdal QCPR manikin.

No clinically significant differences were observed between groups. While all feedback groups achieved compression rates within current AHA recommendations, none demonstrated statistically significant improvement compared with control.

These findings suggest that routine auditory feedback may not enhance chest compression performance among professional rescuers. Although music and metronome cues supported maintenance of appropriate rates, they conferred no advantage over standard practice. Furthermore, background noise introduced by auditory feedback may disrupt team communication, a factor associated with medical errors in high-stakes environments. Strategies emphasizing crew resource management, such as preserving a "sterile cockpit" during critical phases of resuscitation, may provide greater benefit in optimizing team function and patient safety.



Video Interview:
https://youtu.be/U8tXvjJV74I

THE USAGE OF AUDITORY FEEDBACK DURING CPR IN THE PROFESSIONAL RESCUER

In 2015, the American Heart Association (AHA) recommended that all rescuers consider using audiovisual feedback devices to improve chest compression performance (Kleinman et al., 2015). During this period, the AHA also mandated the use of feedback devices during the training of professional rescuers (American Heart Association, n.d.-b). Despite limited supporting evidence,

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the AHA reaffirmed in 2020 its 2015 recommendation that audiovisual feedback devices be used during CPR, citing one study showing improved hospital discharge rates after cardiac arrest. Given the limited and somewhat conflicting evidence, we aimed to evaluate whether auditory feedback, such as a metronome or music, effectively helps professional rescuers maintain an appropriate chest compression rate during simulated resuscitation. For the purpose of this study, a professional rescuer was defined as an individual who is 18 years of age or older, holds current Basic Life Support (BLS) certification adhering to American Heart Association standards, and possesses an active emergency medical service license.

Data points explicitly excluded from analysis in this research included subject compensation status (compensated or uncompensated employee), gender, years of service, chest compression depth, and chest compression recoil. The primary objective of this study was solely to evaluate chest compression rate and determine if auditory feedback influenced the participant's ability to maintain that rate.

METHODS

This study was designed as a randomized controlled trial. We recruited professional rescuers with backgrounds in firefighting and emergency medical services from South Central Pennsylvania and Northern Maryland. Data collection began in March 2025 and concluded in April 2025. In total, we evaluated 57 professionally trained rescuers across various auditory feedback conditions. Chest compression performance was measured using Laerdal QCPR manikins.

Each participant performed two minutes of continuous chest compressions on a manikin positioned on a firm surface at an appropriate height. Chest compressions commenced once the participant heard the assigned auditory feedback cue, except for participants in the control group who performed compressions without audio feedback. At the conclusion of the two minutes, the manikin provided a report detailing the number of chest compressions delivered during that period.

Randomization and Audio Feedback Selection

Following eligibility screening, participants were randomly assigned to one of four auditory feedback conditions. Each then entered the testing area and performed two minutes of chest compressions under their assigned condition. Upon completion, manikin data were immediately recorded on a standardized form, and the setup was reset for the next participant.

RESULTS

Across all four groups, professionally trained rescuers were generally able to perform chest compressions within the expected standards. The metronome group exhibited the lowest variability, with a standard deviation of 8 compressions per minute, while the Music A group had the highest deviation at 12. Both the metronome and silence (control) groups had the same number of participants fall outside the acceptable compression range.

To assess performance accuracy, each group was evaluated within a predefined tolerance: ±1 BPM of the auditory feedback for the metronome and music groups, and a target

range of 100–120 BPM for the silence group, consistent with American Heart Association guidelines (Kleinman et al., 2015).

Despite the lower standard deviation, only 42% of participants in the metronome group matched the auditory cue's exact rate. The Music A and Music B groups achieved match rates of 33% and 36%, respectively. In contrast, 84% of participants in the silence group maintained compression rates within the recommended 100–120 BPM range.

These findings indicate that, in this sample, the silence (control) group more consistently adhered to guideline-compliant chest compression rates than any of the auditory feedback groups.

DISCUSSION

This randomized controlled trial evaluated the effectiveness of auditory feedback—including a metronome and music on the ability of professional rescuers to maintain appropriate chest compression rates during simulated cardiac arrest. Despite prior recommendations by the American Heart Association (AHA) endorsing the use of audiovisual feedback during CPR, our results indicate that auditory feedback alone does not enhance performance in this specific domain (Kleinman et al., 2015).

While the metronome group exhibited the lowest variability in compression rate, only 42% of its participants matched the target beat rate. The music groups performed similarly, with 33% and 36% match rates. In contrast, the silence (control) group demonstrated superior performance, with 84% of participants maintaining compression rates within the AHA-recommended range of 100–120 compressions per minute. These findings suggest that professional rescuers may not derive additional benefit from external auditory cues in achieving guideline-compliant chest compression rates.

One possible explanation for the control group's superior performance is that trained professionals may rely more effectively on internalized pacing, developed through repeated training and field experience, rather than external feedback. Additionally, external auditory cues may introduce cognitive distraction or interfere with team communication.

Our findings are consistent with the mixed evidence regarding auditory feedback described in prior guidelines. While certain studies cited by the AHA have demonstrated improved outcomes with audiovisual feedback (Kleinman et al., 2015), these often-included visual elements, longer training interventions, or layperson participants. By contrast, our study isolated auditory cues and assessed their impact in a controlled, real-time simulation environment among certified EMS professionals.

LIMITATIONS

This study has several limitations. First, it was conducted in a simulated environment, which, although standardized, may not fully replicate the stress and dynamic conditions of real-world cardiac arrest scenarios. Second, chest compression quality was assessed only in terms of rate; other critical metrics such as depth, recoil, and hand positioning were excluded from analysis. Third, while auditory cues were standardized, individual differences in music recognition or preference could have influenced performance in the music groups.

Additionally, the relatively short duration of compressions (two minutes) may not fully capture the effects of fatigue or long-term auditory feedback utility. Finally, the study was limited to a geographically specific cohort of EMS professionals, which may affect the generalizability of findings to broader populations. A study limitation was post-randomization data loss, which reduced the analyzable sample from 57 to 47 participants and may have affected statistical power.

CONCLUSION

In this study, auditory feedback in the form of a metronome or music did not improve—and in some cases may have hindered professional rescuers' ability to maintain guideline-compliant chest compression rates. Given the potential for auditory distractions and the lack of demonstrated benefit in this setting, our findings suggest that the routine use of auditory feedback devices during professional resuscitation efforts may not be necessary. Future research should further explore how feedback modalities influence team performance, communication, and overall resuscitation outcomes in both simulated and clinical settings.

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APPENDIX

Characteristic	Category	N	Percentage (%)
Age Group (Mean Age: 37)	18 - 20	3	5.3
	21 - 30	18	31.6
	31 - 40	18	31.6
	41 - 50	9	15.8
	51 - 60	6	10.5
	61 - 65	3	5.3
Primary Background	Fire	24	42.1
	EMS	30	52.6
	Combined	3	5.3
EMS License	EMR	0	0.0
	EMT	39	68.4
	AEMT	9	15.8
	Paramedic	7	12.3
	PHRN	1	1.8
	Physician	1	1.8
Note: Percentages may not total 100 because of rounding. Ten cases were excluded from final analysis because of data loss related to recording failure / incomplete capture / file corruption.			

Table 1. Participant demographics and background characteristics (N = 57).

Group	Compression Count	Mean	Standard Deviation	% Out of Range
Silence	233, 252, 219, 227, 209, 202, 222, 219, 216, 188, 210, 220	201	10	16.67%
Metronome	221, 229, 222, 195, 207, 220, 220, 220, 220, 212, 216, 256	203	8	16.67%
Music A	219, 209, 209, 208, 195, 207, 216, 210, 215, 230, 197, 186	192	12	25.00%
Music B	232, 260, 221, 226, 216, 232, 225, 186, 224, 223, 226	206	11	18.18%
Note: Music A utilized "Stayin' Alive" by the Bee Gees. Music B utilized "Never Gonna Give You Up" by Rick Astley. "Out of range" was defined as performance outside the predefined target for each study condition. Percentages may not total 100 because of rounding. Ten cases were excluded from final analysis because of data loss related to recording failure / incomplete capture / file corruption.				

Table 2. Chest compressions counts by auditory feedback group.

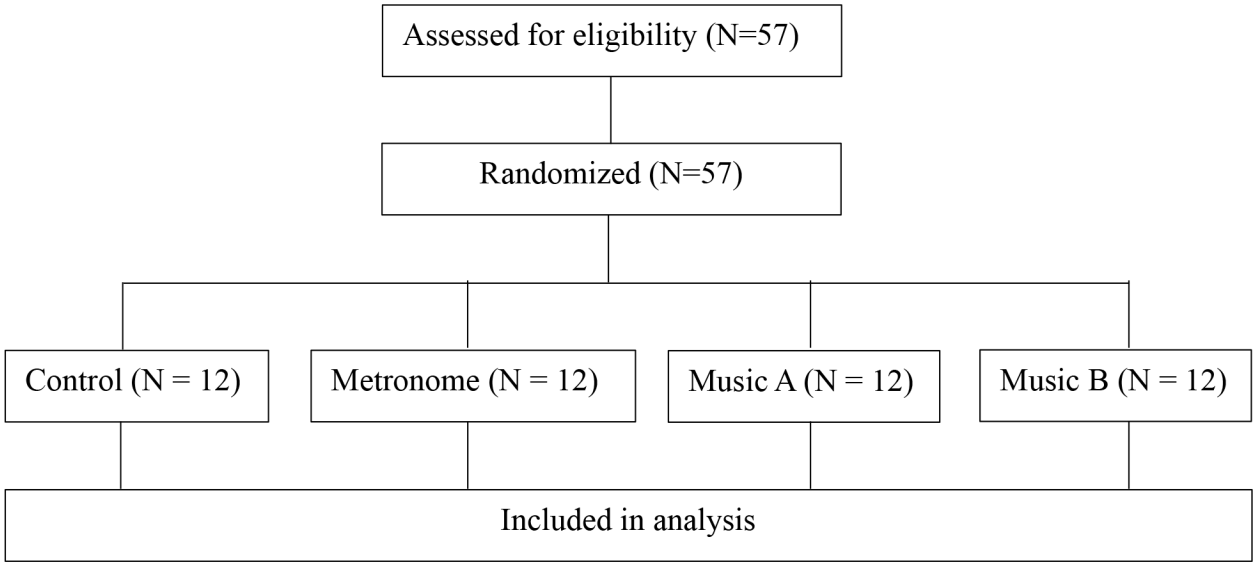


Figure 1. Participant flow through randomization and analysis.



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RESEARCH REPORTS

ASSESSING AUSTRALIAN AND NEW ZEALAND PREHOSPITAL CLINICIANS' TRAINING, EXPERIENCE, AND CONFIDENCE WITH OUT-OF-HOSPITAL CHILDBIRTHS: A MIXED METHODS ONLINE QUESTIONNAIRE

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Keywords: volunteers, obstetrics, birth, out-of-hospital birth, born before arrival, emergency medical services, EMS, paramedicine

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ABSTRACT

Introduction: Unplanned out-of-hospital births (OOHBs) pose significant risks, particularly in rural areas where access to maternity services and response times may be limited. Given that OOHBs are uncommon, prehospital clinicians use these specialized skills infrequently, leading to skill and knowledge decay, impacting clinician preparedness and confidence in managing these presentations. This research investigates prehospital clinicians' perceptions of training, experience, and confidence in managing OOHBs.

Methods: Australian and New Zealand paramedics and volunteers were recruited via social media and asked to complete a cross-sectional mixed-methods questionnaire. Training and exposure were assessed via multiple-choice, matrix, or open-text responses. Confidence in recognizing and managing an OOHB situation (antenatal, second stage, third stage, and postpartum care) was assessed utilizing summed scores of Likert scale responses. Independent samples t-tests compared means between groups.

Results: In total, 222 participants were included in the study, with 147 (66%) being female. Participant ages ranged from 18–72 years old. One hundred and sixty-eight participants (76%) had exposure to laboring or birthing patients prehospitally, and 123 (55%) participants had assisted with at least one OOHB. Complications reported (n=531) included stillbirth, neonatal death, postpartum hemorrhage, and maternal death. Obstetrics refresher training was undertaken by 141 participants in the previous 12 months.

Participants who had previous experience managing an OOHB were significantly more confident recognizing and managing an OOHB compared to participants without previous management experience. Paramedics expressed more confidence recognizing and managing OOHB situations compared to volunteers. However, for participants with children, confidence was only greater for antenatal care (not second stage, third stage, and postnatal care) compared to participants without children.

Conclusion: Participants with prior real-world exposure to OOHBs indicate a greater level of confidence in recognizing and managing OOHB situations. Targeted, practical training and ongoing in-service education are recommended to build capability and improve outcomes in these high-risk, low-frequency events.

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Occasionally, births occur before birth parents arrive at their planned birthing location, typically a maternity suite or hospital. Situations where births do not occur in the planned location are known as unplanned out-of-hospital childbirths (OOHB) (Flanagan et al., 2017). In Australia in 2022, 2,622 births occurred in an unintended location outside of a hospital or occurred in a community healthcare center (excluding planned home births). These OOHBs comprise 0.9% of all births in Australia, increasing from 0.4% in 2010 (Australian Institute of Health and Welfare, 2024). Similar increases in OOHBs have been reported in Finland, the United States of America (USA), Israel, and the United Kingdom (UK) (Cash et al., 2022; Ovaskainen et al., 2015; Siman-Tov et al., 2021; Unterscheider et al., 2011). There is some evidence OOHBs were increasing prior to SARS-CoV-2, however there are documented changes to hesitancy to engage with healthcare services following the pandemic, which may contribute to the growing number of OOHBs (Thornton & Dahlen, 2018; Townsend et al., 2021).

Multiple factors contribute to OOHB incidence, including multiparity, inadequate antenatal care, illicit drug use, closure of birthing units in rural regions, or precipitous labor (Beeram et al., 1995; Helen Haines MP, 2024; Javaudin et al., 2019; Lazi & Taka , 2011; Ovaskainen et al., 2015). Some birth parents desire minimal medical intervention and may delay seeking care, while others receive advice to attend the maternity ward when in active labor (Flanagan et al., 2019; Vik et al., 2016). There are reported increases in OOHBs associated with a decline in maternity services in Australia, the USA, Norway, and Sweden (Engjom et al., 2014; MacDorman & Declercq, 2019; Örtqvist et al., 2021).

Birthing events are rare for prehospital clinicians, forming <0.05% of all callouts (Flanagan et al., 2017). Skills rarely practiced, such as those required for OOHBs, are subject to rapid decay, with classroom-acquired competencies often returning to baseline within 12 months (Woodman et al., 2021). Australian undergraduate education for paramedic students usually involves didactic and workshop simulation training; however, exposure to birthing is unlikely (Hill et al., 2023). Opportunities for in-service or continuing professional development (CPD) can overlook less common complaints, such as OOHBs, for more frequent events, such as falls causing traumatic injury (Corman et al., 2025; Hill et al., 2023). This can lead to educational 'blind spots' where there are absences in understanding of a condition (Tackett et al., 2022). Consequently, prehospital clinicians report feeling unprepared to manage OOHB cases in the absence of regular upskilling (Hill et al., 2024; Hill et al., 2023; Persson et al., 2019; Vagle et al., 2019).

Increased distances to maternity care for rural parents increase the likelihood of prehospital clinician's, including volunteer ambulance officers (VAOs), assisting with births (Dietsch et al., 2010). Registered paramedics require a bachelor's degree; however, VAOs are reliant on in-service training to understand the management of any condition (South Australia Ambulance Service, 2025b, 2025a). Metropolitan regions are serviced by paramedics, while rural and remote regions have greater dependence on VAOs to attend emergency ambulance requests. VAOs typically provide supportive care without invasive treatments such as cannulation and fluid resuscitation (Hill et al., 2024).

Unplanned OOHBs have worse outcomes than in-hospital or planned homebirths. Studies report OOHB neonates have a mortality rate five times higher than those born in hospital (Hilde M Engjom et al., 2017; Ovaskainen et al., 2015). Commonly identified OOHB complications include postpartum hemorrhage and perineal tears for the birth parent,

and hypothermia or prematurity for the neonate (Javaudin et al., 2019; McLelland et al., 2018; Thornton & Dahlen, 2018). These complications can be life-threatening and require a competent clinician to prevent adverse outcomes (Hänninen et al., 2023; Vagle et al., 2019).

While these presentations may be rare, prehospital clinician's must be adequately trained and competent in these situations, particularly as parts of Australia and New Zealand can be many hours from definitive maternity care. Given the high-risk nature of OOHBs and the limited resources available in the prehospital setting, the preparedness of prehospital clinicians is central to ensuring safe and effective care for both the birth parent and neonate. This research sought to determine the perceived levels of experience, training, and confidence in recognizing and managing OOHB presentations of Australian and New Zealand paramedics, ambulance officers (AO), and VAOs (collectively known as prehospital clinicians). VAOs were included because they frequently attend OOHBs in rural settings, despite limited entry-to-practice and more foundational training than registered paramedics. As their exposure to OOHBs is potentially similar, examining all prehospital clinician groups provides a more accurate picture of capability and training needs across the workforce.

METHODOLOGY

Study Design

Participants completed an embedded mixed-methods online cross-sectional questionnaire delivered through Qualtrics software (Provo, UT) and promoted via social media networks (Facebook, LinkedIn, and Twitter). A non-probability sampling methodology was utilized, including convenience and snowball sampling. Additionally, the survey was promoted via one Australian state-based ambulance service [service redacted], and advertised through the ACP (Australian College of Paramedicine) website, the leading paramedic professional body in Australia and New Zealand (Australasian College of Paramedicine, n.d.).

The questionnaire was based on a previous survey for medical students undergoing an obstetrics clerkship and modified for this research, as the focus aligned with training, experience, and confidence (Sabourin et al., 2014). It was further refined using prehospital obstetrics training materials from two Australian universities, with additional expert input from a midwifery academic. The number of items assigned to each stage of labor was informed by the breadth and complexity of presentations typically encountered in prehospital obstetric care. This process ensured coverage of the most clinically relevant recognition and management tasks for prehospital clinicians. Questionnaire face and content validity were established through consultation with four registered paramedics, two of whom were dual-qualified midwives; all reviewers teach at tertiary institutions, and consideration was given to prehospital clinical environments, paramedic scope of practice, and current clinical practice guidelines. The questionnaire (see supplementary material) included two sections: (1) demographic factors; and (2) experience, training, and confidence regarding OOHBs.

Experience questions considered seven potential situations the participant may have attended (e.g., 'A mother in active labor, we transported her to hospital') and asked them to quantify how many cases they have attended for each situation. Open-text responses

were available for complications not included in our list. Training questions considered the level and recency of training received (e.g., advanced first aid). Confidence questions were divided into: (1) antepartum (five questions), (2) second stage (29 questions), (3) third stage (two questions), and (4) postpartum (six questions) concerning confidence in recognizing a situation, and confidence in managing the situation. Confidence questions utilized Likert scales ranked on a 6-point scale (1=low confidence, 6=high confidence). All other questions were forced response/dichotomous response options.

Two elective open-ended questions were also included:

1. What are the factors that most contribute to any fears/anxieties you might have about obstetric emergencies and OOHBs?
2. Are there any barriers to training regarding OOHB?

Participants

Inclusion criteria included being a registered paramedic (which also includes AOs and intensive care paramedics or similar roles) or VAO, residency in Australia or New Zealand, employment with an emergency ambulance service within the previous five years, and aged 18+ years. The survey was active from 21 July 2021 until 31 December 2022. Participants with a dual qualification in Midwifery were excluded due to their advanced obstetric qualifications. Based on Australian Health Practitioner Regulation Agency (Ahpra) 2021 data for operative paramedics, 138 respondents were an appropriate sample size based on a 95% confidence interval and an estimated 90% of prehospital clinicians lacking confidence with childbirth, using the Australian Bureau of Statistics sample size calculator (Australian Bureau of Statistics, 2023; Paramedicine Board Ahpra, 2021; Persson et al., 2019).

Procedure

Participants clicked on the generic survey link circulated through social media, email, or the ACP website, directing them to the Qualtrics survey platform. After reading the information letter, participants confirmed consent to participate in the research. Completion of the questionnaire took approximately 15 minutes. Upon completion, participants received a message confirming responses were recorded and were thanked for their participation.

Ethics

The research was approved by the Edith Cowan University Human Research Ethics Committee (2021-02390). Governance was approved through the [redacted] ambulance service research governance committee. All responses were anonymous, with no identifiable information collected.

Analysis

Quantitative Data

Questionnaire data were downloaded into IBM SPSS 24.0 (SPSS Inc., Chicago, Ill., USA). Demographic, training, and experience questions were analyzed using descriptive statistics. Responses for perceived confidence in recognizing and managing care were summed to create a composite (mean) score for each participant. Internal consistency

of the scale was evaluated using Cronbach's alpha, which reports a number between 0 and 1. Reliability determines how accurately a questionnaire measures a variable, with a Cronbach's alpha above 0.7 indicating good reliability (Kılıç, 2016). The internal consistency was =0.76 (Kılıç, 2016).

Independent samples t-tests were conducted to compare mean summed scores for confidence in recognizing and managing OOHBs and complications between paramedics and VAOs; between prehospital clinicians who have children compared to those without children; and between prehospital clinicians with prior experience/exposure to OOHBs and those without. Significance level was set at =0.05 (Petrie & Sabin, 2019). Effect size was determined by Cohen's d. An effect size is a value measuring the strength of a relationship between two variables in a population. According to Cohen's (2013) guidelines, an effect size of 0.2 is small, while 0.7 represents a moderate to large practical impact (Cohen, 2013; National University, 2024).

Qualitative Data

Word frequency tables and mind maps were generated using NVivo software (NVivo 12 Plus) to provide an overview of free-text responses. An iterative approach was undertaken to code transcripts, where two researchers (MH, BM) established an open-coding protocol identifying key themes in the questionnaire's free-text responses. From these responses, selective coding then formed overarching themes within the data (Braun & Clarke, 2006).

RESULTS

Altogether, 271 participants commenced the online questionnaire, however, 49 participants were removed from analysis due to not completing all demographic questions (n=14), not meeting inclusion criteria (n=25), or not completing a minimum 75% of the questionnaire (n=10) including key demographic, experience, training, and confidence questions, with 222 participants included in the final analysis. No statistical differences were found for any demographic information between those excluded and included.

Demographic Results

Age, gender, role, and place of residence are described in Tables 1–4. Cumulative years of employment equaled 362 years across all roles (Table 3). Most participants were aged <45 years (n=172; 77.5%), were female (n=147; 66.2%), and were registered paramedics (n=133; 59.9%). Participants represented New Zealand and all Australian States and Territories.

Three participants identified as Aboriginal or Torres Strait Islander (1.4%) and one preferred not to say (0.5%). Slightly over half of the participants were childless (n=116, 52%), with four preferring not to say (1.8%).

Age Bracket (n=222)	Total Participants	Percent
18-25	36	16.2%
26-35	93	41.9%
36-45	43	19.4%
46-55	43	19.4%
56-65	5	2.2%
66-72	2	0.9%

Table 1. Demographics – Participant age breakdown.

Gender (n=222)	Total Participants	Percent
Female	147	66.2%
Male	71	32.0%
Non-binary	2	0.9%
Prefer not to say	2	0.9%

Table 2. Demographics – Participant gender breakdown.

Role (n=222)	Total Participants	Percent Total Participants	Cumulative Years Worked in these Roles	Bachelor's Degree Held	Metro	Rural
Paramedic	133	59.9%	183	117	98	35
Ambulance Officer (AO)	18	8.1%	62	7	14	4
Intensive Care/Critical Care/ Mobile Intensive Care Paramedic or similar*	31	14.0%	36	26	21	10
Volunteer Ambulance Officer (VAO)	40	18.0%	81	2	14	26
*Note: * Denotes advanced practitioners trained to manage high-acuity patients using skills beyond those of standard paramedics*						

Table 3. Participant roles, bachelor's degree (paramedical science or similar), and rural or metropolitan location.

Obstetrics Training

Participants disclosed the recency of their last obstetric training activity (Table 5). Participants could select multiple options. One-third of participants suggested completing training in the previous two years through their employer. CPD received the largest response for undertaking OOHB training within the last two years, with a reliance on online courses as opposed to in-person training.

Place of residence (n=222)	Total Participants	Percent
New Zealand	15	6.7%
Australian Capital Territory	7	3.2%
New South Wales	20	9.0%
Northern Territory	4	1.8%
Queensland	18	8.1%
South Australia	11	5.0%
Tasmania	4	1.8%
Victoria	56	25.2%
Western Australia	87	39.2%

Table 4. Demographics – Country, state, or territory where participants reside.

Participants were asked the extent to which they felt their current training had prepared them to attend an OOHB (Figure 1). The scale was ranked from 0 (unprepared) to 10 (very prepared). Most participants selected between zero and five (n=154), indicating lower preparedness, with only one intensive care paramedic selecting 10.

Experience with OOHBs

Participants were asked which birthing situations they had attended, with responses recorded in Table 6. The largest exposure to birthing was in the early stages of active labor, where the birth parent could still contact their midwife or obstetrician and be transported to the planned place of birth.

Overall, 123 participants (55%) reported assisting with a birth, with an estimated 474 births occurring across the 222 participants. Sixty-four participants with >10 years' service assisted with 331 (70%) births. Rural births accounted for 101 cases (21%), averaging 3.33 births per rural participant, compared to 373 metropolitan births with an average of 4.29 births per participant. Six births occurred in VAO care, averaging 2 births per VAO participant.

Table 7 depicts complications encountered. An estimated 531 complications were managed throughout the labor and birthing process, with 135 participants (61%) experiencing at least one complication.

Altogether 130 complications were managed by 33 rural participants, averaging 3.94 complications per participant, compared to 401 metropolitan complications managed by

Level of Training	Percentage Completed this within the Last 2 Years n=x/222* (x%)	Number of Participants Completed at any Time n=x/222* (x%)
Completed an obstetrics course as part of a Paramedical Science degree	27 (12.2%)	159 (71.6%)
Completed obstetrics training as part of an advanced first aid course	25 (11.3%)	49 (22.1%)
Completed annual refresher course in obstetrics through my employer	72 (32.5%)	141 (63.5%)
Completed a course in obstetrics as part of my Continuing Professional Development (not through your employer)	30 (13.5%)	47 (21.2%)
Read or completed an online course about obstetrics, complications, and out-of-hospital childbirth as part of my Continuing Professional Development	91 (41%)	111 (50%)
Other types of training not already listed [Free Text] • Post-graduate studies – diploma or degree (n=11) • Self-directed learning (n=5) • Employer induction training (n=3) • Placement with OBGYN/maternity service (n=3) • Mandatory in-service training (n=3) • Undergraduate nursing/midwifery degree completed/partially completed (n=2) • Obstetric emergency course (n=2) • Session with midwife (n=2) • As part of the registered nurse role (n=1) • Training for the birth of own child (n=1) • Hypno-birthing (n=1) • Undergraduate medical training (n=1)	15 (6.8%)	35 (15.8%)
*Note: *Denotes that participants had the ability to respond to more than one section, so percentages will not add up to 100.*		

Table 5. Participant descriptions and approximate timing of obstetrics training level received.

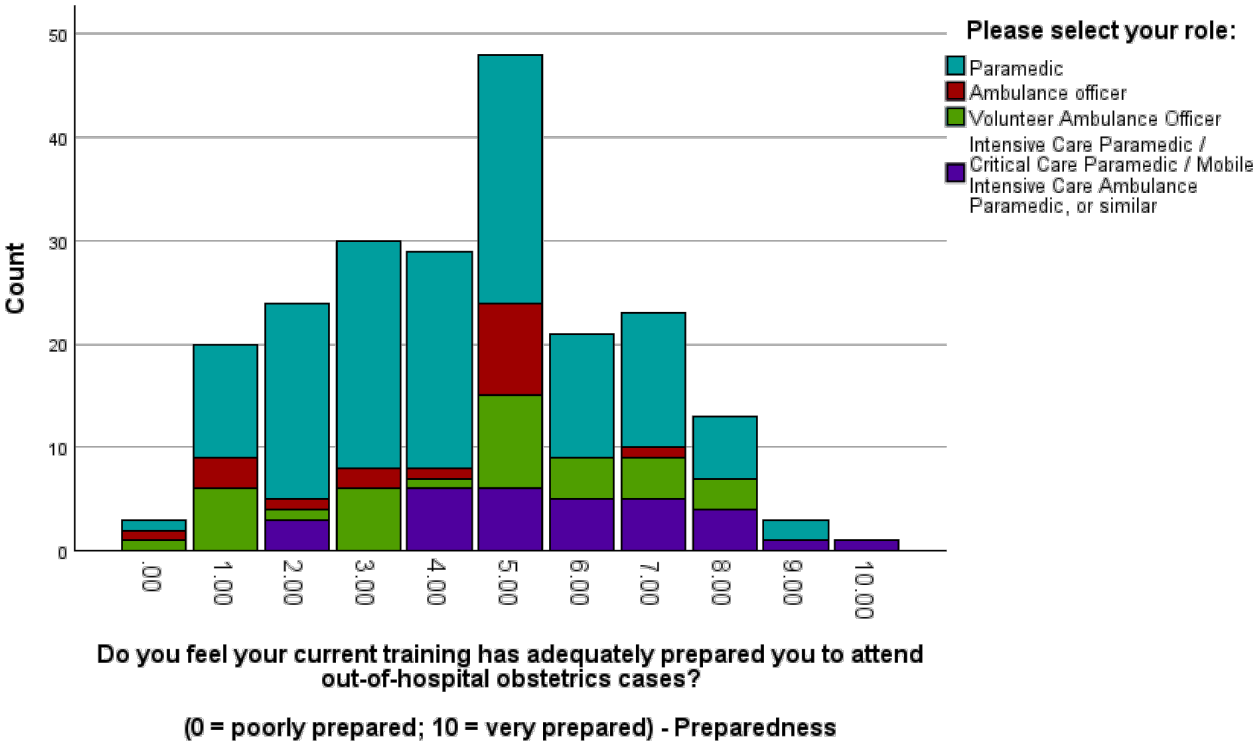


Figure 1. Participant rankings of the extent they felt their training had prepared them for attending OOHBs.

Birthing Presentations (n=168, 54 participants with no experience):	Participants Responding 'yes' (%)	Average Number of Experiences Per Participant with at least one experience
A mother in the early stages of labor. We left her at home and advised her to contact her midwife or obstetrician when in active labor.	40 (23.8%)	4.93
A mother in the early stages of labor. We drove her to the hospital or maternity clinic.	142 (84.5%)	6.35
A mother in active labor. We drove her to the hospital.	145 (86.3%)	5.78
A mother in active labor. We waited until her midwife arrived for an expected home birth.	22 (13.1%)	2.95
A mother in active labor. I helped with the birth.	123 (73.2%)	3.85
A mother who had given birth before my arrival, but the placenta had not birthed.	120 (71.4%)	3.48
A mother who had given birth before my arrival, and the placenta had birthed.	60 (35.7%)	3.27

Table 6. Participant prior birth situation experience.

102 prehospital clinicians averaging 3.93 complications per participant. Rural participants managed seven neonatal cardiopulmonary resuscitations, seven stillbirths, and one maternal death. Three VAOs managed four complications: one premature labor, one neonatal cardiopulmonary resuscitation, one stillbirth, and one miscarriage.

Birthing Complications* (n=168; 54 participants have never attended an obstetric case):	Participants Responding 'yes'
Premature labor (earlier than 38 weeks gestation)	101
Antepartum hemorrhage	71
Postpartum hemorrhage	75
Vaginal tear	39
Breech presentation	22
Face presentations	10
Shoulder dystocia	19
Cord prolapse	26
Nuchal cord (Umbilical cord around the neonate's neck)	33
Any other malpresentation	10
Neonate requiring respiratory assistance (ventilations)	41
Neonate requiring cardio-pulmonary resuscitation	26
Multiple birth	16
Stillbirth	26
Death of the mother	5
Other [Free Text] • Meconium in amniotic fluid (n=1) • En Caul (n=1) • Amniotic fluid embolism at home (n=1) • Failure to progress from the maternity unit (n=1) • In the field C-section, due to cardiac arrest of the mother (n=1) • Miscarriage (n=2) • Uterine inversion and postpartum hemorrhage (n=1) • Low blood glucose in baby (n=1) • No comment left (n=2)	11

Table 7. Participant experiences with birthing complications.

Confidence Attending an OOHB

Participants' confidence in attending various birth situations and emergencies (five antenatal, 29 second stage, two third stage, six postpartum) was graded from 1=low confidence to 6=high confidence. Supplementary file 1 depicts the birth situations and emergencies posed and includes a question requesting participants rate their confidence in how well they feel they would (1) recognize the situation/complication, and (2) effectively manage the situation/complication. Responses were analyzed as a summed confidence score for each participant for both recognition and management of the OOHB stage. Cohort means are recorded in Table 8.

All Participants	Antenatal (/30) – 5 items		Second stage (/174) – 29 items		Third stage (/12) – 2 items		Postpartum (/36) – 6 items		Total Combined Score (/252) – 42 items	
	Recognition	Management	Recognition	Management	Recognition	Management	Recognition	Management	Recognition	Management
Mean	19.77	18.68	121.94	103.27	9.45	8.36	29.08	26.39	180.61	157.21
Standard Deviation	4.78	4.71	32.43	28.24	2.50	2.31	6.20	6.10	42.79	38.13

Table 8. Confidence with OOHBs - Recognition and management of OOHB stages.

		Mean	Standard Deviation	Two-sided p*^	Mean Difference	Std. Diff	Cohens d
Antenatal Recognition (/30) 5 items	Paramedic	20.41	4.37	<0.001^	3.59	0.96	0.78
	VAO	16.82	5.59				
Antenatal Management (/30) 5 items	Paramedic	19.47	4.31	<0.001^	4.41	0.79	1.00
	VAO	15.05	4.85				
Second Stage Recognition (/174) 29 items	Paramedic	126.55	29.72	<0.001^	28.74	6.48	0.93
	VAO	97.81	36.33				
Second Stage Management (/174) 29 items	Paramedic	107.99	26.63	<0.001^	29.36	5.52	1.12
	VAO	78.63	24.21				
Third Stage Recognition (/12) 2 items	Paramedic	9.74	2.30	0.007^	1.77	0.61	0.73
	VAO	7.96	3.01				
Third Stage Management (/12) 2 items	Paramedic	8.60	2.16	0.002^	1.48	0.47	0.66
	VAO	7.11	2.71				
Postpartum Recognition (/36) 6 items	Paramedic	29.92	5.29	0.004^	5.38	1.74	0.91
	VAO	24.54	8.59				
Postpartum Management (/36) 6 items	Paramedic	27.14	5.52	0.004^	4.84	1.55	0.82
	VAO	22.31	7.55				
Total Combined Score (Recognition) (/252) 42 items	Paramedic	186.96	38.67	<0.001^	39.07	9.15	0.94
	VAO	147.88	50.63				
Total Combined Score (Management) (/252) 42 items	Paramedic	162.24	33.69	<0.001^	38.31	7.56	1.12
	VAO	123.92	36.18				
*Note: *Alpha = 0.05, ^Remains significant after applying Bonferroni correction for multiple comparisons.*							

Table 9. Independent samples T-test: Confidence with OOHBs – Comparison between paramedics and volunteers (VAOs).

Paramedics reported feeling more confident with all components of birthing (antenatal care, second stage, third stage, and postpartum care) compared to VAOs (Table 9). Effect sizes were medium-to-large, indicating the difference between the two groups was meaningful (Table 9).

Participants with children reported feeling more confident with recognition and management of antenatal care compared to participants without children, but no differences were found for second stage, third stage, and postpartum care (Table 10).

Participants who had previously attended at least one OOHB reported feeling more confident with all components of birthing (antenatal care, second stage, third stage, and postpartum care) compared to participants with no prior exposure, reaching statistical significance for both recognition and management of these situations (Table 11). Effect sizes were medium to large, indicating the difference between the two groups was meaningful (Cohen, 2013).

		Mean	Standard Deviation	Two-sided p*^	Mean Difference	Std. Diff	Cohens d
Antenatal Recognition (/30) 5 items	Paramedic	20.77	4.25	0.005^	1.82	0.65	0.39
	VAO	18.96	5.00				
Antenatal Management (/30) 5 items	Paramedic	19.46	4.29	0.027	1.42	0.64	0.31
	VAO	18.04	4.87				
Second Stage Recognition (/174) 29 items	Paramedic	32.97	3.66	0.907	0.60	5.07	0.02
	VAO	32.29	3.50				
Second Stage Management (/174) 29 items	Paramedic	103.78	27.63	0.718	1.59	4.39	0.06
	VAO	102.19	28.92				
Third Stage Recognition (/12) 2 items	Paramedic	9.33	2.51	0.596	-.21	0.39	-0.08
	VAO	9.54	2.53				
Third Stage Management (/12) 2 items	Paramedic	8.43	2.36	0.586	0.20	0.36	0.08
	VAO	8.24	2.28				
Postpartum Recognition (/36) 6 items	Paramedic	28.84	6.44	0.709	-0.36	0.98	-0.06
	VAO	29.20	6.05				
Postpartum Management (/36) 6 items	Paramedic	26.18	6.54	0.810	-0.23	0.96	-0.04
	VAO	26.40	5.68				
Total Combined Score (Recognition) (/252) 42 items	Paramedic	181.68	42.64	0.718	2.42	6.70	0.06
	VAO	179.25	43.09				
Total Combined Score (Management) (/252) 42 items	Paramedic	158.59	36.65	0.544	3.61	5.94	0.10
	VAO	154.98	39.25				
*Note: *Alpha = 0.05, ^Remains significant after applying Bonferroni correction for multiple comparisons.*							

Table 10. Independent samples T-test confidence with OOHBs – Comparison between participants with children vs without.

		Mean	Standard Deviation	Two-sided p*^	Mean Difference	Std. Diff	Cohens d
Antenatal Recognition (/30) 5 items	Paramedic	20.55	0.36	<0.001	3.16	0.82	0.67
	VAO	17.39	0.83				
Antenatal Management (/30) 5 items	Paramedic	19.54	4.37	<0.001	4.00	0.79	0.89
	VAO	15.54	5.09				
Second Stage Recognition (/174) 29 items	Paramedic	127.34	29.96	<0.001	24.09	6.16	0.77
	VAO	103.25	36.06				
Second Stage Management (/174) 29 items	Paramedic	108.47	26.30	<0.001	24.10	5.30	0.90
	VAO	84.38	29.14				
Third Stage Recognition (/12) 2 items	Paramedic	9.80	2.27	0.005	1.71	0.57	0.70
	VAO	8.09	3.02				
Third Stage Management (/12) 2 items	Paramedic	8.68	2.12	0.003	1.65	0.52	0.73
	VAO	7.03	2.74				
Postpartum Recognition (/36) 6 items	Paramedic	30.07	5.43	0.003	4.78	1.52	0.80
	VAO	25.29	8.02				
Postpartum Management (/36) 6 items	Paramedic	27.22	5.57	0.007	4.09	1.43	0.69
	VAO	23.23	7.50				
Total Combined Score (Recognition) (/252) 42 items	Paramedic	187.73	38.91	<0.001	32.73	8.20	0.78
	VAO	155.00	49.22				
Total Combined Score (Management) (/252) 42 items	Paramedic	164.02	34.93	<0.001	32.56	8.06	0.90
	VAO	131.45	41.54				
*Note: *Alpha = 0.05, ^Remains significant after applying Bonferroni correction for multiple comparisons.*							

Table 11. Independent samples T-test confidence with OOHB – Comparison between participants with prior experience vs participants without prior experience.

Factors contributing to fears and anxieties		Barriers to training	
Comment	Number of responses	Comment	Number of responses
Lack of exposure or experience with OOHB	107	Desire for obstetrics placements (midwife, hospital)	33
Lack of training, skill decay, and lack of practice	57	Poor opportunity or access to obstetrics training	33
Managing complications	26	Need adequate equipment or facilities to train with	27
Distance to definitive care, delays in care, and remoteness	18	Low exposure = low confidence	20
Lack of equipment, resources to manage an emergency	16	Need high-fidelity simulations during training	15
Lack of clinical support	13	Need qualified trainers	14
Reassuring the patient, managing emotions in an adverse event	13	Time limitations	14
Recall of guidelines, maneuvers	11	Lack of practice	8

Table 12. Quantified high-frequency responses to open-text questions concerning OOHBs.

Qualitative Analysis

The question regarding factors contributing to fears and anxieties with OOHB received 179 responses, while barriers to training received 163 responses. The most popular responses to each question are depicted in Table 12.

Qualitative analysis of the open-text responses was combined, as similar themes emerged from both questions (Rouder et al., 2021). Analysis identified four themes:

- Low exposure to birthing impacts confidence
- Minimal ongoing training impacts confidence and competence
- Organizational resourcing impacts confidence
- The complexities of scene management

Low Exposure to Birthing Impacts Confidence

A major factor affecting confidence in managing OOHBs was the lack of prior exposure to birthing, with 129 comments related to this concept. The quote below reflects many opinions:

> *Lack of exposure. We do not get to see what a birth looks like, be it normal or complicated. [Service redacted] needs to come to an agreement with the obstetric hospitals around [city redacted] to allow hands-on, real-life training/experience. It is absolutely insane that we are taught the basics, with no hospital prac[ticum]s, don't do annual refresher training, and then we are expected to go out and manage a complicated birth. What also annoys everyone is how hard it is to get a placement at an obstetrics hospital to observe or participate in delivering a baby. (Participant 35)*

This cohort has a cumulative 362 years of service with 474 births attended, which equates to approximately 1.3 births per year. The limited exposure and practical application of specialized obstetrics competencies impact not only confidence but recall of relevant information in an emergency. 18 participants offered concerns regarding the ability to remember clinical guidelines and specialized maneuvers, which have the potential to impact patient care and outcomes:

> *I feel unsure about preventative measures such as not touching the placenta during labor. I am anxious about small errors which may lead to extreme deterioration due to lack of knowledge and experience. (Participant 148)*

Minimal Ongoing Training Impacts Confidence and Competence

Challenges relating to training and development were frequently mentioned (n=102). The lack of training commenced with undergraduate studies and persisted into organizational training, with many comments regarding minimal in-service obstetrics training provided by ambulance services (n=21):

> *Very poor university training- no Obstet[ric]s/Maternity placements (compared to UK where students help deliver more than 10 babies), very minimal exposure and only occasional refreshers with often very minimal simulation time. Due to the lack of training (initial and ongoing), lack of exposure, rapidly developing nature of emergencies (i.e. neonatal resus) and complexities of care, obstetrics jobs with abnormal outcomes are arguably my biggest fear. (Participant 109)*

> *During induction school, obstetrics training was one day only, on mannequins. There was no clinical placement or realistic scenarios to prepare us. (Participant 42)*

> *Training not offered by employer. (Participant 41)*

Limited interdisciplinary placements shadowing midwives were raised, highlighting obstacles to effective obstetrics education (n=12). The quotes below indicate difficulties in organizing practica and reflect a need to understand differing scopes of practice between the disciplines:

> *Lack of exposure to maternity wards. I was fortunate to have 4 days on maternity ward and had staff reluctant to provide training as their perception was that I was "jumping the queue" by only being there for a short time. They did not recognize that this was our only exposure and training prior to becoming the only clinician on-scene. (Participant 5)*

> *Previous experiences where the outcome was poor - I attended a spontaneous cord prolapse and the baby died. I had no skills to help in that situation. The hospital staff didn't come outside to meet us after we patched, and were waiting in the delivery suites. The emergency center staff took us to theatre, but the whole wing was empty because they were all in the birthing suite. Then the father got code blacked because nobody was helping his wife and child. The women's hospital staff sometimes tend to treat paramedics like idiots, which is a major barrier to learning. (Participant 4)*

Barriers to attending training courses included cost, distance, and time (n=24). Realistic high-fidelity simulations were preferred yet lacking (n=28). It was acknowledged some training could be undertaken online; however, the opportunity to shadow a midwife was preferred (n=46):

> *Time, cost, available free resources (Participant 112)*

> *Lack of exposure, lack of maternity placements/observation days for existing staff, poor quality and quantity of simulation. (Participant 109)*

Organizational Resourcing Impacts Confidence

Concerns with organization barriers, such as the availability of appropriate infrastructure and equipment to facilitate skills practice, were raised (n=37):

> *Lack of resources- for some reason we can't have training equipment at our depots. (Participant 32)*

Seventeen participants suggested inexperienced facilitators often provided training, and they would prefer facilitators with specialized obstetrics training:

> *Also, very few paramedics with appropriate qualifications to be teaching (e.g. dual registered paramedic/midwife). (Participant 4)*

Twenty-three participants commented on the limited obstetrics equipment available on the ambulance and lack of clinical support, particularly in rural locations. Another consideration voiced by nine participants was the experience and knowledge of their partner, as this could be a VAO in rural locations with limited ability to provide interventions:

> *Lack of exposure and equipment to deal with obstetric emergencies. Often lengthy delays to theatre or whole blood. (Participant 3)*

> *Living rural with no Doctor in town at the moment and worrying about things going wrong. (Participant 156)*

Scene Management

Some comments concerned managing bystanders, handling emotive situations, and even prehospital clinicians managing their own emotions during adverse events were reported (n=26). Additionally, the complexity of one patient becoming two was raised, with the potential for life-threatening complications with both patients (n=15):

> *Scene management. How do I coordinate a newborn resusc[itation] and a PPH [postpartum hemorrhage] for example. Where do I place the baby so mum can see but not be traumatized... how do I keep mum in focus when newborn resus is happening. Very aware of a mother feeling dehumanized in the experience. (Participant 146)*

> *I have not had any births out of hospital that I have had to manage yet. It is hard to imagine the situation without actual experience. Also knowing that the care you provide may have a lasting impact/consequence for the child and their family. That is stressful. (Participant 116)*

Some participants mentioned factors such as having minimal antenatal information or previous birthing history, impacting optimal care. Obstetrics complications are often time-critical, and extrication can be difficult, further impacting prehospital clinicians' anxieties. Some participants working in rural locations discussed distances to definitive care being a considerable concern.

DISCUSSION

The results of this research suggest prior exposure to an OOHB leads to increased confidence attending these cases. Preparation and training are important aspects of medical care, particularly with vulnerable patient groups such as OOHB patients (Persson et al., 2019; Svedberg et al., 2020). Multiple studies report prehospital clinicians feel underprepared and lack confidence managing OOHBs (Gardiner, 2024; Hill et al., 2023, 2024; Persson et al., 2019; Sheikhi & Heidari, 2024; Vagle et al., 2019). Whilst OOHBs are infrequent, they do occur and can have life-threatening complications for both birth parent and neonate (Hilde M Engjom et al., 2017; Flanagan et al., 2017; Lazi & Taka , 2011; McLelland et al., 2018), which places an obligation on emergency ambulance services and prehospital

clinicians to ensure they are adequately trained in management of complications to ensure patient safety and optimal outcomes. Many participants in this study expressed a desire for practical experience beyond high-fidelity simulations, with placement in a maternity unit to gain vital exposure to birthing and practice obstetric skills.

Australian universities often provide one semester of obstetrics coursework for paramedic students; rarely is a maternity placement provided. Courses may combine obstetrics care with other special populations, such as pediatrics (CQ University Australia, 2024; Edith Cowan University: School of Medical and Health Sciences, 2022; University of the Sunshine Coast, n.d.). By necessity, prehospital clinicians are generalists and not specialists (Newman, 2022); however, it is difficult to imagine another aspect of healthcare where a clinician is expected to lead care of medical emergencies involving (potentially) life-threatening complications with so little prior exposure, preparation, or training. Additionally, ambulance resources are severely limited compared to hospital resources (Svedberg et al., 2020), meaning obstetrics care is extremely constrained in the prehospital environment.

In Australia, approximately 67% of the population live in metropolitan areas, while 99.3% of the Australian landmass is considered regional, rural, or remote (Australian Bureau of Statistics, 2022; National Rural Health Alliance, 2025). In metropolitan areas, registered paramedics provide emergency care, whereas rural and remote emergency ambulance organizations rely on hybrid paramedic-VAO subcenters or VAO-operated subcenters (The Council of Ambulance Authorities, 2011). VAOs have less medical education and training than paramedics and are limited to providing first aid and supportive care (St John Ambulance WA, 2022). Therefore, no invasive, potentially life-saving interventions can be administered by a VAO, such as cannulation and intravenous fluids or medications. A recent investigation reported on the challenges of VAOs accessing clinical support in rural emergencies, the lack of obstetric equipment on some ambulances, and the long distances to definitive care, yet VAOs are still expected to handle obstetric emergencies (Hill et al., 2024). This research confirmed that rural clinicians manage as many complications as metropolitan clinicians, including fatalities and stillbirths. Some ambulance services provide telehealth services for prehospital clinicians to access during obstetric emergencies (Gardiner, 2024; The Royal Children's Hospital Melbourne, n.d.). This resource provides excellent clinical expertise and support when required and would be beneficial throughout Australia and New Zealand.

This research suggests there are barriers to accessing obstetrics CPD, including cost, availability, and time restrictions. An additional challenge to maintaining obstetrics proficiency is the requirement for specialized equipment (e.g., birthing manikins) to practice with. Furthermore, inadequate/unavailable equipment is a barrier to provision of in-service high-fidelity simulation training, which was desired by our participants. Obstetric emergencies have little overlap with other prehospital emergencies, meaning these skills are not practiced with other medical or trauma presentations, further exacerbating atrophy of obstetrics competencies (Thornton & Dahlen, 2018; Woodman et al., 2021). Foregoing real-life exposure to birthing, high-fidelity simulations may better prepare prehospital clinicians for OOHBs. A systematic review of 15 studies concerning high-fidelity simulation for neonatal resuscitation indicated moderate to large benefits of high-fidelity simulation in skill performance with single-arm or randomized control trials (RCTs), moderate improvements in knowledge with RCTs, and small improve-

ments in knowledge when comparing high-fidelity to low-fidelity simulations (Huang et al., 2019). Simulations are considered an effective educational method in medicine when clinical experiences are limited; however, high-fidelity classroom simulations can be resource-intensive in terms of physical resources and facilitators' time (Astbury et al., 2021). A novel approach is the use of digital technologies, which may be suitable to bridge this theory-practice gap, reducing reliance on training facilitators, established infrastructure requirements, and associated resources. Digital technologies have been successfully utilized in simulation training to provide experiential exposure and enable practice of high-risk procedures in a low-risk environment in medicine and midwifery; however, these technologies are less common in paramedicine (Birtill et al., 2021; Elendu et al., 2024; Georgieva-Tsaneva et al., 2024). Given the low on-road exposure to birthing, experiential exposure to OOHBs via virtual reality could enhance knowledge retention, improve accessibility and active engagement with simulation training, and provide a safe learning environment for this rare presentation (Elendu et al., 2024).

Our participants reported that scene management could be anxiety-provoking for OOHBs. Some fear stems from managing complex emotions in the event of adverse outcomes, such as neonatal resuscitation or death (Hill et al., 2024). Midwives also navigate these difficult presentations. A recent systematic review indicated that midwives who are older and more experienced are better equipped to manage these situations. Coping strategies included empathetic listening skills, communicating with peers, training, and institutional support (Garcia-Catena et al., 2023). Another meta-synthesis interpreting parents' experiences of perinatal loss suggested many clinicians struggle with managing complex emotions, demonstrating compassion, and communicating appropriately with grieving parents (Berry et al., 2021). Research should be expanded into the prehospital environment to produce educational frameworks and content to aid prehospital clinicians' communication skills during difficult discussions, which occur without support from hospital mental health teams.

Other avenues for research include investigation into prehospital clinician confidence attending OOHBs versus actual competence, to determine shortfalls in clinical education and improve patient safety and outcomes. Additionally, this research reveals prehospital clinicians who have been exposed to childbirth are more confident attending an OOHB. Accordingly, practicum opportunities should be explored for prehospital clinicians to ensure experiential exposure to birthing before attendance at an OOHB with possible catastrophic outcomes. Obstetrics placements would also provide interdisciplinary exposure, enabling clinicians from differing specialties to understand each other's scope of practice and competencies. More research into the long-term patient outcomes from actual OOHBs should also occur, to identify where prehospital care can be improved to minimize adverse sequelae.

LIMITATIONS

Online questionnaire data were self-reported and anonymous. Given the self-selection recruitment methodology, participants with an interest in OOHBs may be more likely to participate, contributing to response bias. Additionally, the information participants provided is potentially subject to recall bias and may not be accurate. Open-text responses provided insight into prehospital clinicians' fears and anxieties regarding OOHB; however, are unable to provide an in-depth exploration that qualitative inquiry might.

Further, confidence does not equate to competence in the management of OOHB care (Flanagan et al., 2024); nonetheless, prehospital clinicians without confidence are unlikely to be proficient in managing an OOHB with complications. Given the non-probability sampling method, the sample may not reflect the demographic profile of the wider prehospital clinician workforce. Accordingly, findings should be interpreted as reflecting the views of respondents rather than a representative population sample. Furthermore, results may not be generalizable beyond Australia and New Zealand. However, these results provide insight into OOHB educational gaps and service limitations, which could serve as a benchmark to improve these aspects of prehospital care.

CONCLUSION

This online mixed-methods questionnaire reviewed the training, exposure to, and confidence with attending OOHBs amongst 222 Australian and New Zealand prehospital clinicians. While exposure to a laboring patient wasn't uncommon, assisting with an actual birth occurred rarely, with many serious complications encountered. Participants who had assisted with an OOHB were more confident in their ability to effectively manage these presentations, compared to participants with no prior exposure. Similarly, registered paramedics were more confident than their VAO colleagues, attributable to the higher level of education required for paramedics. Continuing, frequent, and effective education needs to be undertaken in obstetrics care to ensure prehospital clinicians' recency of practice for these vital skills.

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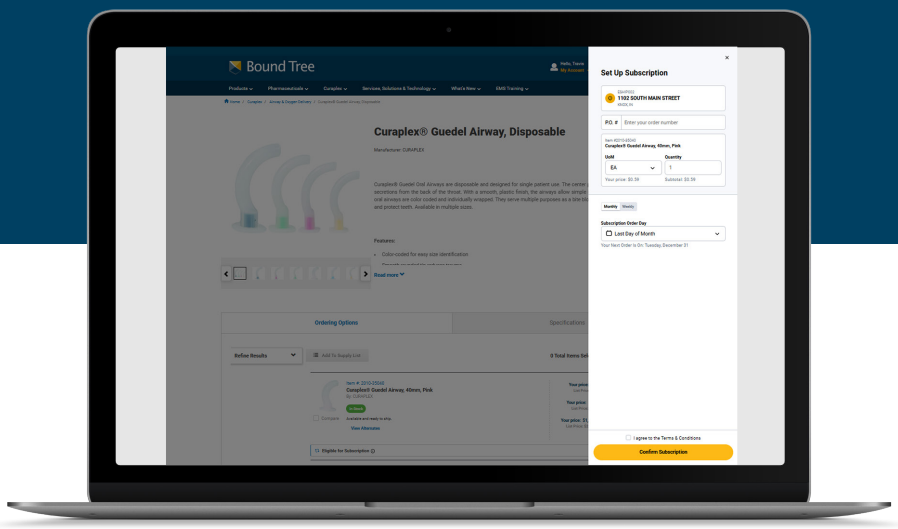
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RESEARCH REPORTS

EDUCATING FOR THE PARAMEDICINE OF TODAY: EXPLORATORY FINDINGS RELATED TO PRIMARY CARE PARAMEDIC TRAINING IN NORTHERN ONTARIO

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ABSTRACT

Background: Long distance ground and air transportation is often used in Canada to ensure that rural and remote communities have access to medical care. This, coupled with the increasing utilization of community paramedicine, positions paramedics in an increasingly autonomous role. As such, it is important to consider how these professionals are being prepared to work in socially just and socially responsible ways with the diverse populations they serve. Scant literature examines health care provider (HCP) students' preparedness to provide socially just and responsible care overall, and even less focuses specifically on paramedic students. This study explored HCP students' perceived preparation to enact social justice and social responsibility (SJSR) in practice.

Methods: Part of a larger qualitative explorative case study, findings discussed in this article focus on paramedic students. Based in a constructivist ontology, semi-structured qualitative walking interviews (Carpiano, 2009) were conducted with primary care paramedicine (PCP) students at one college in a northern region of Canada. Once transcribed, interviews were analyzed using thematic analysis (Peel, 2020).

Results: Participants reported a mixture of feeling prepared and uneasy about enacting SJSR. Students' personal backgrounds and work and academic experiences impacted their sense of preparation. Students listed several areas of concern including: a devaluing of SJSR within their curriculum and marking structure, poor role-modelling, and a superficiality of SJSR-related content.

Conclusions: While the study had few paramedic student participants, considering results within the context of the larger Canadian PCP education landscape may be beneficial. Currently, efforts are in place to educate future paramedics on SJSR; however, enhancements and additional work may help to guide PCP curriculum and create more robust accreditation standards within Canada. Considerations include restructuring curriculum to incorporate SJSR longitudinally, connecting SJSR to the role of the paramedic, and long-term, to change the current PCP diploma programs to baccalaureate degrees, potentially recruiting learners with previous post-secondary certifications.

BACKGROUND

In Canada, paramedicine is, like nursing and other health professions, regulated at the provincial level. Yet despite lobbying by the profession, primary care paramedicine in Ontario, is not regulated by its own college (Ontario Paramedic Association, n.d.-c). Rather, two entities regulate the profession: the Emergency

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Health Services Branch of the Ministry of Health and Long-Term Care (MOHLTC) and eight Base Hospital programs associated with the MOHLTC (Ontario Paramedic Association, n.d.-b). Before entry to practice, Ontario paramedics must pass a two-year primary care paramedic (PCP) course to earn their diploma and write the Advanced Emergency Medical Care Assistant exam, passing with 70% or greater (Ontario Paramedic Association, n.d.-a). Only advanced paramedicine training programs require accreditation, which is currently done through the Canadian Medical Association. The general 2-year PCP training programs in Ontario have no accreditation requirement (Ontario Paramedic Association, n.d.-b) impacting curriculum standardization and quality assurance.

For many people, the expansive geography of northern Ontario necessitates air or long-distance ground transportation to access health and medical care. Care and support during travel is generally provided by paramedics who are often patients' first points of contact with the healthcare system. Ontario paramedics play an increasingly vital role in providing safe and equitable care through, for example, community paramedicine, providing in-home care to seniors with extensive care needs awaiting long-term care admission (Ontario, 2014; Ontario, 2021; Shannon et al., 2022). However, recent reports from Ontario recount instances of unsafe care and prejudicial attitudes held by paramedics (Blackburn, 2022; Grimaldi, 2021; Loriggio, 2022). This is not new to healthcare, but other professions such as nursing (Canadian Association of Schools of Nursing [CASN], 2022) and undergraduate medicine (Committee on Accreditation of Canadian Medical Schools [CACMS], 2023) have implemented quality assurance measures like accreditation guidelines to address the issue. Accreditation and standardization have led to initiatives and movements in health education including an increased focus on cultural competency (Gallegos et al., 2008), cultural safety (Ramsden, 2002), cultural humility (Stubbe, 2020), and the emergence of social accountability (Boelen & Heck, 1995; Global Consensus for Social Accountability of Medical Schools, 2010). Educating about these and concepts such as intersectionality (Crenshaw, 1989), social determinants of health (SDOH) (Mikkonen & Raphael, 2010), anti-racism (Blanchet Garneau et al., 2018), and anti-colonialism (Binagwaho et al., 2022) is considered part of educating on SJSR. However, with no accreditation requirements, mandatory inclusion of these topics has yet to be seen in Ontario's PCP programs (Allana & Pinto, 2021). In place of accreditation requirements, paramedics in Ontario have entry-to-practice competency requirements that are set out by the Paramedic Association of Canada and include general objectives including acknowledgement of cultural differences and "valu[ing] patient advocacy" (Paramedic Association of Canada, 2011, p. 30).

In addition to entry-to-practice competencies, PCP programs have listed program standards as a part of the Ontario public college system, which helps guide program structuring and learning outcomes. Of importance are the guidelines which emphasize effective and appropriate communication with patients; utilizing relevant theory and best practice; and meeting ethical, professional, and legal responsibilities (Ontario, 2008). Ontario colleges also require students to take a general education component so "that graduates have been engaged in learning that exposes them to at least one discipline outside their main field of study … increas[ing] their awareness of the society and culture in which they live and work" (Ontario, 2008, Requirement section, para. 2). Yet, while these concepts are presented as integral to the role of a paramedic, clarity on how they are best taught and demonstrated within primary care paramedicine is lacking. For

example, while the standards exemplify effective and appropriate communication with "advocat[ing] for patient's rights", how advocacy is enacted in the PCP role is not defined (Ontario, 2008, The vocational learning outcomes). Allana & Pinto (2021) assert that the PCP curriculum does not emphasize curriculum regarding SDOH such as "assessing social risks, integration with community services and patient advocacy" (p. 71), despite the fact "that many emergency calls are non-urgent, exacerbated by social factors … and related to gaps in primary care" (p. 69).

The social accountability and multicultural education movements in nursing and medicine discussed above ultimately resulted in a lack of conceptual clarity across North America and in the emergence of two broad approaches: cultural competence and critical culturalism (Reitmanova, 2011). These two approaches seem to continually govern many health care programs today. This means that students are taught to either become competent in their knowledge of an "other" or to think critically about the circumstances and power dynamics that perpetuate health inequities between various demographic groups (Reitmanova, 2011). This is but one example, and much is being done across the health disciplines to help learners acquire this knowledge.

Other examples include programs which have engaged peer-to-peer cross-cultural interaction to help learn about social determinants of health, and health inequities by partnering mainstream public health students with Indigenous health-focused public health students (Dickson & Manolo, 2014), or have used community-based learning wherein students are partnered with a family facing health inequities and are encouraged to create care plans and interventions that work for their designated clients (Biswas et al., 2020).

Despite a lack of agreement on what constitutes best practice, O'Meara and colleagues posit that education is an enabling factor for the expanding role of the paramedic profession (O'Meara et al., 2014). That is, if paramedics are to be working in increasingly community-based roles, their education will have to prepare them for how to do that in an equitable and safe manner.

Given the expanding scope of paramedics in Ontario, its geographically large northern region, the diversity of the patient population, and reports of inequitable, unsafe, and prejudicial care, the focus of this study is whether PCP students in one northern Ontario region felt prepared to enact socially just and socially responsible care in future practice.

Positionality

Acknowledging that all research is conducted from a particular standpoint, shaped by the researcher's own social identities, experiences, and perspectives, we start the next section by positioning ourselves. At the time of writing, the principal investigator (PI) Alexis Starkes is a graduate-trained nursing student located in northwestern Ontario, Canada. In addition to being a researcher, she is also a healthcare worker, health educator, and staunch supporter of health and healthcare equity and access. This background has informed and influenced the work herein and the perspectives that are held related to the content and structure of this research. Dr. Helle Møller is an Associate Professor in Health Sciences at Lakehead University where she teaches graduate-level students. She is a medical anthropologist and former registered nurse with work and research experience in northern contexts including Greenland, Nunavut, and northern Ontario. Her

work focuses on SDOH, social justice and equity in the context of health, healthcare and health education, locally, nationally and internationally.

METHODS

Guided by social constructivist ontology, the larger explorative qualitative study was constructed as a multiple case study involving as different "cases" institutions within one northern community that educate health professionals (nursing, undergraduate medicine, and paramedicine). Reporting on one of the student groups within one case study that comprised PCP, practical nursing, and baccalaureate nursing programs, this article focuses on the experiences of the college-enrolled PCP students. The guiding principle of social constructivism holds that all meaning is constructed socially within and between people, their environments, and their contexts. This principle lends itself well to understanding complex fields like education and the subjective experiences of individuals within them (Creswell & Poth, 2017). Constructivist ontology supports the exploration of phenomena and allows "for multiple facets of [a] phenomenon to be revealed and understood" (Baxter & Jack, 2008, p. 544). After receiving ethical approval from the participating institutions' ethics boards (Protocol [redacted]), data collection occurred from October 2022 to December 2022.

Recruitment

Using purposive recruitment (Campbell et al., 2020), students were invited to participate through flyers, direct recruitment via faculty and instructors, in-class recruitment presentations provided by the PI, and snowball recruitment (Chan, 2020).

Interviews

Semi-structured walking interviews (Carpiano, 2009) were used to gather participant perspectives regarding their academic preparation. Semi-structured interviews allow for the flexibility that is required to construct meaning while also providing structure to guide the flow of conversation (Adams, 2015). Interviews were audio recorded and transcribed verbatim by the PI using Express Scribe Transcription Software Version 11.10.

Thematic Analysis

Interview transcripts were de-identified before being uploaded to NVivo® (Lumivero, 2023) for coding and support with thematic analysis (Peel, 2020). A mix of inductive and deductive coding was used. A priori themes were established through review of the pertinent literature on educating healthcare students on SJSR in healthcare, while new codes and themes emerged through repeated engagement with transcripts. This organic development of new themes aligns with a social constructivist approach where meaning is constructed between participants' expressed experience and the researchers' understanding of their experience, inductively developing a "pattern of meaning" (Creswell & Poth, 2017, p. 24). Findings were organized into basic, organizing, and global themes. Basic themes consisted of individual participant quotes, while organizing themes consisted of clusters of similar quotes. Global themes are what are presented here and are a synthesis of the lower groupings. Analysis of the larger study occurred until data saturation (Creswell & Poth, 2017) was reached, indicated by the lack of emergence of new themes

across case data (in this instance, composed of PCP, baccalaureate nursing, and practical nursing student interviews).

While data saturation was met as evidenced by a lack of emergence of new themes across each case within this multiple case study, saturation of themes as they relate to solely PCP students may be seen as unsubstantiated. However, the themes reported on within the larger study were supported by the data provided across the PCP student subgroup.

Additionally, an environmental scan of institutional documents (retrieval and analysis of curriculum outlines and institutional initiatives related to SJSR) allowed for an adaptive triangulation (Carter et al., 2014) to support or refute the interview data findings. Refer to the original study for a more robust description of the thematic analysis (Harvey, 2023).

With regards to the data published within this paper, triangulation was limited given that documents pertaining to this specific program within the case were difficult to retrieve. Additionally, findings reported by students included lived experiences and perceptions of preparation and thus were unable to be substantiated given the methodology used within this study (i.e. no use of observation to corroborate reported occurrences, or qualitative scales to corroborate perception).

RESULTS

Of the 24 participants interviewed for the larger project, four were PCP students. Interviews varied in length from 45 minutes to 1.5 hours. The main findings from PCP interviews included: 1) students feeling prepared enough, 2) the fine line between valuing and devaluing of SJSR throughout their programs (as compared to other course material), 3) the sense that only so much is taught about SJSR and that more exists, and 4) the influence of instructors and mentors on the student experience. Findings are referenced with numbers that correspond to de-identified transcripts which have been anonymized to protect the participants' identities. The themes discussed are part of the larger case. PCP focused findings should be considered exploratory because of the small number of PCP participants.

Prepared Enough

Of the PCP students interviewed, three reported that they felt prepared to enact social justice and social responsibility (SJSR); however, most qualified this stating that they would be learning much on the job: "… learning on the fly. You're going to just hope that the program is recruiting, like good people, who … ultimately want the best for the community" (PCPT3). Participant transcripts are titled as "PCPT#" to maintain that the authors are operating with transcripts that portray participant stories rather than portraying participants as numbers.

A sense of confidence in their abilities to enact SJSR in their work, despite how they felt the program was disseminating the information, appeared to correlate with having had relevant background experience. While participant identities and experiences may influence their understanding of the concepts of SJSR. This topic is beyond the scope of this paper. For more discussion and information on this, refer to the larger study: Harvey, A. (2023). Student perspectives on preparation to be just and socially responsible providers:

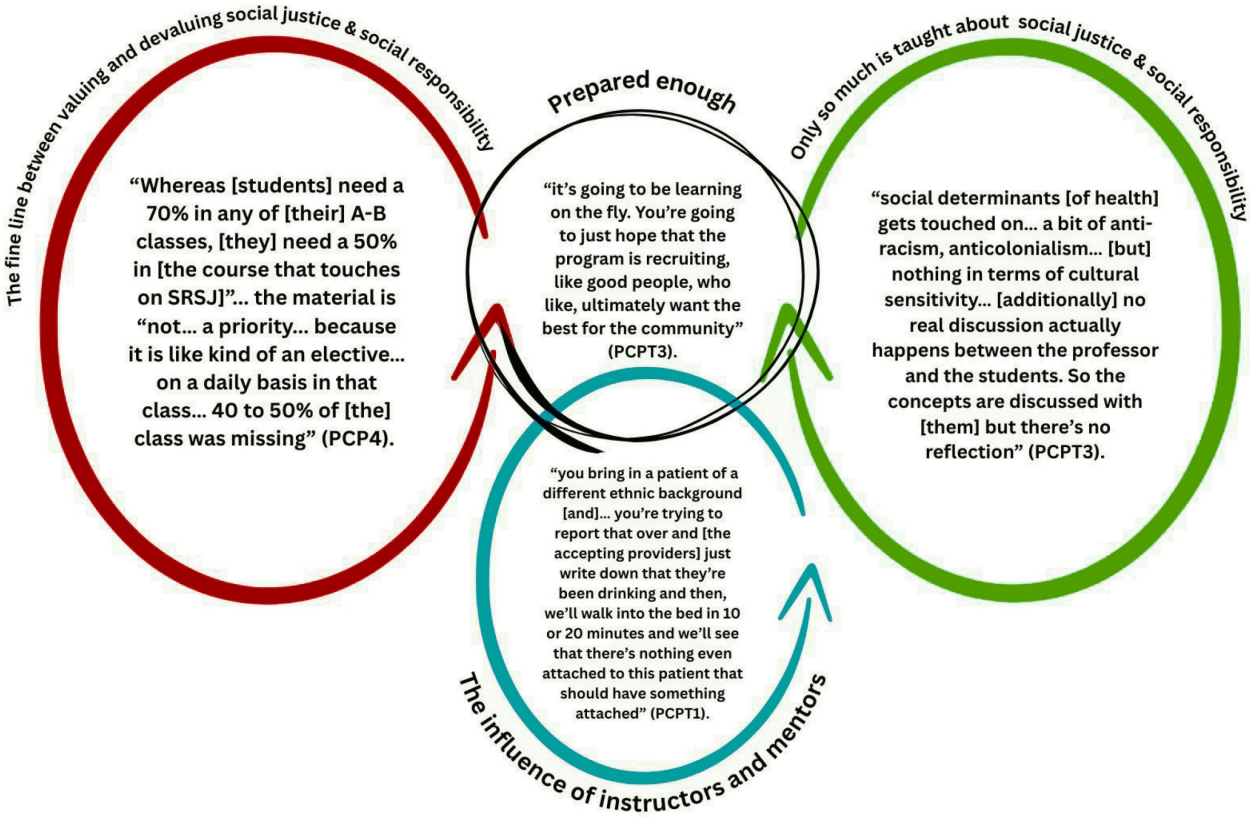


Figure 1. Main themes reported by PCP participants.

A northwestern Ontario qualitative case study [Master's thesis, Lakehead University]. Lakehead University Knowledge Commons. https://knowledgecommons.lakeheadu.ca/items/6d66819d-1ec5-4bdb-8e27-4ef47520ac04

Such experience was gained either from working a person-facing profession, volunteering, or from time spent in other post-secondary academic programs (PCPT1, PCPT2, PCPT3, PCPT4).

While most PCP students felt that they were being prepared somewhat by their current program and everyone mentioned a required "Human Diversity" course which reportedly included topics such as "SDOH," "population health," and "diversity" (PCPT1, PCPT2, PCPT3, PCPT4), no single course or pedagogical model was felt to be the most effective for teaching SJSR. Students cited exposure to SJSR concepts through "lecture-based [courses] and just doing … assignments and projects" (PCPT2), watching "documentaries" (PCPT4), reading books such as "The Seven Fallen Feathers" (PCPT1), and doing "scenarios as students together … [and] talk[ing] about it after" (PCPT1).

The Fine Line Between Baluing and Devaluing Social Justice and Social Responsibility

While all PCP students referred to the Human Diversity course when asked whether they had a designated course focused on SJSR-related concepts, reservations were reported about the effectiveness of course delivery and implementation. Two students noted that the Human Diversity course was comparable to an elective as the grading scheme was different from their other required courses (PCPT3, PCPT4). Although in-class participation marks were given, attendance was not mandated, resulting in many students

not attending regularly (PCPT3): with "40 to 50% of [the] class … missing" daily (PCPT4). The structuring of the course marking system and the low "50% [to pass] in that class" compared to "70% in any of [their] A-B classes" (such as Anatomy & Physiology) resulted in an "expectation difference, between an elective and core courses" (PCPT4). This was reported to cause students to prioritize other courses and dismiss these topics as unnecessary to succeed in their field (PCPT4). While the environmental scan confirmed that the course was, as the program's website posited, a "forced" elective, the specifics of the grading scheme could not be confirmed (Confederation College, 2025, p. 8).

Only so much is Taught About Social Justice and Social Responsibility

Despite the focus on SJSR-related concepts in the Human Diversity course, students felt that that kind of content "we kind of just learn on the road" (PCPT1). Students described the course as lecture-based (PCPT2, PCPT3, PCPT4), with minimal discussion, reflective practice, or application of learned concepts. One student stated that although "social determinants [of health] gets touched on very briefly … a bit of anti-racism, anticolonialism does come up … no real discussion actually happens between the professor and the students. So, the concepts are discussed … but there's no reflection" (PCPT3). Students also relayed how the Human Diversity course touched on different populations and their circumstances but did not link these topics to "SDOH" (PCPT4) or "advocacy" (PCPT1). Within the environmental scan, the course description on the institution's website states the course is meant to teach students about diverse populations using an anti-oppressive and social justice framework (Confederation College, n.d.). However, with no access to a course syllabi or further information regarding course delivery, pedagogical methods could not be ascertained.

The Influence of Instructors and Mentors

Lastly, students talked about multiple experiences with challenging community practice that contradicted the learned curriculum (PCPT1, PCPT2, PCPT4). While students reported being taught about diversity and respectful communication, several instances were mentioned where discriminatory language was utilized while in placement: bariatric-sized equipment referred to as "fat mat[s]" instead of trademarked names like "Mega-Mover[s]" (PCP4), or Indigenous clientele being labeled as "HBD or has been drinking" without confirmation of blood alcohol content (PCPT1). Furthermore, students felt that many healthcare professionals were facing pressure due to high demands across the field, often leading to lackluster care, and for paramedics, a lack of leadership related to the outflux of senior paramedics during the COVID-19 pandemic (PCPT2, PCPT4).

DISCUSSION

As evidenced by the expanding scope of paramedicine across Canada into more community-based work, there is a need for curriculum that departs from the typical focus of emergency response (O'Meara et al., 2014; Weber et al., 2024). However, it would be remiss not to discuss the implications of such a change within the context of our study. As PCP participants and current literature point to, the case's program context is constrained due to the condensed 2-year program model (Colleges Ontario, 2025; O'Meara et al., 2014), an outpouring of senior leadership and thus mentors (PCPT2, PCPT4; Glazier, 2023), and a healthcare system that is consistently burdened with understaffing and high

demand (Glazier, 2023). These points are important as no data within a social constructivist study can be separated from its context (Creswell & Poth, 2017).

Thus, we proceed with our discussion of our exploratory findings while considering the local and contemporary context (i.e., location, current workforce limitations, curricular models, and lack of standardized requirements), as well as the limited number of PCP student participants. Feeling prepared enough (rather than well prepared) to enact social justice and social responsibility (SJSR) within their future practice appears to be the result of a combination of experiences: (a) being somewhat exposed to SJSR through various methods; (b) not having enough time to learn all aspects of the profession; and (c) not spending time on discussion, reflection, or applying SJSR-related theoretical concepts–resulting in learning (or not) while on the job rather than prior to practice. As was mentioned earlier, much work has been done in undergraduate medicine and nursing to bring SJSR into curriculum, and thus many of the pedagogical methods discussed by participants (e.g., fictional literature-guided curriculum, use of films, and scenario or case-based learning) have been seen throughout the literature within other health-related disciplines instructing on SJSR (Mkandawire-Valhmu et al., 2019; Ryder et al., 2013; Uy & Dimaano, 2019). Thus, it is possible that implementation of such pedagogy would translate well to instructing PCP students on SJSR. The reflection, discussion, and debriefing that students relayed as missing from their Human Diversity course are important for the development of critical practices that not solely recognize the other culture and background of a client, but understand the history, context, and power dynamics that may have led to the development of the health inequities they live with. These are all key components of culturally safe practice (Curtis et al., 2019). In this same vein the importance of interweaving SJSR-related content longitudinally throughout curriculum (rather than offering a stand-alone course) has been advocated for within the literature on health professions education to better support students in developing an understanding of health inequities and an ability to reflect on them (Beavis et al., 2015; Chooniedass et al., 2025; Dogra et al., 2009; Forsyth et al., 2019).

The fine line between valuing and devaluing of social justice and social responsibility is related to having a stand-alone course dedicated to SJSR with a grading scheme that differed from other mandatory coursework, as relayed by students. When considered in tandem with participants' reports that only so much is taught about SJSR, and with the lack of critical discussion-based reflection and connection between SJSR curriculum and their future practice, a disconnect between good intent and effective outcomes appears to exist. While the program is reported to have meaningful content that students can discuss when prompted, students lack a meaningful connection of SJSR curriculum to their reality as future paramedics—a crucial component within the field of adult learning (Palis & Quiros, 2014).

Lacking clarity in how these concepts relate to their field of work indicates a focus on teaching about multiculturalism rather than a focus on developing cultural safety or cultural humility among students (i.e., critical culturalism according to Reitmanova, 2011). Multiculturalism, rather than focusing on students gaining an understanding of intersectionality, power dynamics, and how to work with and for individuals from differing backgrounds, teaches students cultural and other "facts" about different population groups. Banks (2014) describes this as being a consequence of Anglocentrism in curriculum, which Kline (2013) posits, often results in multicultural education being included as

an add-on course rather than strategically positioned throughout curriculum. Additionally, critical pedagogues cite the need for particularly adult learners to see the relevance of the curriculum and make connections to their own experience and lives to maintain engagement (Palis & Quiros, 2014). That is, students will not effectively learn if they have no stake in the topics being taught, whether this is through a grading scheme impacting their average, or understanding how intersectionality and power dynamics create health inequities that affect different populations, including populations with which the learners may identify or serve in their future practice.

A move away from dedicated courses for multicultural education and onto integrative approaches such as community placements and multi-year courses and workshops has been seen elsewhere (Murray et al., 2012; Ross et al., 2014, 2019) and may also be evolving in PCP programs. The constraints posed by the 2-year timeframe of the PCP program is raised across the field and is gaining traction locally, which may lead to curriculum reform (Colleges Ontario, 2025). Related to time constraints, theory and in-class instruction is only part of the learned curriculum; role-modelling and the influence of instructors and mentors is another.

Students' reports suggested that practice often contradicted the classroom curriculum. They reported hearing derogatory and stereotypical remarks about patients under their care from role models while in practicum. While these instances may be attributed to provider burnout due to the current demands on the system (Kuilanoff, 2021), such negative role-modelling may lead to trainees internalizing preceptor biases and teachings, as suggested in the review by Alshareef and Flemban (2025). Role modelling contributes to a "hidden curriculum" which has been described as "more than simple transmission of knowledge and skills, it is also a socialization process … The hidden curriculum consists of what is implicitly taught by example day to day, not the explicit teaching of lectures" (Mahood, 2011, p. 983). Hidden curriculum through role modeling poses the risk of perpetuating racism and discrimination across health professions, systems, and society (Hopkins et al., 2016). Role-modelling can serve as a very positive tool within education, or it can work to spread biased attitudes (Alshareef & Flemban, 2025) and create a culture of biomedical superiority with health professionals seen as experts and clients as inferior—an outright contradiction of SJSR.

This last point is particularly important considering the tension that exists between the standard models of PCP education and professional expectations and the tenets that underlie SJSR. PCP has traditionally been focused on emergency medical management which requires unilateral decision-making and knowledge of what is best for the client, whereas SJSR highlights power dynamics, the importance of cultural safety, and patient-centred care. Although SJSR tenets appear to misalign with PCP practice, with the profession moving into community paramedic roles and consequently working within the primary care model, these tenets in fact align well (Butscher, 2025).

CONCLUSION

The PCP student-related findings discussed in this study are exploratory given the small number of participants. However, they provide information worthy of consideration within the scope of the community paramedic. Findings suggest that a potential need for curricular reform exists and is worthy of further exploration when reconsidering profes-

sional priorities within PCP locally. As such, findings should be seen as the beginning of a much larger conversation demonstrating the need for additional research on the topic. The following conclusions are not generalizable to the whole of Canada or the PCP profession but are discussed considering the perspectives of the study's PCP participants and the contemporary context within which they learn and work.

With seemingly little space for curricular reform, and much to learn in the way of SJSR, efforts across other health disciplines may not be a good fit for PCP. While the expansion of paramedicine into a 4-year degree is possible and beginning to take root in Canada (e.g., University of Toronto Scarborough, 2023), the current demand for paramedics in Canada seems to outweigh the appetite for a 4-year PCP program (Rowland & Brydges, 2023). However, a focus on restructuring curriculum to incorporate more reflective practice exercises within the greater curriculum on SJSR-related topics may be worthwhile. Similarly, the devaluing of SJSR content via weighting of marks and the lack of conceptual connection to the profession of paramedicine is important to examine. While literature examining this phenomenon is absent, efforts to balance the weighting of marking schemes across the curriculum and/or better highlighting the connection between SJSR and the profession's expanding roles may result in students focusing more effort on SJSR-related content instead of prioritizing other courses as reported. Furthermore, making SJSR content more relevant to professional practice through more instruction on SDOH, intersectionality, and the connection to health inequities could potentially be implemented without further straining the curriculum.

Appropriate role modelling is important. The context of the current study is one in which the medical system is struggling to align health care needs and available human resources while navigating severe burnout following the COVID-19 pandemic. Ensuring appropriate role modelling involves a lot more than providing training to preceptors and educational staff. It may involve remedying a medical system that was not built to sustainably handle current demands—a topic beyond the scope and length of this article. Kuilanoff (2021) provides an excellent discussion of the topic. Lastly, incorporating critical reflection exercises and debriefing to foster students' development of critical practice and deeper understanding of themselves and the contexts within which they work may be more lucrative. This has been utilized elsewhere, through incorporation into already-existing curriculum (Crampton et al., 2016; Denizard-Thompson et al., 2021; Essa-Hadad et al., 2015; Harrison et al., 2020; Snyman & Geldenhuys, 2019; Uy & Dimaano, 2020; van den Heuvel et al., 2014).

These exploratory results provide a starting point for a much larger conversation around students' preparation and the efforts to equip PCP students across northern Ontario to work towards SJSR. Should future studies result in similar findings, certain initiatives may be warranted. These include consideration of additive versus longitudinal curriculum on SJSR-related content, though we acknowledge the challenges this would introduce given the condensed nature of two-year PCP programs. It may also be worthwhile to consider long-term initiatives. These include creating more baccalaureate degree programs for PCP throughout the province and continuing to recruit learners with previous degrees or experience in the social and health sciences to ensure that future paramedics are coming into the field with a good understanding of SJSR-related topics.

Ultimately, future research into this phenomenon should employ a larger sample of participants from several educational institutions across Ontario and or Canada to better elucidate trends in preparation to enact SJSR. These approaches would provide more robust data to better understand this phenomenon.

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RESEARCH REPORTS

ZOOM FATIGUE AMONG PARAMEDICINE STUDENTS: A CROSS-SECTIONAL STUDY

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ABSTRACT

The COVID-19 global pandemic changed how higher education was delivered in response to frequent lockdowns and social distancing rules. Universities around the world transformed quickly, often with little planning, from classroom-based face-to-face learning to remote online learning, particularly using Zoom conferencing. Elements of this still occur today. Despite the obvious benefits of Zoom, which enabled continued communication with work, family, and friends, extended and frequent Zoom meetings quickly turned into video conferencing fatigue, or what has become known as 'Zoom fatigue'.

Our study aimed to answer three research questions: Did paramedicine students experience Zoom fatigue after transitioning to online learning during COVID-19? If so, were there differences in the level of fatigue experienced by students in different years of the degree? And did gender influence the level of fatigue experienced?

This cross-sectional study used the Zoom Exhaustion and Fatigue (ZEF) scale with students from all 3 years of the Bachelor of Paramedicine at Monash University in Australia.

Of the 224 students who participated, 61.1% identified as female, 36.3% as male, and 1.8% as non-binary. Most students were in the third year of the degree (48.7%), while 27.4% and 23.9% were in the first and second year, respectively. Our study found that students did experience Zoom fatigue. General and motivational fatigue were experienced most by all students. Students in year 2 experienced less fatigue than students in year 1 and year 3. For example, the mean general fatigue score differed significantly between years, $F(2,223) = 4.288$, $p = .015$. Female students experienced more fatigue than male students across all factors, including general, visual, social, motivational, and emotional fatigue.

This study provides empirical support for the existence of Zoom fatigue among paramedicine students and suggests it increases with meeting frequency and is greater for female students. More research is required to explore its contextual, methodological, and practical aspects.

In 2020 and 2021, the COVID-19 global pandemic changed the way that higher education is delivered in response to frequent lockdowns and the adherence to social distancing rules. Universities around the world transformed quickly, without much plan-

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ning, from classroom-based face-to-face learning to remote online learning, particularly using Zoom conferencing. Despite the obvious benefits of Zoom that enabled continued communication with work, family, and friends, extended and frequent Zoom meetings quickly turned into video conferencing fatigue (Dobson, 2021; Massner, 2021). Video conference fatigue is therefore a recent phenomenon that has emerged during the COVID-19 pandemic and is defined as the degree to which people feel exhausted, tired, or worn out, attributed to engaging in video conferencing (Bennett et al., 2021; Massner, 2021). Some definitions suggest that the definition includes extensive and extended use (Massner, 2021). Video conference fatigue is synonymous with 'Zoom fatigue' as Zoom became the leading software, proving to be an easy-to-use and robust tool for productivity, learning, and social interaction (Bailenson, 2021). Bennett et al. (2021) note that videoconference fatigue is similar to other fatigue constructs, such as compassion fatigue (Williams et al., 2022) and citizenship fatigue (Bolino et al., 2015), but it has distinct antecedents and a unique temporal structure, making it a unique phenomenon. For example, compassion fatigue occurs after cumulative experiences, but videoconference fatigue can occur after a one-off event. Video conferencing has been shown to impact people differently, and some of the differences mentioned in the literature include a person's gender, age, culture, and personality type (Bennett et al., 2021; Fauville et al., 2023; McConnon, 2021). For example, women experience more Zoom fatigue than men (Fauville et al., 2023), and younger students and workers are more susceptible to Zoom fatigue than older students and workers (Beyea et al., 2025; Epstein, 2020), and introverts experienced higher levels of fatigue than extroverts (Dobson, 2021). Zoom fatigue has also been shown to increase with meeting frequency and timing (Asgari et al., 2021; Bennett et al., 2021). To capture the complexity of Zoom fatigue, some researchers have developed models, such as Massner (2021), whose model is comprised of situational, individual traits, environmental, and communication factors. Bailenson (2021) describes nonverbal communication in face-to-face as remarkable, explaining that it is simultaneously effortless and incredible complex; and compares this to the nonverbal communication required for videoconferencing is not only complex but also requires a person to work hard to deliver and interpret signals and messages. Most studies about Zoom fatigue are in the context of the workplace (Epstein, 2020; Toney et al., 2021); however, some studies have focused on Zoom fatigue in higher education (Fauville et al., 2023; McArthur, 2021; Peper et al., 2021). In a study by (Rouse, 2020), university students who were asked if they had experienced Zoom fatigue after transitioning over to online learning. All responded 'yes', regardless of whether they had only taken part in a few online classes or had the majority of their classes online. In another study by Peper et al. (2021), 80% of students found it harder to focus their attention and stay present during online classes and reported experiencing more isolation, anxiety, and depression, than in face-to-face classes. Fauville et al., (2021) explored the impact of Zoom fatigue on nursing students and found that Zoom fatigue increased with the frequency of teleconference meetings and was also influenced by participant characteristics such as age, gender, and attitude. Rather than trying to understand the Zoom fatigue phenomenon through the perspective of the student, (McArthur, 2021) explored ways that teachers in higher education modified, altered, or transformed their face-to-face nonverbal behaviors into nonverbal behaviors more suitable for online learning environments, including what strategies they used to reduce Zoom fatigue. Many reasons for Zoom fatigue are mentioned in the literature. Epstein (2020) mentions a range of issues that cause virtual interactions to be very hard on the brain by increas-

ing the intensity of focus required to absorb the content. These include communication not always being synchronous, being distracted using chat boxes or navigating to unmute or ask questions, challenging the brain's central vision by seeing multiple people at the same time, paying attention with a constant gaze, and limited sensory dynamism by only being able to take in visual information. Bailenson (2021) provides four arguments on why the Zoom interface is likely to lead to Zoom fatigue through nonverbal overload. These include:

- Excessive amounts of close-up eye gaze that violate interpersonal distance rules
- Cognitive load
- Increased self-evaluation
- Constraints on physical mobility

In a study by Asgari et al. (2021), reasons for Zoom fatigue included unreliable internet access, work-life balance issues, a lack of motivation, focus, peer support, private space to attend classes, and clear guidelines from instructors.

While a recent meta-analysis by Beyea et al., (2025) synthesized the Zoom fatigue literature, finding important contributing and conditioning factors across the higher education sector, our study recognizes the limited research on Zoom fatigue in higher education, with no studies identified in the field of paramedicine. Our study also assumes that paramedicine educators and higher education in general, need to understand the complexity inherent in Zoom fatigue as suggested by Ozainne et al. (2023). It aimed to answer three research questions:

- Did paramedicine students experience Zoom fatigue after transitioning to online learning during COVID-19?
- If so, were there any differences in Zoom fatigue between students in different years of the degree?
- Did gender influence the level of fatigue experienced?

This study explored this using the Zoom Exhaustion and Fatigue (ZEF) scale with students from all three years of the Bachelor of Paramedicine at Monash University in Australia.

METHODS

Study Design

This was a cross-sectional study. The study was designed and reported consistently with the STROBE guidelines (Vandenbroucke et al., 2007). No formal sample size was calculated as the study was exploratory in nature.

Participants

Students were invited to participate in the study if they enrolled in the Bachelor of Paramedicine, Monash University. No exclusion criteria were applied. All students enrolled in the Bachelor program were invited to participate in the study to reduce selection bias. Data were collected from a cohort of undergraduate paramedicine students from a large Australian university. Students were provided with an explanatory statement and were informed that participation and completion of the questionnaire were voluntary and

anonymous. The paper-based questionnaire took less than 10 minutes to complete. No follow-ups were undertaken.

Procedure

The paper-based questionnaire was provided to all willing students, and they were asked to read through the explanatory statement before considering participating in the study. Completed questionnaires were returned to a non-teaching research assistant.

Instrumentation

The questionnaire included two parts: the demographics and the ZEF questionnaire. The demographic section collected demographic data including the year of course, age group, and gender. The second section included the Zoom Exhaustion & Fatigue Scale developed by Fauville et al. (2021b). This is a 15-item scale where items are scored on a 5-point Likert scale with 1= "Strongly Disagree" and 5= "Strongly Agree", with higher scores indicating a higher level of Zoom exhaustion & fatigue. The 15 items represent 5 factors, including General Fatigue (items 1-3), Visual Fatigue (items 4-6), Social Fatigue (items 7-9), Motivational Fatigue (items 10-12), and Emotional Fatigue (items 13-15). The ZEF scale is a valid and reliable measure for Zoom fatigue and limited any measurement bias in this study.(Fauville et al., 2021; Riedl et al., 2023; Simbula et al., 2024)

Analysis

The Statistical Package for Social Sciences (SPSS) version (27) was used for all data analysis. Descriptive statistics were reported as count and proportions and mean and standard deviations. Differences in the mean score of fatigue levels across age groups, gender, and year level were assessed using analysis of variance (ANOVA) and Student t-test as appropriate. A two-tailed p-value of <0.05 will be considered statistically significant.

Ethics

The study was approved by the Monash University Human Ethics Committee (Approval #: 29964). Implied consent was provided through participation and completion of the questionnaire.

RESULTS

Demographics

A cohort of 224 (overall 53% response rate) undergraduate paramedicine students from a large Australian University participated in the study. Table 1 presents the frequency and percentages of participants in each category. Among the 224 participants included in the study, 61.1% identified as female, 36.3% identified as male, and 1.8% identified as non-binary. Most students were in the third year of the Bachelor's degree (48.7%), and 27.4% and 23.9% were in the first and second year, respectively. Approximately half (50.9%) of the students were in the

Category	Variable	Frequency	%
Age	< 21	89	39.4
	21-25	115	50.9
	>25	20	8.9
Gender	Female	138	61.1
	Male	82	36.3
	Non-binary	4	1.8
Year Level	1	62	27.4
	2	54	23.9
	3	108	48.2

Table 1. Participant demographics.

21-25 age group, and almost 40% of the students were under 21 years of age.

ZEF

Table 2 illustrates the item responses and scale reliability, showing the mean answers to each item between students and the Cronbach's Alpha (α) of each scale corresponding to each of its items. The analysis shows that the mean and standard deviation of answers ranged from 2.04 ±1.18 (Item 7) to 3.62 ±1.031 (Item 1). The Cronbach alpha coefficient is acceptable for all scales as they range from .86 for the motivational and social scales to .88 for the emotional scales. This indicates a very good internal consistency between items. This means that the questions are holding the meaning of their scale, and we can rely on these in testing this specific type of fatigue.

Factor	Item	Mean (SD)	α
General fatigue	1	3.62 (1.03)	.87
	2	2.99 (1.11)	
	3	3.53 (1.12)	
Visual fatigue	4	2.42 (1.31)	.86
	5	2.65 (1.28)	
	6	2.08 (1.16)	
Social fatigue	7	2.04 (1.18)	.86
	8	2.23 (1.23)	
	9	2.44 (1.30)	
Motivational fatigue	10	2.63 (1.27)	.88
	11	3.11 (1.27)	
	12	2.88 (1.24)	
Emotional fatigue	13	2.54 (1.28)	.88
	14	2.38 (1.30)	
	15	2.28 (1.22)	

Table 2. Mean score of ZEF and the reliability value.

For the general fatigue scale, the mean in year 1 was 10.45±2.83, year 3 was 10.45± 2.99, and year 2 was 9.13±2.71. For the visual fatigue scale, the mean in year 1 was 7.74±3.17, year 3 was 7.44± 3.43, and year 2 was 5.89±2.99. For the social fatigue scale, the mean in year 1 was 7.16±3.51, year 3 was 6.93± 3.41, and year 2 was 5.76±2.85. For the motivational fatigue scale, the mean in year 1 was 9.48±3.58, year 3 was 8.71± 3.22, and year 2 was 7.43±3.26. For the emotional fatigue scale the mean in year 1 was 7.85±3.42, year 3 was 7.49± 3.61, and year 2 was 5.85±2.69.

The results of the ANOVA tests show that the mean general fatigue score is significantly different between students of different years f (2,223) = 4.29, p= .015. Also, the mean visual fatigue score is significantly different between students of different years f (2,223) = 5.49, p= .005. The mean social fatigue score is significantly different between students of different years f (2,223) = 3.03, p= .05. The mean motivational fatigue score is significantly different between students of different years f (2,223) = 5.597, p= .04., and the mean emotional fatigue score is significantly different between students of different years f (2,223) = 5.94, p= .003.The results show that when the mean fatigue score for each scale is calculated for each year group and then compared with each other, there is a difference in fatigue scores between the students, and the difference has not happened to chance. That is, students in year 1 and year 3 experienced more fatigue than students in year 2, with students in year 1 experiencing the most fatigue.

Table 4 presents the descriptive analysis of each fatigue scale by gender. There were higher levels of fatigue among female

Factor	Mean Score Across the Year Level			F-Value	P-Value
	Year 1 (n=62)	Year 2 (n=54)	Year 3 (n=110)		
General fatigue	10.45 (2.83)	9.13 (2.71)	10.45 (2.99)	4.29	.015
Visual fatigue	7.74 (3.17)	5.89 (2.99)	7.44 (3.43)	5.49	.005
Social fatigue	7.16 (3.51)	5.76 (2.85)	6.93 (3.41)	3.03	.050
Motivational fatigue	9.48 (3.58)	7.43 (3.26)	8.71 (3.22)	5.59	.004
Emotional fatigue	7.85 (3.42)	5.85 (2.69)	7.49 (3.61)	5.94	.003

Table 3. Differences in the mean factor score of fatigue level across year level (ANOVA).

students for all factors (general, visual, social, motivational, and emotional). For example, the mean score for general fatigue for women was 10.8, and the mean for men was 9.07 (p= .000). Since the p-value is less than 0.05, the study can conclude that women have significantly higher general fatigue levels than men.

Fatigue levels for the other factors were also significantly higher for women than men, with mean differences of 2.038, 1.512, 1.68, and 1.268 for visual, social, motivational, and emotional fatigue, respectively. The greatest difference was for visual fatigue, and the least difference was for emotional fatigue. In addition, general and motivational fatigue were the two highest experienced forms of fatigue by both female and male students.

Factor	Females (n=138)	Males (n=82)	P-Value
General fatigue	10.80 (2.67)	9.07 (2.98)	.000
Visual fatigue	7.86 (3.24)	5.82 (3.04)	.000
Social fatigue	7.23 (3.45)	5.72 (2.73)	.001
Motivational fatigue	9.25 (3.25)	7.57 (3.34)	.000
Emotional fatigue	7.70 (3.43)	6.43 (3.24)	.007

Table 4. Mean factor score of fatigue level in males compared to females (Student t-test).

DISCUSSION

This study explored the impact of Zoom meetings on undergraduate university students and found that students experienced Zoom fatigue. General and motivational fatigue were experienced the most by all students. Second, students in year 2 experienced less fatigue than students in year 1 and year 3. Finally, results indicated that female students experienced more fatigue than male students for all factors, including general, visual, social, motivational, and emotional fatigue. Our results can be compared with other studies. One study with 597 nursing university students in the Philippines Oducado et al., (2021) showed that high and very high levels of Zoom fatigue were experienced by 46.9% and 19.8% of students, respectively, using the ZEF scale. The composite mean score for these was 3.82 ± .7. Higher levels of fatigue were also experienced by students who were female, younger, had lower income status, poorer academic performance, unstable internet connection, longer and more frequent meetings, and had a negative attitude toward videoconferencing, where gender and academic performance were the two highest influencers (Oducado et al., 2021). The effects of Zoom fatigue also seem to be compounding, with a study by Shockley et al., (2021) showing that fatigue not only affects same-day meeting performance but also the performance of next-day meetings. Nesher Shoshan & Wehrt, (2022) also conducted a study to compare video conference meetings to meetings during the pandemic to rule out the possibility that Zoom fatigue was just meeting fatigue and found that Zoom fatigue was its own type of fatigue.

Similar findings were reported in Zoom fatigue studies in the workplace. For example, Fauville et al., (2023) found that daily usage predicts the amount of fatigue. They also showed that women reported 13.8% higher Zoom fatigue than men. In our study women experienced 16%, 26%, 21%, 18%, and 16.5% higher Zoom fatigue than men for general, visual, social, motivational, and emotional fatigue, respectively. One explanation given in Fauville et al's study is that women often have longer meetings and shorter breaks between meetings than men, accounting for women experiencing higher overall Zoom fatigue. In addition, Fauville et al., (2023) also showed in their study that women are highly susceptible to visual fatigue, and confirmed that mirror anxiety leading to visual fatigue mediates the gender difference in fatigue. Visual fatigue was also the highest influencer

for gender difference in our study; however, we saw gender differences across all factors. Several studies refer to mirror anxiety that occurs when a person is exposed to digital and physical mirrors, and how this heightens (Clanton, 2021; Fauville et al., 2023) 'self-focused attention' that can lead to depression. Shockley et al. (2021) particularly looked at the impact of camera use on videoconference fatigue over 4 weeks with 103 employees (recording 1408 daily observations) and found that having a camera on produced more fatigue than the camera being off, with women and new employees experiencing the most fatigue when the camera was on. This finding of new employees experiencing more fatigue may also explain, in part, the higher levels of fatigue in our first-year students (in conjunction with more daily use). A possible explanation for this is that people who feel more connected to others in meetings are less likely to experience fatigue (Kaplan & Berman, 2010). Although this is speculation, we do know that year 1 and year 3 students in our study did experience more Zoom meetings than year 2 students.

Given that videoconferences have continued beyond the COVID-19 pandemic, it is important to provide clear practical recommendations on how to reduce videoconference fatigue. Some studies have focused on reducing videoconference fatigue (Bennett et al., 2021; Massner, 2021; Rouse, 2020). Samara & Monzon (2021) highlight the challenges that arose in medical education because of the pandemic, the major difficulty being Zoom burnout. They suggest that to combat Zoom burnout, there is a need to use different technology, such as virtual reality, creating an authoritative presence by directly looking at the camera, and interspersing Zoom meetings with other learning activities to limit screen time and provide variety. Other suggestions include holding meetings earlier in the workday, enhancing the perceptions of group belongingness, muting your microphone to reduce stress related to maintaining a quiet atmosphere (Bennett et al., 2021), activity switching, online small groups, and asynchronous lectures (Toney et al., 2021), and enabling instructors or supervisors to reflect on their practice in terms of new research on videoconferencing fatigue to make better decisions in videoconference meeting design (McArthur, 2021; Nesher Shoshan & Wehrt, 2021).

Rößler et al. (2021) explored how the emotions of 35 students influenced the outcomes of videoconference meetings during a one-semester course where Zoom meetings were held twice a week, with students divided into eight groups. Emotion was tracked through snapshots of both the supervisor and the student using facial emotion recognition that recognized six emotions: happy, sad, fear, anger, neutral, and surprise. Findings included:

- The happier the speaker is, the happier and less neutral the audience is
- The more neutral the speaker is, the less surprised the audience is
- Triggering diverse emotions such as happiness, neutrality, and fear leads to a higher presentation score
- Triggering too much neutrality among the participants leads to a lower presentation score

In addition, they found that keeping the audience constantly happy is not very engaging and a good presenter needs to challenge the audience by puzzling it and providing unexpected and even temporarily painful information, which is then resolved throughout the presentation (Rößler et al., 2021). Just as Oducado et al. (2021) concluded that nursing schools should consider the undesirable impact of videoconferences on students and seek protective factors against videoconference fatigue, we suggest this for paramedicine

schools as well. In addition, both nursing and paramedicine are disciplines that require a large degree of hands-on learning with a large focus on problem-solving approaches and critical thinking. These are similar qualities that Asgari et al. (2021) mention about engineering education (i.e., content-centered, hands-on, design-oriented, critical thinking skills) shows that urgent and careful planning is needed to mitigate the negative effects of abrupt conversions of conventional face-to-face instruction in these types of disciplines.

LIMITATIONS

Although our study shows that paramedic students experienced Zoom fatigue in all its forms and that some students experienced it more than others, there are still opportunities to gain a greater and more detailed understanding of this area. Our study was simply a cross-sectional study with a self-reporting questionnaire and is limited by response bias and non-response bias. The results of this study are also limited by using students from one university and we did not collect any data on the extent of Zoom use and time.

FUTURE RESEARCH

There are several opportunities for future research that stem from the findings of this research. Firstly, research into Zoom fatigue is new, and more research is needed to understand causes and consequences of Zoom fatigue for different groups (e.g. gender, culture, age groups) in different contexts. Secondly, since this research is in its infancy, there is limited understanding of the long-term effects of Zoom fatigue, as well as studies exploring the longitudinal aspects of Zoom fatigue. For example, Fauville et al. (2021a) suggest exploring how Zoom fatigue accumulates and dissipates over time over a week. Third, research with paramedicine students that incorporates additional significant aspects (e.g., culture, age group, personality type) should be included Finally, a focus on interventions and ways to reduce Zoom fatigue would seem a more proactive approach to Zoom fatigue research.

CONCLUSION

Higher education, including paramedicine education, is continually shaped by information technology and online learning, influencing the student's learning journey. Although video conferencing technology has been available for more than a decade, COVID-19 transitioned students over to this technology rapidly and normalized it in higher education. As such, Zoom meetings became essential rather than an add-on or optional tool for educators and continues to this day. This study contributes to the limited literature on understanding the life of the university student during the COVID-19 pandemic, providing empirical support for the existence of 'Zoom fatigue' and how Zoom fatigue increases with meeting frequency and is greater for female students. We believe that universities can only fully support their students when they understand in more detail the complexity of this type of fatigue. Identifying characteristics, as well as ways to reduce Zoom fatigue, can inform both teaching theory and practice, particularly about how video conference lessons are designed and evaluated.

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RESEARCH REPORTS

ATTITUDES OF FIRST RESPONDERS TOWARDS SUPERVISED CONSUMPTION SERVICES FOR PEOPLE WHO USE DRUGS: A CROSS-SECTIONAL SURVEY USING MORAL FOUNDATIONS THEORY

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Keywords: firefighters, paramedics, first responders, moral foundations theory, supervised consumption services, harm reduction, emergency medical services, EMS, paramedicine

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Abstract

Objectives: This study aimed to determine the degree to which first responders' moral foundations predict attitudes toward supervised consumption services (SCS).

Methods: This cross-sectional study surveyed first responders working in Winnipeg, Canada. The survey used validated instruments to explore attitudes toward SCS using moral foundations theory (MFT). We used correlation, ANOVA, and multiple OLS and logistic mediated regression techniques to test our hypotheses. We used first responders' professional designation (0 = firefighter, 1 = paramedic), and the Moral Foundations Questionnaire as the primary predictor and mediator variables, respectively. Attitudes towards SCS (1 = strongly oppose, 5 = strongly support) served as the primary dependent variable. We transformed this dependent variable by removing responses of 'neither oppose nor support' to test an additional logistic mediated regression model.

Results: Paramedics (n=91) had higher levels of individualizing moral foundations and lower levels of binding moral foundations relative to firefighters (n=51). Individualizing moral foundations predicted greater support for SCS, whereas binding moral foundations predicted lower support. These two categories of moral foundations mediated relationships between first responders' professional designation and their support for SCS.

Conclusions: Paramedics and firefighters differ in their moral foundations and level of support for SCS. These findings can inform policymakers and decision-makers in developing strategies to consider first responders as essential stakeholders in implementing SCS.

Supervised consumption services (SCS) are safe spaces for people who use drugs (PWUD) to consume substances bought off-site under the supervision of health care professionals. They often provide ancillary services such as medical care, substance

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use treatment, case management, and counseling. Research shows that SCS are cost-effective ways to decrease mortality from substance use, increase access to addiction treatment and medical care, reduce rates of viral transmission, and decrease substance use and syringe litter in public (Kennedy et al., 2017; Kral & Davidson, 2017; Kral et al., 2020; Lange & Bach-Mortensen, 2019; Potier et al., 2014; Wood et al., 2004). Among approximately 120 SCS worldwide, no fatal overdoses have been recorded (Kral et al., 2020). Support for SCS among community members and public sector professionals, such as first responders, is critical to implementing these services effectively (Lange & Bach-Mortensen, 2019; Strike et al., 2015).

Emergency medical technicians, paramedics, and firefighters have unique insight into the burden of substance use in their communities because of their daily work with PWUD, but only a small body of literature has examined their attitudes toward SCS. Existing studies outline a range of views and opinions, covering concerns related to implementation, accompanying services, impact on the community, and effect on responder call volume and work experience (Fockele et al., 2024; Pennington et al., 2021; Pennington et al., 2023; Perlmutter et al., 2023; Taverner & OACP Substance Abuse Committee, 2012; Watson et al., 2012). Among different settings and designs, these studies highlight both positive and negative views towards SCS, as well as the collaborative nature of stakeholder involvement in SCS implementation (Kryszajtys et al., 2022; Lange & Bach-Mortensen, 2019; Pennington et al., 2021; Pennington et al., 2023; Taverner & OACP Substance Abuse Committee, 2012; Watson et al., 2012). Additionally, Pennington et al. (2021) identified a sense of duty as the most common shared theme among firefighters working close to an SCS, indicating that the moral foundations of these responders are closely linked to their attitudes to SCS. This finding connects to a growing body of research that explores differences in personal values and their relationship to divergent opinions towards PWUD in general and SCS in particular. One approach to this research employs Moral Foundations Theory (MFT), a social psychological theory that posits that people's moral concerns do not originate from conscious cognition (Haidt, 2001), but rather from the extent to which they value and prioritize five moral foundations: care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, and purity/contamination (Graham et al., 2008; Graham et al., 2009). Simply put, MFT posits that a person's underlying value system triggers strong emotions like anger, contempt, and disgust in response to a perceived moral violation. Widely deployed in a variety of settings, MFT has recently been applied to the public's view of harm reduction measures (Christie et al., 2019; Pijl et al., 2025), but not specifically to emergency responders.

The five interrelated moral foundations can be broadly organized into the categories of individualizing moral foundations and binding moral foundations (Graham et al., 2009; Haidt et al., 2009). Individualizing moral foundations combine the care/harm and fairness/cheating moral foundations, whereas binding moral foundations combine the loyalty/betrayal, authority/subversion, and purity/contamination moral foundations (Nilsson, 2023; Zakharin & Bates, 2021). Individualizing moral foundations focus on fostering the dignity, agency, and health of every individual; binding moral foundations focus on protecting the safety, order, and health of the community and/or group (Davies et al., 2014; Graham et al., 2009). Individualizing foundations are positively associated with politically liberal ideologies, as well as general support for SCS and other harm reduction strategies, whereas binding foundations are positively associated with politically conser-

vative ideologies as well as general opposition towards SCS and other harm reduction strategies (Christie et al., 2019; Davies et al., 2014; Pijl et al., 2025; Zakharin & Bates, 2021).

SCS implementation has been extensively debated across local, regional, and national levels. In a context where substance use continues to exact a social cost and burden emergency resources, policy makers require evidence that can inform policy solutions. Existing research explicitly calls for more research related to the impact of underlying attitudes on views toward SCS as well as perspectives of different responder roles (Perlmutter et al., 2023). Therefore, the purpose of our study was to address this research gap and describe attitudes of firefighters and paramedics towards SCS and their relationship with MFT.

METHODS

Design and Setting

This is a cross-sectional survey of employees of an emergency medical services (EMS) agency in central Canada. The Winnipeg Fire Paramedic Service (WFPS) provides emergency fire and medical coverage for the city of Winnipeg, Manitoba (population approximately 750,000) and responded to over 140,000 total calls for service per year at the time of the study (City of Winnipeg Fire and Paramedic Service, 2021). With approximately 1,200 employees in all roles, it uses a tiered-response model for medical calls. Within the overall organization, the Fire Department delivers basic life support (BLS) first response on apparatus staffed by firefighters and cross-trained firefighter-paramedics. The emergency medical services division provides mixed BLS and advanced life support (ALS) continuing care and transport by ambulance. Under national licensing terminology, BLS and ALS providers in this service are Primary Care and Advanced Care paramedics, respectively, and are generally referred to as paramedics with additional designation for role (firefighter-paramedic).

Reporting of this study conforms to the Checklist for Reporting of Survey Studies (CROSS; Sharma et al., 2021). Study conduct was overseen by the University of Manitoba Research Ethics Board (HE2022-0328).

Data Collection

The survey instrument consisted of six sections with 88 questions in total. (The survey is available as Supplemental File 1: Survey Instrument.) Questions reflected a mix of choice among pre-determined responses (such as professional role), Likert-scale answers, and 3 long answers. Participants completed one section related to demographic information (15 questions); remaining sections reproduced existing and previously validated instruments related to MFT (30 questions), stigma (9 questions), and attitudes towards and proximity to people who use drugs (PWUD; 14 questions), and posed direct questions related to professional designation (5 questions) and to attitudes towards SCS (10 questions).

As part of Section 2 of the survey, participants completed the Moral Foundations Questionnaire (MFQ 30; Davies et al., 2014; Graham et al., 2009). This is a 30-item self-report measure that assesses the extent to which individuals prioritize five moral domains: care/harm, fairness/cheating, loyalty/betrayal, authority/subversion, and purity/con-

tamination (Davies et al., 2014). The instrument consists of two 15-item (plus two attention-check questions) subscales, each of which is scored on a 7-point Likert scale. The first subscale assesses the relevance respondents ascribe to each foundation in response to the following prompt: "When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking?" The second subscale requires respondents to indicate the degree to which they agree or disagree with a range of moral statements (Davies et al., 2014; Graham et al., 2008; Graham et al., 2011).

Prior research reports Cronbach's alpha values for the five moral foundation subscales ranging from poor to good based on standard conventions: care/harm=0.61; fairness/cheating =0.59; loyalty/betrayal=0.61; authority/subversion=0.61; purity/contamination=0.76 (Nilsson, 2023; Zakharin & Bates, 2021). However, in keeping with theoretical considerations (Graham et al., 2009) and past research (Alper & Yilmaz, 2019; Barnett et al., 2018; Christie et al., 2019), combining the care/harm and fairness/cheating subscales into an individualizing moral foundations scale, and the loyalty/betrayal, authority/subversion, and purity/contamination subscales into a binding moral foundations scale greatly improved psychometric reliability (individualizing moral foundations Cronbach's $\alpha = 0.77$; binding moral foundations Cronbach's $\alpha = 0.84$).

After consultation with senior WFPS leadership and first responder labor groups, we disseminated the survey via memo, emails, and posters. Recruitment began in June 2023, with reminder emails sent in September 2023. The survey was administered electronically using Qualtrics Research Suite®. It was voluntary, anonymous, and accessible via direct link via respondents' work email and QR codes. Participants had the opportunity to register for a $20 gift card in recognition of their time, with no connection between identifying information and survey responses. To avoid duplicate entries into the study, we asked respondents to declare, following the consent checkbox, that they had not previously completed the survey; we were unable to eliminate duplicate entries by IP address as many respondents completed the survey while at their place of work with a shared IP address. As no prior research has applied MFT to this population, no sample size calculation was performed. The survey closed in December 2023.

Statistical Analysis

Our primary goals were twofold. We sought to assess: (1) the degree to which first responders' moral foundations predict attitudes toward SCS; and (2) whether differences between firefighters and paramedics in their moral foundations could explain their views towards SCS. As such, our a priori hypotheses were as follows: [H_1] Paramedics, as the professional designation whose training involves greater focus on providing immediate medical attention to individuals, will report greater support for SCS; [H_2] Paramedics will have higher levels of individualizing moral foundations and lower levels of binding moral foundations relative to firefighters; [H_3] Individualizing moral foundations will positively predict support for SCS and binding moral foundations will negatively predict support for SCS; [H_4] Moral foundations will mediate the relationships between first responders' professional designation and their support for SCS.

Participant characteristics (age, gender, education, role) are presented with descriptive statistics. To explore associations between moral foundations and attitudes towards SCS, we first used univariate analysis of variance (ANOVA) to determine how to categorize

firefighter-paramedics. Although they are cross-trained, firefighter-paramedics are organized and operate within the Fire Department in all phases of their work; this alignment informed initial exploration of their categorization.

After coding all participants by professional role, we then collapsed results from the MFT questionnaire into binding and individualizing domains. Participants reported their support or opposition to SCS in response to the following prompt "Overall, how supportive are you of supervised consumption services for people who use drugs?" (1 = strongly oppose; 5 = strongly support). A plurality of firefighters (42%) reported strong opposition to SCS whereas a plurality of paramedics reported strong support (41%). Firefighter-paramedics had a relatively even distribution across response options (see Supplemental Figure 1 for full details). We also transformed this variable from its original 5-point scale into a dichotomous variable by re-coding responses of 'strongly oppose' and 'somewhat oppose', and responses of 'strongly support' and 'somewhat support' into (0 = oppose, 1 = support). For this transformation, we removed 16 responses of 'neither oppose or support,' and treated them as missing data. The continuous support variable was used in all analyses except for the logistic regression model.

We first analyzed the correlations between role and support for SCS. We next assessed the indirect predictive associations between first responders' professional designation via individualizing and binding moral foundations on support for SCS in two parallel mediation models (one OLS regression model and one logistic regression model). The logistic regression model using the dichotomous support for/against SCS was included to provide further context and complementary results to the primary regression model. This logistic regression model allows for greater ecological validity of inference regarding the relationships between professional designation, moral foundations, and the odds of either supporting or opposing SCS. We examined the indirect predictive relationships of the regression-based path models based on 5000 bootstrap samples (Hayes, 2013).

Among incomplete responses, age was the variable with the highest number of missing entries (n=10), which represented 6% of the total sample. We performed Little's missing completely at random (MCAR) test for missing data (Little, 1988). Little's test was not significant ($p = .298$), indicating MCAR data. Given the low number of missing entries, we followed the recommendations of Meyers et al (2017) by using listwise deletion where applicable. All analyses were performed with IBM SPSS Statistics version 29.0.2.0.

RESULTS

A total of 165 first responders participated in this study (approximate response rate of 14%). Of these, 51 were firefighters, 91 were paramedics, and 23 were firefighter-paramedics. The mean age was 42 (range = 24-68). The majority of first responders were male (70.3%) and had a diploma or higher level of education (50.9%). The remaining sample had either a certificate or completed high school (49.1%).

ANOVA testing showed that firefighter-paramedics did not differ from firefighters in terms of individualizing moral foundations (Ms = 38.00 vs. 37.43, $p = .78$), binding moral foundations (Ms = 48.52 vs. 48.47, $p = .987$), gender (Ms = 1.00 vs. 1.21, $p = .11$), or education (Ms = 2.64 vs. 2.83, $p = .50$). Similarly, firefighter-paramedics did not differ from paramedics regarding individualizing moral foundations (Ms = 38.00 vs. 40.65, $p = .16$), or education (Ms = 2.64 vs. 3.03, $p = .14$). However, firefighter-paramedics had signifi-

cantly higher binding moral foundations than paramedics (Ms = 48.52 vs. 41.10, p < .001), and a greater proportion were males (Ms = 1.00 vs. 1.40, p = .001). Thus, we classified firefighter-paramedics as firefighters for all subsequent analyses, driven largely by their similar scores on binding moral foundations. Firefighter-paramedics were significantly younger (M = 35.52) than both firefighters (M = 40.15, p = .02) and paramedics (M = 47.88, p < .001).

Correlations (Table 1)

As predicted, first responders' professional designation correlated with their moral foundations, such that paramedics had higher levels of individualizing (r = .19, p < .001), and lower levels of binding (r = -.29, p < .001) moral foundations. In further support of our hypotheses, individualizing moral foundations had a positive association with support for SCS (r = .34, p < .001), whereas binding moral foundations showed a virtually equivalent but opposite relationship (r = -.36, p < .001).

	Variable	1	2	3	4	5	6	7
1.	Age	-						
2.	Gender	.05	-					
3.	Education	.13	.16*	-				
4.	Professional Designation	-.20*	.24*	.12	-			
5.	Individualizing Foundations	-.13	-.07	-.09*	.19*	-		
6.	Binding Foundations	.06*	-.21*	-.13	-.29*	.14	-	
7.	Support for Supervised Consumptions Services (SCS)	-.23*	.04	-.05	.31*	.34*	-.36*	-
	M	41.72	1.29	2.92	.55	39.28	44.41	3.17
	SD	9.08	.53	1.12	.50	8.22	12.92	1.61

Note: Correlations were calculated using pairwise deletion N range = 155-161. Firefighters coded as 0, paramedics coded as 1. Males coded as 1, females coded as 2.

** p < .05 (two-tailed tests).*

Table 1. Zero-order correlations of study variables.

Mediation Models (Table 2, Figures 1 & 2)

In support of our hypotheses [$H_{2\text{-}4}$], we found that the designation of paramedic (vs. firefighter) predicted an increase in individualizing moral foundations [β = .40, p = .020, 95% CI = .063 to .729] and a decrease in binding moral foundations [β = -.51, p = .002, 95% CI = -.834, to -.183]. In turn, individualizing moral foundations predicted higher levels of support for SCS [β = .51, p < .001, 95% CI = .281 to .735] and binding moral foundations predicted lower levels of support for SCS [β = -.65, p < .001, 95% CI = -.834, to -.183]. Accordingly, the indirect association with being a paramedic (vs. firefighter) through individualizing moral foundations was significant in a positive direction [β = .20, 95% CI = .250 to.841], as was the indirect relationship through binding moral foundations [β = .33, 95% CI = .128 to .607]. Contrary to our hypothesis [H_1], the direct predictive effect of professional designation was not significant [β = .37, p = .134, 95% CI = -.117 to .863].

An additional logistic regression model using the transformed dichotomous measure of support (vs. opposition) to SCS replicated our first model, with stronger results. Specifically, being a paramedic (vs. firefighter) predicted higher individualizing moral foundations [β = .51, p = .005, 95% CI = .157 to .855], and lower binding moral foundations [β = -.51, p = .005, 95% CI = -.851, to -.152]. These foundations predicted increased odds of supporting SCS [OR = 2.19, p = .002, 95% CI = 1.378 to 3.509], and decreased odds of supporting SCS [OR = 0.38, p = .002, 95% CI = .237 to .620], respectively. In accordance with the first model, the indirect relationships between professional designation (paramedic vs. firefighter) through individualizing and binding moral foundations both significant-

ly predicted increased odds for support of SCS [OR = 1.49, 95% CI = 1.048 to 2.476; OR = 1.62, 95% CI = 1.176 to 3.055, respectively]. Once again, professional designation did not have a significant direct predictive effect on support for SCS [OR = 2.34, 95% CI = .959 to 5.725].

Exploratory Mediation Models

To further explore unique characteristics associated with first responders' professional designation, we tested supplemental parallel OLS and logistic parallel mediation models that examined firefighter-paramedics as a separate independent group. Results remained consistent in models examining potential differences between paramedics and firefighter-paramedics; paramedics were predicted to have higher individualizing moral foundations, and lower binding moral foundations relative to firefighter-paramedics. Firefighters were predicted to have slightly higher levels of both individualizing and binding moral foundations relative to firefighter-paramedics. These relationships were not statistically significant, likely due to the decrease in statistical power caused by the substantial reduction in sample size.

DISCUSSION

This study examined the attitudes of firefighters and paramedics in a mid-size Canadian city toward SCS, and the relationships between these attitudes and moral foundations. We found that paramedics had higher levels of individualizing moral foundations, and lower levels of binding moral foundations relative to firefighters. The magnitude of these associations was substantial, with paramedics (vs. firefighters) predicted to have one-half of a standard deviation difference for both categories of moral foundations. Similarly, a

Predictor variable	**Individualizing Foundations**		**Binding Foundations**		**Support for SCS (Continuous)**	
	β	95% CI	β	95% CI	β	95% CI
Age	-.07	-.229, .092	.03	-.131, .183	-.21	-.434, .015
Gender	-.20	-.497, .106	-.26	-.552, .038	-.10	-.525, .327
Education	-.08	-.222, .060	-.07	-.203, .072	-.08	-.279, .116
Professional Designation	.40*	.063, .729	-.51*	-.834, -.183	.37	-.117, .863
Individualizing Foundations	-	-	-	-	.51*	.281, .735
Binding Foundations	-	-	-	-	-.65*	-.887, -.423
R2	.06		.12		.33	
Predictor variable	**Individualizing Foundations**		**Binding Foundations**		**Support for SCS (Dichotomous)**	
	β	*95% CI*	β	*95% CI*	*OR*	*95% CI*
Age	-.07	-.235, .093	.04	-.126, .203	0.70	.464, 1.066
Gender	-.20	-.521, .115	-.20	-.516, .121	0.74	.275, 2.021
Education	-.12	-.267, .033	-.09	-.241, .060	0.88	.600, 1.276
Professional Designation	.51*	.157, .855	-.50*	-.851, -.152	2.34	.959, 5.725
Individualizing Foundations	-	-	-	-	2.19*	1.378, 3.509
Binding Foundations	-	-	-	-	0.38*	.237, .620
R2	.09		.11		.38	

Note: SCS = Supervised Consumption Services; CI = confidence interval; OR = odds ratio. N = 155 (top); N = 140 (bottom). Firefighters coded as 0, paramedics coded as 1. Males coded as 1, females coded as 2. The standardized results presented above the dividing line modeled support for SCS as a continuous variable; the standardized results presented below the dividing line modeled support for SCS as a dichotomous variable (support vs. oppose).

** p < .05 (two-tailed tests).*

Table 2. Regression coefficients for mediation models.

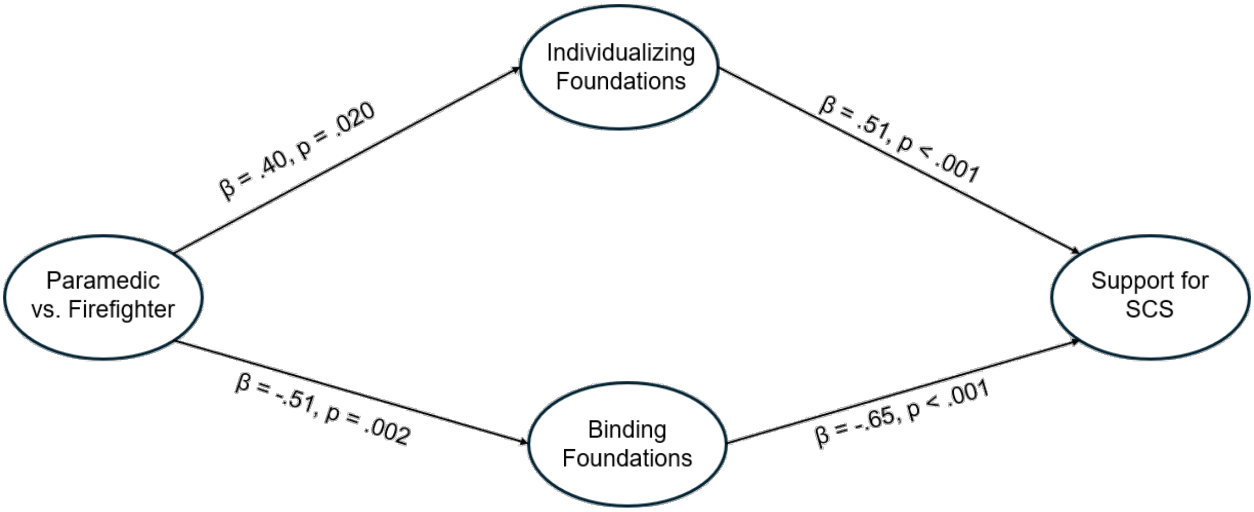


Figure 1. Relationships between professional designation, moral foundations, and attitudes towards SCS (continuous).

Note: Firefighters coded as 0, paramedics coded as 1. Estimates obtained from a regression-based parallel mediation model with 95% bootstrapped confidence intervals. Bootstrap N = 5,000. Figure 1 presents support for SCS as a continuous variable (N = 155). Gender, age, and education were included as covariates for all outcomes. The slopes showing relationships between professional designation and moral foundations are presented in a partially standardized metric demonstrating predicted differences in moral foundations for paramedics relative to firefighters. The slopes showing relationships between moral foundations and support for SCS are presented in a fully standardized metric.

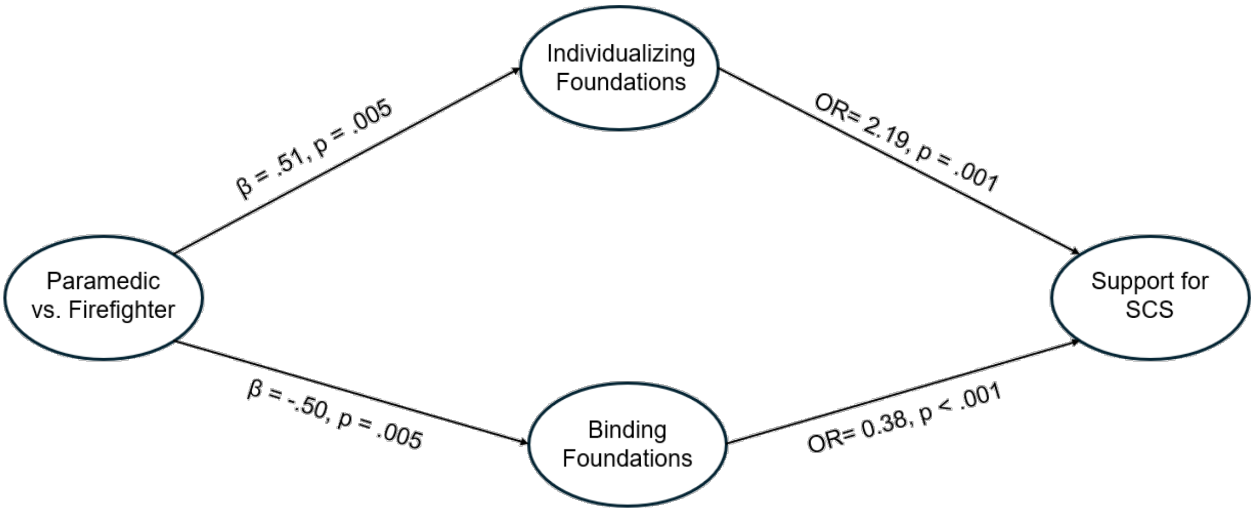


Figure 2. Relationships between professional designation, moral foundations, and attitudes towards SCS (dichotomous).

Note: OR = odds ratio; firefighters coded as 0, paramedics coded as 1. Estimates obtained from a regression-based parallel mediation model with 95% bootstrapped confidence intervals. Bootstrap N = 5,000. Figure 2 presents support for SCS as a dichotomous variable (N = 140). Gender, age, and education were included as covariates for all outcomes. The slopes showing relationships between professional designation and moral foundations are presented in a partially standardized metric demonstrating predicted differences in moral foundations for paramedics relative to firefighters. The slopes showing relationships between moral foundations and support for SCS are presented in a partially standardized odds ratio metric.

one standard deviation increase in individualizing moral foundations predicted a one-half standard deviation increase in support for SCS, while a one standard deviation increase in binding moral foundations predicted a reduction in support for SCS by nearly two-thirds of a standard deviation.

These effect sizes became more noteworthy when support for SCS was transformed into a dichotomous (support vs. oppose) variable. This mediation model showed that a one standard deviation increase in individualizing moral foundations predicted an increase of 119% in the odds of supporting SCS, while a one standardized unit increase in binding moral foundations predicted a decrease of 62% in the odds of supporting SCS. It is important to note that removing responses of 'neither oppose nor support' for the logistic regression model enhanced the strength of results by pushing responses toward their respective extremes. However, the results of both models are consistent in showing that there may be large and meaningful differences between firefighters and paramedics in terms of their moral foundations, which in turn are strong predictors of support for SCS.

Further, while those in the combined role of firefighter-paramedics resemble paramedics in terms of individualizing moral foundations, we found a large difference in binding moral foundations, indicating that moral foundations among firefighter-paramedics more closely resemble firefighters. The similarities between firefighters and firefighter-paramedics in their moral foundations align with the organizational and operational divisions within the workplace. However, this is a novel finding that future studies should investigate. This will help to determine if our findings represent firefighter-paramedics in general, or if they are an artifact of our relatively small and localized sample.

Among prior related research, a systematic review of stakeholder perceptions of SCS included representation from EMS and fire agencies (Lange & Bach-Mortensen, 2019). This review documented ambivalent attitudes towards SCS, describing perceptions of both benefit and harm. It also noted misconceptions about SCS that persisted within those groups, as well as the importance of language in how goals are communicated to stakeholders (Lange & Bach-Mortensen, 2019), confirming the importance not only of stakeholder opinion, but also underlying attitudes in shaping perceptions. Among research directly involving firefighters and paramedics, an earlier study by Pennington et al. (2021) surveyed firefighter-emergency medical responders on their perspectives on working near SCS facilities in Vancouver, British Columbia. Among four themes identified in the qualitative portion of the survey, a "sense of duty" appeared in over 35% of responses. A more recent study described the views of emergency service providers (68% of whom were firefighters or paramedics) towards SCS implementation (Perlmutter et al., 2023). This study identified three themes that express concerns over safety, perceptions of alternative strategies for managing substance use in the community, and the appropriate use of emergency services (Perlmutter et al., 2023). While neither of these studies is directly aligned with MFT, their findings can be seen to reflect the characteristics primarily of binding moral foundations as concerned with the safety, order, and health of the community and/or group.

A recent study by Pijl et al. (2025) helps to contextualize our findings regarding first responders' levels of moral foundations. The authors found that among the general population of the Canadian prairie provinces average levels of individualizing moral foun-

dations (M = 41.5) were comparable to both firefighters (M = 37.7) and paramedics (M = 40.7). However, like firefighters (M = 48.5), the general population's binding moral foundations (M = 47.4) were considerably higher than paramedics' (M = 41.1). This study provides additional evidence suggesting that paramedics may have lower average levels of binding moral foundations and higher average levels of support for SCS relative to other relevant populations. These differences may be due, in part, to factors such as workplace culture, training, leadership messaging, call types, or previous experience with SCS. In the context of existing research and ongoing policy debate that involves paramedics and firefighters as professional stakeholders, the findings of this study focus on underlying moral attitudes to offer a path to dialogue that addresses foundational beliefs.

LIMITATIONS AND FUTURE DIRECTIONS

This study used a cross-sectional design with no experimental manipulation. As such, it does not allow for causal inference regarding the relationships between first responders' moral foundations and their support for SCS. This notwithstanding, our correlational models are appropriate for examining the role of moral foundations as mediators. Theoretically, moral foundations develop early in life and are thus considered to have temporal precedence over most observed behaviors and attitudes (Graham et al., 2013). However, studies demonstrate that models examining moral foundations as mediators are valid for investigating different patterns of relationships, rather than establishing causal pathways (Baldner & Pierro, 2019; Giacomantonio et al., 2017; Lasaleta et al., 2024).

Additionally, although the survey included items designed to eliminate repeat survey risk, it is possible that one or more first responders may have taken the survey twice. However, this risk is minimal given the survey safeguards, and the length of the survey relative to the potential compensation. Another limitation pertains to how our convenience sample of one agency in one location may not accurately represent the characteristics of the whole population, including the wider population of first responders in Canada or North America. We also did not recruit any police officers for this study, who represent another critical component of the first responder population. First responder role was also not further characterized outside of paramedic, firefighter, and cross trained paramedic-firefighter.

Identifying the moral foundations of a subset of paramedics who work primarily in non-urgent roles focused on preventative medicine and follow-up (termed community paramedics) would provide a more comprehensive understanding of front-line attitudes towards SCS. Given community paramedicine's role in the overall EMS system and given the findings of the current study, the attitudes of community paramedics towards SCS would be expected to represent a strong advocacy point for SCS concept and operationalization. Further research with a large sample size comprising different types of first responders in assessing role-specific findings is warranted. It is also worth noting that, at the time of publication, there is not a currently operating SCS in the community where the study population works. Future research investigating how proximity to an existing SCS may impact the attitudes and beliefs about SCS among first responders and the public, would help to clarify the findings of the current study. For example, first responders' attitudes towards SCS may change depending on whether they are strictly conceptual, or if they are based upon their actual experience working in a community with an SCS.

CONCLUSION

Overdose deaths doubled between 2019 and 2020 in Manitoba and rates continue to rise further (Coubrough, 2021). Effective evidence-based strategies such as SCS are urgently needed to curb mortality and morbidity. Support for SCS from public sector professionals, such as firefighters and paramedics, is critical to effectively implementing these services.

By understanding the moral foundations that inform attitudes towards SCS, we can engage in more meaningful, authentic, and productive dialogue (Alderman et al., 2010). In a social context increasingly characterized by rising human needs and widening ideological polarization, novel interdisciplinary insights are needed to empower public discourse to explore the middle ground (Mills, 2023). Establishing new ways to explore differences of opinion regarding SCS is the first step towards fruitful discourse and enhanced service provision. For example, our findings suggest that addressing the morality-based concerns of those who oppose SCS may be a productive avenue for building cooperation and enacting policy. These concerns may include issues pertaining to security, cleanliness, proximity to schools and community centers, and the provision of addiction treatments, among others.

This study builds an understanding of the factors that predict attitudes and perceptions of SCS among first responders in terms of moral foundations. As few studies have addressed the interface of first responders and SCS in Canada (and none in Manitoba), the current findings contribute to the literature on SCS by deepening an understanding of the overlap between both kinds of services (first responders and SCS), and how the perspectives of first responders may affect the linkage between points of care. These findings can inform researchers, policymakers, and decision-makers in developing strategies to consider first responders as essential stakeholders in implementing and accepting SCS in Manitoba.

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RESEARCH REPORTS

SELF-REPORTED ADHD IN A CONVENIENCE SAMPLE OF EMS CLINICIANS

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ABSTRACT

Background: ADHD is a neurobehavioral disorder marked by challenges with attention, hyperactivity, and/or impulsivity, often impairing functioning across academic, occupational, and social domains. While ADHD affects approximately 5% of children and 2.5% of adults, recent research suggests that this decline in prevalence may not reflect true symptom remission but the freedom to gravitate toward novel, fast-paced environments—such as emergency medical services (EMS)-where previously inhibiting traits promote success. This study examines the prevalence of ADHD traits within the EMS workforce.

Methods: This cross-sectional, descriptive study received prospective IRB review and exemption. Participants included EMS professionals who completed an anonymous online survey consisting of a demographic questionnaire and the Wender Utah Rating Scale (WURS-45), a validated retrospective self-report instrument for recalling childhood symptoms, behaviors, and traits associated with ADHD. The WURS-45 includes the WURS-25 core items and additional factor items to generate fitted diagnostic values. The survey was administered via Microsoft Forms and distributed through social media and email lists from February 2 to February 24, 2025.

Results: A total of 554 respondents met inclusion criteria. Of the full non-probability sample, 322 (58%) reported a formal ADHD diagnosis, while 145 (26%) reported no formal psychiatric diagnosis. Based on WURS-25 scoring, 338 of 554 participants (61%) scored above the clinical cutoff of 30. Linear and multivariate regression analyses were conducted to determine if relationships existed between ADHD-indicators (formal diagnosis and/or positive screening) and (1) the number of barriers to completing EMS education and (2) the highest level of EMS certification attained. Although individuals with formal ADHD diagnosis and/or a positive screening experienced statistically more barriers to EMS attainment, no statistically significant relationship existed between a positive diagnosis/screening and EMS certification achievement.

Conclusions: The prevalence of ADHD traits in this EMS sample far exceeds that of the general adult population. However, neither a formal ADHD diagnosis nor elevated WURS-25 scores predicted lower EMS educational outcomes.

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is a commonly diagnosed neurobehavioral life span disorder associated with challenges with attention, hyperactivity, and/or impulsivity (American Psychiatric Association, 2013). An ADHD brain has fewer dopamine receptors in the reward center than a neuro-

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typical brain, making daily routine under-stimulating and often leaving the individuals seeking novel, dynamic, and unpredictable experiences (Friedman, 2014; Moëll et al., 2015). Clinically, ADHD is associated with comorbid psychiatric disorders, including anxiety, depression, substance abuse disorder (SUD), and posttraumatic stress disorder (PTSD), which may complicate diagnosis and/or treatment (Howlett et al., 2018; Mohammadi et al., 2021).

ADHD impacts an estimated 5% of children and impairs daily functioning across multiple settings, including academic, occupational, and social environments, with up to 70% of individuals reporting persistent challenges (Cortese et al., 2023; London & Landes, 2022; Varrasi et al., 2022). Although it is generally believed that adult ADHD is less prevalent due to symptom improvement or resolution (London & Landes, 2022), a recent systematic review and meta-analysis of global data estimate the prevalence of persistent adult ADHD and symptomatic ADHD to be 2.58% and 6.76%, respectively (Song et al., 2021).

Research investigating the phenomenon behind how individuals "grow out" of their ADHD symptoms suggests that the freedom of adulthood allows young adults to pursue opportunities best suited to their interests, compensatory strategies, and neurodiverse strengths (Lasky et al., 2016; Sedgwick et al., 2019). In the correct environment, childhood symptoms previously labeled as undesirable "weaknesses" are reframed as skills and strengths, such as pattern recognition, working well under pressure, creative problem solving, hands-on skills, and hyperfocus (Friedman, 2014; Johnson & Ahluwalia, 2025; Lasky et al., 2016; Sedgwick et al., 2019; Taylor et al., 2024). The dynamic, unpredictable nature of the prehospital setting may be highly appealing for individuals with ADHD, but despite the inherent qualities of this occupational environment, there is a lack of information regarding rates of ADHD in the emergency medical services (EMS) workforce. However, the literature does support that EMS personnel experience mental health conditions, such as anxiety, depression, PTSD, and SUD, at rates far exceeding that of the general population (Alzahrani et al., 2025; Hruska & Barduhn, 2021; Morrison et al., 2021; Petrie et al., 2018; Wagner et al., 2020).

The purpose of this study was to quantify the frequency of EMS clinicians in a convenience sample who self-report and/or screen positive for ADHD on a validated instrument. The secondary aim was to explore relationships between ADHD indicators and educational outcomes. Symptomatology associated with ADHD can create unique challenges for EMS professionals, including, but not limited to, difficulties attaining desired learning outcomes, obstacles to ongoing career development, development of mental health comorbidities, and persistent burnout. Better understanding the frequency of ADHD in this population and the relationships between ADHD-related indicators and educational outcomes can better inform program design to support learning and mental health needs.

METHODS

Study Design and Setting

This study employed a cross-sectional, descriptive research design, which received prospective IRB determination of exemption before data collection. EMS professionals were recruited via social media posts and email distribution lists. Respondents completed

an online questionnaire hosted in Microsoft Forms between February 2 and February 24, 2025. The questionnaire included a demographic survey and the 45-item Wender Utah Rating Scale (WURS-45), a validated screening tool described below. The online questionnaire did not employ forced-response items; participants were allowed to skip any question they did not wish to answer. As a result, item-level sample sizes may vary across variables. In addition, participants were provided with space to add free text comments if desired.

Measures

Demographic Survey

The demographic survey consisted of 15 items and collected information regarding age, ethnicity, EMS level attained, traditional educational level attained, diagnoses (before age 18, after age 18, after starting EMS), and compliance with prescribed therapies (if any).

The final item on the survey asked participants to describe the obstacles they experienced while completing their EMS education by selecting all applicable options from a list of nine potential barriers.

Wender Utah Rating Scale (WURS)-45

The WURS-45 is a 45-item retrospective self-report instrument used to assess childhood symptoms of ADHD and persistence into adulthood (Gift et al., 2021; Reimherr et al., 2021; Reimherr, 2022). Each item is rated on a 5-point Likert scale from zero ("Not at all or very slightly") to four ("Very much"). Responses to these 45 items are then calculated to produce six scores: a raw score calculated by adding the values from the 25 items that comprise the WURS-25, and five factor scores–Disruptive Mood/Behavior, ADHD, Academic, Social, and Anxiety/Dysphoria.

WURS-25 scores of 30 or higher most accurately identify ADHD in community samples (sensitivity = 91%, specificity = 92%, PPV = 93%, NPV = 90%). In clinical settings, scores of 46 or higher perform best (sensitivity = 62%, specificity = 86%, PPV = 72%, NPV = 79%). Cross-referencing calculated factor scores substantially improves accuracy by more effectively differentiating ADHD from major depressive disorder (MDD) and generalized anxiety disorder (GAD). In community settings, this method yields a sensitivity of 92%, a specificity of 89%, a positive predictive value of 89%, and a negative predictive value of 90%. In clinical settings, the corresponding indices are as follows: sensitivity = 80%, specificity = 93%, positive predictive value = 87%, and negative predictive value = 89%.

RESULTS

Descriptive Analysis

Demographics

Five hundred fifty-four respondents met the inclusion criteria–279 (50%) males, 273 (49%) females, and 2 (0.3%) individuals who chose "other" or declined to respond. The average age of respondents was 52. As seen in Figure 1, participants self-reported as identifying as the following ethnic backgrounds: 496 (89.5%) White, 18 (3.2%) Hispanic, 1 (0.1%) Black, 4 (0.7%) Asian, 3 (0.5%) American Indian or Alaska Native, and 28 (5%) Bi- or Multi-racial.

Regarding traditional education, respondents were asked to share the highest level of traditional education they attained. In the United States, there is no consensus regarding mandating a degree requirement for EMS professionals, and only 23 universities in the United States offer EMS-related degrees (Engel, 2022; National Highway Traffic Safety Administration (NHTSA), 2021). In addition, 32% of American EMS providers reported their highest level of education to be a high school degree (Engel, 2022), which closely aligns with the findings of this study. Participants were relatively evenly distributed between a high school diploma/GED, associate's degree, and bachelor's degree, 158 (28.5%), 184 (33.2%), and 132 (23.8%), respectively, while 66 (11.9%) held a master's degree, and 14 (2.5%) obtained a doctorate. Participants were not asked to share their academic major or degree history; therefore, it is unknown how many had completed an associate's or bachelor's degree prior to obtaining their EMS certification.

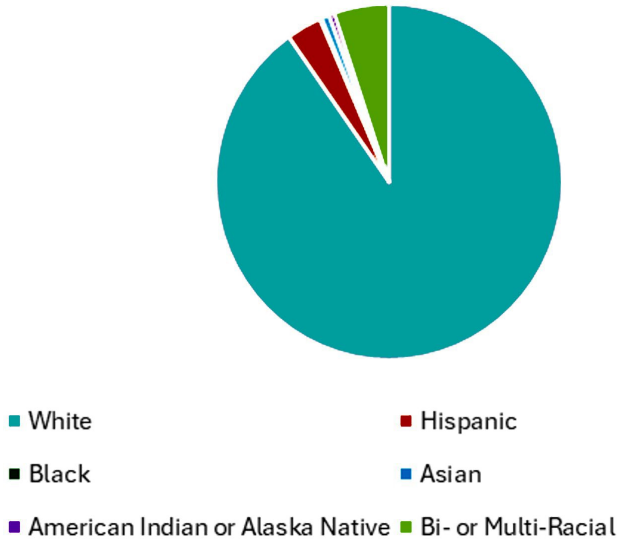


Figure 1. Ethnic background.

Of respondents who reported holding a master's degree or a doctorate degree, 82.7% were also certified as a paramedic or specialty paramedic (38% female, 60% male). Figure 2 displays the gender breakdown between each level of traditional education achieved.

Participants were asked to identify the highest level of EMS certification attained: EMT, AEMT, paramedic, or specialty paramedic. In the survey, the term "specialty paramedic" was defined as any EMS-specific certifications that were obtained after paramedic certi-

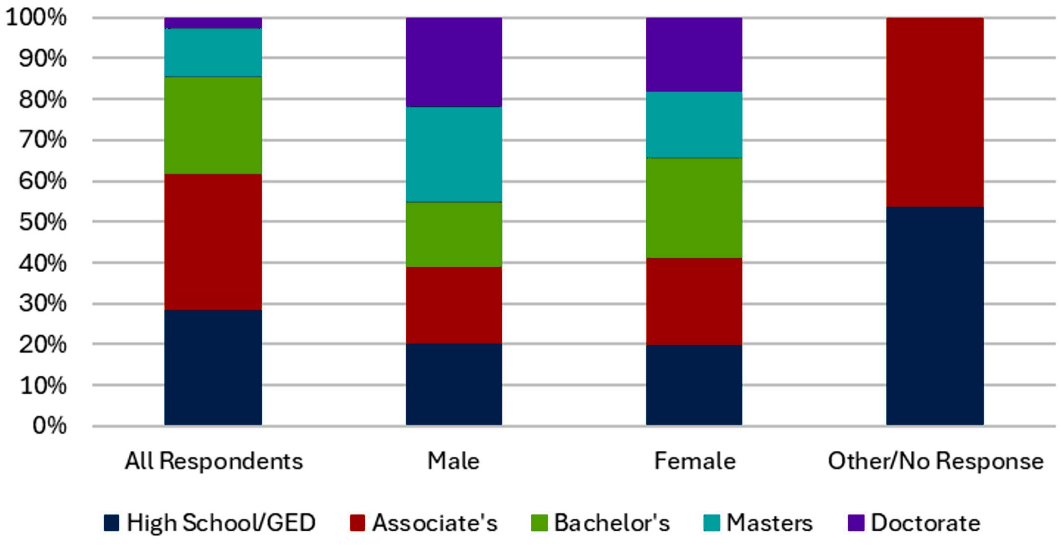


Figure 2. Traditional education levels.

fication, such as critical care, community paramedic, and/or flight paramedic. The majority of respondents (299, 54%) were paramedics; 115 (20.8%) were EMTs, 45 (8.1%) were certified as AEMTs, and 95 (17.1%) obtained specialty paramedic certifications. Figure 3 details the gender breakdown of each certification level.

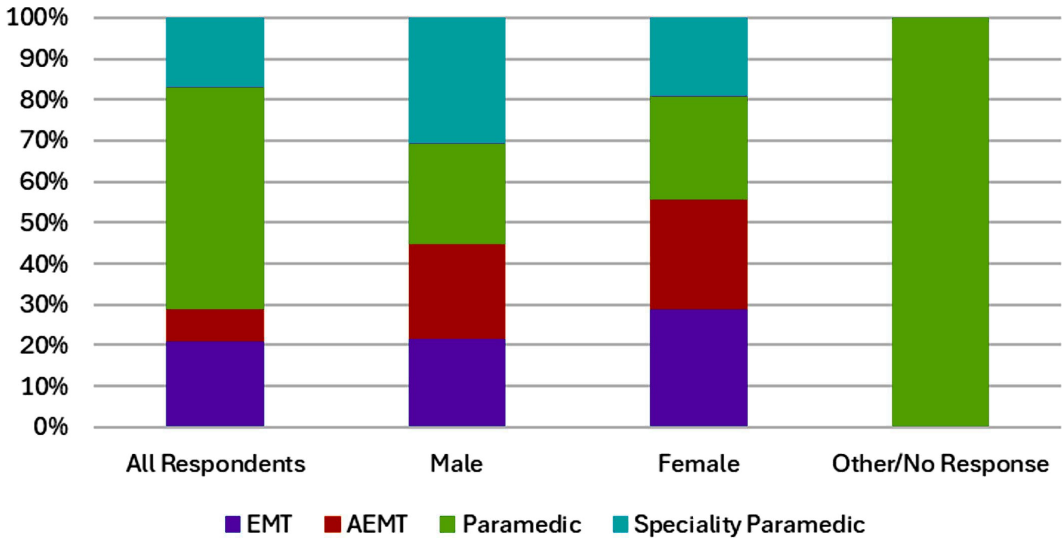


Figure 3. EMS attainment levels.

Self-Reported Challenges to EMS Certification

Respondents were asked to clarify the challenges they experienced while completing their EMS education, with 46% of respondents reporting that they found completing their EMS education to be a challenge. Further clarification was requested regarding the nature of the challenges by asking participants to select all barriers they perceived from a list of 9 options. Respondents were asked to choose from the following barriers:

> *I struggled to allocate appropriate time for studying and completing assignments.*
>
> *I had difficulty remembering important deadlines and exam dates or bringing necessary materials.*
>
> *I experienced challenges in keeping track of study materials, schedules, and certification requirements.*
>
> *I struggled to complete and submit required shift or skills documentation on time.*
>
> *I experienced challenges in maintaining concentration during long training sessions or while studying complex material.*
>
> *I had difficulty absorbing and retaining large amounts of procedural information.*
>
> *I was easily sidetracked during practical training or written exams.*
>
> *I struggled with timed exams or multiple-choice questions due to attention issues.*
>
> *I felt overwhelmed by the certification or performance pressures.*

The primary obstacle experienced by all respondents, regardless of subclassification (i.e., gender, EMS level) was "challenges in maintaining concentration." Difficulty allocating

appropriate time and absorbing information were also frequently selected as major barriers to completing certification. Figure 4 details the frequency of reported barriers.

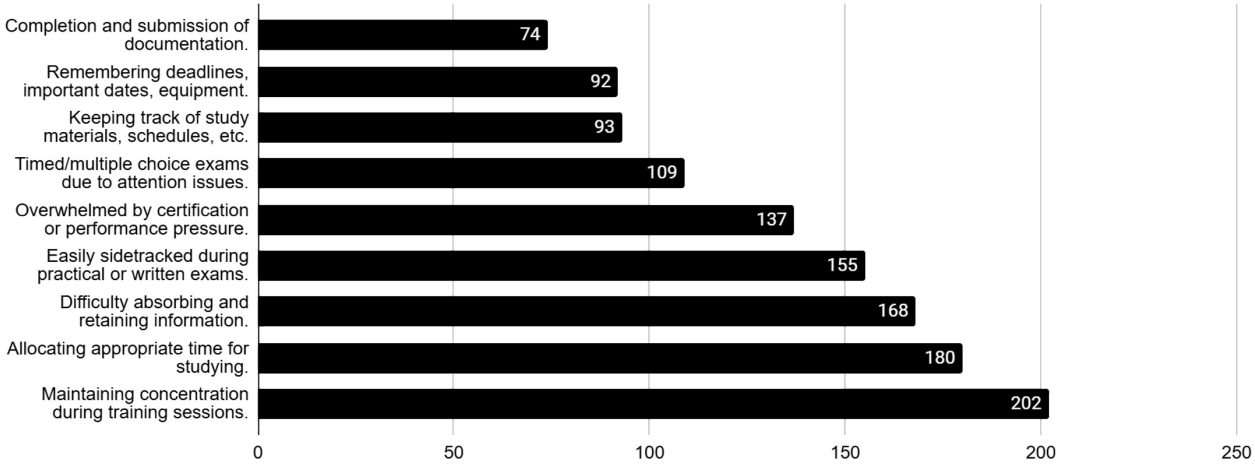


Figure 4. Barriers to EMS education.

On average, respondents experienced 2.1 barriers to completing their EMS education (*SD* = 2.81). When stratified by sex, female respondents reported a slightly higher mean number of barriers (2.24, *SD* = 2.87) than male respondents (2.9, *SD* = 2.75). The large standard deviations in both groups indicate substantial variability in the number of barriers reported by individual participants.

When stratified by timing of ADHD diagnosis, respondents who self-reported an ADHD diagnosis before age 18 reported a mean of 2.8 barriers (*SD* = 2.80), those diagnosed after age 18 reported 2.75 barriers (*SD* = 2.81), and those diagnosed after starting their EMS career reported 2.99 barriers (*SD* =2.81). Subgroup means all exceeded the overall sample mean of 2.1 barriers.

Given the historical perception of ADHD as a male-only disorder (Attoe & Climie, 2023), the sample was also stratified by sex and timing of ADHD diagnosis to determine if female respondents were more significantly impacted by struggles related to under- or later-in-life diagnosis. Of 114 individuals self-reported having a diagnosis of ADHD prior to 18 years old, 66 were female, reporting an average of 2.3 barriers (*SD* = 2.86) and 48 were male, reporting an average of 2.77 barriers (*SD* = 2.72). 208 participants self-reported an ADHD diagnosis after age 18, 106 were female, reporting an average of 2.0 barriers (*SD* = 2.88), and 102 were male, reporting an average of 2.2 barriers (*SD* = 2.75). Of the 184 individuals who self-reported an ADHD diagnosis after starting their EMS career, 100 were female, reporting an average of 2.0 barriers (*SD* = 2.86), and 84 were male, reporting an average of 1.98 barriers (*SD* = 2.75).

Across sex and diagnosis-timing strata, sex differences are small and inconsistent in direction, which does not support the idea that female EMS clinicians are more burdened by educational barriers associated with under- or late-diagnosis. ADHD is linked to more barriers than the general sample and is broadly comparable between genders within each diagnosis-timing group.

Self-Reported Diagnoses

Formal Diagnoses

Respondents were asked to identify if they were ever formally diagnosed with ADHD and/or commonly associated comorbid conditions including autism, dyslexia, dyscalculia, dyspraxia, MDD, GAD, substance use disorder (SUD), and posttraumatic stress disorder (PTSD). Participants were also asked to indicate whether their diagnosis occurred before age 18, after age 18, or after they began their EMS career.

As detailed in Figure 5, 322 (58%) respondents reported a formal ADHD diagnosis and of those participants, 59 reported a formally diagnosed co-morbid condition. No respondents reported a formal diagnosis of MDD, GAD, or PTSD. This finding differs from previously reported prevalence rates in both EMS and ADHD populations (Britt et al., 2016; Howlett et al., 2018; Hruska & Barduhn, 2021; Mohammadi et al., 2021), likely reflecting under-recognition, under-diagnosis, or under-reporting rather than true absence.

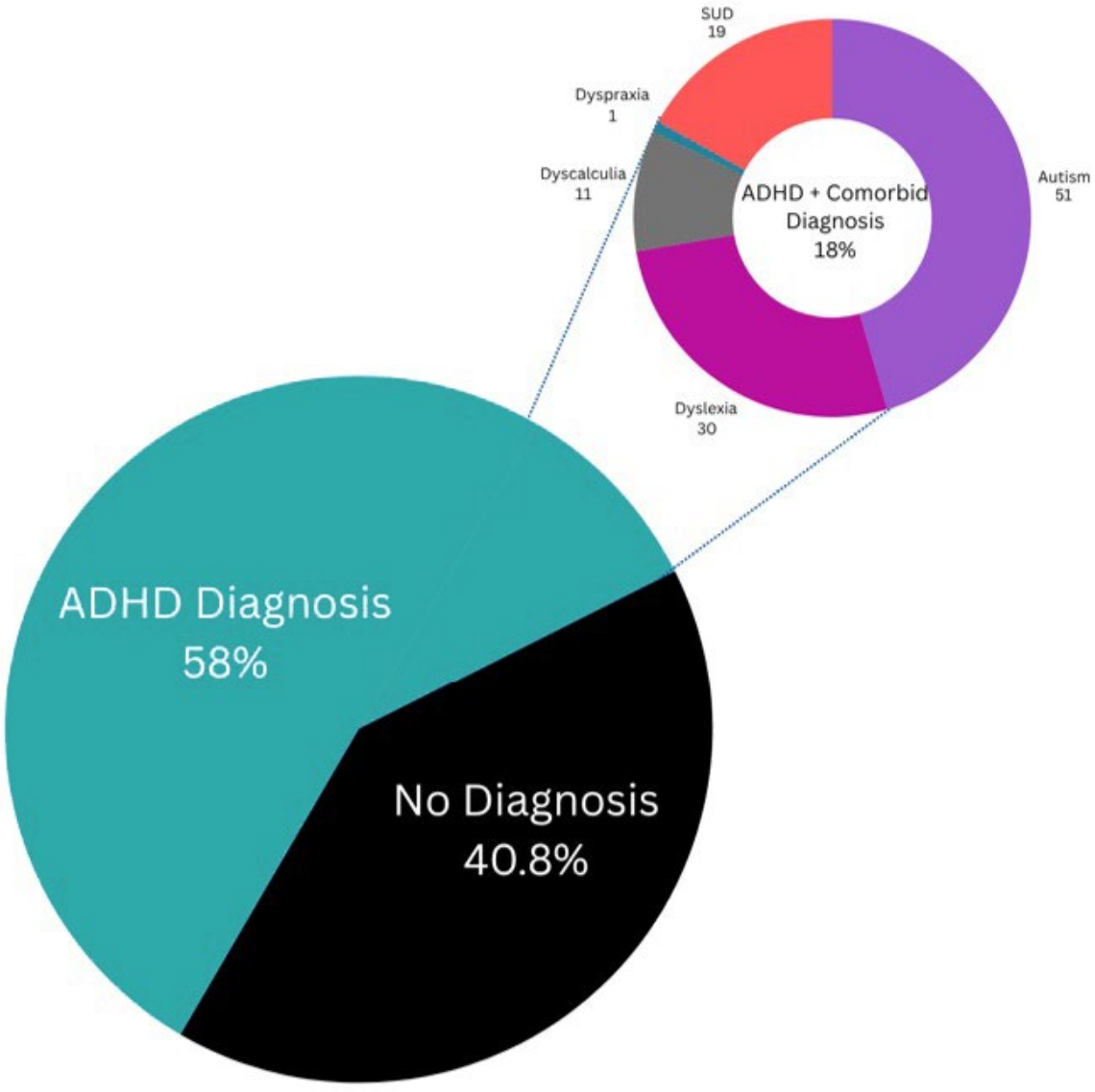


Figure 5. Formal diagnoses.

Treatment

Respondents with formal diagnoses reported adhering to the treatments outlined in Table 1.

Treatment	Before 18	After 18	After Starting EMS Career
Medication	139	269	248
Talk Therapy	85	151	148
CBT	52	91	82
Other/Unspecified	26	32	28
Multiple Therapies	114	220	321

Table 1. Self-reported treatment modalities.

WURS-45 Screening Results

All respondents completed the WURS-45 inventory in full. Responses to the WURS-45 portion of the questionnaire were computed to generate a WURS-25 score and five factor scores by using the equations provided in the Handbook of Utah Scales for the Assessment and Treatment of ADHD in Adults, version 1 (Reimherr, 2022).

WURS-25 Screening

To classify screen-positive results, WURS-25 scores were analyzed using the pre-specified published community-setting cut-point of 30. Although no respondents self-reported formal MDD, GAD, or PTSD diagnoses, given the inherent nature and risk of EMS work, the existence of unrecognized or undiagnosed comorbid psychiatric concerns is statistically more likely (Britt et al., 2016; Hruska & Barduhn, 2021). Therefore, to increase sensitivity of the screening, the population was further stratified using the clinical setting cut point of 46.

Of respondents, 338 (61%) scored above the clinical cut-off of 30. Of those 338 participants scoring above 30, 186 participants scored 46 or higher representing 57% of the positive screening group and 33.6% of the cohort.

WURS-45 Factor Score Screening

The strength of the WURS-45 is the ability to calculate fitted "factor scores" to distinguish ADHD from confounding psychiatric diagnoses such as MDD and GAD. This is particularly useful in individuals who screened positive but scored less than 46 on the WURS-25 component of the inventory (Reimherr et al., 2021; Reimherr, 2022). Factor scores greater than 2 indicate an area of concern requiring further investigation (Reimherr, 2022). Factor scores were analyzed and cross-referenced for additional insight, as outlined in Table 2.

All 26 respondents had a WURS-25 score above 30, and 23 scored above 46. Within this subgroup, 100% had positive ADHD and Anxiety/Dysthymia factor scores; 16 (61.5%) respondents had positive Disruptive Mood/Behavior factor scores; and 18 (69%) had positive Academic factor scores. Of the full cohort, 26 (4.5%) individuals screened positive for a possible comorbid diagnosis of MDD or GAD. None of the respondents had a positive Social factor screening.

Factor	Number of Respondents with Positive Factor Score (>2) Stratified by WURS-25 Score		
	Total Cohort (n=554)	30-45 (n=152)	46+ (n=186)
Disruptive Mood/Behavior	71 (19%)	2	69
ADHD	178	52	118
Academic	84 (15%)	23	55
Social	11 (2%)	6	5
Anxiety/Dysthymia	148	38	103

Table 2. Cross-referenced WURS-25 screen & positive factor score.

Additionally, 8 individuals (6 female, 2 male) had a negative WURS-25 screen but a positive ADHD factor score. Of these, three had a formal ADHD diagnosis and reported adherence to at least one therapeutic intervention.

Statistical Analysis

Descriptive statistics were calculated to summarize participant characteristics and key study variables for the full sample and, where relevant, stratified by sex and by level of EMS certification. Linear and multivariate regression analyses were conducted to identify if any relationships existed between positive ADHD diagnosis and/or screening and EMS certification achievement. Linear and multivariate regression analyses were also conducted to identify if any relationships existed between positive ADHD diagnosis and/or screening and the number of barriers to EMS certification experienced.

Inferential Statistics

Analyses revealed no statistically significant relationships between ADHD indicators and EMS certification achievement. Although individuals with higher WURS-25 scores reported a greater number of perceived barriers to EMS certification attainment (r = 0.312), no statistically significant relationship exists between the number of barriers experienced and the level of EMS certification achieved (R^2 = 0.002, p = 0.297).

DISCUSSION

In this convenience sample of EMS clinicians, 58% of respondents reported a formal ADHD diagnosis, and 61% screened positive on the WURS-25 using the community cut-point of 30. These proportions are dramatically higher than published estimates of persistent and symptomatic adult ADHD in the general population of 2.6% and 6.8%, respectively (Song et al., 2021). The observed difference likely reflects a combination of factors rather than a true 10- to 20-fold elevation in prevalence. First, topic-aware, self-selected recruitment may have preferentially attracted EMS clinicians with prior diagnosis or heightened interest in ADHD. Second, EMS work may genuinely appeal to individuals with ADHD traits, given its novelty, time pressure, and need for rapid problem-solving, concentrating neurodivergent professionals within this workforce. Third, increasing awareness and destigmatization of ADHD in adulthood may lead to higher rates of diagnosis among EMS clinicians. Given the older average age of the cohort (52), and the higher number of respondents diagnosed after age 18 (208), it is most likely that neurodivergent individuals entered the EMS occupation prior to official diagnosis. Accordingly, these findings should be interpreted as descriptive of this sample rather than as representative of prevalence estimates for the broader EMS workforce.

Lack of awareness of the prevalence of ADHD in the EMS population creates a synergistic effect in two pre-existing gaps: unsatisfactory preparation for EMS educators in accommodating neurodiverse students and inadequate mental health resources for EMS providers. People with ADHD typically possess skills that make them well-suited for EMS work, such as high-level problem-solving, creative and innovative thought processes, empathy, and excelling in chaotic and novel environments (Johnson & Ahluwalia, 2025). However, failure to acknowledge and cultivate these unique strengths is a missed opportunity to improve instructional methods and incorporate additional mental health training in EMS curricula.

Sex Differences

This study included approximately equal numbers of male and female EMS clinicians, allowing for basic sex-stratified descriptive comparisons. Female respondents reported a slightly higher mean number of perceived educational barriers than male respondents; however, in regression models, sex was not significantly associated with the highest level of EMS certification attained. While these exploratory findings suggest potential sex-related differences in perceived challenges during EMS education, they do not indicate a sex-related disadvantage in ultimate certification achievement. Future studies with larger, probability-based samples and prespecified hypotheses should further investigate how sex and gender may interact with ADHD symptomology and/or timing of ADHD diagnosis and educational experiences in EMS training programs.

EMS Education

The 2021 National Education Standards indicate that the requirement for EMS educators is to "have a proper background, relevant knowledge and a degree or recognized and credible credential in the topic" (NHTSA, 2021). In a vast majority of EMS programs in the United States, providers are often educated and certified outside of the traditional higher education system by educators with little to no postsecondary education or formal qualifications in teaching or education (National EMS Advisory Council (NEMSAC), 2016; NHTSA, 2021). Many EMS educators do not have formal qualifications in teaching or education beyond state requirements to attain an instructor certification. The National Association of State EMS Officials' (NASEMSO) standards for educators require only that educators have a high school diploma and are certified to the EMS level (i.e., EMT, paramedic) to which they are teaching (National Association of State EMS Officials, 2010). This may result in educators failing to recognize students with ADHD, and struggling to implement evidence-based teaching strategies or classroom management techniques better suited for neurodivergent students (Bailey et al., 2024).

Specific educator training on ADHD is an important component of influencing the frequency of applying effective classroom management techniques (Szép et al., 2021). Providing EMS educators with additional training and resources to manage a neurodiverse classroom may improve learning outcomes and provide long term benefits for EMS professionals. Current EMS instructional strategies may not be well-suited to the learning needs of individuals with ADHD. As supported by this study, respondents found many of the prevalent learning modalities to hinder their success, finding it challenging to sit for long lectures, prepare for frequent testing, absorb large quantities of knowledge in a short period of time, and complete self-directed learning (such as textbook reading).

Modifying classrooms to include more neurodiverse-informed learning strategies not only accommodates students with ADHD but may optimize learning outcomes for all students. Generalizable approaches, such as emphasizing organizational skills (i.e., interactive class calendars, detailed syllabus, digital reminders), active learning techniques (i.e., hands-on, simulation, group work), gamification of the classroom, and computer-aided instruction can help calibrate learning, improve executive functioning, and help trigger the neurological reward circuits to drive engagement and improve student outcomes (Friedman, 2014; Lasky et al., 2016). In addition, initiatives such as mindfulness training can also benefit all EMS professionals, regardless of neurodivergence, as it helps

improve inattention, emotional regulation, hyperactivity, working memory, cognitive inhibition, impulsivity, and performance monitoring.

It is important to distinguish between educational attainment and clinical performance. Our findings demonstrate that neither a formal ADHD diagnosis nor an elevated WURS-25 score was associated with lower EMS certification levels; however, we did not evaluate on-the-job performance, quality of care, or patient outcomes. No inferences can be drawn from this study regarding how ADHD traits may affect day-to-day clinical performance. Future research incorporating objective performance metrics is needed to examine potential relationships between ADHD symptomatology, educational experiences, and quality of work in the field.

Mental Health Outcomes

Despite research exploring various protective factors that EMS professionals exhibit against developing PTSD, psychological impairments amongst this population are significantly higher than the general population (Brooks & Brooks, 2021; Hruska & Barduhn, 2021). Previous studies determined the prevalence of PTSD in ambulance personnel to be approximately 11% as compared to 3.5% as seen across the general population of the United States and 1.1% internationally (Petrie et al., 2018). The EMS population also has a higher-than-average prevalence of anxiety (15%), depression (15%), and general psychological distress (27%) than the general American population (Petrie et al., 2018).

Neurodivergence, specifically ADHD, is closely associated with other psychiatric comorbidities such as anxiety disorders, depression, and substance abuse (Johnson & Ahluwalia, 2025; Mohammadi et al., 2021). In a longitudinal study of American soldiers, it was determined that soldiers with ADHD are more likely to experience anxiety and depression, developing PTSD post-deployment (Howlett et al., 2018). Like the armed services, EMS is a profession with an above-average risk profile for mental health struggles including anxiety, depression, and PTSD due to the high potential for consistent exposure to traumatic stressors (Britt et al., 2016; Hruska & Barduhn, 2021). Given the lack of research regarding ADHD within the EMS workforce, it is essential to explore the possibility that the combination of trauma exposure, un- or misdiagnosed ADHD, and limited education in managing well-being, resilience, and effective coping mechanisms are contributing to the ongoing mental health crisis in this population (Alzahrani et al., 2025; Ntatamala & Adams, 2021; Petrie et al., 2018).

LIMITATIONS

Several important limitations of the study are noted. Recruitment relied on topic-aware convenience sampling, which may introduce selection and coverage bias. As a non-probability sample, findings are not generalizable to broader populations. Given the open and convenient recruitment, as well as participant awareness, the findings are descriptive and not intended as population prevalence estimates. In addition, although the WURS-25 is considered the criterion standard for ADHD self-reporting, and application of the additional 20 items included in the WURS-45 boosts performance, as a self-report inventory, the possibility of recall bias exists. Additionally, the survey platform did not require forced responses. Participants could leave items unanswered, which may have introduced item non-response, reducing the effective sample size for some variables.

Because respondents could selectively omit sensitive or burdensome items, missing data may not be completely at random, potentially biasing some descriptive estimates.

The cross-sectional survey design limits interpretations to associations only, without temporal or causal inference. Data collection occurred over a short period, which increases the potential for missing or duplicate responses. Analyses are unweighted; estimates for small subgroups may be unstable. Further research is encouraged by repeating the study with a stronger, topic-blind approach to sampling. Including items in the demographic survey specific to common challenges experienced by adult learners is recommended for a more robust analysis of barriers to EMS education.

Although the WURS-45 is a validated and reliable self-report instrument, patients with complicated psychiatric presentations (i.e., substance dependence/abuse, PTSD, etc.) may reduce the efficacy of the instrument (Reimherr, 2022). Given the self-reporting nature of the demographic survey, as well as the possibility of under- or misdiagnosis of psychiatric comorbidities in the EMS population, the sensitivity and specificity of the WURS-45 may be reduced in this population. A formal ADHD diagnosis requires a psychological interview with a qualified clinician.

CONCLUSIONS

The frequency of ADHD traits in this EMS sample far exceeds that of the general adult population. EMS professionals are at a higher-than-average risk for developing secondary psychological issues due to their chosen occupation. Confirmatory studies using representative samples are encouraged to better understand the prevalence of primary risk factors within the population, such as ADHD.

Neurodiversity is only a disability when in an environment not suited to the diverse strengths (Johnson & Ahluwalia, 2025). Despite the increased frequency of formal ADHD diagnoses and positive WURS-25 screenings, there was no correlation with lower EMS certification attainment. Although individuals with formal diagnoses and positive screenings self-reported experiencing more challenges during their EMS education than those without a diagnosis or positive screening, it was not a limiting factor to attaining EMS certification. Rather, positive factor score screenings associated with ADHD-specific symptomatology, such as academic difficulties and anxiety, may contribute to the increased perception of obstacles. Despite this, neither a formal ADHD diagnosis nor an elevated WURS-25 score corresponded to lower EMS educational outcomes. Further investigation regarding ADHD-related indicators and educational outcomes is warranted to better inform program design to focus on targeted supports for learning and mental health needs of neurodivergent individuals without assuming inherent academic disadvantage.

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REVIEWS

THE EVOLVING PROFESSIONALIZATION OF PARAMEDICINE: A SCOPING REVIEW

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ABSTRACT

Introduction: Paramedicine has rapidly evolved in recent years, with practitioners now working across diverse healthcare settings, exercising increased autonomy and clinical responsibility. Despite this progress, the professionalization of paramedicine remains uneven across jurisdictions due to variability in education, regulation, and role clarity. This scoping review, conducted in accordance with the Joanna Briggs Institute framework, explores the extent and characteristics of paramedicine's professionalization and the key factors influencing its development.

Method: A scoping review methodology was used to map the breadth of literature related to the professionalization of paramedicine. Fifteen academic databases were searched, supplemented by grey literature sources including Google, Google Scholar, and Consensus AI. A total of 1,377 records were screened, with 63 studies meeting the inclusion criteria.

Results: Six overarching categories emerged: (1) attributes of professionalism unique to paramedicine, (2) the development of professional identity, (3) the role of regulation and registration, (4) ethical practice and professional codes of conduct, (5) education and continuing professional development, and (6) challenges facing the profession. These categories collectively illustrate the complex, evolving nature of professionalization in paramedicine and highlight areas of both progress and ongoing uncertainty.

Conclusion: The professionalization of paramedicine is dynamic and multifactorial, underpinned by robust ethical frameworks, evolving regulatory structures, and increasing academic and clinical education. However, challenges persist, including emotional labor, unclear professional boundaries, and underrepresentation in scholarly discourse. These issues highlight the need for enhanced support structures, clearer role definitions, and further empirical research. While advances in education, regulation, and practice are evident, gaps in research and global variation continue to challenge the full realization of paramedicine as a profession. Future studies should aim to strengthen the profession's identity and guide policy and practice across diverse healthcare contexts.

INTRODUCTION

Professionalism is well established in traditional healthcare professions such as medicine and nursing and is commonly understood as a constellation of values and behaviors encompassing

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clinical competence, ethical practice, accountability, regulatory oversight, and commitment to ongoing professional development (Kirk, 2007, Mahony, 2003, Reynolds, 2004, Townsend & Luck, 2019a, Williams & Webb, 2015). Professionalization extends beyond individual clinical skills to a broader social and structural process involving education, regulation, ethical responsibility, and the development of a coherent professional identity (Freidson, 1994; Lynch et al., 2004). In emerging professions such as paramedicine, the meaning and scope of professionalism remain fluid and contested.

Historically rooted in vocational, technician-based models, paramedicine has transitioned toward a more autonomous, evidence-informed healthcare profession, generating ongoing debate about how professionalism is defined within practice and recognized within wider healthcare systems (Evetts, 2011; Gallagher, Vyvyan, et al., 2016; Knox & Batt, 2018; Trede, 2009; Wynd, 2003). This process remains uneven internationally, with substantial variation in educational pathways, regulatory frameworks, and role clarity across jurisdictions (Bowen & Williams, 2020; Freidson, 1994; Newton, 2014; P. F. O'Meara et al., 2012a). Building on the foundational work of Reed et al. (2019), this scoping review examines how professionalism is conceptualized within paramedicine, the factors influencing its professionalization, and the implications for practice, education, and policy. By synthesizing current international literature, the review seeks to clarify areas of convergence and divergence in understandings of professionalism and to identify priorities for supporting paramedicine's continued development as a recognized healthcare profession.

Professionalism in Healthcare and Paramedicine

Within healthcare, professionalism shapes interactions with patients, colleagues, and communities and is typically underpinned by standardized education, licensure, regulatory oversight, ethical codes, and continuing professional development (CPD) (Collings-Hughes et al., 2022; Mahony, 2003; Reynolds, 2004). In paramedicine, professionalism is being reshaped by evolving educational and regulatory structures and the growing recognition of paramedics as autonomous practitioners (Givati et al., 2018; P. L. James, 2013; Johnston & Bilton, 2020). As the profession expands across diverse clinical and community contexts, professionalism increasingly incorporates critical thinking, leadership, adaptability, ethical decision-making, and effective communication alongside technical competence (McCann & Granter, 2019; McEwen & Trede, 2014; Tavares et al., 2016). Establishing clearer and contextually relevant definitions of professionalism will be essential for strengthening professional identity, enhancing practice, and supporting recognition of paramedicine within modern healthcare systems.

METHODS

Review Design

A scoping review methodology was selected to map the breadth of literature related to the professionalization of paramedicine and to identify key concepts, evidence gaps, and areas for future study. The review followed the Joanna Briggs Institute (JBI) framework for scoping reviews (Peters et al., 2015), based on the Arksey and O'Malley model (Arksey & O'Malley, 2005), and adhered to the PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) reporting guidelines for scoping reviews. The protocol was prospectively registered on the Open

Science Framework (OSF) (Reference Redacted). A wide range of sources including peer-reviewed articles, policy documents, professional guidelines, and grey literature was examined to capture diverse perspectives on professionalization. Multiple databases accessed via EBSCOhost provided coverage across healthcare, emergency medicine, and professional studies. The review aimed to synthesize existing knowledge, build on prior work (Reed et al., 2019), and provide an updated overview of how professionalization is conceptualized within paramedicine.

Search Strategy

A qualified health sciences librarian from University College Cork supported the development of the search strategy, refining search terms, Boolean operators, and indexing to enhance sensitivity and precision. The Peer Review of Electronic Search Strategies (PRESS) checklist guided an independent assessment of the search strategy to ensure methodological robustness. Grey literature searches were conducted on Google and Google Scholar to identify additional sources not captured in database searches. Reference lists of included studies were screened to identify further relevant literature. An example free-text search conducted through EBSCOhost is presented in Table 1.

Search Criteria (PCC Framework)

Eligibility criteria were guided by the JBI Population–Concept–Context (PCC) framework.

- Population: Studies involving paramedics, as well as other prehospital professionals (e.g., EMTs (Emergency Medical Technicians)) whose roles intersect with or inform the professionalization of paramedicine, particularly in advanced emergency or community-based care contexts. Both registered and non-registered practitioners were included. In some jurisdictions, particularly the United States, nursing professionals may hold paramedicine-adjacent roles (e.g., flight or critical care transport nurses). Studies focused exclusively on nursing practice were therefore excluded unless they explicitly examined interprofessional models, role boundaries, or issues directly informing the professionalization of paramedicine.
- Concept: Professionalization of paramedicine, including professional identity, education and accreditation, regulation and registration, CPD, ethical practice, scope of practice, and the cultural or structural factors influencing recognition of the profession. Studies examining barriers and enablers to professionalization were also eligible.
- Context: No geographic, system-level, or healthcare setting restrictions were applied. Studies from emergency medical services, community and primary care, education, leadership, and other paramedicine-related environments were included to capture global variation.

Inclusion Criteria

Eligible sources were English-language publications with full-text availability through open access platforms, the University College Cork Library, and the Health Service Executive Library. No date limits were applied to maximize coverage. Studies were included if they met the JBI PCC criteria and examined professionalism or the professionalization of paramedicine. Eligible source types included peer-reviewed articles, policy documents, reports, and grey literature. The initial search (July–August 2024) spanned 15

Search	Query
S1	Paramedic*, paramedic or EMS or emergency medical service or prehospital or pre-hospital or ambulance or emergency medical technician or EMT, paramedic or ambulance or pre-hospital, paramedics or paramedic or emergency medical service or EMT or ambulance, paramedicine, paramedics or paramedic, paramedic or pre-hospital or ambulance, paramedic or pre-hospital or ambulance, paramedics or paramedic or emergency medical service or EMT or ambulance or emergency medical technician or pre-hospital, paramedic or ambulance, paramedic practice.
S2	Professionalism*, professionalism or professional or profession, professionalism in healthcare, professionalism in the workplace, professionalism in education. Professional development, professional development or professional learning or professional training or professional education, professional development or professional learning, professional development plan.
S3	S1 AND S2
S4	Regulation*, regulation or law or policy or legislation, regulations or policies or legislation or laws, regulations and laws, regulations and policies, regulations or policies or legislation or laws or policy, regulations or laws, regulations in healthcare.
S5	S3 AND S4

Table 1. EBSCOhost free search term combinations.

academic databases. Grey literature searches on Google and Google Scholar used combinations of terms such as paramedicine professionalism, professionalization, professional identity, regulation, education, and codes of conduct. The first 200 results from each search engine were screened, and citation chaining was conducted to capture additional sources. All records were imported into EndNote and de-duplicated manually and automatically. Title/abstract and full-text screening were performed independently by two reviewers, with disputes resolved by a third. Exclusion criteria included lack of relevance to paramedicine, absence of a professionalism focus, insufficient conceptual depth, or non-English language.

Data Extraction

A standardized extraction form, based on JBI guidance, was used to collect data on authorship, year, country, study design, population, aims, and findings. Data extraction was performed by one reviewer and independently verified by a second, with discrepancies resolved through discussion or by a third reviewer when required, in accordance with JBI guidance.

Data Analysis

Data were analyzed descriptively using basic qualitative content analysis. Recurrent concepts were coded and organized into six overarching categories reflecting key dimensions of professionalism and professionalization identified in the literature, including professional identity, regulation, ethics, and education (Freidson, 1994; Lynch et al., 2004; Reed et al., 2019). The resulting categories were: (1) attributes of professionalism, (2) professional identity, (3) regulation, (4) ethics and codes of conduct, (5) education and continuing professional development, and (6) future challenges.

RESULTS

Across database and grey literature searches, 1,377 records were identified. Records excluded before screening included 285 duplicates, 193 non-English records, and 26 records for which full text was unavailable. The remaining 873 titles and abstracts were screened, with 63 full-text sources meeting the eligibility criteria and included in the final review. The study selection process is summarized in the PRISMA-ScR flow diagram (Figure 1).

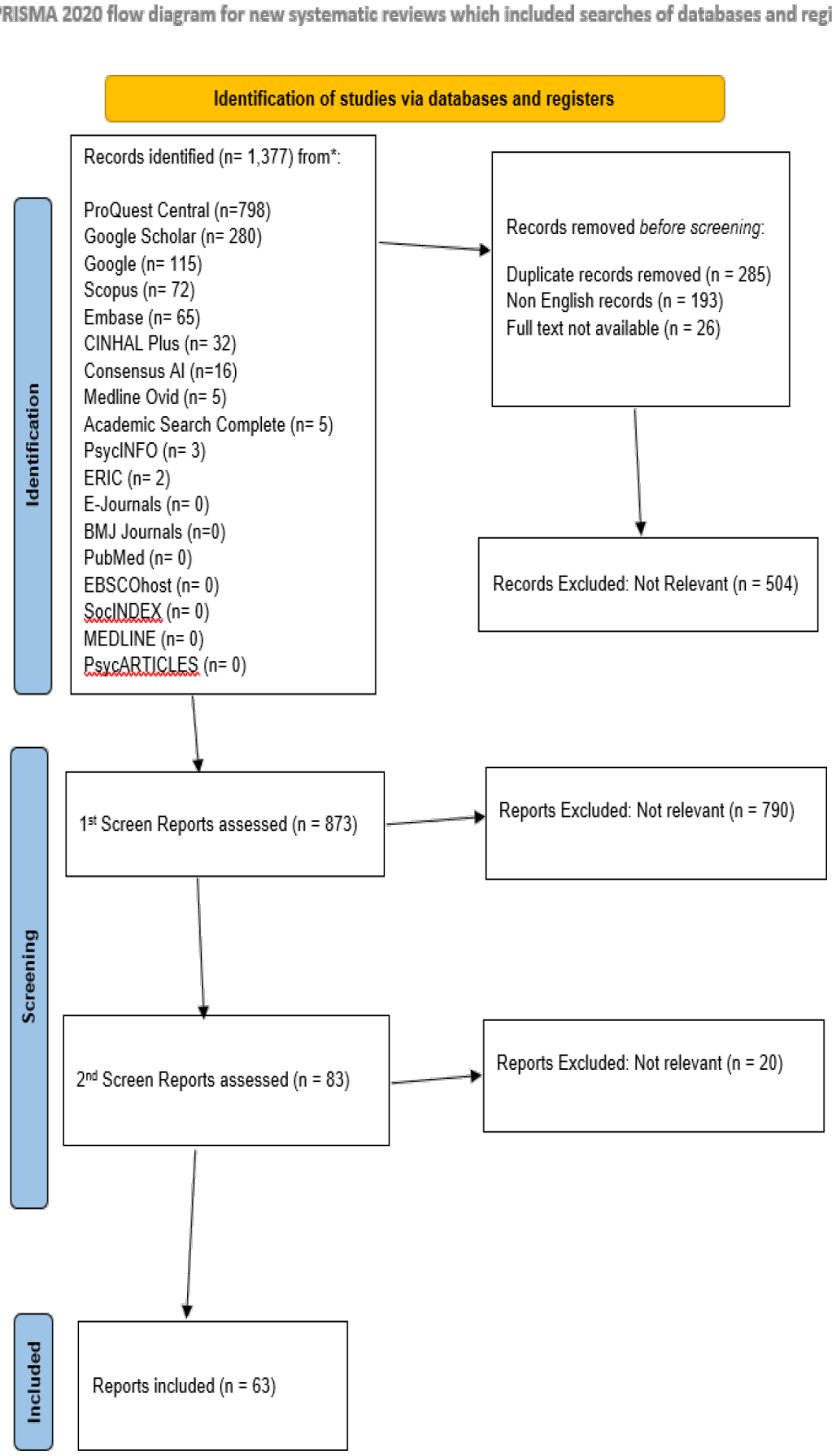


Figure 1. PRISMA flow chart.

The review of 63 studies identified six broad categories that describe the factors shaping professionalism and the professionalization process within paramedicine. These categories provide a descriptive overview of recurring concepts in the literature:

- The attributes of professionalism unique to paramedic practice;
- The formation and evolution of professional identity;
- The role of regulatory frameworks in establishing standards and accountability;
- The influence of ethics and professional codes of conduct in guiding practice;
- The significance of education and continuous professional development in fostering competency; and
- The various challenges that affect the growth and recognition of the profession.

Attributes of Professionalism in Paramedicine

The literature reflects growing interest in professionalism within paramedicine, though much of it is produced by a small group of recurring authors and with limited representation from women or front-line licensed prehospital and EMS (Emergency Medical Service) practitioners. This likely reflects the emerging academic profile of the profession (Berkes et al., 2024; Gourevitch et al., 2019; Olaussen et al., 2021). Studies span qualitative analyses (Reed et al., 2022a), quantitative and psychometric work (Bowen & Williams, 2020), cross-sectional and comparative designs (Brainard & Brislen, 2007; Williams, 2011, 2021; Williams & Webb, 2015), opinion pieces, and empirical studies (First et al., 2012). Across this literature, professionalism remains difficult to define or measure consistently (First et al., 2012; Williams & Webb, 2015). The absence of an agreed framework limits comparisons across jurisdictions, and several authors argue that professionalism is dynamic and context dependent rather than a static attribute (Brainard & Brislen, 2007; First et al., 2012; Reed et al., 2022). Historically, paramedicine has been framed as a technical or emergency response role rather than a healthcare profession, though recent work demonstrates a shift toward broader professional recognition (Eastwood et al., 2023; Joyce et al., 2009; McCann et al., 2015; Williams et al., 2012c).

Public and intra-professional perceptions continue to lag behind this evolution, with some stakeholders still viewing paramedics primarily as technical responders (Klepacka et al., 2018; Murcot et al., 2014). Studies further link professionalism to workplace pressures, emotional labor, and role ambiguity, although interventions to support professional behavior in high-stress environments remain underexplored (Bowen & Williams, 2020; First et al., 2012; Reed et al., 2022b; Townsend, 2017b; Williams et al., 2010c).

Regulation and Registration

Regulation is widely regarded as a cornerstone of professionalization (Gourevitch et al., 2019; Reed et al., 2019, 2021, 2022b, 2022a, 2023, 2024; Townsend, 2017b). The United Kingdom (UK) model is often cited as a benchmark, while jurisdictions without formal regulatory structures report challenges related to credibility, accountability, and workforce standardization (Reed et al., 2019; Townsend, 2017b). Countries with established regulation, such as the UK and Australia, demonstrate clearer progression toward professional recognition (Eastwood et al., 2023; Reed et al., 2019; Townsend, 2017b; van der Gaag & Donaghy, 2013). Australian studies highlight the benefits of regulation for enhancing accountability but also note challenges such as increased administrative demands and tensions between professional autonomy and medical oversight (FitzGerald & Bange,

2015; Munro et al., 2018; P. O'Meara et al., 2018; Reed et al., 2021, 2022b, 2023, 2024). Paramedics express mixed views: some see regulation as legitimizing the profession, while others perceive it as bureaucratic. Regulation is also strongly linked to CPD engagement and reflective practice (Knox et al., 2016; Lloyd-Jones, 2015a; Reed et al., 2019, 2021).

The implementation of regulation in Australia has been well documented, outlining legal and practical complexities (Moritz, 2017, 2018), as well as disparities between self-regulation and externally governed systems (A. Batt & Knox, 2017; Munro et al., 2018; Reed et al., 2021). Although not universally accepted, regulation is consistently positioned as a major milestone in the shift from occupation to profession, with evidence from Australia and Ireland suggesting its importance in shaping professional practice and CPD participation (A. Batt & Knox, 2017; Knox et al., 2016; Moritz, 2018; Reed et al., 2019). Overall, regulation is viewed as essential but insufficient on its own to ensure consistent professional development and improvements in patient care (Alt & Naamati-Schneider, 2021; A. Batt & Knox, 2017; A. M. Batt et al., 2025; R. R. Bowles et al., 2017; FitzGerald & Bange, 2015; Knox et al., 2016; Lloyd-Jones, 2015a; Moritz, 2017, 2018; Munro et al., 2018; P. O'Meara et al., 2018; Sandars & Cleary, 2011; Todaro, 2022; van der Gaag & Donaghy, 2013).

Education and CPD

Education is closely tied to professionalization, though training standards and their influence on professionalism vary internationally,(Bowen & Williams, 2020; Williams & Edlington, 2019; Williams & Webb, 2015). Research focuses on graduate attributes and the development of tools to assess student professionalism (Williams, 2011, 2021; Williams et al., 2010b, 2012a), though evidence of long-term predictive validity is limited. The transition from vocational training to university-based education (including higher education delivered through universities and community or college-based institutions, depending on jurisdiction) has opened pathways to academic careers but also introduced challenges such as role ambiguity and institutional misalignment (Birden et al., 2013; Bowen et al., 2017; I. Brooks et al., 2018; Caffrey et al., 2019; Munro et al., 2019; O'Brien et al., 2014; P. O'Meara, 2014; Williams et al., 2010b, 2015). Professionalism is shaped not only by formal education but also by workplace culture, mentorship, and experiential learning, suggesting the need for stronger integration of professionalism within curricula (Birden et al., 2013; Bowen et al., 2017; Brainard & Brislen, 2007; Munro et al., 2019; O'Brien et al., 2014; P. O'Meara, 2014; Townsend, 2017b; Williams et al., 2010b, 2015; Williams & Webb, 2015). Studies highlight gaps in preparedness among new graduates entering prehospital practice and document evolving expectations as paramedicine expands into community and primary care roles (Chom towska et al., 2021; Hill & Eaton, 2023; P. F. O'Meara et al., 2017a; Williams et al., 2010d, 2010a).

Research also identifies longstanding tensions between traditional paramedic culture and emerging academic expectations, with early work describing paramedic academics as occupying a "no man's land" (Meadley et al., 2022; Munro et al., 2018). CPD remains uneven across jurisdictions: Irish studies highlight barriers to participation, UK research identifies workload pressures, and Australian literature emphasizes flexibility and self-directed learning (A. Batt & Cummins, 2016; Bryant et al., 2023; Donaghy, 2018; Ellis et al., 2016; Gent, 2016; Handyside & Watson, 2024; L. Hobbs et al., 2021; L. R. Hobbs, 2019; Knox, Cullen, et al., 2015; Knox, Dunne, et al., 2015a, 2015b; Knox et al., 2013a, 2013b, 2014;

Knox & Dunne, 2013; Williams & Edlington, 2019). Professional identity formation is closely tied to educational experiences, yet inconsistencies persist in how professionalism is taught across programs (Belgraver et al., 2022; Johnston & Bilton, 2020; Munro et al., 2018).

Professional Identity

Paramedicine has historically lacked a clearly defined professional identity compared with other healthcare professions (Brainard & Brislen, 2007; McCann et al., 2015; Reed et al., 2019). Identity formation is shaped by education, regulatory structures, and workplace experiences, and continues to evolve as the scope of practice broadens into community care and specialized roles (Brydges et al., 2022; Hill & Eaton, 2023; Long et al., 2018; Majchrowska et al., 2021; Munro et al., 2018; P. F. O'Meara et al., 2012b). Student paramedics often struggle to articulate their professional identity due to shifting expectations throughout training and early practice (Hill & Eaton, 2023; Johnston & Bilton, 2020; Long et al., 2018). Ethnographic studies highlight the influence of workplace culture, noting that high-pressure environments create a strong occupational identity but can also foster resistance to change and emotional strain (Brydges et al., 2022; Candra et al., 2023; Fitzgerald, 2020; Johnston & Bilton, 2020; McCann et al., 2015; Todaro, 2022). Several studies suggest that professional identity is shaped more by real-world experience than by formal education (Brydges et al., 2022; Hill & Eaton, 2023; Majchrowska et al., 2021; Meadley et al., 2022). Regulatory frameworks further influence perceptions of autonomy, responsibility, and professional status within the broader healthcare system (Fitzgerald, 2020; Johnston & Bilton, 2020; Klepacka et al., 2018; Murcot et al., 2014).

Ethics and Codes of Conduct

Ethical reasoning in paramedicine is highly contextual, shaped by time pressures, unpredictable environments, and competing demands. Studies show that ethical considerations are often secondary to immediate operational or clinical imperatives in emergency settings. As a result, ethical reasoning relies heavily on situational judgment rather than strict adherence to formal frameworks (Campbell et al., 2024; Campeau, 2016; Williams, 2009; Williams & Ross, 2020). Several authors argue for stronger integration of ethics into paramedic education, with greater emphasis on real-world dilemmas, simulation, and reflective practice rather than abstract theory. Paramedics frequently experience ethical tensions related to system constraints, patient needs, and institutional policies, occasionally leading to ethical distress (Williams, 2009; Williams & Ross, 2020). Structured support systems such as debriefing, ethics committees, and CPD-based ethical training have been recommended. A recent scoping review by Collings-Huges et al, 2023, highlights the role of professional codes of conduct in setting behavioral expectations, though paramedics' understanding and use of these codes varies widely. This variability underscores the need to ensure ethical guidelines are practical and relevant to the realities of prehospital care. As paramedicine evolves, ethical expectations must be continually updated to reflect emerging challenges (Campeau, 2016; Collings-Hughes et al., 2023; Strong et al., 2013).

Future Challenges

Key challenges to professionalization relate to regulation, ethical frameworks, identity formation, education, and workplace culture. Although paramedicine's knowledge base

is expanding, concerns persist regarding limited practitioner and female author representation, (Berkes et al., 2024; Sanders et al., 2012; Seweryn, n.d.; Ward, 2023).

Regulation and Codes of Conduct

Although codes are essential for professional legitimacy, many paramedics rely on experiential judgment rather than formal guidelines due to limited understanding or perceived relevance (Brown & Gardner, 1999; Caulkins, 2022; Collings-Hughes et al., 2023; Eaton, 2023; Gallagher, Snook, et al., 2016; Weber et al., 2021).

Professional Identity and Recognition

Public and institutional understanding of paramedic roles remains limited, influenced in part by underrepresentation in leadership and policy positions. Transitioning into academic roles also presents identity challenges for practitioners (Bartle, 2014; Brown Jr et al., 2005; A. Devenish et al., 2014; Hill & Eaton, 2023; Lloyd-Jones, 2015b; Munro et al., 2018; Panchal et al., 2015).

Education and Training

The shift to university-based education has created tensions between academic and practice discourses, complicating socialization into the profession. CPD implementation requires a cultural shift toward self-directed learning, which remains difficult for many practitioners and organizations (Bennett et al., 2022; A. Devenish et al., 2016; Martin, 2006; Paterson, 2019; Sanders et al., 2024; Turner, 1985; Williams et al., 2012b).

Workplace Culture and Morale

Low morale, high sickness rates, and strained relationships between staff and management hinder professionalization efforts. A "targets culture" and concerns about job security further challenge paramedics and students. Expanding roles in primary care, community health, rural practice, and telemedicine demand supportive policies, enhanced training, and mental health resources (Alruwaili, 2024; Bigham et al., 2013; Blaber, 2012; S. Devenish et al., 2020; Eaton et al., 2021; Ford Jones & Daly, 2022; Joyce et al., 2009; Larkin, 1999; McCann et al., 2015; Newton, 2012; P. F. O'Meara et al., 2012a; Risambessy, 2023; Wankhade et al., 2015; Williams et al., 2010d).

DISCUSSION

The professionalization of paramedicine is a multifactorial and dynamic process shaped by education, regulation, workplace culture, and public perception. Although substantial progress has been made, continued variation in training standards, regulatory structures, and professional identity reflects the evolving nature of the profession. Key themes across the literature include professional identity, regulation, ethics, and CPD (R. Bowles, 2009; Makrides et al., 2022; McDonell, 2009; Williams et al., 2021). This review complements and extends the earlier work of Reed (Reed et al., 2019). Whereas their scoping review highlighted definitional ambiguity and the limited application of sociological theory, the present review provides an updated, practice-oriented synthesis organized into six applied categories: professionalism attributes, professional identity, regulation, ethics, education, and future challenges. Together, the two reviews trace both the theo-

retical foundations and the operational realities of professionalization, offering a more comprehensive understanding of current drivers and barriers.

Professional Identity and the Evolution of Paramedicine

Professional identity continues to shift as paramedics increasingly work in community, urgent care, and primary care settings rather than solely in emergency response roles (Givati et al., 2018; Johnston & Bilton, 2020). This expansion presents identity tension, with practitioners navigating changing expectations from employers, regulators, and patients (Acker, 2016; Bettin, 2024; Lloyd-Jones, 2015a; McCann, 2022). Consolidating a coherent professional identity will require a deeper understanding of how paramedics internalize their roles and adapt to new models of care.

The Role of Regulation in Professionalization

Regulation is widely recognized as central to professionalization, providing legitimacy, accountability, and patient safety (Knox et al., 2016; Reed et al., 2021, 2023, 2024). National registration systems in Australia and the UK have strengthened public trust, though concerns persist regarding administrative burden and potential constraints on autonomy (Ali & Bradburn, 2018; Bell et al., 2021; Burford et al., 2011; B. James & Lindstrom, 2004; Luck & Townsend, 2024; Mosca & Kruger, 2022; P. O'Meara, 2009; Shaban et al., 2019; Simmonds et al., 2015; Townsend, 2017a; Weber et al., 2024a). Further research is needed to evaluate how regulatory frameworks influence patient care, retention, and scope of practice in both emergency and non-emergency contexts.

Ethical Reasoning and Decision-Making

Ethical reasoning remains a challenging aspect of paramedic practice due to high pressure, time critical environments. Paramedics often rely on experiential judgment rather than formal ethical frameworks when balancing clinical, legal, and patient centered obligations (Campbell et al., 2024; Collings-Hughes et al., 2022, 2023; Grenier et al., 2021; B. James & Lindstrom, 2004; Simmonds et al., 2015; Townsend, 2012, 2017a; Townsend & Luck, 2012b, 2012a, 2019b, 2019a; Williams, 2009; Williams & Ross, 2020). There is a recognized need to strengthen ethics education through realistic scenarios, simulation, mentorship, and structured reflection to support ethical competence.

The Importance of CPD

Continuing professional development (CPD; referred to in some jurisdictions, including the United States, as continuing education or continuing competency) is essential for maintaining competence and advancing the profession, yet participation varies due to resource limitations, workload pressures, and inconsistent employer support (I. A. Brooks et al., 2016, 2018; Corman et al., 2025; Daly, 2018; Hanna et al., 2021; Knox, Cullen, et al., 2015; Lord, 2003; P. F. O'Meara et al., 2017b; P. O'Meara & Maguire, 2018; Sheahan et al., 2025; Weber et al., 2024b; Williams et al., 2012a). Innovative CPD models, such as online learning, workplace-based training, and peer mentoring—may improve accessibility and engagement.

Aspect	This Review	Reed et al.
Primary focus	Practical exploration of drivers of professionalization	Conceptual and theoretical analysis of professionalism and professionalization
Methodology	15 databases + grey literature; 63 sources	10 databases + grey literature; 53 sources
Timeframe covered	Includes literature up to 2025	Literature published before 2019
Structure of results	Six applied categories: identity, ethics, regulation, education, CPD, challenges	Thematic categories; less structured synthesis
Use of theory	Minimal; focused on applied insights	Strong theoretical foundation (e.g., Freidson, Greenwood, structuralism)
Contribution	Policy- and practice-oriented guidance for the profession	Foundational academic discourse; call for theoretical expansion

Table 2. Comparison between the current scoping review and Reed et al.

Future Research

Future research should adopt longitudinal and interdisciplinary approaches to examine how education, regulation, workplace culture, and employment conditions influence professional identity, workforce sustainability, and patient care across a paramedic's career. Comparative international studies are needed to identify transferable best practices in regulation, educational pathways, CPD models, and remuneration structures. Further investigation into the long-term effects of professional regulation on autonomy, job satisfaction, retention, and perceptions of professional value is warranted, as is research into how ethical competence develops over time and can be better supported through training and CPD. Additionally, studies addressing paramedic well-being, burnout, and resilience—including the role of pay and benefit equity alongside interventions such as mentorship, psychological support, and workload management—will be essential for sustaining the workforce and supporting ethical, professional practice.

LIMITATIONS

This review emphasized breadth rather than depth, consistent with scoping methodology, and did not conduct formal quality appraisal. Limiting the search to English-language sources introduces potential language bias, and the grey literature search may not have captured all unpublished materials. The literature is dominated by recurring authors with limited representation from women and practicing paramedics, which may skew perspectives. Additionally, most studies originate from high-income English-speaking countries, limiting global applicability. The involvement of studies authored by the review team or their collaborators may introduce bias, mitigated through adherence to JBI protocols and multi-reviewer screening.

CONCLUSION

The professionalization of paramedicine is progressing but remains shaped by ongoing challenges in education, regulation, professional identity, and workplace culture. Achieving an effective balance between standardization and adaptability is central to supporting paramedics' diverse and expanding roles across healthcare systems. As practice settings broaden into primary and community care, regulatory frameworks must remain flexible while upholding core professional values. Professional identity and practitioner well-being are vital to sustaining a competent workforce. The demanding nature of paramedic work including exposure to trauma and ethical complexity

highlights the need for structured support such as mentorship, debriefing, and mental health resources.

This review builds on the foundational conceptual work of Reed et al. (2019) by providing a contemporary, applied synthesis that identifies practical strategies for advancing professionalization. Ongoing collaboration among policymakers, educators, and practitioners will be essential in strengthening the profession and enhancing the quality of patient care.

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CONCEPTS

IMPLEMENTATION OF MENTAL HEALTH SUPPORTS FOR CANADIAN PARAMEDIC STUDENTS DURING PRACTICUM PLACEMENTS

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ABSTRACT

High stress levels and exposure to traumatic events increase the likelihood that paramedics may develop mental health issues during their practicum and as they transition into professional practice. Implementing mental health support for paramedic students before and during practicum and during transition into the workforce may act as a preventative measure for common challenges such as PTSD, depression and anxiety. We propose four pillars of support that could be implemented including: proactive education, specialization for mental health providers, facilitation of social support, and transitional support. These pillars are embedded within the educational system. Suggestions for implementation and potential obstacles are explored. We believe these solutions can facilitate a smoother transition into practice and help minimize mental health challenges among students and future paramedics.

INTRODUCTION

Mental health vulnerability is a major challenge for paramedics. Paramedics are regularly exposed to traumatizing experiences that can affect their psychological well-being. Research indicates a high prevalence of PTSD, depression, and anxiety in paramedics, particularly paramedic students, who experience higher job-related levels of stress compared to other healthcare professions (Alzahrani et al., 2025; Alzahrani et al., 2023; Hammer et al., 1986). Additionally, compared to the general population, paramedics are more likely to die by suicide (Vigil et al., 2019).

These vulnerabilities can be exacerbated for paramedic students during practicum and can reach levels that exceed paramedic providers and the general population (Alzahrani et al., 2025). Practicum is an essential part of paramedic education, providing students with clinical practice under the supervision of professionals (Ross et al., 2015). Working in the same environment as practicing paramedics means students are just as vulnerable to psychologically challenging experiences that come with the profession (Michael et al., 2025). Practicing paramedics blend

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experience with knowledge to develop a strong self-confidence in practice. Contrastingly, paramedic students lack experience in the field, creating a barrier to understanding how to apply their knowledge, which can cause poor self-confidence and when combined with stressors such as making a clinical mistake, can amplify mental health challenges (Warren-James et al., 2021; Wongtongkam & Brewster, 2017). With constant exposure to life-or-death situations, paramedic students are expected to manage the psychological weight of the profession without the same experience, training, coping skills, and resilience as practicing paramedics (Michael et al., 2025). Additional challenges for paramedic students, such as managing the preceptor-student hierarchy (Poku et al., 2025), fitting into the workplace culture (Kennedy et al., 2015), and the general emotional stresses of clinical education, can make paramedic students particularly vulnerable to mental health challenges.

People who choose to enter the profession of paramedicine tend to have personality traits associated with resiliency (Hebel et al., 2025; Mason et al., 2022), though they also demonstrate other traits such as conscientiousness that are associated with PTSD and burnout (Mirhaghi et al., 2016). While programs to train resiliency can have positive effects, there needs to be continued support to maintain efficacy (Vaughan et al., 2020). The decay effect of training means that targeted mental health support is essential throughout practicum placements and the transition to professional practice. Strengthening support during these periods will help students better manage the psychological and emotional challenges they encounter (Alzahrani et al., 2025). Intervening before, during, and after practicum could prevent paramedic students from experiencing severe adverse effects like PTSD, depression, and anxiety. Literature supports the need to equip students with the tools to approach and navigate the emotional challenges paramedic students face (Kennedy et al., 2015; Michael et al., 2025); however, more is needed in the way of support. We assert that paramedic students' mental health must be supported through structured, evidence-informed approaches during the continuum of transition from practicum to early practice.

This position paper is framed using a four-pillar model embedded within a broader educational ecosystem. The four pillars for strengthening student mental health are proactive education, specialized mental-health providers, social support, and transitional support. These pillars exist in a system of stakeholders that includes paramedic students, educators, preceptors, peers, families, educational institutions, and paramedic services. Interactions among these groups shape both stress response and resilience across the continuum of training and early practice. This framework guides the organization of the paper and clarifies how the proposed pillars may support student well-being, which is an ethical and professional obligation.

ETHICAL AND PROFESSIONAL CONSIDERATIONS

Educators, preceptors, and program administrators share a professional responsibility to prepare students not only for clinical competence but for the emotional realities of the profession. The ethical duty to protect trainees from foreseeable harm underpins the need for structured mental health support in paramedic education. Introducing structured support mechanisms reflects both ethical stewardship and professional accountability to ensure learners' long-term well-being. A shift in the profession can start with

advocating for psychological safety, providing support, and providing information on how to access support.

EVIDENCE AND SUPPORTING ARGUMENTS

Proactive Education

The first pillar of preparation is proactive education addressing the mental health challenges students may face. A study of paramedics and firefighters found that 100% of participants discussed the need for more mental health education (Jones et al., 2020). Curricula for paramedics should include education on common mental health challenges and available support. This education should also teach healthy coping strategies and warn students about maladaptive mechanisms common in practicing professionals, such as emotional distancing and dissociation (Clompus, 2014).

With paramedicine's deep curriculum, there may not be adequate time to address supporting mental health during practicum (Essington, et., 2019). Tests, assignments, and projects produce the most stress in post-secondary students during their studies (Santiago et al., 2024). Adding a separate class may serve as an additional stressor. However, incorporating small mental health discussions within regular lectures and labs may be beneficial. Educators should also discuss the differences between practicum and practice, and the additional stressors present for paramedic students, like poor self-confidence (Wongtongkam & Brewster, 2017), fitting into the workplace culture as a student (Kennedy et al., 2015), and navigating the preceptor-student hierarchy (Poku et al., 2025). Consistently discussing these stressors could give students a clearer understanding of what practicum entails, and mental health education and support provided throughout practicum placement can be beneficial, as students will likely be exposed to traumatic situations.

Mental Healthcare Providers

The second pillar is the necessity for those who evaluate the mental health of paramedics to be more thorough and improve their evaluations by considering the multitude of factors that play a role in the mental health of paramedics, e.g., length of service, age, relationship status, etc. (Jones et al., 2020). Providing therapists with specialized training can equip them to handle the mental health concerns of paramedics, leading to more efficient support. A concern among practicing paramedics was that those with previous negative therapist experiences were less likely to seek help (Jones et al., 2020). These individuals felt that mental healthcare providers could not relate to or did not understand the nature of their job and lacked training in trauma-informed methods of care. Paramedics preferred a counsellor with a similar background (e.g., a military veteran or former first responder) as they could better relate to paramedic practice (Jones et al., 2020). Educating therapists on supporting paramedics' mental health could lead to better care and more paramedics seeking help.

It can be argued that placing additional work on individuals entering the mental health workforce is unfair, especially to serve only one specific population. Another issue with educating prospective mental-health providers is finding educational methods to help them understand the paramedic profession (Jones et al., 2020). Additional training in the form of micro-credentials could be offered for aspiring mental health workers who spe-

cifically want to work with first responders. Micro-credentials could allow those in the mental health field to observe common calls and traumatic scenes to understand their future patients better. To ensure that mental health providers are adequately prepared to provide the unique care required for those in paramedicine, before entry to a credentialing program, pre-program assessment or qualification should be included to ensure overall competence. This option may decrease negative therapist experiences and equip mental-health providers to relate to paramedics (Jones et al., 2020).

Facilitating Social Support

Family and Caregivers

The effects of trauma on paramedic mental health can indirectly expose those around them to trauma through secondary injury (Anderson, 2019). As paramedics can be reluctant to share the mental health problems they experience with family due to a desire to "protect" family members (Jones et al., 2020) it would be beneficial to provide family members, especially caregivers, with information regarding how paramedicine may impact the paramedic student and themselves. Schools could provide informational resources such as brochures or pamphlets to students' families at the beginning of students' training. These resources would have basic information about the potential impact of paramedic practice on students and where to seek support. Providing family members with early education on relatives entering the profession can proactively prepare them for possible adverse outcomes.

Peer Support Among Students

The work culture surrounding paramedicine can be one of stifling emotions, but paramedics are more likely to seek help for their mental health if they have peer support (Jones et al., 2020). Mental health support can be provided through mental health-specific education before the beginning of student practicums. Recognizing the signs of different mental health challenges can allow students to be attentive to their mental health and that of others, increasing the likelihood of noticing any worrying signs. Supporting recognition of peer mental health issues should be done through formal programs such as Simulated Training for Resilience in Various Environments (STRIVE), which focus on psychological first aid and depression/suicidal recognition (Smith & Horton, 2020). These programs can be integrated into the curriculum, reinforced during practicum, and practiced by paramedic services to develop their skills.

Promotion of horizontal peer-to-peer support and openness concerning mental health, if done intentionally and early, can discourage the "every man for himself" mentality often seen in paramedicine. Knowing peers are also experiencing mental health challenges encourages paramedics to seek help themselves. Being able to "offload" emotions by sharing experiences, feelings, and thoughts in less formal environments with friends, colleagues, and family can be beneficial for students (Williams, 2013).

Support via Preceptors

Leaders in paramedicine must foster open, supportive communication about mental health challenges and psychological safety in the workplace. To support vertical preceptor-to-student support, preceptors should be prepared to discuss mental health chal-

lenges with students. During practicum, preceptors take on a mentorship role with their students as they are more qualified and understand the student experience. Beyond preceptors focusing on the technical aspect of the profession, it would benefit students if preceptors could aid in managing students' mental health. Preceptors should also receive mental health training through specific programs, like STRIVE, to be able to have more open discussions during practicum with students (Smith & Horton, 2020). Preceptors learning to notice the signs of mental health struggles in their students can improve student practice, as students are given guidance on handling their mental health, resulting in better performance (Williams, 2013). Debriefing calls with students to review performance and promote communication, open dialogue, and teamwork may help students experiencing mental health issues to seek help and encourage a new culture of openness.

Students must understand that they are not alone in their mental health journey and that challenges can become less of a burden if shared with others. Support from educators who empower students and provide early training, including during practicum, can lead students to take action for mental health rather than suffer silently.

Transitional Support from Practicum to Early Practice

The final pillar is transitional support. To ensure a successful transition from practicum to practice and demonstrate ethical stewardship, it is important to continue providing support as students enter practice. If a paramedic student has had a negative psycho-emotional experience during practicum, cessation of support after completing their education may lead to exacerbation of the negative effects as the student enters practice.

Most post-secondary institutions offer mental health support at a free or 'student rate'. Allowing paramedic students to access this discounted support for the first year after entering the workforce may encourage them to seek support. Regular "check-ins" with first-year paramedics may be done through post-secondary institutions. These check-ins could be completed once every 2-3 months by previous program supervisors, structured as a short, casual conversation where student paramedics are free to express feelings, questions, and concerns. Individuals running check-ins are not expected to give psychological support; however, they should be able to evaluate the students and direct them to appropriate resources. Lastly, healthcare worker hotlines and counselling services should be promoted to paramedics during their transition from school. Psychological support openly encouraged in the workplace could lead an individual to explore support options. Paramedic services should affiliate with and promote specialized mental health workers to best support employees' psychological well-being. Developing a "hand-off" period of support between education and practice may facilitate better mental health, psychological well-being, and ultimately paramedic retention, reducing the high rate of attrition in early career paramedics (Middleton et al., 2025; Newton et al., 2024).

RECOMMENDATIONS

The preceding sections have outlined key areas for intervention. The following recommendations are derived from the gaps identified and reviewed above and are evidence-informed. Although direct empirical testing of the specific recommendations proposed is lacking, the recommendations provide actionable pathways for implementation that align with established findings on the challenges faced by paramedic trainees.

- National and provincial/state associations, in collaboration with schools providing paramedic training, should develop curriculum and competency profiles that include guidance and recommendations for integrating mental health support and developing resiliency into curriculum.
    - Acknowledging the potential emergence of mental health challenges during paramedic education underscores the need for a unified effort to prioritize and integrate mental health education throughout the curriculum. To accommodate this, expanding to a degree-level certification could provide additional curricular time to support such integration..
    - High prevalence of PTSD, anxiety, depression, and stress in paramedic students (Alzahrani et al., 2025; Warren-James et al., 2021) and clear evidence of insufficient preparation for psychological demands (Michael et al., 2025; Kennedy et al., 2015) support integrating mental health competencies into formal curriculum structures.
- National and provincial/state associations should work with accrediting bodies for m ental h ealth clinicians and providers to develop training focused on paramedics and the unique challenges faced by paramedics.
    - Students and new paramedics may want help but are limited by access due to the abnormal hours that come with shift work. Specialized psychological support should include expanded hours. Digital interventions, which have been shown to moderately reduce symptoms of anxiety, depression and burnout in the workplace can also be implemented (Cameron et al., 2025).
    - Paramedics report negative experiences with mental health providers lacking trauma-informed or role-specific knowledge (Jones et al., 2020), and prefer clinicians with an understanding of first responder work, suggesting the need for specialized training pathways.
- National and provincial/state associations in collaboration with schools providing paramedic education should evaluate existing mental health support programs for first responders, and, as needed, develop new programs, to promote and facilitate social support from family, peers, and educators.
    - Work culture can be a significant barrier, expectations and unspoken rules within the 'brotherhood' of paramedicine can cause new paramedics to believe they will not receive the best practicum experience unless they are accepted by senior paramedics (Kennedy, 2015). Acceptance can depend on the new paramedic's ability to suppress emotion and stay unfazed by traumatic calls. Changing norms around social support may help change culture and mitigate concerns about potential demotion, and confidentiality worries that prevent help-seeking behavior among paramedics (Jones et al., 2020).
    - Evidence shows family systems are affected (Anderson, 2019), peers influence help-seeking (Jones et al., 2020), and supportive educator and preceptor relationships buffer emotional strain (Williams, 2013). These findings support structured social support initiatives.
- Paramedic services and schools should work together to develop a transition pathway for students that maintains and promotes mental health support as students move into the workplace and begin practice.
    - Lack of resources and financial burdens may hinder the implementation of mental health support during students' transition from school to the para-

medic workforce. To mitigate these costs, larger institutions should establish a provincial support system. Support from a centralized body could help reduce expenses for smaller post-secondary institutions. Students experience stress spikes during practicum and early practice (Michael et al., 2025), and early-career paramedics have high attrition linked to psychological burden (Middleton et al., 2025). Coordinated transition support is logically aligned with these risks.

- While the arguments in this paper are evidence-informed there is a paucity of empirical evidence on the topic. Future research should evaluate the effectiveness of these supports within paramedicine education programs to inform evidence-based policy and accreditation standards, fulfilling the profession's ethical duty to safeguard student well-being.
- This paper, the issues identified, and recommendations made, are based on the author's localization, knowledge, and experience within the Canadian context. However, we believe that if local conditions are taken into consideration, the key areas for intervention identified and the recommendations made can be extended to other countries.

CONCLUSION

There is an ethical imperative to recognize and address the mental health concerns and risks faced by paramedic students, and to provide proper support as they enter a workplace that entails exposure to traumatic events. This can be achieved through proactive education, improved preparation of mental health providers, fostering social support, and implementing transitional support measures. Equipping students with the right tools, resources, and support not only enhances their practicum experience but also facilitates a smoother transition into professional practice. Additionally, increasing awareness of mental health challenges and available support can benefit those involved in students' educational and professional pathways.

Ultimately, improving patient care begins during paramedic students' education and training. Students need to learn how to manage their mental health now to maintain well-being throughout their careers. Building a stronger, more resilient, and effective workforce through mental health supports could positively impact paramedicine and, consequently, the health of the populations paramedics serve.

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CONCEPTS

MASS OPIOID EXPOSURE: ENHANCING MEDICAL COUNTERMEASURE PREPAREDNESS

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ABSTRACT

The feasibility of using opioids to intentionally cause mass casualties has been demonstrated to horrific effect in the past 25 years, and the current wide availability of high-potency synthetic opioids in the United States raises the risk of their use as a weapon of mass effect on the civilian population. These facts highlight the pressing need to prepare for future events with easily and quickly administered, fast onset, durable medical countermeasures. The recently FDA-approved intranasal nalmefene was developed to those requirements. Intranasal nalmefene can increase availability, access, and treatment capacity for emergency response to a mass exposure to synthetic opioids and expand first responders' ability to treat certain opioid overdose patients. Emergency responders and local supplies of naloxone and nalmefene serve as the first line of defense against a mass opioids incident, with government stock of nasal nalmefene spray available for resupply to prevent depletion of opioid receptor antagonist products in the community.

INTRODUCTION

The proliferation of opioids, both illicit and prescribed, has led those who plan for chemical disasters, disaster medicine, and mass casualty incidents to worry about mass dispersal of opioids in a closed environment as well as other potential mass exposure routes (Morrell, 2017). Methods to reverse the incapacitating effects of highly potent synthetic opioid exposure quickly and effectively are essential. The evolution of synthetic classes of opioids that are highly potent and capable of causing life-threatening respiratory depression necessitates opioid receptor antagonists that simultaneously are potent enough to reverse the effects of synthetic opioids with a rapid onset of action and last long enough to protect patients from "renarcotizing" into unconsciousness with inadequate breathing. Importantly, for a mass casualty incident, they must also be administered easily without the use of needles (Gold et al., 2025).

The mass release of a highly potent synthetic opioid (fentanyl, alfentanil, carfentanil, or other derivatives) was carried out in-

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tentionally in Moscow in 2002 to aid Russian authorities in ending a hostage siege at the Dubrovka Theater (Riches et al., 2012). The event unfolded when 40 Chechen separatists took more than 900 theater-goers hostage, demanding that Russian authorities withdraw troops from Chechnya. After four days, the Russian authorities pumped an "aerosolized anesthetic" into the theater to put everyone to sleep. While the siege did end, the cost was horrific. The aerosolized drugs were all too effective, severely intoxicating everyone in the theater with the exception of a few terrorists who donned gas masks. At least 132 hostages died from exposure to the aerosolized synthetic opioids pumped into the building (BBC News, 2002). There were reports that ambulance personnel attempted to use naloxone to revive some patients but did not have enough–despite authorities later insisting that emergency personnel had 1,000 doses (Chemical and Biological Weapons Nonproliferation Program, 2002). What is unclear is how many patients received even a single dose of naloxone, much less multiple doses.

This event was the first known use of an aerosolized synthetic opioid release with the intent to sedate many people simultaneously. Multiple-victim opioid overdose incidents involving fentanyl are increasingly being reported (Desai, 2024; KOAA NEWS5, 2025; Moreno-Paz & Nguyen, 2024). In the U.S., counterfeit prescription pills contaminated with opioids have threatened public health and emergency systems, exemplified by the 2016 Norco counterfeit drug exposure in California and, more recently, by the 75 overdoses and 9 fatalities during a 2024 opioid overdose outbreak in Austin, Texas (Moreno-Paz & Nguyen, 2024; Vo, 2016). Counterfeit pills are no longer confined to tainted drugs purchased on the "street" or to illicit drug users. Deaths of children and adolescents from illicit fentanyl have increased (Tanz et al., 2022). The Centers for Disease Control and Prevention (CDC) issued a statement in October 2024 warning of the potential public health risk of counterfeit prescription medications sold by illegal online pharmacies (CDC, 2024; U.S. Attorney's Office [USAO], 2024). As synthetic opioids have become more common, the use of aerosolized or fine particulate formulations–either as a weapon of mass effect or as a potential additive to counterfeit pills and aerosolized drugs of abuse–is also becoming more likely. Public health and emergency response authorities need the ability to deploy an overdose rescue treatment capable of rapidly and lastingly reversing the respiratory effects of synthetic opioids. The rising risk of intentional use of opioids to cause harm has not gone unnoticed by federal government planners and medical countermeasure experts. Use of more powerful fentanyl analogs and emergence of other classes of synthetic opioids, including nitazenes, means that as naloxone becomes less effective, renarcotization will continue to become more common (Laffont et al., 2024).

CONCEPT DESCRIPTION

In an effort to address the first surge of fentanyl overdose and to prepare for a mass opioid overdose scenario, the Biomedical Advanced Research and Development Authority (BARDA) within the Administration for Strategic Preparedness and Response, along with the National Institute on Drug Abuse (NIDA) at the National Institutes of Health, both part of the U.S. Department of Health and Human Services, undertook pharmaceutical development of a repurposed, long-lasting opioid receptor antagonist in a new form amenable to rapid administration to many patients. The goal was to develop a rapid-onset opioid receptor antagonist that is easily administered via a nasal spray device with fast onset and long lasting enough to reduce the capacity requirements needed to frequently reevaluate patients for renarcotization and readminister treatment during a

mass exposure response. A mass casualty incident in this context is considered an emergency event in which patient count exceeds local resources and capabilities in a short time, overwhelming the local emergency response and/or hospital healthcare system.

Currently, the predominant opioid receptor antagonist used for reversing opioid overdose is naloxone. In the management of individual patients, naloxone is effective, but due to the shorter half-life of its effect, requires continued vigilance of the patient's respiratory status to ensure that renarcotization does not occur, especially in the presence of synthetic opioid overdoses.

To address the growing concern of synthetic opioids and their potential weaponization, BARDA and NIDA, with the U.S. Food and Drug Administration's (FDA) guidance and fast track designation, supported the development of a previously approved pharmaceutical product that met the requirement for a long-lasting and potent opioid receptor antagonist–nalmefene–but in an efficacious intranasal formulation. A durable opioid receptor antagonist in a familiar nasal spray device was developed to support effective deployment and use in the out-of-hospital environment by first responders. New clinical data from pharmacokinetic studies supported by BARDA and NIDA demonstrated the long half-life of the intranasal form of nalmefene (Crystal et al., 2024; Opiant Pharmaceuticals, 2023). In May of 2023, the FDA approved nalmefene nasal spray in a single-use intranasal administration device for the known or suspected treatment of opioid exposure, including synthetic opioids, such as fentanyl, with a half-life of about 11 hours that provides sustained reversal effects (FDA, 2023; Opiant Pharmaceuticals, 2023). In addition, BARDA funded a pharmacodynamic clinical Phase 2 study required by the FDA that showed the effectiveness of intranasal nalmefene in reversing remifentanil-induced respiratory depression longer than naloxone in healthy, non-dependent but opioid experienced volunteers (Ellison et al, 2024; Opiant Pharmaceuticals, 2023).

The challenge that first responders will face in a mass opioid exposure incident will be two-fold: availability of opioid receptor antagonists in quantities sufficient to reverse the respiratory depression effects on multiple victims, and the need for responders to continually re-evaluate patients for renarcotization, readministration of treatment, and/or additional resuscitative measures for respiratory failure, such as positive pressure ventilation. This two-fold challenge could be alleviated, in part, by using a potent, long-lasting reversal agent like nasal-administered nalmefene, giving this type of treatment an important place in mass opioid overdose preparations. It is well understood that to enable improved preparedness, medical countermeasures must be readily available and preferably in use day-to-day and "flexed" to support mass care operations. This principle is why nalmefene, particularly the easily administered intranasal form, can be a "force multiplier" in prehospital emergency mass care operations.

DISCUSSION

In patients who have opioid use disorder histories and are susceptible to precipitated withdrawal, naloxone may remain the better treatment (Stolbach et al., 2023). Both naloxone and nalmefene should be available so that the first responder can use the product best suited for the emergency situation. In patients who are naïve to opioids or are occasional users, current evidence indicates that nalmefene can be a better treatment as its long-lasting effect will decrease the likelihood of renarcotization (Laffont, 2024). The

half-life of intranasal nalmefene, which was determined to be approximately 11 hours in clinic research, is longer than that of naloxone, and this more sustained time in the body to maintain opioid reversal effects decreases the likelihood of readministration to treat fentanyl overdose (Crystal et al., 2024; Opiant Pharmaceuticals, 2023). This may prove critical for patient transport, particularly over longer distances, and during mass care efforts. Clinical results from the pharmacodynamic study on reversal of remifentanil-induced respiratory depression showed that intranasal nalmefene (2.7 mg) had a faster onset of action compared to intranasal naloxone (4 mg) widely used by first responders. Additionally, nalmefene, particularly in the nasal spray form, will provide additional capacity for mass opioid exposure incidents thereby expanding the operational capability of the responders and improving the survivability of patients. Timing of emergency treatment is critical for any opioid overdose scenario, but in a mass opioid exposure incident, the availability of a large number of treatment doses is also crucial.

Stockpiled opioid overdose treatments may take too much time to distribute into the field, so the standard availability and use of naloxone by first responders for daily operations coupled with commercially available nalmefene nasal spray represent the first line of emergency response in a mass casualty opioids incident. The uptake of nasal nalmefene spray in the commercial market ensures the availability and additional capacity of an additional countermeasure for daily and mass care use in patients 12 years and older. However, the adoption of nasal nalmefene spray since its commercial launch has been hampered by barriers including higher cost per unit dose than naloxone, initial shelf life, required approvals for adding to medication lists and pharmacy formularies, and, likely, lack of established guidelines and patient protocols. There are anecdotal concerns raised by certain harm reduction and emergency medicine communities that nalmefene may precipitate an untoward reaction of withdrawal in the opiate dependent patient (Stolbach et al., 2023). This concern has also influenced the adoption of nalmefene. However, in a mass exposure event, the vast majority of victims will likely be opioid naïve, and nalmefene poses no risk of withdrawal and provides a substantial reduction in risk of "renarcotization". Unlike for nasal nalmefene spray, prehospital protocols exist for naloxone, the current standard of care in the prehospital environment, and two formulations of intranasal naloxone can now be purchased over-the-counter by individuals. Because nasal nalmefene spray is an additional medical countermeasure with important use cases that augments, but does not replace naloxone, it is critical to increase awareness and include the new drug in prehospital training and education as well as into field protocols.

Nasal nalmefene spray is currently being stocked in the U.S. government inventory under vendor management and can be deployed to supplement and resupply local emergency opioid overdose antidote stocks preventing depletion of local and neighboring emergency caches (BARDA, 2024). Unlike nerve agent antidotes, nasal nalmefene spray has potential everyday life-saving use in the local community (along with naloxone) as well as for responses to mass exposure incidents. Deployment strategies for each EMS system must be based upon their operational environments, including prevalence of risk, available resources (i.e., number of response units), first responder utilization of opioid medical countermeasures (i.e., quantity of nasal opioid antagonist available outside of EMS units), and financial impact of stocking a new medication. By evaluating these and other operational variables, EMS systems and their medical directors can determine their needs for a longer acting opioid antagonist such as nalmefene. Implementing a standard

operating procedure (SOP) for utilization of a longer acting opioid receptor antagonist might include the determination of patient opioid dependency at the individual patient and/or community setting (e.g., severe opioid use disorder in unhoused populations versus poisonings from adulterated pills in a school/university environment). Having this determination process embedded in a SOP will benefit the patients and enable the availability of a long acting opioid antagonist for the multiple patient scenario.

Future real world clinical studies comparing nasal nalmefene spray and naloxone in the field are needed to provide data for developing or enhancing SOPs for nalmefene use in the prehospital setting. Although FDA-required clinical studies in the laboratory setting demonstrated the non-inferiority of nalmefene with superior pharmacokinetic and pharmacodynamic readouts, as well as durability of opioid reversal, real world assessment in a variety of environments and types of opioids is critical (Ellison et al, 2024; Opiant Pharmaceuticals, 2023). In addition, a pediatric study for intranasal nalmefene use in patients under 12 years old is planned. Nalmefene nasal spray was initially developed to address a critical treatment gap for fentanyl overdose when it emerged as the predominant opioid in the public health crisis. Since its approval, the shelf-life of nasal nalmefene spray has been extended to 4 years, equivalent to nasal naloxone spray. As nasal nalmefene spray is a new opioid reversal product that can augment naloxone in certain opioid overdose emergencies, it is critical to increase awareness through paramedicine training and education for community use and emergency planning as well as additional field research. With the emergence of the more potent and longer acting fentanyl analog, carfentanil, and an entirely different class of even stronger synthetic opioids, nitazenes, the need for nalmefene for first responder use has become clear.

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BRITISH PARAMEDIC JOURNAL

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December 2025

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The International Paramedic PhD Registry: An Overview of Paramedic Doctorates. https://doi.org/10.29045/14784726.2025.12.10.3.63 (ResearchGate)

March 2026

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PARAMEDICINE

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Corrigendum to "Redesigning paramedicine systems in Canada with "IMPACC." https://doi.org/10.1177/27536386251396457

Corrigendum to "Paramedic occupational violence: A qualitative examination of aggressive behaviour during out-of-hospital care." https://doi.org/10.1177/27536386251396461

Corrigendum to "Implementation of a strategy to manage EMS COVID-19 patient disposition with physician consultation: A retrospective descriptive study." https://doi.org/10.1177/27536386251396455

VOLUME 23 ISSUE 2, MARCH 2026

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February 2026

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VOLUME 30, ISSUE 1

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To help paramedicine professionals to keep abreast of the literature in our discipline, the Paramedicine Literature Search provides the results of a standardized search of the PubMed database. This search results will include articles from journals that many paramedicine professionals may already be familiar with. The search strategy is also designed to include articles in journals they may not be commonly monitoring, such an article about ambulance care for cancer patients that appeared in an oncology journal.

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DIALOGUES

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The Dialogues section publishes 'letters to the editor' with comments and questions regarding previously published articles. Our intent is to foster professional conversations about the papers to include its methods, analyses, results, conclusions, implications, and implementation issues. We will also accept general comments and questions regarding the Journal. The selection of submissions with be at the sole discretion of the Journal's editorial team. IJOP will also facilitate discussions of articles in the NEMSMA email discussion group on Google Groups ((https://groups.google.com/g/nemsma) to facilitate broader reach and participation in scholarly conversations. The IJOP editorial team will moderate these conversations and curate posts to include in the pages of the Journal. The authors of articles will be invited to directly participate in these discussions. We anticipate that a many of these conversations will take place in the message threads of the IJOP's email discussion group, called IJOP Dialogues. We want to reach and engage more of our colleagues in professional discourse regarding the art and science of paramedicine. We hope that this IJOP Dialogues section will help accomplish that.

RE: DEBATE: AN ASSOCIATE DEGREE SHOULD BE REQUIRED FOR ENTRY-LEVEL PARAMEDICS. HTTPS://INTERNATIONAL-JOURNALOFPARAMEDICINE.COM/INDEX.PHP/IJOP/ARTICLE/VIEW/3543

The following is a curated excerpt from the message thread on the NEMSMA Discussion Group (https://groups.google.com/g/nemsma) labeled "[3543] IJOP Perspectives Debate: An Associate Degree Should be Required for Entry-Level Paramedics.

Gunderson MR, Walker E, Duckworth R, Bouthillet T, Cebollero C, Washko J, Taigman M, Gerard D, Chapleu W, Judge T, Proc-

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tor B, Imperatrice L, Lawrence R, Anderson J, Keavney M, Dworsky P, Phelps S, Sandy C, O'Meara P, Smith A, Kirkwood S, Violato E, Nudell N, Heffern T. Discussion Thread for DEBATE: An Associate Degree Should be Required for Entry-Level Paramedics.

The January-March issue of the International Journal of Paramedicine includes a new section called Perspectives. This is a venue for the debate of controversies facing the paramedicine community.

Our first debate was on the proposition that an Associate degree should be required for entry-level paramedics. The debate teams members were: Sean Caffrey, Ed Bauder, Louis Imperatrice, Gregg Margolis, Mike Thomas, and John Todaro. They were organized into two teams - arguing in support of and in opposition to the proposition.

The debate was conducted through a series of eight asynchronous video recording sessions moderated by IJOP Editor-In-Chief, Mic Gunderson. The event was organized by IJOP Perspectives Section Editor, Ted Lee. The eight video sessions were edited into a single program posted on the IJOP YouTube channel (https://youtu.be/9I6Xpp-pA6yw). It will also be made available soon on IJOP's audio podcast outlets:

Apple Podcasts: https://podcasts.apple.com/gb/podcast/international-journal-of-paramedicine/id1765013611

iHeart: https://www.iheart.com/podcast/269-international-journal-of-p-209676566/

The audio was transcribed to produce the manuscript that appears in the pages of the Journal (https://internationaljournalofparamedicine.com/index.php/ijop/article/view/3543).

The debate is not over. What do you think - and why? The paramedicine community is invited to participate in a professionally-toned conversation where you can share your perspective. This is taking place in the NEMSMA discussion group on Google Groups (https://groups.google.com/g/NEMSMA). Look for the message subject line: "[3543] IJOP Perspectives Debate: An Associate Degree Should be Required for Entry-Leve Paramedics." Please make your voice heard by participating in the discussion. This is moderated discussion group, so please use a respectful and professional tone, particularly towards those whose opinions differ from your own.

Complementary to the debate, the January-March issue also features a narrative review paper entitled, "Bachelor's degree as entry-to-practice: A literature review of paramedicine and other health professions." It is available at https://internationaljournalofparamedicine.com/index.php/ijop/article/view/3528.

- - -Mic
Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

Today, to help start the conversation addressing the debate, I'll be inviting several people to comment.

To get things started, I'd like to introduce Eoin Walker. With over 20 years of experience in paramedicine and critical care, he is passionate about advancing the standards and practices of pre-hospital emergency medical services globally. As a Senior HEMS segment promoter at Airbus Helicopters, he works with governments, organizations, and stakeholders to design and deliver customized Helicopter EMS solutions that meet the bespoke needs and challenges of each healthcare eco-system. Eoin also shares his knowledge and expertise as an Associate Professor at Northeastern University, where he teaches and mentors students in the discipline of Human Factors and the fundamental interplay with medicine. Additionally, he hosts and run three podcasts that reach a global audience of over 500,000 listeners across 145 countries, covering topics such as emergency medicine, extreme medicine, and wellness. Through these platforms, he aims to inspire, educate, and empower the next generation of clinical and non-clinical professionals and leaders. In addition, Eoin is a podcast section editor for IJOP.

Eoin, What's your take on the issues raised in the paramedic degree debate?

- - -Mic

Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

In my opinion, the case for degree-level certification within paramedicine is both pragmatic and evidence-based, reflecting the increasing clinical, cognitive, and professional demands placed upon modern paramedics. While historic and contemporary concerns regarding cost and accessibility of education are valid, they should not be conflated with arguments against higher educational standards. Education is expensive; however, it is precisely this investment that confers empirical credibility, professional legitimacy, and long-term sustainability to the profession.

Paramedicine has evolved far beyond a purely technical or skills-based role. Contemporary paramedics are required to exercise autonomous clinical judgment, interpret complex physiological data, engage in shared decision-making, and integrate seamlessly within wider healthcare systems. Degree-level education strengthens these capabilities by developing critical appraisal skills, clinical reasoning, communication proficiency, and research literacy, competencies that cannot be reliably achieved through certificate-only models. The empirical literature consistently demonstrates that higher educational preparation in healthcare correlates with improved clinical decision-making, patient safety, and system integration.

The nursing profession provides a compelling and relevant analogy. Nursing's transition toward degree-based entry pathways did not diminish clinical excellence; rather, it professionalised the workforce, enhanced public trust, and enabled role expansion into advanced practice, leadership, education, and research. Importantly, nursing retained diversity in educational routes while creating structured academic progression. Paramedicine stands at a similar inflection point. A degree requirement does not invalidate experiential learning; it contextualises it within a robust academic framework that supports lifelong development.

Affordability concerns must be addressed, not ignored. Initiatives such as bursary schemes, employer-supported education, and community college pathways directly mitigate financial barriers and strengthen the argument for degree-level entry. These mechanisms acknowledge the reality that education has a cost, while recognising its long-term return on investment for clinicians, services, and patients alike. Critically, such schemes democratise access to higher education rather than restricting it, ensuring that socio-economic status does not preclude professional advancement.

Degree-level certification also establishes a clear educational roadmap for paramedics. It creates coherence between entry-level practice, postgraduate education, clinical specialisation, leadership roles, and opportunities beyond frontline practice. This structured progression promotes workforce retention, enhances professional mobility, and enables paramedics to transition both within the profession, into education, management, research, or advanced clinical roles, and outside it, into broader healthcare, policy, or academic domains.

I am a direct beneficiary of degree-level education within paramedicine. The academic foundation it provided enhanced my clinical reasoning, credibility, and professional mobility, while opening pathways that would otherwise have remained inaccessible. My experience reflects a broader truth: degree-level education does not distance paramedics from patients; it equips them to serve patients more effectively, safely, and sustainably.

I think that degree-level certification is not an unnecessary barrier but a necessary evolution. It strengthens clinical practice, legitimises paramedicine as a profession, supports workforce development, and aligns paramedics with their healthcare peers. The future of paramedicine depends not on resisting educational advancement, but on embracing it with appropriate structural and financial support. This has proven to provide personal and professional mobility in the international pre-hospital, humanitarian, and corporate sectors.

- - -Eoin Walker

The next commentator to join the discussion is none other than Rom Duckworth. Rom is a dedicated emergency responder, author, and educator with more than thirty years of experience working in career and volunteer fire departments, hospital healthcare systems, and private emergency medical services. Rom is the Chief of the Ridgefield Connecticut Fire Department and director of the New England Center for Rescue and Emergency Medicine. Rom holds a master's degree in public administration, is an accredited Fire Officer and graduate of the National Fire Academy's Executive Fire Officer program, and is the recipient of the NAEMT Presidential Award, American Red Cross Hero Award, Sepsis Alliance Sepsis Hero Award, and the EMS 10 Innovators Award. He is the author of "Duckworth on Education" as well as chapters in more than a dozen EMS, fire, rescue, and medical textbooks and over 100 published articles in fire and EMS magazines. A member of the NAEMT Board of Directors, Sepsis Alliance Advisory Board, Fire Engineering Advisory Board, as well as other professional advocacy boards, Rom continues to work for the advancement of emergency services.

Rom, how do you feel about the proposition that an associates degree should be required for entry level paramedics and any of the points raised so far in the formal debate or the ensuing comments?

- - -Mic

Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

I want to be clear at the outset that I am speaking only in my role as a paramedic and as a personal advocate for our profession, not on behalf of any organization. I also want to be transparent that I hold a college degree and deeply value what formal education has contributed to my development as a clinician, educator, and leader.

I strongly support professional development through higher education. Paramedicine has evolved dramatically since the 1990s, when many of us—including myself—were trained primarily as technicians. Today's frontline paramedics function as autonomous clinicians, expected to synthesize complex information, manage uncertainty, communicate across systems, and make high-stakes decisions in resource-limited environments. College-based education clearly supports those competencies, and I agree with much of what has been articulated here and in the literature about the benefits of degree-level preparation.

Where I diverge is not on the value of education, but on the tool we are proposing to achieve it.

The debate proposition before us is specific: an associate's degree should be required for entry-level paramedics. The critical question, in my view, is not whether paramedics should be educated at the college level—but whether a mandated degree requirement, implemented broadly and uniformly, is the right mechanism at a time when EMS systems are under unprecedented financial and workforce strain.

Across large portions of the country, particularly in rural, frontier, and mixed volunteer–career regions, EMS already operates as a fragile system. We are seeing the expansion of what many have rightly termed EMS deserts—areas where access to timely paramedic care is tenuous or disappearing altogether. In those environments, even modest increases in cost, time to entry, or educational availability can have outsized effects on workforce sustainability and patient access.

Affordability is not a theoretical concern. Many of the federal and state funding streams that historically supported EMS education, workforce development, and community college infrastructure are increasingly unstable, challenged, or reduced. Mandating an associate degree without simultaneously securing durable funding, geographic access, and employer support risks creating a barrier that disproportionately affects the very communities already struggling to maintain coverage. The result could be a net reduction in paramedic availability, even as the clinical expectations of the role continue to rise.

I do not believe this is an argument against degrees or academic rigor. Rather, it is an argument for. Professions do not advance solely by raising entry requirements; they advance by building coherent, supported pathways that align education, workforce needs, compensation, and career longevity. In some systems, an associate-degree re-

quirement may be entirely appropriate and achievable. In others, it may unintentionally accelerate the contraction of EMS services.

A degree can (and should) be a powerful enabler of professional growth, mobility, leadership, and advanced practice. But when used as a hard gate to entry, absent sufficient structural support, it can also function as an exclusionary filter with real downstream consequences for access to care.

For me, this is not a binary choice between "education" and "no education." The question is whether a universal associate-degree mandate, applied at the point of entry, strengthens or destabilizes an already uneven national EMS landscape. I believe we can and must continue to elevate educational standards while remaining honest about the operational realities of the systems we serve.

If our goal is a stronger, more professional, and more sustainable paramedic workforce, then our solutions must be as nuanced as the varied environments in which paramedics practice.

- - -Rommie L. Duckworth

The next commentator I'd like to introduce is Tom Bouthillet. Tom is another one of those folks that doesn't need an introduction because most of you are already familir with much of his work.

Currently, Tom is the Policy, Accreditations, and ISO Manager for Chatham County Fire Department, and Advisor for the Cambridge Consulting Group; Creative Director of Plank Bridge Media. Among hos many other professional activities, Tom has been a member of NHTSA's High Performance CPR Working Group; Program Director of the South Carolina Resuscitation Academy, Member of the Editorial Advisory Board of EMS World; Content reviewer for the British Paramedic Journal; Co-producer of the Code STEMI web series, and Editor of EMS12Lead.com. Tom is interested in system performance, process improvement, and evidence-based performance measures for time-sensitive diagnoses.

He graduated with a paramedic/paramedicine degree from Parma Community Hospital EMS Education Program. His writings have been referenced in the American Heart Journal, the Journal of the American College of Cardiology: Cardiovascular Interventions and the EP Lab Digest.

Tom, what's your view on the idea that an associate degree should be required for entry level paramedics and any of the points raised in the discussion so far?

- - -Mic
Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

Mic,

Thank you for the opportunity to comment.

First, congratulations! The Socratic approach was refreshing. Given what the Rimstad literature review found about workplace tension between pre-reform and post-reform practitioners in the UK, this kind of civility will go a long way to ensure experienced providers feel welcomed to engage constructively rather than pushed aside.

I support the associate's degree requirement, but this debate solidified for me that how we implement it will determine whether it succeeds or fails. The literature review identifies proximity to institutions, cost, and time to completion as the primary barriers students face, particularly in comparable health care professions. The community college infrastructure Gregg Margolis described can address these, but only if we're intentional about it.

We have an educator pipeline problem. While Rimstad identifies this as a potential bottleneck, neither document offers a concrete strategy for addressing it. If we require associate's degrees taught at the college level, we need faculty

credentialed and supported to teach there. We cannot mandate educational requirements without a serious plan to develop the educators who will deliver that education.

The debate did not spend much time specifying what the additional education should contain, although I appreciated John Todaro's inclusion of expanded practice roles. If we're asking future paramedics to spend more time in school, we should take the opportunity to introduce things like epidemiology, evidence-based medicine, advanced clinical reasoning, improvement science, system design, and research literacy. In nursing these would be advanced courses, but even at the associate's degree level we should start building the foundation.

One thing that troubled me was the notion that the only thing that matters is proof that degree requirements improve patient outcomes. If the discussion is limited in this way, we risk unintentionally adopting an industrial logic, where a paramedic becomes interchangeable with an ambulance or a tank of fuel. Degree requirements may actually improve working conditions over time by establishing that paramedics are professionals worthy of investment, not interchangeable inputs to keep trucks running.

The Rimstad review found that degree-prepared practitioners in other fields reported increased confidence, improved decision-making, and greater career mobility. These aren't patient outcomes in the narrow sense, but they affect retention, job satisfaction, and our ability to attract talent, which eventually circles back to patient care anyway. When we think about EMS as a profession, the focus changes to developing practitioners capable of independent judgment and adaptation to circumstances their original training didn't anticipate.

Canada, Australia, New Zealand, and the UK have already made this transition. The literature review mentions they observed benefits, but beyond workplace tensions, neither document seriously examined what implementation looked like or what problems emerged. If we're going to have an evidence-informed discussion, the experience of countries that have already done this seems relevant.

In summary, the question isn't really whether paramedics should be better educated. It's whether we're willing to invest in building the infrastructure (educators, curricula, institutional partnerships, financial support for students) that makes better education achievable.

Respectfully,

- - -Tom Bouthillet

Our next commentator is Chris Cebollero. Chris has strong credentials inside and outside of EMS. He has a background as a senior operations executive with over two decades of experience leading enterprise-level initiatives across healthcare and human services and a proven track record of optimizing complex systems, scaling service delivery across multi-site operations, and aligning cross-functional teams with mission-critical objectives. Chris is known for driving measurable improvements in quality, compliance, and workforce performance across large regional markets. His expertise includes financial stewardship, organizational design, and regulatory navigation—supported by deep experience in transforming underperforming operations into integrated, outcomes-driven systems. In addition to all of that, Chris is also a podcast section editor for IJOP.

Chris, What's your take on the issues raised in the paramedic degree debate?

- - -Mic
Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

Thank you Mic, I have enjoyed reading the journal article and listening to the debate. Also, I appreciate my peers' thoughts and insights here this morning. I would like to encourage those of you who are following this post to share your thoughts. I have debated this topic tons with many of you out there, and your opinions are great.

In my opinion, I do not believe requiring an associate degree as a condition of entry into paramedicine is the right move for EMS currently. We are already facing a critical paramedic shortage, and extending initial education requirements risks worsening that problem. Many EMTs pursuing paramedic education are doing so while earning EMT wages, often living paycheck to paycheck. Asking them to remain in school an additional year without meaningful financial relief creates a real barrier to entry and retention. This is not a question of educational rigor or professional standards, but one of feasibility, timing, and sustainability within the current EMS environment.

There is also a persistent misconception that degree requirements alone will lead to higher pay or improved reimbursement. EMS is still classified by CMS primarily as a transport benefit, not a provider service. Until the reimbursement model changes and paramedics are recognized as billable healthcare providers, additional education does not translate into higher wages or sustainable system funding. My experience working in the Mobile Integrated Healthcare and Community Paramedicine transition for over a decade reinforces this reality. Paramedics cannot bill independently, nor can agencies reliably capture revenue under a physician's license for clinical services. If compensation is the goal, reimbursement reform must come first. Then in my opinion, an AS degree would not be the entry point, but a Bachelor's degree would be the bar. But I digress.

As an EMS educator and executive, I firmly believe in higher education and lifelong learning for EMS professionals—but not as a mandatory entry requirement. Education absolutely matters—but so does experience. What makes a great paramedic is experience, mentorship, and progressive clinical exposure, supported by targeted education along the way. Our priority should be getting new paramedics into the field safely and efficiently, then creating clear pathways for advanced education, leadership development, and specialization. I fully support advanced education through tuition assistance, flexible scheduling, and partnerships with colleges, including hosting satellite classrooms within EMS agencies. Higher education should be encouraged, supported, and rewarded—but it should not be a gatekeeper to entering the profession.

Respectfully submitted,

- - -Chris Cebollero

I appreciate the collegiate presentation of well recent points from all participants. As I read through them, I still see improved academic requirements as the right direction, but not the right step. From a purely academic standpoint, it's a no-brainer. From a policy standpoint, the underlying framework issues, if not addressed first, will result in an elevated academic mandate, raising costs significantly without resulting in significant benefit.

- - -Rommie L. Duckworth

The next commentator is Jon Washko. He is one of those guys with staggering credentials and credibility in our field. Jon is a seasoned healthcare executive with over 40 years of experience in pre-hospital and healthcare operations improvement. Beginning his career as a volunteer firefighter and EMT at the age of 16, he has progressively held executive leadership roles at local, regional, and corporate levels within various EMS and healthcare organizations.

Jon is a leading industry expert in EMS system design, high-performance EMS concepts, deployment strategies, EMS economics and finance, lean business processes, system status management, and the integration of technology in healthcare. His expertise extends to mobile integrated healthcare, community paramedicine, air-medical program development, telehealth, transfer centers, and emergency medical dispatch. He is frequently sought after by organizations, both thriving and in crisis, to provide consulting services and drive transformative change.

A prolific author, researcher, educator, and speaker, Jon regularly presents at national conferences, publishes in peer-reviewed journals, and contributes to industry publications. He serves on numerous editorial boards, industry association committees, and government advisory councils. He also provides expert witness testimony on complex EMS and healthcare legal matters.

Currently, he serves as the Assistant Vice President for the Center for Emergency Medical Services at Northwell Health and SkyHealth, is an Assistant Professor of Emergency Medicine at the Hofstra/Zucker School of Medicine, and is CEO of a private consulting firm specializing in healthcare delivery and EMS system optimization.

Jon earned a Bachelor of Science in Emergency Medical Services Administration from Drexel University and a Master of Business Administration in Global Health Services Administration from Hofstra University. His academic achievements are recognized through his induction into Beta Gamma Sigma, the international honor society for business excellence. Jon is also a member of the peer-review team at IJOP.

Jon, what are your thoughts on the proposition question and the points raised in the debate?

- - -Mic

Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

Thanks Mic,

Please note that these comments are my personal opinion and do not reflect the position of any organization.

Back in 2019, I was deep in the middle of this debate while sitting on my seat with the National EMS Advisory Council (NEMSAC) who had initiated a rather controversial advisory on the issue. I heard hours and hours of testimony from both sides, and found myself quickly acting as mediator between the educators, fire service, privates, 3rd service, dispatchers, hospital based, air medical and volunteers, and others, all heavily attached to their perspectives.

My stance on the matter has not changed much over the years, and I wrote an article on the subject back then (see below). Ultimately, until we find a way to pay for our existing undervalued efforts and under reimbursed expenses, let alone the additional value that degrees could bring, all we are doing is setting expectations that will over promise and underdeliver to our front line clinicians.

Fixing the reimbursement system is the only path to resolving this debate. Unfortunately, our industry's voice and limited PAC dollars are largely caught in a self-defeating, endless loop: repeating the same approaches we've used for decades, yet expecting different results....you know the rest.

Hopefully the data collected from the recent GADCS results can be the foundational evidence we need to shift the narrative, but not necessarily through the traditional methods of lobbying our congressional legislators who ultimately string us along to end up with extending, extended, extended, extended, extenders and not much reform. It's time for a different approach here if we truly want to change the economics to value our efforts and education.

https://www.jems.com/ems-training/to-educate-or-not-to-educate-an-economic-and-ems-role-confusion-conundrum/

To Educate or Not to Educate: An Economic and EMS Role Confusion Conundrum

Recently I was called out by individuals on various social media channels because I haven't weighed in publicly about the importance of postsecondary education for EMS providers. Although I believe that pursuing higher education is an important piece of a successful progressive career, I'm not ready to "take sides" as to its mandatory requirement for all of our traditional frontline EMS provider roles.

For those who advocate for formal education, the evidence is strong. A postsecondary education provides a foundation for skills development beyond what we learn in EMT and paramedic school, such as helping us develop critical-thinking skills, challenging us to strengthen our emotional intelligence, helping us improve our financial and business acumen, and teaching us skills that make us more astute in our selected specialty and better-informed citizens and consumers, all desirable traits that have value. Furthermore, there's research and evidence that suggest

that individuals with postsecondary education make a higher wage and some in EMS believe that having degrees will also garner us more respect at various tables–not sure on the evidence on this one.

Although I've personally pursued both postsecondary and postgraduate studies, I'm not convinced that these items would have helped me earn more respect or a higher wage when I was in a primary clinical role as a 9-1-1, transport and ED practicing paramedic. Rather, these tools have helped me to form a foundation for the basis of pursuing my career aspirations beyond a field provider role, shifting me from a primarily physical role to a mostly intellectual one.

In fact, when I was a field paramedic with my undergraduate degree, I was often on the receiving end of criticism, bias and prejudice by my peers and superiors, who couldn't comprehend why I "wasted my time and money getting a degree," and I was often treated differently from what I can only assume was a defense mechanism for those who thought my intellectual pursuits were intimidating. (This was the early 90s.)

Wearing the Grey Collar

EMS is a mix of career types as well as professional roles that sit in two color spectrums, white and blue, and include public safety, healthcare, public health and disaster response functions. Some of these functions are considered white collar in nature and use more intellectual skills, and some are considered blue collar in nature and rely more on physical, hands-on skills.

Given this conundrum, we should really classify EMS in a third spectrum, as a "grey collar" profession, meaning it's a mix of both blue and while collar skills sets. Traditionally, blue-collar work is vocationally educated, and white-collar work requires postsecondary education. Given our grey-collar status, an argument can be made that the primary role that a provider is participating in should drive the educational requirements.

I consider the public safety and disaster response sides of our mission towards the blue-collar side of our grey collar color spectrum, and our public health and healthcare roles leaning toward the white-collar side of the grey collar color spectrum. Thus, an argument can be made that if you're in a traditional EMS provider role, then the current vocational education system seems appropriate and has worked for decades. However, if your role is taking you more into the public health and healthcare aspects of our changing mission (e.g., community paramedicine, expanded scope paramedic, etc.), then a strong argument can be made that additional postsecondary education is warranted in order for us to first, do no harm.

Lastly on this topic, I believe that postsecondary and postgraduate education is an absolute requirement for all future EMS leaders, given the forthcoming complexity of disruption that lies ahead. Although my take on this topic will likely be cast as waffling or riding the fence of this divergence, the fact is that for now, given the current environment, both arguments are correct and as is often the case in EMS, one size does not always fit all.

This said, it's time for us to adapt to our changing environment, and I believe we'll see EMS diverge into two paths as the future of healthcare reform takes shape: One path will continue our traditional public safety roles, funded by subsidies of which the vocational education system has a proven record. The other path is where EMS becomes more healthcare-focused, funded by value incentivized healthcare revenue arrangements, which will require additional postsecondary education.

Also, I have to call out the belief that higher education for EMS practitioners will result in upward pressure on wages, as I believe this is a chicken and egg argument. On one side, higher education is typically rewarded with higher pay, however on the other side you can't get blood out of a turnip to pay for it.

Compensation and Salary

In order for EMS to pay better, it needs better reimbursement mechanisms, whether it be from some form of subsidy or an alternative healthcare reimbursement system. The bottom line is that we as an industry have underspent on wages and many other expense categories, especially in the private sector, because our existing healthcare reim-

bursement system isn't aligned with what should be our true costs (which includes better compensation), nor is it aligned with the value EMS providers bring to the healthcare continuum.

Because a significant portion of our revenues are essentially "capped," the ability for us to charge–and actually get paid–based on our actual and/or desired expenditures (e.g., better wages), plus the need for all businesses to produce some form of a margin to at a minimum recapitalize, forces downward pressure on everything when revenues stay flat or decrease against a rising expense base. In these cases, subsidization of some form is needed to pay for what's desired in order to fill the gap; however, in markets where this option isn't desirable, wages, margins and dollars suffer with tremendous downward pressure, not allowing an expenditure to exist at all or putting upward pressure on productivity, thus burning out our providers.

Although I agree that higher education is a good thing, to mandate it now for everyone with the expected outcome of upward pressure on wages would also require considerable payment reform for EMS that fully accommodates this upward pressure on expenses. Without this intrinsic tie, we'll likely hurt and dissolution ourselves by creating an educated workforce without the ability to pay for the value this next evolutionary step could ultimately bring our profession.

Additionally, this situation would likely add additional downward pressures on the available supply of labor, which is already a substantial problem in many communities. For rural EMS and volunteer-based EMS systems, this type of requirement could be disastrous without some form of financial offsets, essential service or critical access status designation.

Lastly, respect is earned not given. This holds true no matter your education, experience or background. If we truly desire to gain the respect of our peers, EMS leaders must focus on creating a culture of trust and respect within themselves and their own organizations if we ever expect to get respect from others.

As Maya Angelou put it, "I've learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel." Respect is earned by how you make people feel, not titles, not status, not position–and certainly not just education.

- - -Jon Washko

As a point for clarification on Jon's post, he referred to "GADCS." For those not familiar, it is the acronym for Medicare's Ground Ambulance Data Collection System.

- - -Mic

Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

The next commentator is Mike Taigman. Like several of the others participating in this conversation, Mike has amazing credentials, qualifications and experience in our discipline. Mike is one of those guys that David Letterman might say "needs no introduction."

During his more than five decades in EMS, Mike has focused the majority of his career on helping to make things better. As a street paramedic in Denver he honed Myers clinical skills caring for patients and helping new paramedics learn to provide solid clinical care with kindness and compassion. He is a popular conference educator and author of more than 600 articles in professional journals. He is an Associate Professor in the Master of Science in Healthcare Administration and Interprofessional Leadership at the University of California San Francisco UCSF where he helps healthcare leaders develop the ability to make meaningful and measurable improvements. As a consultant, he has worked with EMS, Fire, and Public Health in 48 of the 50 states, most of the Canadian Provinces, Israel, Palestine, Australia, and throughout Europe. His expertise includes EMS Street Survival, Patient Centered Leadership, and Effective Quality/Performance Improvement. Mike holds a Masters Degree in Organizational

Systems. Mike was the facilitator for the development of the EMS Agenda 2050. Mike serves as the Improvement Guide at FirstWatch. IN addition, Mike is a member of the Editorial Advisory Board for IJOP.

Mike, what are your perspectives on the proposition that an associates degree should be required for entry level paramedics and the issues raised in the debate?

- - -Mic
Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

Thank You Mic!

I'm the product of a 600-hour vocational paramedic program run through a Colorado hospital in 1980. A couple of decades later, I had the opportunity to do some consulting in Australia. I was getting a tour of the main hospital in Melbourne when the cardiologist who was showing me the CCU stopped to take a phone call. As he was taking a report on a patient having an inferior wall MI who was being admitted to his unit, I realized that it was a paramedic admitting the patient. It turns out that paramedics were directly admitting patients to the CCU, the OR, and labor and delivery. I was blown away.

The next day, I toured their Ambulance Officer College, where new employees spent three years full-time learning how to be our equivalent of an EMT. They have volunteers in Australia who complete a 200-hour program, but that's not for folks who make EMS their profession. Talking with the medic was like talking with PAs or nurse practitioners here. They understood disease process, differential diagnosis, and treatment options at a level far past me. Keep in mind, this was 25 years ago.

That planted the seed in my mind that we could elevate our profession, provide much more sophisticated care, and become equals in the house of medicine. I understand the short-term staffing crisis and the dynamics of younger generations. But I firmly believe that we need to bite the bullet and make degree requirements part of our world.

- - -Mike Taigman

Next in our line up of commentators is Dan Gerard. Dan Gerard, MS, RN, NRP is the Immediate Past President of the International Association of Emergency Medical Services Chiefs. With 40+ years in the field, starting in Newark, NJ, he's both a National Registered Paramedic and an RN. As the EMS Coordinator for a Northern California fire department, he leads the EMS division, Community Paramedic Unit, and Mobile Crisis Team. He's also shaped Oakland's EMS as Coordinator and interim EMS Director. An author and educator, Dan worked as an EMS consultant to revamp EMS systems from Hong Kong to the Bahamas. He holds a Master's in Healthcare Administration, and is a doctoral candidate in organizational leadership who has completed a Harvard Kennedy School fellowship.

Dan, you have a lot of experiences in EMS to draw from – what do you make of the question that an associate degree should be required for entry level paramedics and any of the points made in the discussion so far?

- - -Mic
Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

Thank you Mic it is an honor to be invited to participate with this stellar group.

Paramedicine is no longer a technical trade, it is a clinical profession. Modern paramedics practice independent clinical judgment in uncontrolled environments, often without immediate physician oversight.

In EMS specifically, today's patients are older, sicker, and more complex. The system is no longer dominated by trauma and cardiac arrest.

A degree does not just add knowledge, it builds the cognitive framework needed to manage complexity safely. If we want paramedics treated as clinicians rather than drivers with skills, the profession must align with the educational norms of clinical practice.

Countries with degree-based paramedicine models (e.g., UK, Australia, Canada) show higher retention, professional status, and system integration.

It is intellectually inconsistent to demand higher level thinking and clinical expertise from certificate-level preparation . This is not about turning paramedics into physicians.

It's about giving paramedics the education they need to safely do the job we already ask them to do independently, ethically, and expertly. An associate's degree is not inflation; it is alignment with reality.

- - -Dan

Daniel R. Gerard, MS, RN, NRP

http://www.linkedin.com/in/dangerard

I'd like to bring someone else into the conversation - Will Chapleau.

Will Chapleau is a founding partner of the International PreHospital Medicine Institute and one of our editorial advisory board members. He has been a Paramedic since 1976, graduated nursing school in 1989 from Prairie State College and worked as a Trauma Nurse Specialist for 37 years. His career began in 1975 with the Chicago Heights Fire Department, the last 6 of which, as Chief of the department. For 15 years he was an educator in the Good Samaritan Hospital EMS System in Downers Grove, Ill., and at St. James Hospital and Prairie State College in Chicago Heights. In April of 2020, he retired from the American College of Surgeons (ACS) where served as the Director of Performance Improvement (8 years), previously managing Trauma training programs for the ACS-Committee on Trauma (6 years).

Will served as the Chair of the Pre-Hospital Trauma Life Support (PHTLS) Executive Committee of the National Association of Emergency Medical Technicians (NAEMT) for nearly 20 years. He also served on the NAEMT Board of Directors, the boards for the National Association of EMS Educators, the Society of Trauma Nurses, chaired a task force for the National Association of EMS Physicians and a frequent contributor to the Journal of Emergency Medical Services (JEMS), EMS World Magazine, and Fire Apparatus Magazine. He has published in the Journal of Trauma and Critical Care, the Journal of Emergency Medicine and served on the editorial board of EMS World Magazine. Will has written and edited twenty pre-hospital care textbooks, published in four languages, taught prehospital care and lectured in conferences in over 60 countries.

Will, how do you see the issues in the debate and any of the comments made so far?

- - -Mic

Mic Gunderson, REMT-P (Ret.), FAEMS

Editor-In-Chief, International Journal of Paramedicine

Thanks for letting me join this discussion Mic

I'd like to begin by saying that I am a fan of developing PreHospital Medicine Associate, and advanced degrees. I believe that many people that dedicate their lives to EMS would be able to use that education to further the profession and hopefully improve patient outcomes.

That being said, I do not support making it mandatory for entry level Paramedics to have associate degrees. My colleagues have already pointed out the staffing issues we have with the current system and they are right to be concerned that adding to the time and cost of school would likely cause further shortages of staff.

Some of my colleagues have suggested that the degree requirement would improve outcomes and I have to say, there is scant if any science to support that. Others have said that the additional education would elevate the profession and bring better wages and more respect to Paramedics. I think my colleagues have also pointed out, that policy and regulation is needed to accomplish that not degree programs.

Critical thinking is an important tool and teaching and practicing Critical thinking will likely have a positive effect on our providers and our patients. I don't agree that degree programs necessarily provide that support for critical thinking. Here, I think continuing education gives the best opportunity for exercising our critical thinking skills.

We also need to consider our workforce. For many of our providers, being a Paramedic is part of their job, not all of it. They are also working Firefighters, Police Officers, and other public servants that provide this service along with their other jobs.

I believe Medical Directors and Education centers have the best opportunity to improve the workforce and patient outcomes is through continuing education tied to the experience of the providers and patients in their system.

As I said, I'm a fan of developing degree programs for PreHospital Medicine. I don't think it should be required. We may get there. Strong program development in time, might drive providers into that pathway and a support a natural progression to that end.

- - -Will Chapleau

The next person to bring into the conversation is Tom Judge. Tom has an extensive background in EMS. He is the Executive Director and co-founder of LifeFlight of Maine. He has also served as chair of the Association of Critical Care Transport (ACCT) and has advised many organizations around the world on EMS program development. Tom began his career serving as an EMT and Paramedic over forty years ago. He introduced the first community paramedicine program in the State of Maine.

With an extensive background in emergency medical services and air medicine, he has worked in the private, public and non-government sectors designing and implementing emergency care systems nationally and internationally. Tom has served as an air medical and EMS subject matter expert for the Institute of Medicine, the US Government Accountability Office, the National Transportation Safety Board, and the State of Maryland as well as serving five successive appointments to the Federal National EMS Advisory Council. He currently serves on a federal Advisory Commission to end surprise patient billing. Other current service includes the Board Quality Committee for the Coastal Healthcare Alliance, the Rural Health Transformation Team for the Maine Department of Health and Human Services, and the Rural Health Action Network.

A long-time faculty member for the National EMS Physicians Association's National EMS Medical Director Course, Tom has worked in multiple arenas developing standards for air medical care and EMS including assisting with the development of the international standards of the Joint Commission on Accreditation of Health Organizations and led the development the first international standards for Critical Care Transport. A keen advocate for patient and operational safety, he leads the Infrastructure work group for the US Helicopter Safety Team and has been a member of the International Helicopter Safety Team since its inception. He is a past Chair of the Association of Critical Care Transport, past President of the Association of Air Medical Services, a Board Member for the Medevac Foundation International, and served 10 years on the Maine EMS Regulatory Board including serving as Chair.

I could go on and on about Tom's contributions to our discipline, but I should also mention that Tom is a member of the IJOP Editorial Advisory Board.

Tom, given your extensive experiences and deep insights on EMS, what do you make of the arguments for and against the proposition that an associate degree should be required for entry level paramedics?

- - -Mic

Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

Thanks, Mic, for setting up this interesting debate and commentary. I appreciate the inputs from so many great thinkers and doers in EMS over the years. This is an interesting topic that has been wandering through the profession since the late 70's and early 80's. There are quite a number of comments about reimbursement, the cost of education, challenges in recruitment and retention, and the construct of a profession. These are real issues, but I think miss the point.

Parallel to the topic of degrees and academic credentials is the ongoing and never resolved issue of what is EMS? Our originating premise was time limited, delegated practice resuscitation medicine for cardiac arrest and life taking trauma. Over the years we realized that was less than one percent of our practice of unscheduled medicine.

The path for evolution, the original EMS Agenda for the Future in 1998 postulated EMS is the intersection of public safety-rescue and resuscitation medicine, emergency medicine, and public health. This has been repeated over time. The IOM picked up the conversation with the 2006 EMS at the Crossroads which called for a lead Federal Agency to coordinate the ongoing development of EMS. Despite the great work over the years, or the NHTSA Office of EMS, FICEMS, and NEMSAC there is still no single policy identity for EMS, and it may well be the ensuing times have hardened the edges of all the players into a series of silos, all important but increasingly distinct from the original premise of cardiac arrest and life taking trauma. Without coherent policy there will be a never-ending struggle for reimbursement and education. Note, the Department of Education defines nursing as a profession but is currently in a debate just proposed to exclude graduate nursing programs (like MSN, DNP) from its technical definition of "professional degree" for federal loan purposes, which will dramatically increase costs and barriers but doesn't change the actual professional nature of the job.

We were doing a project back in the early 90's in Belfast, Northern Ireland during "the Troubles" one of the paramedics pointed out: "our real job is we are the dustbin men of society." Everything that goes wrong lands at the door of EMS. The expansion of resuscitation medicine, into broader unscheduled medical need large and small is now mental health, elderly health, social failures in food, housing, addiction medicine, public health, violence prevention, time critical care for acquired brain injuries, vascular disease, complex respiratory failure, sepsis, etc. etc. The evolution and remit of EMS continues. Indeed, EMS is all of these and more. And true to our historical origins meeting the people we care for at the point of nee

I think the better and first question is to figure out what do our patients need? What are the delineation lines of EMS—what in the most simplistic terms is the practice geography of:

- *time limited, protocol driven resuscitation medicine primarily delivered through public safety agencies, requiring technical education, versus:*

- *the much more complex practice geography of community level medical care, delivered through the healthcare system requiring far more academic science.*

If we look at the question through the eyes of patients and their unscheduled need I think we will find the path forward.

Resuscitation medicine continues to be refined. The much wider breadth of field medicine at the point of need however is in transformation requiring science and evidence. EMS is the closest we have to universal healthcare access and the safety net is fraying, especially in rural areas. One of the examples we face every day in rural America (and really, rural everywhere) is the continued dissolution of the hospital obstetrics system and the need for high-risk OB interface and transport. Five years ago, we were not in the HROB business. Today we are. Hospital OB

services and indeed hospitals continue to close. The patient time gap between need and care is extending rapidly and will depend on EMS, as it always must manage the gaps. The stakes are high, and mistakes are beyond easy calculation of costs. The lines between pre-hospital and hospital medicine continue to transition. The scientific basis and evidence as well as technology continues to change rapidly with increasing miniaturization of diagnostic technology coupled with new capabilities for specialist physician decision support and ability to guide a remote practitioner's hands. As an example of the latter, we have the ongoing discussion of treat and no transport with increasing need for additional experience and skill sets in our community paramedics. Once we can agree on the distinct fields of practice, we will be more able to agree on the necessary education and credentials including residencies to gain practice proficiency.

The future is unfortunately always Darwinian, and the continuing rapid evolution of EMS is no different. Our non-protocol, technician based high performing pit crew practice is one geography and destiny while the much larger role of EMS clinician driven extended practice and community medicine is going to become increasingly complex requiring increasingly academic practice and science based. Quick examples are papers published in medical journals showing J shaped curves for both EMS and emergency medicine nearly 800 EMS and over 7400 emerg medicine papers published in 2020 in 31 journals. And these do not count the myriads of other papers related to today's EMS practice. The science is ever bigger and more demanding.

- - -Tom Judge

Great debate. From a patient's perspective at the point of need, the answer is both technical and academic practice depending on the geographies. My own take is a community college associate's degree reflects the current practice environment for ever more needed and skilled street paramedics with high quality technical education. Further academic degrees may be required for more complex medicine. As noted earlier, the urban rural EMS paradox continues and the practice environment where we sophisticated practitioners is rural America.

As other commentors in the debate have noted, we can also learn from afar. One of the really interesting emergency medicine education programs back in the 90's at the University of Sheffield in the UK had everyone going into medicine—paramedics, nursing, and physicians taking the first two years of training together followed by one to several more years of education depending on the final practice environment. If we want to build a comprehensive emergency care team this is a good model. I would also add one editorial note that in countries where EMS is a core component of the healthcare system per patient reimbursement and cost of paramedicine education are not drivers in the system. We spend a lot of energy managing fundamentally bad system design.

It will be interesting to see if we are responsive too necessary change—one of the major Maxwell challenges of medicine to meet the practice needs of all patients.

- - -Benjamin Proctor

My name is Benjamin Proctor. I am currently a U.S. Army Combat Paramedic and work outside of traditional EMS systems. I hold a bachelor's degree from Columbia Southern University and am currently enrolled in the University of Louisville School of Medicine's Health Professions Education program. I have worked alongside paramedic professionals from around the world, including Canada, Spain, Sweden, South Korea, Lithuania, and Latvia.

As a paramedic working outside of traditional EMS, I've been following this debate closely and wanted to add a my perspective.

A recurring issue is that this discussion is being framed almost entirely through the lens of EMS. EMS matters, but paramedicine is larger than ambulance-based systems. Paramedicine is a healthcare profession centered on clinical assessment, diagnosis, and treatment. When we conflate paramedicine with EMS, we limit how we think about education, scope, and professional growth.

I created a LinkedIn post that highlights what we are up against without degree-based education. In that example, two physicians successfully argued before the Texas House Health and Human Services Committee that they could not delegate tasks such as IV placement and medication administration to paramedics. Their justification was not competence or experience, but education. Specifically that paramedics do not hold degrees comparable to nurses. This is the reality of the fight we are having. Until paramedics are educated like our medical peers, we will continue to struggle to earn a seat at broader medical decision-making tables.

We also need to be precise with language. Entry into paramedicine begins at the EMT level. At most colleges, EMT training is typically 10–12 credit hours, which nearly satisfies the first semester of a paramedic program. EMT education provides the foundational skills. Paramedic practice is a progression into higher-risk decision-making and greater autonomy, and education should reflect that responsibility. Importantly, CoAEMSP already requires paramedic programs to be sponsored by or aligned with a college or university. That standard is already in place. Given this, we should ensure paramedics receive academic credit for the education they are already completing rather than continuing to rely solely on certificate-based coursework.

Concerns about workforce and access are valid, but there are ways to address them without staying locked into the current certificate-only model. One option is allowing students to test for the NREMT Paramedic exam before completing all degree requirements, then practice under a restricted license with strict supervision in a structured "resident paramedic" model. During this phase, experienced paramedics serve as true clinical educators, and students can complete their remaining coursework, potentially online. Once all degree requirements are met, the paramedic transitions to an unrestricted license.

This debate is not about gatekeeping. It is about aligning education with responsibility, recognizing the education paramedics already receive, and preparing paramedics for modern clinical roles. I appreciate the opportunity to contribute and look forward to continued discussion.

- - -Benjamin Proctor

Hi Benjamin,

You're experience points out the potential benefit for higher and diverse education options for providers not working in EMS operations. I agree, there's a place in this discussion for the depth and breadth of where Paramedics find themselves working and how we can support opportunity and the challenges faced in those environments. That being said, most Paramedics will work in EMS. EMT's and Paramedics were created to serve EMS in communities everywhere.

As I said in my initial response, I support developing degree programs. I also support specialized education and training for diverse atmospheres. Today we're talking about the base and while we can improve the quality of current training, I don't think a degree requirement for entry level Paramedics is the answer.

- - -Louis Imperatrice

Good evening everyone, I love seeing so much discussion and involvement in the thread and topic and am grateful to have been a part of this! As I mentioned during the debate, this topic tends to see us stray from the notion that this is for entry level paramedics. We are not talking about degrees for advanced practice paramedics, EMS educators, or EMS leaders, we're talking about the day 1, ink still wet on their paramedic card provider. I want to first start by saying, I am in no way opposed to degrees for paramedics, during the debate I touched on this, however I must agree with Rom and Chris. Rom's point on EMS deserts and the mandating of a degree will likely only decrease access to paramedic care. I also agree with Chris's point which I believe says it best..."What makes a great paramedic is experience, mentorship, and progressive clinical exposure, supported by targeted education along the way."

For me, in my discussion points during this debate, the key indicator for me being on the disagreement side of the question posed was the word "mandatory." For decades, and still currently, we collectively as EMS professionals, across the country and the world, are providing high quality, evidence based medicine, without a degree mandate. Even without the degree mandate we still see a lack of ability to easily enter the field.

If there was clear and concise measurable data that paramedics with an associates degree provide higher quality clinical care to patients, I would support this mandate 100% over and over, but we just don't have that full data set yet.

Do I believe eventually we should be at a point where associates degrees or higher are mandatory for EMS, I sure do, however until we have the measurable data, and have solved the recruitment and retention aspect of EMS, we are just simply not there yet. There are too many barriers to entering into EMS as it stands, low pay, college is expensive, lack of access to paramedicine degree programs in areas of the country, etc.

Collectively, especially dating back to the 70s, 80s, and 90s, we have overlooked the mental health and well being of paramedic students and EMS providers. EMTs working for near minimum wage while going to paramedic school and barely making ends meet; having to make decisions of food on the table or pay next semesters tuition, dealing with the obstacles and hurdles of everyday life - for the hopes of a better career. We have allowed paramedic students to become sleep deprived, stressed, and loose their resilience. I personally, in my career, knew two paramedic students, who at the onset of their education were excited, driven, and motivated, who took their own lives due to the stress of paramedic school. This just simply cannot happen.

Instead of focusing on making it more difficult to become a paramedic, we should be focusing on ways to make it easier and more affordable. As Chris mentioned, EMS is still classified as a transport benefit with poor billing reimbursement. Would a more feasible approach be to allow certificate or vocation paramedics to enter the profession, obtain real-life on the job experience, and simultaneously enroll in an accelerated associates program, funded by state or federal government? Students could use real-life experience (which we know is a major basis of being a great paramedic and clinician) to obtain credits towards a degree, use educational credits from their certificate program and complete an associates degree at an accelerated pace.

Having state or federal financial support would also ease the burden of financial stability, allow for a better work life balance (wouldn't have to do the work, school, work, school, shuffle) and allow for overall mental health awareness. This would produce, in my opinion, better prepared and more resilient paramedics, who are set up for long term success in the profession. Not to mention, the experience clinically of working as a paramedic with the baseline knowledge, will only increase the chances of true success in an associates or higher degree program.

I want to also add that collectively as a whole, in many professions, not just EMS, more and more emphasis on experience and soft skills verses degrees is taking light. Breaking through the paper ceiling is something that more and more organizations are embracing. Walmart, IBM, and Google are all companies that now weight real-life experience and soft skills over credentials. Maryland, Colorado, and Pennsylvania have also removed degree requirements from many governmental jobs, and the federal government has recently expanded its competency based hiring frameworks over degree requirements in recent years.

I understand we are talking about medicine and clinical care which is a highly technical profession requiring advanced knowledge, however I am sure we all know the cardiothoracic surgeon with the laundry list of post-nominals who has never treated or operated on a complex case compared to the baseline educated surgeon, who spent 15 years operating in a major cardiac center taking on the most complex cases with success. Who would you want operating on you? The same can be said about paramedics...the twenty year paramedic who has worked in a busy, high performance, EMS agency with ample experience and clinical excellence, or the paramedic with the degree, but no real world experience whatsoever?

- - -Louis Imperatrice

Will Chapleau, thank you for your response to my post.

I don't agree that most paramedics will work EMS. If the average career lifespan of a paramedic really is around five years, then by definition most paramedics have already moved on, either into other areas of healthcare or out of medicine entirely. That tells me they may start in EMS, but we will lose them when they realize that EMS isn't a profession but a job.

Keeping entry requirements to a certificate program has not stabilized the workforce or improved retention. It has simply preserved the status quo. We also do not see this approach taken in other healthcare shortages. There is a well documented physician shortage in this country, yet no one is seriously proposing that Doctors don't need degrees and the degree requirement is an unrealistic barrier to entry.

Our current certificate paramedic education already meets almost all of the academic requirements for an Associate of Science degree. In most cases, it would only take minor adjustments to transition the programs we already have into degree-granting pathways. The U.S. military offers a real world example that often gets overlooked. It is the largest producer of EMTs and paramedics in the United States. All graduates of the Combat Paramedic Program and the Special Operations Combat Medic Program earn 56 academic credit hours and an Associate of Science in Health Sciences with a major in Emergency Medical Services Paramedic. That program was not created by shopping around for an existing degree to fit into. It was deliberately built to meet the operational and clinical needs of the military. Uniformed Services University (USU)Emergency Medical Services - Paramedic, A.S.H.S.

That same approach can apply to civilian paramedicine. An entry level associate degree in paramedicine does not have to be generic or borrowed from another profession. We can design it to meet the actual needs of today's paramedic. When our original certificate programs were built, they were largely based on resources like the 3rd edition of Nancy Caroline's Emergency Care in the Streets, which was roughly 650 pages. The scope, responsibility, and knowledge expected of paramedics today goes far beyond that.

Modern paramedicine already contains enough academic and clinical content to justify an associate degree. The question is not whether the material exists. It clearly does. The real question is why we continue to sell ourselves short by not giving our paramedics the credit they have already earned.

If we want paramedicine to mature as a profession, improve retention, and be taken seriously alongside our healthcare peers, then raising educational expectations has to be part of that conversation.

- - -Benjamin Proctor

Louis great points, but I want to reframe them for a minute. The framing of this as an "entry-level" issue actually strengthens, not weakens, the case for a degree. Day-one paramedics are not entry-level healthcare workers in any meaningful sense. On their first shift, they independently administer high-risk medications, make irreversible clinical decisions, manage undifferentiated complaints, and assume legal responsibility for patient outcomes in uncontrolled environments. That level of autonomy is fundamentally different from other OJT (on the job) models. Experience and mentorship are essential, but experience without a strong educational foundation simply accelerates the repetition of habits, not the development of clinical judgment. Education is what teaches how to think, not just what to do, and it is precisely at entry that those cognitive frameworks must be established to protect patients and providers alike.

Second, the argument that we lack "clear measurable data" sets an unrealistic and internally inconsistent standard. We already mandate associate degrees for nurses, respiratory therapists, and radiologic technologists without randomized trials proving degree causality for every outcome. Healthcare regulation has never relied on absolute proof; it relies on risk management, complexity, and precedent. The evidence across health professions is clear that higher education correlates with improved critical thinking, safer medication administration, better communication, and stronger adherence to evidence-based practice, qualities that matter profoundly in EMS's increasingly complex

clinical environment. Waiting for perfect EMS-specific data while the scope, acuity, and liability of paramedicine continue to expand is not prudence; it is professional stagnation.

Finally, concerns about access, cost, mental health, and EMS deserts are real, but they are arguments for system investment, not arguments against education. Low pay, burnout, financial stress, and suicide risk are not caused by degrees; they are caused by a system that demands advanced clinical labor while refusing to professionalize, reimburse, or support it appropriately. Regarding mental health and resilience, EMS clinicians will become the most routinely trauma-exposed mental health professionals in United States as we implement more crisis response models and increase engagement as law enforcement transitions out of this role.You are absolutely correct since the 1970's we have overlooked mental health and well-being of the EMS provider, but we have an opportunity to address wellness as part of obtaining your associates degree. Work life balance is a misnomer. If you are unhappy at home, you don't leave that at the door when you come to work, vis a vis if you are unhappy at work that follows you home, regardless of the state of balance you have achieved. Other countries did not solve workforce sustainability by lowering educational expectations, they solved it by aligning education with compensation, career mobility, and institutional support. Allowing certificate-only entry indefinitely does not reduce barriers; it locks paramedics into a low-status, high-attrition model with limited leverage for reform. If we truly care about access, resilience, and long-term success, the solution is not to keep paramedicine under-educated, it is to make degree-based entry affordable, supported, and paid, so the profession finally matches the responsibility we already place on its newest clinicians.

We can easily mnage a pathway forward for those who are currently paramedics or in school, so that they will continue to have the same success as the people who come after them.

All great points though.

- - -Dan Gerard

Benjamin if I may.

From my own experience it harkens directly to what you are speaking to. I wanted to earn my associates degree. I already had some college credits from Union County College for my paramedic education, 16, and Thomas Edison State College gave me credits for my clinical education (which was 1200 hours so they gave me 40 credits). I found an associates degree program at my community college. I CLEPED my general education required (GER) credits, 21 in total, the only GER I took was English, because I am from NJ and it is a different form of the Queens tongue...but I digress...

I took my A&P (I & II), microbiology, and medical anthropology/sociology. When I was done with those two semesters, I had 95 credits...when I went in to talk to my counselor at the community college, she said you blew past the associates degree. She had all the paperwork filled out for my transfer to Montclair State. I needed 33 credits for my BS, and all I did was take 1 class a semester, winter and summer sessions, and before I knew it I was done.

I hope there are people scratching there head here and saying "I can do that now!"

Just Do It (thank you Nike)

- - -Dan Gerard

Will,

How would you do it in a long game scenario...not a light switch, we are pivoting to AAS paramedics in 3...2...1... but rather over the course of time? King for a day, how would you like to see a degree program for paramedics, but in parallel with specialized training and education for those working in other complex spaces (CCT, community paramedicine, tactical medicine, occupational med., etc.).

Tell me where the diverge, tell me where they overlap...(Go White Sox)

- - -Dan Gerard

Our next commentator is Rob Lawrence, who is also an IJOP podcast section editor.

Rob is Rob is currently the Director of Strategic Implementation for PRO EMS and its educational arm, Prodigy EMS, in Cambridge, Massachusetts, He is also the current President of the Academy of International Mobile Healthcare Integration (AIMHI), and the Executive Director of the California Ambulance Association. He previously served as the Chief Operating Officer of the Richmond Ambulance Authority in Virginia and the Chief Operating Officer for Paramedics Plus in Alameda County, California. Prior to emigrating to the U.S. in 2008, Rob served as the COO for the East of England Ambulance Service in Suffolk County, England and as the Executive Director of Operations and Service Development for the East Anglian Ambulance NHS Trust.

Rob, given your broad experience in EMS operations and policy issues working at a national level with various professional associations, I'm curious what your take is on the debate.

- - -Mic
Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

Good afternoon, all. Some great discussion points made today. Let me offer two responses. First me thoughts and followed by my report and commentary on the original debate that will shortly be published at EMS1.

In terms of my thoughts - well the UK, Australia, Norway and others, can't have got this wrong - they educate to the paramedic degree level and as graduate level practice has evolved in those countries, that has now led to such advanced practitioners as paramedic prescribers and other specialists. My recent conversations with the team at the top of the Royal College of Paramedics (International Paramedic Day 2025: Celebrating paramedics worldwide) are suggesting that degree education is going to take a further advanced step and consider courses that prepare the graduate student not for a life on the truck, but for a life of MIH.

Let's discuss MIH for a second. MIH isn't a TITLE... it's a LIST of requirements for successful operation Mobile, Integrated, Healthcare (delivery).

But this all brings me back to a degree in the US and here's the but

BUT

Is our system ready for it. It is certainly ready for the knowledge and therefore the ability to treat the patient with an assured level of academic competency, but that's not the but

BUT

The folk that say, a degree will confer higher wages and better terms and conditions are out of touch with the reality of US healthcare economics. the system is currently set up to deliver minimum income for maximum effort. We are fighting an administration (and it has been both administrations) that have singularly failed, and are failing to provide the cost of readiness (versus the cost of transport) to EMS systems, so we can't afford the levels of employee we have now. Mik asked me to take a policy view, well this is it. we can describe and define the cruise liner option of educational delivery when we cant even afford the oars for the rowboat.

BUT

We should continue to have and evolve this debate, its not about APOT ambulance offload times or response times its currently about affordability and expectation and the realist in me says we have to sort the pathway before we can walk down it!

My second offering is my suggested op ed for EMS1:

"Degrees, Debate, and Direction: Why This Debate Deserves Our Attention. IJOP Perspective on an associate degree should be required for entry level paramedics."

Every now and then, a debate lands in front of the EMS community that deserves to be read slowly, listened to carefully, and reflected on honestly. The recent Socratic debate published by the International Journal of Paramedicine on whether an associate degree should be required for entry-level paramedics is one of those moments. I read IJOP and I listened to the debate on the YouTube channel, hosted by IJOP Editor in Chief Mic Gunderson, and came away encouraged, not because the issue was "settled," but because it was treated with the seriousness and respect it deserves.

This was not a shouting match. It was not social media theater. It was a structured, thoughtful exploration of a question that sits at the heart of our professional identity: What should it take to become a paramedic?

Before we get into the content, it's worth pausing on the method. This was a 'Socratic' debate, which is not a cage match about defeating the other side, but one of presenting reasoned arguments, exposing assumptions, and inviting the audience to think more deeply. Each side is given space to articulate its case fully, without interruption or rebuttal designed to score points. The goal here was understanding, not conquest, and that tone elevated the entire discussion.

The Argument for an associate degree

Advocating for an associate degree were Sean Caffrey, Gregg Margolis, Mike Thomas, and John Todaro. They framed their case around professional maturation and alignment with modern healthcare, arguing that paramedicine has evolved beyond its historical roots. Today's paramedics are expected to assess undifferentiated patients, make autonomous clinical decisions, integrate with complex healthcare systems, and function as the front door to care. That level of responsibility, they contended, requires a deeper and more structured educational foundation.

Their argument emphasized that an associate degree is not about elitism or exclusion, but about equipping clinicians with essential competencies critical thinking, ethics, communication, research literacy, and clinical reasoning that support practice in environments where protocols alone are insufficient. As clinical complexity increases, so does the need for education that fosters judgment rather than rote compliance too.

They also pointed to professional trajectory. A degree-based entry pathway, they suggested, creates smoother transitions into leadership, education, community paramedicine, research, and system design, helping avoid educational dead ends and supporting long-term career development.

Notably, this team did not dismiss current workforce pressures. Instead, they challenged the profession to consider whether it is prepared to invest in the level of education that aligns with the expectations, responsibilities, and future direction it increasingly places on paramedics.

The Argument Against Mandating a degree.

The opposing team of Lewis Imperatrice and Ed Bauter did not argue against education. They argued against exclusion. Their concern was practical, grounded, and urgent. Mandating an associate degree risk narrowing the entry pipeline at a time when EMS is already stretched thin. Cost, access to colleges, time, geography, and life circumstances are real barriers particularly in rural systems and underserved communities. They reminded us that EMS has historically thrived on multiple pathways into the profession, and that excellent paramedics are built through quality instruction, mentorship, and experience not solely academic credentials.

Most powerfully, they asked an uncomfortable question: if we raise entry requirements without fixing pay, working conditions, and career sustainability, are we simply asking people to give more to a system that gives little back? That is not resistance to progress, it's just realism.

The International Lens

The debate also sits within a broader global context. In countries such as the UK, Australia, and Norway, graduate-level paramedic education bachelor's degrees rather than associate degrees has become increasingly common. These models reflect different healthcare structures, funding mechanisms, and professional histories.

Whether those systems offer lessons, warnings, or simply contrasts is a matter for thoughtful consideration and precisely the kind of reflection this debate invites.

No Verdict by Design

What makes this IJOP debate so valuable is that it does not tell the reader what to think. There is no declared winner, no attempt to "score points," no effort to dismantle the opposing view. Instead, it presents reasoned arguments side by side and trusts the profession to engage with them, and that may be its greatest contribution.

So rather than offering a verdict here, I would encourage you to do what this debate asks of us all: read it, listen to it, reflect on it and decide for yourself and then contribute to the debate via the NEMSMA list serve: https://groups.google.com/g/nemsma The jury, quite deliberately, is you.

In the words of panelist Greg Margolis – 'thank you for listening and for keeping an open mind.'

References:

Gunderson, M., Lee, E., Bauter, E., Caffrey, S., Imperatrice, L., Margolis, G., Thomas, M., & Todaro, J. (2026). Debate: An associate degree should be required for entry level paramedics. International Journal of Paramedicine. (13). 155-175. https://doi.org/10.56068/YAZI5535.

- - -Rob Lawrence

There are two camps here, one is the camp that knows the New York Mets is the greatest sports franchise ever, and those who are afraid to admit it....oh sorry I thought I was on the NYMETS Sports/Redditt...

Overall question for those who dont think that an associates degree is necessary/required for entry into the profession, what would it take from a profession stand point, in your opinion, for the field to say "this is it, we have to make an associates degree the minimum for entry into paramedicine, we have no other choice. What are those parameters, roadmarks, what are they?

For those who have a "RIDE OR DIE ASSOCIATES DEGREE PARAMEDIC" tattoo, what happens if we dont get there, how could you keep the profession afloat?

- - -Dan Gerard

Dan, always great to get your perspective on things and of course, much respect to a fellow NJ MICP (LOL).

I highly agree that education is vital to being a great EMS provider, I just have concerns about it being mandatory. On my ride home from work today I thought about something.

What about the following model:

- Prospective paramedics enroll into an associates program

- The certificate portion is front loaded and they take their NREMT or any state specific exam after they have completed the certificate requirement (roughly 12 - 18 months). They can then begin to work clinically as a paramedic, obtain experience, and set themself up financially a bit better.

- They then continue their degree, completing the core courses , and other courses required to obtain their associates degree (roughly 6 - 9 additional months)

This results in a pathway to obtain their associates degree while also gaining real life experience, being better set up financially, and can better relate the degree content to their clinical practice.

- - -Louis Imperatrice

Louis, what if our certificate programs already meet or exceed the hour requirements of many Associate of Science programs and we are not awarding degrees?

Thank you, Daniel, for adding your experience. It helped me to re-frame my thought process slightly.

When you look at the numbers, this becomes clear. An EMT program typically requires 150 to 200 hours of education. Paramedic programs commonly require 1,200 to 1,800 hours of combined didactic, lab, clinical, and field internship time. When EMT training is included, most paramedics complete approximately 1,500 to over 2,000 total educational hours before initial licensure.

For comparison, an Associate of Science degree generally requires 60 credit hours, which translates to roughly 1,800 contact hours when you account for lecture, lab, and clinical time. Many allied health A.S. programs fall within this same range.

In other words, the academic load is already there. The difference is not rigor, time, or expectations. The difference is that we choose not to formally recognize this education with a degree.

If paramedic education meets associate-level standards in content and outcomes, then it should result in an associate degree. Anything else undervalues both the learner and the profession.

- - -Benjamin Proctor

Louis absolutely that works. To be honest there doesnt have to be a SINGLE pathway to achieve an associates degree, so any way you or anyone else can make it "work" is fine. The other important issue is that we dont leave those behind who cannot make the leap. We have to have a spot for certificate program paramedics as we transition from one point in time to another.

The other thing to consider is a new option. In the UK (if you play "God Save the King Rob Lawerence will stand at attention - https://www.youtube.com/watch?v=Sqse9O9j3kg), Australia, NZ, if you become a nurse, accountant, or teacher, your BS degree takes 3 years to complete. This is becoming an option, though limited, in the US. Lets take a line from Prince "Let's Go Crazy"...what if there was a 3 year, 90 credit BS degree for paramedics?

I am really way ahead of myself here with that one, but there are a variety of different pathways to achieve an associates degree, and Louis your suggestion is excellent. I think the important thing is not to pigeonhole ourselves as we look to advance the profession.

- - -Dan Gerard

I wanted to respond to a few statements made in this thread related to paramedic education in the interest of clarity. I personally don't know which side I fall on. I am a paramedic program director for a community college based paramedic program that offers a certificate and an Associate of Applied Science in Paramedic.

The difference between a certificate and an AS/AAS is the general education courses. I could triple the number of hours of paramedic content in my curriculum and my students would still not qualify for the AAS without the general education courses. A degree signifies completion of a certain amount of general education. Most community college based paramedic programs are around 60 credit hours. 18-21 of those hours are in general education courses.

There are formulas for converting clock hours into credit hours. The typical lecture course ratio is 15 clock hours to 1 credit making a standard 3 credit lecture course about 45 clock hours. Labs are usually around 45 clock hours per credit. Clinical and field courses conversions are all over the place. My program is around 1200 clock hours and is 43 credits, 6 of which are Anatomy and Physiology. I am maxed out on credits and clock hours.

Someone mentioned a 90 hour degree. I think most healthcare disciplines would love this because we all have more content than we have time to teach. The only quibble I have with this is calling it a Bachelor's degree. This would probably mean moving programs from the 2 years schools to the 4 years schools. We do not want to do this. I believe we will be better treated by the 2 years schools, with a few exceptions.

The last issue I think it is important to clarify is that the academic program vs workforce program debate is not about the quality of the curriculum. Most of the rules that we follow in the academy are about student protection. The CAAHEP standards also are mostly about establishing a floor and providing protection for students. You can have a mediocre program that barely does it's job exist in a college and maintain programmatic accreditation. The key to having a quality program is the people running it and the help they get from their leadership. An EMS agency could have a phenomenal paramedic program if it chose to. The notion that college based program have better education or more critical thinking is not necessarily true.

I am enjoying this discussion.

- - -Jeff Anderson, NRP
Bossier City, LA

Great comments Jeff

I think pathways for Paramedics to advance their education are the way to go.

- - -Will Chapleau

I can agree with pathways for advancement and making degrees a reasonable way for personal and career development for Paramedics.

I don't agree with making degrees mandatory for entry level paramedics.

If we're looking to science to guide us on PreHospital education, we see that our best opportunity to have an impact on competence and patient care, is to address degradation of skills and knowledge. Aggressive continuing education driven by local medical direction and data can have a huge impact.

- - -Will Chapleau

I absolutely agree that colleges should review the EMT and Paramedic Curicula and award credits to students that would apply to degree programs. I know Community Colleges are doing that here in Illinois

- - -Will Chapleau

Dan,

To make medics better and to improve outcomes, I would first support vigorous Medical direction and CE tied to data. Science tells us that skill and knowledge degradation can be managed when tied to review and CE.

As for the degree programs, I would first push for uniform recognition of the EMT and Paramedic curricula by the Community College system in the form of college credits that can be applied to degree programs.

Rather than making Associate degree mandatory for entry level, I would like to see the workforce evolve to determine the value of the degree programs.

- - -Will Chapleau

Louis and Ben make excellent points here.

Louis- you are describing what nursing is doing in NY here already. You must have an associates to become licensed as an RN and you have 10 years to become a BSN. I am not sure if other states are the same. Institutions are generally responsible for fully funding or partially funding their employee's education on the basis that they will need it to keep their jobs, though nursing seems to have as bad of attrition that we have in EMS, at least on the in-patient side. I am the first to resist comparing EMS to nursing but their pathway worked...

Of course, all of this is a funding issue but I think we are at a pivotal time in EMS where we have to be leaders and push for the advancement that we want.

To Ben's point, the certificate program at my local community colleges are 12-15 credits off from being an associates degree, making it a really obtainable goal. There is some state level funding where you can get an associates degree for free for in demand professions, paramedicine being one of them.

Certainly, this is not a one size fits all solution but it seems like everyone is interested in the profession advancing, just have to find a pathrway(s) to get there.

- - -Jonathan Lindskoog

I'm going to introduce another esteemed colleague to our conversation, Margaret Keavney.

Margaret is a former EMT and paramedic with over 30 years of experience as a healthcare attorney. She has represented hospitals and health systems, as well as health insurers, physician practices and individual physicians, and has focused for the last 23 years on EMS providers. She obtained her law degree from Tulane as well as her MHA in health systems management. She served as General Counsel for the largest provider of EMS in New Jersey, and now works in private practice in New Jersey and Louisiana. Although her law practice is limited to states in which she is licensed, she is also a part of EMSAegis, a nationwide EMS consulting firm. She lectures on EMS legal and management issues. I should also mention that Margaret is a peer-reviewer for IJOP.

Margaret, what do you have to say about all of this – the formal debate as well as the ensuing discussions that have been taking place on the listserv?

- - -Mic
Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

Hi Mic, thanks for the introduction, and for inviting me to comment.

We've been having this discussion for a long time, and its great to see so many knowledgeable people weigh in on it.

I'm on Team Education. A college degree that is the result of challenging the student and requiring completion of work in fields other than EMS creates a paramedic who is a well-rounded person, with critical thinking skills and empathy. I support a college degree for anyone who wants one, no matter how they intend to use it.

However, the Pros of requiring an AS/AAS before becoming licensed as a paramedic are outweighed by the cons one of which is access. We will lose a lot of potential paramedics if we put this gate in place. Using a college degree to screen applicants will eliminate many people who would otherwise prove to be excellent paramedics.

Who are we talking about? People with learning disabilities. People who can't forgo 2 years of gainful employment to enroll in college. Those whose family members have never sought an education and for whom education seems irrelevant. All people who can succeed in an AS/AAS program with added support before and during the program. If we want this to work, the employers have to provide that support.

As Mike Thomas pointed out, "We shouldn't lower the bar because of barriers. We should break down the barriers so that everyone can reach the bar."

My question is "How do we break down those barriers?" It can be a simple as having EMS agencies sponsor EMT-employees who want to become paramedics and provide them with schedules and hours that allow them to take the classes and still maintain a job to cover their cost of living. It would include study sessions and help with all classes, not just the EMS ones. Are there sufficient EMS leaders with the educational background to do that? I think there are, but I will bet it varies greatly across the country.

Non-traditional students, the ones who would be otherwise deterred by the college requirement, may need additional support to believe in themselves to start such a time and resource consuming feat. It's not that they can't do it, but they may not have had a good experience with formal education before. A lot of this will depend on the EMT training they got.

I like the proposal from Benjamin Proctor: Paramedic practice under a restricted license until they achieve the degree which allows them a plenary license.

We have an opportunity for a natural experiment, if anyone can put this together. A few states are now requiring an associate's degree for licensure as a paramedic. Most do not. There are so many variables, that it may not be possible to isolate this one, but comparing before and after the change, or comparing paramedics from those states to those in no incense required states may show us the difference between the two, on a large scale. Of course, we will have to choose a meaningful data point(s) to compare. For those of you who do research, what is that? Is it outcomes?

I disagree with those who say adding a minimal requirement of a college degree will help us increase wages for paramedics. As Chris Cebollero pointed out, reimbursement reform comes first, and as long as Medicare considers ambulance service as a transport benefit, and not healthcare in its own right, there will not be enough reimbursement from any payor for employers to pay paramedics commensurate with their education and experience.

I am enjoying reading the comments from the original debaters and the posts of all the commenters, and learning

- - -Margaret Keavney

Coming in late to the conversation so some of this may have been addressed by others, so bear with me.

I fully support a degree for EMS providers, for several reasons:

1. By virtue of adding two years of education, the EMS provider has an opportunity to mature for those additional two years. I recently read an article about someone who became the youngest paramedic and my first though was does she have the maturity level to deal with both the situations she will find herself in – both clinically and socially.

2. Also the education, if the programs are set up in my version, the provider also takes math which enhances drug calculations, writing composition which enhances the ability to write a better patient care report, a business class to better understand how a business (the agency they work for) operates and what budgets mean, toss in a public health class and your getting close to a well-rounded education which theoretically includes better decision making skills.

3. Gives the provider the opportunity to see beyond the narrow world of EMS by interacting with people of different views, backgrounds and education levels in a controlled environment.

I say this as a person who obtained a BS in EMS management and an MPH in Health Systems Administration, which allowed me to learn from people like Carl Post (Omaha Orange), Willie Krasner and other leaders in the industry.

- - -Peter I. Dworsky, MPH, NRP, CEM, FACPE

Dan,

This is truly a great question...how do we get there. I think that it would need to be something phased in over time and incentivized such as nursing. When nursing transitioned from hospital based certificate programs to associates and now many requiring BSNs, it was phased over time. Grandfathered in nurses were exempt. Hospital's began requiring associates degree and bachelors degrees for new hire nurses, however there was and always has been an increased level of pay for nurses with varying degrees. ASN have a pay scale, with BSN nurses making more money and MSN nurses making even more.

We would need this model for EMS. We simply could not expect entry level paramedics to require an associates degree (many which are upwards of 20k these days) without some type of incentive for this. This also could be the pathway to pay parity and an overall system increase in compensation.

In the 1970s, the ANA recognized that there was a significant service gap between new graduate nursing skills and and initial employment expectations of the hospitals. This led to the rise in the BSN programs which focused significantly on job preparedness at a higher level than a certificate nursing program, with significant focus on organization and integration into the healthcare system.

We must ask ourselves that same question with paramedics? For those of you in favor of associates degrees for entry level paramedics I ask this...Do you believe that a certificate paramedic is less equipped and prepared to to meet your agencies entry level paramedic expectations. The answer should be no, and we can thank the NREMT for that. Certificate paramedics, associate paramedic, bachelors and masters degreed paramedics still all need to meet the same requirement of the NREMT to practice (or for the few states that have not yet adopted the NREMT, their specific requirements). And then can those entry level paramedics gain those necessary skills and education that comes with an associates degree within say, the first five years of their career. The job description reads "Minimum Qualifications: NREMT-P, must obtain Associates Degree within 5 years of hire." We then supplement this through tuition reimbursement, incentives, and an increase in pay when the milestone is met.

All of these ideas on both sides of the debate are amazing. It's minds and conversations like this that are going to advance our profession.

- - -Louis Imperatrice

What nobody has commented on so far is the practical reasoning.

Whether you complete a degree or a certificate program, it is upper college-level learning which translates into ~45 college credits. The remainder of credits are a combination of entry-level English, Math, Social Science, and Anatomy and Physiology which are usually required by law. There are a lot of ways to translate certificates into appropriate college credit, but they usually have a time limit. By not requiring the AAS, either pre-licensure or within the first re-licensure cycle (so that they can start earning) new medics (who may be short-sighted and not prioritizing the degree which is needed for advancement in the ranks or transitioning to another career) will sometimes screw themselves for the sake of five classes that they are much better prepared for NOW than they will be 10 years from now. Investing in those 5 classes when you're young is analogous to forcing new employees into tithing into a 401k-they may not be thinking about it now, but a minimum investment when they are young means a much easier life later on.

The bigger question which is NOT discussed is how to transition paramedic education to the bachelor level. Most AAS programs limit majors to 30 credits of the 60-64 credit degree. It is already breaking the AAS model, which is why you frequently see colleges fudging credit for skills and clinical hours to stay within mandatory caps. Paramedic education is already 45 credits with the content expanding every year. The second problem is that paramedic education isn't lower-level (freshman/sophomore) content. It is, by definition higher-level content (junior/senior) because it teaches you how think and apply that thinking. Both of these problems are solved by moving paramedic education to the bachelor level, where paramedic education would have room to grow and could easily expand to 60 credits. It would also have the advantage of decompressing paramedic education a bit, which would allow more time for student to absorb more and engage in more reflective learning.

Most UK and AU bachelor programs have fit into this middle ground as three-year bachelor degree programs with limited non-Paramedicine content.

- - -Scot Phelps

I wanted to chime in. I have over 40 years of EMS experience as a paramedic and EMS physician and have functioned as the lead paramedic instructor at a college program, state medical director and corporate CMO. I completed a degree in EMS Management from GWU that included a 2200 hour paramedic course that was 2 semesters and a summer term in length. I am speaking for myself.

This has been a very interesting read and good discussion. Most have argued for or against a degree from the perspective of our current EMS system design. Let's take a step back and ask if the current EMS model is sufficient for the needs of the healthcare system. The answer should be a resounding no as a "you call, we haul" mentality or system design doesn't work anymore. From capacity, costs, quality, patient satisfaction, transporting is not the answer for the majority of patients. EMS has served as the access point for many patients needing acute care and have no alternative to receive that care and systems have failed to evolve to address this change in use. Unfortunately, the current reimbursement model prevents EMS from doing the right thing for patients or the system in many cases. We are too "hospital-centric" with our care and need to move into a more system-based outpatient approach to patient care. We are too "public safety" focused and don't have enough health system integration.

From an education standpoint, our current model isn't adequate for the complexity of current patients we are seeing nor the non-emergent basis of most of our cases nor for the future vision of the paramedic practitioner. The base foundational educational experience must expand and strengthen including increased exposure to patients in ER, ICU, L&D, OR, primary care, etc. Whether its part of a degree or not, better and more clinical experience is necessary. I see too many paramedic students rotating in the ER and simply doing 12 leads and IVs but not pushing medications, not intubating, not performing full patient assessments, not rotating with the MD and discussing thought process and differential. We need to admit the paramedic education model is lacking in comparison to almost every other healthcare license including AT-C and RT. My wife had to do 3000 proctored hours after her Master's degree to get the LCSW and she's not even allowed to prescribe; my daughters have done nail tech school at 350 hours and esthetician school at 1800 hours; 3 FT semesters for medical lab science after full science prereq-

uisites including micro, A&P, bio and general chemistry; My barber had a 2000 hour requirement for licensure and I won't even outline the education/apprenticeship my electrician who did my remodel completed to get his journeyman's license.(8,0000 hours) Whether we are technicians or healthcare professionals, the hours don't match up within either discipline. Any degree discussion needs to focus on a clinical degree and not just any degree. For example, an RT AAS has over 60 credit hours of RT specific coursework after appropriate prerequisites - usually 24 hours, making the degree 5-6 semesters. I think the biggest challenge is creating these clinical opportunities since hospitals typically don't hire paramedics and aren't sure how to help with that clinical experience - do paramedics rotate with the nurses or with the techs or RTs or as I did, rotate with the medical students where present.

As EMS tries to redefine and fund itself with MIH, there are companies already partaking in a 5 billion dollar industry in the out-of-hospital space providing acute care services. They utilize telehealth physicians or PA/NPs in the home providing care and billing traditional evaluation and management and CPT codes. These companies are especially beneficial in States and systems that have been slow to adopt MIH from EMS agencies but also provide a higher level of care including point of care testing, radiology/ultrasound resources and full pharmacy medication delivery at the bedside. The hospital-at-home model is growing and shows good promise on providing care in the home for patients who would otherwise be hospitalized. As has been mentioned, the paramedic of the future is a MIH practitioner who does occasional life-threats.

I believe the future will require a further split between public safety and healthcare and that the "911" system will run the true life threats (1%) of calls and the rest will be addressed through the MIH practitioner through acute care response, telehealth, and case management to match the proper resources and level of care to the patient's need. Getting the state regulatory framework and local jurisdictions to see the vision will be a major challenge and reimbursement reform is an absolute necessity. In those States and systems slow to respond, the non-EMS MIH programs will continue to flourish, though the potential benefits on the 911 side will be missed. Public Safety agencies will continue to hire the PA/NP to provide a level of service and struggle with funding of this system.

It's going to take a tiered transition to get to this state but we need to have a unified vision of where we need to be and then work towards that through federal, state and healthcare partners.

- - -Curtis Sandy, MD, FACEP, FAEMS

Sandy has it about right.

Stepping up to an Associates Degree is about patients, now and in the future. Other Paramedicine systems around the world have been moving in this direction for the last 20 years. It's a challenging journey, but progress is possible and extends well beyond this small, but important step.

Meanwhile, too many people in the U.S. find reasons to operate a model that was designed for the past. There is a pressing need for reform for the sake of patients, communities and your fantastic paramedics. Modernising your education requirements to be on par with other health professions is one element of modernisation that is doable. Other people on this discussion have made it clear that the move to an Associates Degree in Paramedicine is not that great. Just do it!

As Sandy said, if Paramedicine in the U.S. doesn't change, others will fill the gap and the opportunity will be lost.

- - -Peter O'Meara
Professor of Paramedicine, Monash University

While I'm probably not familiar to most of you, I've been on this listserv for about 12 years. I rarely post (and, full disclosure, I don't always remember to pay my NEMSMA dues....Dont tell Pat), but I do read — and I've read this entire thread with real interest. It's been one of the more thoughtful and substantive discussions I've seen here in a long time.

I find myself agreeing with pieces from both sides, but it also reminds me of why I stepped back from national-level EMS conversations years ago. Too often, they felt whimsical and disconnected from reality. I'd attend Pinnacle or other national leadership conferences and hear, sometimes from the same presenter, "EMS is healthcare" in one session and "the healthcare reimbursement model is broken" in the next — without the presenter ever realizing that saying we are healthcare tethers us to a broken reimbursement model. It's always been clear to me that most of us agree the current fee-for-service transport model is flawed, yet we keep begging to stay a part of it.

For context, I'm a rural EMS director who has worked in fire-based and third-service systems, in both urban and frontier environments. From that perspective, there are a few commonly cited arguments in this debate that I struggle with.

1. "College education equals more competent providers."

In my experience, some of the least prepared EMT and AEMT applicants we see come directly from college-based programs. I would much rather hire an applicant who completed an agency-run EMT program embedded in real culture. Education matters — but preparation, mentorship, and context matter more than where the classroom happens to be located.

2. "Requiring a degree will improve pay and professional status."

Pay in EMS is wildly variable by region, system design, funding mechanism, and leadership. There are plenty of degree-required professions that earn less than paramedics, and plenty of non-degree roles that earn more. Suggesting that a degree is the common denominator that drives compensation misunderstands basic market forces and ignores the reimbursement and governance realities most EMS agencies operate under. If you want to improve pay and improve the professional status of your staff.....DO IT NOW!!!.... Nothing is stopping you, find the funds, cut admin staff, stop buying 600k ambulances and really invest in your people.

3. "Requiring a degree will improve patient outcomes."

This circles back to competence versus credentials. I have several highly educated paramedics with bachelor's degrees who are excellent at reading research papers and discussing the latest clinical trends, they are so educated that they can point out slight axis deviations.....But just recently on a call they couldn't locate the patient or successfully input GPS coordinates. No amount of academic knowledge or expanded scope compensates for fundamental operational failure. Outcomes depend on systems, training, experience, and execution — not degrees in isolation.

4. "Degree requirements will shrink the workforce."

Here I actually disagree with many on the opposing side. Every time we've raised standards and clearly defined expectations for excellence, we've attracted more and better candidates — not fewer. Workforce challenges are far more influenced by organizational culture, leadership, pay practices, and how people are treated than by entry requirements alone.

One additional point I keep coming back to is our tendency in EMS to try to be everything to everyone. We frequently point to international models — the UK, Australia, Canada — and there is absolutely value in learning from them. But those systems were built intentionally around their governance structures, funding mechanisms, workforce models, and national healthcare systems. The United States is fundamentally different. We operate under a fragmented mix of federal, state, county, municipal, fire-based, third-service, private, volunteer, and hospital-based systems, all layered on top of a reimbursement model that was never designed for modern EMS. Importing pieces of other countries' education or scope models without acknowledging those structural differences often leads to unrealistic expectations and policy proposals that don't translate operationally.

I realize that may sound like I'm arguing both sides — and I probably am. Because I absolutely believe in increasing education. I hold a bachelor's degree myself and, with some luck, will be starting a master's program soon. Education has real value.

But I don't think this is the right argument.

The real issue isn't whether paramedics should be more educated — it's how education, scope, reimbursement, system design, and workforce realities are aligned. Until we address those foundational pieces together, we'll keep circling the same debate without meaningfully moving the profession forward.

Appreciate the discussion and the many thoughtful perspectives shared here.

Respectfully,

- - -Andy Smith
Executive Director, Grand County EMS

I was fortunate enough to work in a lot of different EMS systems across the country, with medics trained all around the world (I had UK & Aussie partners once, and hosted medics from Japan and other countries).

Personally, I would support a degree requirement for entry level paramedics (hopefully with some changes, stupid get ed requirements like a Microsoft Word class and generalized child psych).

However, a large, politically effective organization is against this for its members. The fairly large state I recieved my AEMT-CC and later brigade to AEMT-P (NREMT-P for non NY'ers) decided to eliminate the homegrown AEMT-CC level, stopped new cert classes, and said no new recents after X date. That was back in either the late 90's or early 2000's. Last September, AEMT-CC's could still recert, and the NYS Health Commissioner said the level stays for now. Pure politics.

I'm back living in upstate NY, and being in the capitol, I see a lot of the state press releases. Our lovely governor just vetoed two bills to stabilize EMS (NY's current governor hands out cash as door prizes for showing up). Post COVID, agencies in NY are increasingly consolidating at the county government level https://www.osc.ny.gov/files/local-government/publications/pdf/ems-report-2024.pdf. Claude's AI suggests significant percentages (38-53%, depending on locality:

Per Claude: Based on my search, the percentage of ambulance calls covered by Medicaid in New York State varies significantly by urban area. According to testimony from the United New York Ambulance Network (UNYAN) to the NY State Senate:

- *Rochester: 53% of calls are to Medicaid recipients*
- *Albany: 42%*
- *Syracuse: 40%*
- *Buffalo: 38%)*

If the state, which is putting out 'EMS Crisis' memos, won't fund EMS through their own Medicaid, and won't remove an old, outdated certification level, what chance is there for increased education requirements? Buffalo, the highest medicaid percentage introduced AMR's 'Earn While You Learn' program, because AMR couldn't get EMT's to work for them, so they started their own EMT class.

Claude was also unable to return significant data for pay differentials both nationwide, and in NY. That suggests agencies might want degreed paramedics, they aren't paying a premium for degreed medics. If the market won't pay for it, why require it? No Pay, No Gain.....

Degree's mean little in today's job market.

My two cents is that the 'elite' or progressive agencies need to put degree requirements in place, and see how they fare. Bring back data.

Show us better outcomes with degreed medics, and advanced practice medics with bachelors or masters level degrees. Do medic's with FP-C or CCEMT-P credentials (I'm assuming they are still boutique certs that require additional education) have better or less expensive outcomes than EMT-P's? Do current degreed medics have better outcomes?

Last, I'd look at the international programs that require degrees. Some do, many don't. How do we translate?

Given the US's current take on college degree's, I don't think it's a sustainable option today. My take would be to add on to EMT-P, create at least one flavor of 'advanced practice' at a degree level. Prove the model, then build.

Given the number of EMS agencies I see in the news struggling, closing and merging, perhaps we triage first.

As much as I'd like to wave my magic wand, I can't. EMS is local. Always was, always will be.

NY's BSN law hasn't moved outcomes much, but there are a ton more strikes over conditions and pay since it was passed.

- - -Curtis Sandy, MD, FACEP, FAEMS

Catching up here as there has been so many in depth and great conversions added to this thread!

Andy, I could not agree more than increased degree requirements will not improve pay within EMS. You hit the nail on the head when you said that pay varies widely by region. Just looking at this on it's surface, here in NJ, the starting rate for a day 1, zero experience paramedic is an average of $37.00/hr with many medics making close to if not over $100k a year after about ten years of service. I personally know a paramedic with 20 years of experience, full time, with one overtime shift a week (48 hours per week) made over $125k last year. We do not have an college level degree requirements for paramedics in NJ.

Go across the bridge into Pennsylvania and the average wage band for a paramedic is $24 - 36.00/hour. Head further out west and it's even less. In Texas for example, you have paramedics at some agencies starting at $19.00 an hour!

I also see postings on job sites for leadership positions. I recently came across a job posting for an EMS Educational Program director, with a minimum qualification of a masters degree with a salary range of $88 - 94,000 and an EMS Operations Director position in a large metropolitan area in the midwest with a salary range of $75 - 100k. This is embarrassing. Asking someone to have a masters degree, be responsible for an entire college paramedic program, and paying them in this range is sickening.

On the contrary, the average Director of Nursing for a hospital system is making $150k or more.. Until the healthcare systems across the country, the municipalities, and the government entities recognize the importance, and the value of EMS, we will never see pay be where it should be, and a degree requirement is simply not going to change this at all.

There is a lot of talk in this thread about college degrees aiding and improving critical decision making, higher level thought process, etc. However I tend to disagree and here's why:

Looking at the curriculum for an associates degree program at a local community college where I live who offers paramedic associates degrees, as several people have mentioned, the non-paramedic courses typically include your basic, low level, college courses such as English Composition, A & P (which typically is required in certificate programs as well), Intro to psychology (maybe), and Lower level math classes such as Statistics or Basic College math.

While I am sure that there is some benefit to these classes for the paramedic, will these lower level college courses really do what we are asking them to do, increase critical decision making and thought process? In my opinion, no. These are not your third or fourth year college courses as I believe Scot Phelps mentioned (maybe someone else).

Many individuals actually take these courses in high school to begin with, well before considering paramedic education.

I agree with everyone here who says that the critical decision making necessary for paramedics comes from experience. Specifically, the empathy and patient advocacy required to be a great paramedic. This comes from being on actual calls, continuing education classes, and more important than anything else - MENTORSHIP! I'm sure we all know highly educated individuals with post nominals longer than their actual name, who lack critical thinking, lack empathy, lack the ability to understand and navigate human factors - no college course can guarantee this.

- - -Louis Imperatrice

Just a couple of points to consider.

The law of supply and demand would suggest that less paramedics entering the workforce, resulting in a decrease in the supply of labor, would cause the price of labor (wages) to occur. We saw the results of that phenomenon quite profoundly when the supply of paramedics declined substantially after the COVID debacle. Since I believe a degree requirement would decrease the supply, one could expect that supply would decrease and salaries would increase.

Remember, too, that the market will pay only what it must. If it can hire a director of EMS education or a college faculty member for $60K, they will do so. If that salary is not enough for qualified individuals, don't take the position. The ego and resume boost won't make up for it, and it will hold everybody else back.

Second - on the salary question. A Director of Nursing (usually a VP around here) does make a nice chunk of change - but at the local hospitals, the Chief Nursing Officer is responsible for an average of 3,500 nursing staff, plus nursing assistants, and perhaps 18-24 nursing units (with managers, clerical staff, etc.). Not many EMS directors have that scope of responsibility.

Just thoughts for your consideration.

- - -Skip Kirkwood

As we continue discussion on the debate proposition, I'd like to introduce the authors of a paper that was published at the same time as the debate. The paper was a narrative literature review entitled, "Bachelor's degree as entry-to-practice: A literature review of paramedicine and other health professions." The authors were Cameron Rimstad from MacEwan University in Edmonton, Alberta, Canada; Jasmine Kayanja and Sidney Newman from the University of Alberta in Edmonton; and Efrem Violato from the Centre for Advanced Medical Simulation at the Northern Alberta Institute of Technology, also in Edmonton. Here is a link to their paper: https://international-journalofparamedicine.com/index.php/ijop/article/view/3528.

In contrast to the debate proposition on an associate degree requirement for entry level paramedics, they were looking at a bachelor's degree requirement. I think this reflects on how some countries have already seen the value from associates degrees and are now considering or have already elevated the requirements. I've asked these authors to reflect on the arguments made in the debate as well as the posts here in this discussion to see how their findings may support or refute points that have been made.

Joining us now in the discussion is Efrem Violato, PhD, the senior author for the literature review paper. Welcome Dr. Violato. What do make of the debate and comments so far?

- - -Mic
Mic Gunderson, REMT-P (Ret.), FAEMS
Editor-In-Chief, International Journal of Paramedicine

Efrem a study linking better care would be great, it might be in the best interest to see what other professions have done, what the metrics are that they utilized, and then do our own comparison.

- - -Daniel R. Gerard, MS, RN, NRP

I agree, and that is the big challenge for education, and generally, there is a lack of success in linking education/changes in education to actual care and better outcomes. There is research looking at some higher-level outcomes, such as we saw in the literature review, where hospitals with higher levels of degree-educated nurses saw more positive patient outcomes, but that research does not control for the multitude of covariates related to organizational outcomes. There is a recent paper (a couple of years old now) by Varpio and Sherbino, that discusses the difficulty in linking education and care. They make some suggestions about this (which I do not necessarily agree with) "First, we suggest that HPE research's history of endorsing a linear and causal association ethos has driven its quest to connect education to patient outcomes. To ensure the sustainability of HPE scholarship, we must deconstruct and disempower patient outcomes as one of HPE's god-terms, as the pinnacle goal of educational activities." Demonstrating causality, bestowing honours, and contributing to the arms race: Threats to the sustainability of HPE research - PubMed

Point being, it may be difficult to adopt metrics from other areas, though I do think this can be done at a higher level where even an economic analysis that examines care costs in areas where changes to the type of education could be insightful. The other possibility could be to go down to the individual level and follow randomly selected subsets of practitioners with different levels of education and examine patient outcomes related to their practice. Though this also poses many logistical and ethical barriers.

While it may be difficult to make the link, I disagree with Varpio and Sherbino, and I think it can be done; it just requires some creativity in how patient outcomes and education are measured, and the actual hard work of gathering the data.

- - -Efrem Violato

Here is another paper that was just published today that deals with the same types of issues and lack of evidence from current practices (in medicine) from the accreditation/regulatory perspective Accreditation science—the need for evidence to guide the global expansion of medical education accreditation: Medical Teacher: Vol 0, No 0 - Get Access

The question about how we train health professionals and the direct link to patient outcomes is the "big question" in health professions education. Though again I would say (and the authors of the Accreditation science article may agree), is not intractable and without any forms of evidence. At least if we base our educational practices on sound educational theory, we can infer that the benefits conferred through better learning will have some positive impact on patient care, e.g., developing better critical thinking and clinical reasoning skills will produce trainees and practitioners who are capable of providing better care.

- - -Efrem Violato

I've addressed this more at the baccalaureate level, because our AS or certificate in EMS, or whatever it is called, already has sufficient credits to exceed what is required for an associate degree. I believe that our colleague Scot Phelps has an excellent paper on that issue. (If I've got the wrong person, apologize in advance).

There are a number of studies about the quality of care rendered by ASN, Diploma, and BSN nurses. They may be a bit difficult to find, as the "mandatory BSN" movement ran (as far as I can remember) from the mid-1970s until the late 1980s, so they may not be easily found on line, except in some serious nursing or health care academic libraries. But my recollection is that they did establish a positive impact on patient care. And additionally (on the

subject discussed in (2) below, the move clearly pushed a "better salaries, better career options, and all that comes in the 30 years after."

There really are several discrete questions to answer. As these are longitudinal studies (probably requiring over a decade of data for each question), it could take a while. And we need many more paramedic academicians and researchers to peel this onion.

1. What is the impact of a BSPm on quality of patient care? Note that this can NOT be done with today's "take an associate paramedic or BS-EMS program and graft on enough general ed courses to award some sort of bachelors degree - it will require a curriculum that is focused on clinical care, not "fleshed out" with introductory courses in educational theory or business management. We'd need to look closely at the paramedic degree programs in Canada, Ireland, England, and Australia.

2. What is the impact of a degree (ASPm or BSPm) on the workforce, job market, and salaries? Many discussants say, "not much." Upon further exploration, the answers usually are "I know X and Y, they have degrees, and they get paid more than me." Wrong question and wrong answer. This is looking at a micro sample and drawing macro conclusions. The question must be, "When the degree is the minimum entry standard, what is the impact on workforce, salaries, etc. The other response is, "Medicare won't pay any more, so why bother?" That is looking at the cart before the horse, as well as assuming that the "fee for transport" model is the only option available. Staying inside today's box shuts down the discussion prematurely.

I would submit the following for consideration:

a. The imposition of a degree requirement, particularly a BSPm degree, would reduce the size of the workforce, as there would be fewer newly graduated paramedics in any given year. The law of supply and demand applies to the paramedic job market as well. Quantity of paramedics goes down, price goes up. Again, at a macro level and spread over a decade - not at one agency in two years.

b. In addition to (a), EMS/ambulance agencies would be forced to seriously explore different financial models, and look seriously about career options, both horizontal and vertical, for paramedic personnel.

Pardon the length. There is so much more to consider, but this is food enough for one, perhaps several, meals. Although I am thoroughly enjoying retirement, I still hope for full and rewarding careers for the profession that I so enjoyed.

- - -Skip Kirkwood

I'm really appreciating the depth and tone of this thread. It's a sign we're taking our profession seriously enough to wrestle with the hard questions.

From my lens, I don't think Skip's macro view and Efrem's education science view are at odds. They're describing different parts of the same elephant.

A few quick points:

1. We keep answering the wrong wage question. The issue isn't whether one individual medic with a degree gets paid more today. The real question is: when a degree becomes the entry standard over time, what happens to workforce structure, career mobility, and bargaining power? Other health professions didn't see a clean, immediate "degree = raise" relationship either. They saw role differentiation and market power evolve over decades.

2. Outcomes linkage is hard, but not a reason to stand still. Health professions education struggles to draw straight lines from "education change" to "patient outcome." That doesn't make education irrelevant; it means we need better models than transport-era metrics. If we hold paramedicine to a proof standard that no one else has cleanly met, we'll always talk ourselves into inertia.

3. "Bolt-on degrees" is a fair critique. If a bachelor's is just a certificate program plus random gen ed, people are right to be skeptical. A meaningful BS Paramedicine has to be intentionally built around clinical reasoning, systems thinking, ethics, research literacy, and longitudinal care, not padded with filler.

4. Access and rural reality matter. Any serious degree conversation has to include funded pathways, credit for prior learning, transitional models, and multiple on-ramps. I do not equate professionalization with exclusion. We need ladders, not cliffs.

5. Degrees aren't only about pay. They're about legitimacy, portability, influence, and being able to define our own scope instead of having it defined for us. Paramedicine's vulnerability to outdated reimbursement and regulatory stagnation is not separate from how we educate and credential the workforce.

My take: this probably isn't a single mandate flipped overnight. It's a phased strategy—build clinically rigorous degree pathways, align accreditation and competencies with where practice is going, expand advanced practice roles with clear value, and collect better data as we go. In other words, build the profession we want to measure, rather than waiting for perfect evidence before we allow it to exist.

Respectfully,

- - -Nick Nudell, PhD(c), MS, MPhil, NRP, WP-C
Paramedic Scientist, The Paramedic Foundation, a 501(c)3 non-profit charity

Thank you to Skip and Nick both for those comments.

I think Nick did a very good job of synthesizing and summarizing things. I think points 1 and 5 are particularly interesting especially from a professionalization and labour perspective.

Being from Canada I lack the American context, but from what I have seen here, I think that the transition to a degree would increase the perceptions and respect for paramedicine. While paramedicine is a respected profession in general, from within and without healthcare, I do not think it receives the same level of respect and recognition as medicine or nursing (with the same being true for other non medicine and nursing professions). The perception still exists of "ambulance drivers" or "you call we haul."

Whether appropriate or not, having a degree will, to some extent, increase the prestige and respect of the profession. Along with this will be increased bargaining power and the ability to negotiate for better wages and working conditions. With improvements in wages and working conditions, along with general respect for the profession, the job will be perceived more positively and will attract more people to the profession, with increased competition leading to a higher quality of students who are more suited for the profession.

With the shorter program length, we see many students who enter the program, complete their training at a minimal level, and then leave the profession shortly after as they decide that it is not really for them. I have heard from many people involved in clinical education that a degree may be positive in terms of selection standards or "gatekeeping."

The counter to this, as has been noted, is that some people who would be highly qualified and make excellent paramedics will not enter the profession because the degree program is a barrier for various reasons.

- - -Efrem Violato

This is an absolutely fantastic discussion, and thanks to Mic for putting it together. We're going to have a very hard time mandating any sort of a degree requirement in the near future, although I am a staunch supporter that a paramedic should be at minimum an associate's degree.

From my perspective, I think the discussion of a Bachelors requirement should not be focused on the paramedic, but rather should focus on more advanced designations, especially surrounding critical care and community (i.e. primary care) paramedics.

I have taken and taught several community paramedicine classes and was literally pulling textbooks from medical school to refresh my memory on the amount of physiology, pharmacology and pathophysiology that emergency medicine has made me forget through the years. There is so much additional knowledge base (and completely different management approaches) needed for those two disciplines that there is a strong argument for expanded education right now that is not being met with the limited hours of current certificate programs.

Tiering an associate's degree in 'general' paramedicine with these 'subspecialties' of paramedicine also can set a precedent for the development of further specialization in EMS, including the incorporation of EMS Medicine within higher level advanced practice provider programs--specific to or providing emphasis on the prehospital environment. This would also soften the compensation arguments around a bachelor's degree as we have established higher reimbursement rates with Specialty Care Transport codes and are hopefully getting closer to a separate reimbursement structure for CP/MIH.

Again, just a couple of thoughts to throw out for the group to eviscerate!

- - -Todd Heffern, MD, FACEP, FAEMS, NRP
EMS Medical Director

International Journal of Paramedicine

Published by the National EMS Management Association (USA)

GUIDELINES FOR AUTHORS

Effective Date (supersedes all prior versions): April 14, 2026

The *International Journal of Paramedicine (IJOP)* is a forum for scholarly contributions and state-of-the-art research relevant to patient care and the growth and advancement of paramedicine, including the areas of paramedic leadership, management, education, operations, culture, professional, and clinical practice. The IJOP encourages exploration of paramedicine from diverse theoretical and practical views from all disciplines, including business and economics; the natural, basic, and applied sciences; and the humanities, social sciences, and arts. Priority will be given to submissions that use sound theoretical or conceptual frameworks, strong methodological design, and relevance to the international paramedic community. All methodologies, such as quantitative, qualitative, mixed methods, and knowledge syntheses, will be considered.

NEMSMA is a longtime collaborator with the National Association of EMS Physicians in support of *Prehospital Emergency Care (PEC)*. In continuation of that relationship, *IJOP* and *PEC* have established a collaborative relationship that will facilitate the exchange of submissions in certain circumstances, based in part on which journal may be the best fit for a particular manuscript.

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- Merriam-Webster's Collegiate Dictionary (11th ed.) should be consulted for spelling.
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IJOP recognizes that artificial intelligence (AI) tools are increasingly used in research, clinical education, and manuscript preparation. This policy establishes standards for the responsible, transparent, and ethical use of AI in all materials submitted for consideration in the Journal and is aligned with the policies of the International Committee of Medical Journal Editors (ICMJE, 2023; ICMJE, 2024) and the Committee on Publication Ethics (COPE, 2025).

The goal is to ensure academic integrity, patient safety, and accountability in the dissemination of paramedicine research and other scholarly content.

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References for This Policy

Collins, G. S., Moons, K. G. M., Dhiman, P., et al. (2024). TRIPOD+AI statement: Updated guidance for reporting clinical prediction models that use regression or machine learning methods. *BMJ, 385*, e078378. https://doi.org/10.1136/bmj-2023-078378

Committee on Publication Ethics. (2025). *Authorship and AI tools* [COPE position statement]. https://publicationethics.org/guidance/cope-position/authorship-and-ai-tools

International Committee of Medical Journal Editors. (2023). *Recommendations for the conduct, reporting, editing, and publication of scholarly work in medical journals* [Section II.A.4 and V]. https://www.icmje.org

International Committee of Medical Journal Editors. (2024). *Updated recommendations: Section V — Use of artificial intelligence in publishing*. https://www.icmje.org/news-and-editorials/updated_recommendations_jan2024.html

Messaritakis, I., et al. (2025). The TRIPOD-LLM reporting guideline for studies using large language models. *Nature Medicine, 31*, 21–31. https://doi.org/10.1038/s41591-024-03425-5

U.S. Food and Drug Administration. (2025). *Artificial intelligence-enabled device software functions: Lifecycle management and marketing submission recommendations* [Draft Guidance]. https://www.fda.gov/media/184856/download

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As part of the submission process, authors will be required to confirm that their submission complies with all of the items below. Submissions may be returned that do not adhere to these guidelines.

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- An ICMJE Form for Disclosure of Potential Conflicts of Interest is submitted for each author. The form is available at: https://icmje.org/disclosure-of-interest/
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Manuscript

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- SPIRIT and the PRISMA-P extension (https://www.equator-network.org/reporting-guidelines/spirit-2013-statement-defining-standard-protocol-items-for-clinical-trials)

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- STARD (https://www.equator-network.org/reporting-guidelines/stard)

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- TRIPOD+AI (Collins et al., 2024, BMJ) (https://doi.org/10.1136/bmj-2023-078378). Required for all studies developing or evaluating AI/ML prediction or diagnostic models. This guideline supersedes the 2015 TRIPOD checklist and must be used in its place for all new submissions. A completed TRIPOD+AI checklist must be submitted as a supplemental file.
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- Identify one author as the corresponding author.
- If the work presented in the manuscript was presented at a conference or published in abstract form, identify the name of the event, location, format, and date of presentation.
- Acknowledgements, where applicable, should be brief and must include the required AI use disclosure statement (or the affirmative statement of no AI use).

Funding Information

- Please provide the details for any funding that supported the submitted work.
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Please do not use extensive formatting. Use single spaces between sentences. Separate paragraphs with a carriage return. Do not indent the first line of paragraphs with tabs or added spaces.

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- Provide the suggested title for the published article. The title used for publication is subject to editorial team approval.

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- Include between three (3) and six (6) keywords or short phrases for search optimization. The keywords paramedicine, EMS, and emergency medical services will be added by default and do not count toward the keyword limit.
- State any disclosures or conflicts for each author, in addition to the completed ICMJE Disclosure Forms. If there are no conflicts, state "None."
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- The primary body of the manuscript follows the abstract page. Composition varies by category; refer to category-specific descriptions for details.
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- Tables should summarize large amounts of information and must be labeled sequentially and referenced in the text.
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References

- Use APA7 style in-text citation and endnote formatting.
- Include a hyperlink for each reference. A DOI hyperlink in the format https://doi.org/XXXXX is preferred.
- Authors are responsible for the accuracy of all references, links, and in-text citations. AI-generated reference lists must be independently verified against the original source prior to submission (see Use of Artificial Intelligence above).

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These manuscripts share the experience of unusual clinical presentations, circumstances, or treatment approaches. Case reports should be structured as described in the Consensus-based Clinical Case Reporting Guideline (CARE; https://www.equator-network.org/reporting-guidelines/care).

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These papers present a specific management or clinical concept, idea, or theory and describe its practical application. If the paper presents a new concept, it may also suggest research, improvement projects, or pilot implementations. The primary manuscript body should contain:

- Introduction: Describe the problem, issue, or circumstance that the concept is intended to address, the current literature that demonstrates a gap, and any pertinent background information.
- Concept Description: Provide a description of the concept and how it can be applied, with sufficient detail of any methods or procedures, the setting, and the population to which the concept applies.
- Discussion: Include a critical review of related research and a discussion that highlights how the concept contributes to the field of paramedicine. Address limitations.

Dialogues (≤1,000 words)

The Dialogues section publishes comments and questions from readers related to previously published articles. The primary manuscript body should include:

- Subject Paper Information: Provide the title, name of the first author, and the *IJOP* issue for the paper that is the subject of the correspondence.
- The narrative of the correspondence.

Editorials (≤2,000 words)

Editorials are a venue for the expression of opinion and perspective on topics relevant to the paramedicine community. They should make clear points in a concise manner with a scholarly approach and tone. They should not be used for the presentation of data, findings, or research that has not been previously published.

Educational Methods and Processes (≤3,000 words)

These submissions explore a specific educational process, approach, or method, and discuss issues to consider in its practical application. The primary manuscript body should contain:

- Introduction: Describe the problem or circumstance addressed, relevant literature demonstrating a gap, and pertinent background information.
- Description: Describe the educational process, approach, or method and how it can be applied, with sufficient detail of methods, procedures, setting, and population.
- Discussion: Include a critical review of related research highlighting how the approach contributes to paramedicine. Address limitations.

Empirical Investigations / Original Research (≤4,500 words)

Submissions may be clinical or non-clinical. Apply the applicable EQUATOR guidelines described above. Authors may provide, or editors may suggest, that some information be provided as a supplemental file so that the main paper remains concise. Supplemental content may include data sets, images, video clips, and in-depth methodological details.

Empirical investigations on clinical topics may be forwarded to *Prehospital Emergency Care (PEC)* for initial consideration with the author's consent.

Submissions that evaluate AI tools as research instruments must comply with the full AI research instrument requirements described in the Use of Artificial Intelligence section above, including prompt disclosure, model version specification, TRIPOD+AI/TRIPOD-LLM checklist submission, and regulatory status acknowledgment.

Methodology (≤2,000 words)

This category provides deep explorations of methods used, or that may be used in research studies or improvement projects. These methods should be novel in a way that makes them of significant interest in their own right, separate from the studies in which they are utilized. The primary manuscript body should contain appropriate elements from the applicable EQUATOR guidelines.

Quality Improvement Project Reports (≤3,000 words)

IJOP acknowledges the importance of quality improvement activities and welcomes manuscripts describing improvement projects. United States regulations do not require quality improvement activities to have IRB/REB approval, but the distinction between manuscripts requiring or not requiring approval can be subtle. Manuscripts that appear to have framed a research activity as quality improvement to circumvent compliance standards will be rejected.

Authors uncertain whether their work should be submitted as quality improvement or research are encouraged to contact the editorial office. When in doubt, submission to an IRB for an independent determination is encouraged.

Quality improvement project reports should adhere to SQUIRE guidelines (http://www.squire-statement.org). With permission of the Editorial Team, authors may use other generally accepted frameworks (e.g., IHI Model for Improvement; DMAIC).

Reports should describe the process examined; the process change(s) tested; baseline performance; methods for conducting tests and evaluating results; post-intervention performance; confounding variables and balancing measures; and process change iterations. Discussions and conclusions should highlight what the external audience can learn from the experience, not only the activity's internal success or failure.

Reviews / Synthesis (≤4,000 words)

IJOP invites the submission of reviews of all types, including those with and without meta-analytic components. All submissions in this category should be consistent with the PRISMA 2020 guidelines for reporting systematic reviews (https://www.equator-network.org/reporting-guidelines/prisma/). Reviews that incorporate AI tools in the literature search or screening process must disclose this in the Methods section, specifying the tool, version, and how AI-identified sources were independently verified.

Toolbox (≤3000 words)

These submissions explain a tool or technique and describe its practical use. Where applicable, the articles may include a supplemental file or link containing the tool and a data file where the reader may try it out. The primary manuscript body should contain.

- Introduction: An overview of the type(s) of projects the tool or technique could be used for, or the specifics of the project in which it was actually used.
- Description of the Tool / Technique: An in-depth examination of the tool or technique and its mechanics. Describe how it should be applied in a clinical, operational, or administrative setting.
- Discussion: The underlying rationale for the tool or technique, why it may be favored over other options, and a critique of related methods. Include a discussion of limitations.
- Exercise: Where applicable, describe how to use the tool or technique in conjunction with a sample data set or scenario.

KEY INTERNATIONAL STANDARDS REFERENCED IN THESE GUIDELINES

- ICMJE Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals: https://www.icmje.org
- COPE Core Practices and Position Statements on AI: https://publicationethics.org
- EQUATOR Network Reporting Guidelines: https://www.equator-network.org
- TRIPOD+AI (Collins et al., 2024): https://doi.org/10.1136/bmj-2023-078378
- TRIPOD-LLM (Messaritakis et al., 2025): https://doi.org/10.1038/s41591-024-03425-5
- CRediT Contributor Roles Taxonomy: https://credit.niso.org
- U.S. FDA AI/ML Software as Medical Device: https://www.fda.gov/medical-devices/software-medical-device-samd/artificial-intelligence-software-medical-device

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Occasionally, issues requiring clarification, correction, or supplementation are identified after publication. In accordance with the Committee on Publication Ethics (COPE) guidelines, the journal uses addenda, errata, and corrigenda to maintain the integrity, transparency, and reliability of the scholarly record. Addenda are published to provide additional information that was not available at the time of publication and that does not affect the validity of the original work. Errata are issued to correct errors introduced during the journal's editorial or production process. Corrigenda are issued to correct errors made by the authors.

FEBRUARY 24, 2026

ADDENDA:

Rimstad, C., Kayanja, J., Newman, S., & Violato, E. (2025). Bachelor's degree as entry-to-practice: A literature review of paramedicine and other health professions. *International Journal of Paramedicine*. (13). 120-132.

A graphic and link to the video interview of the author was added to the frontmatter of the article.

- Article: https://doi.org/10.56068/HRSG6460
- Complete issue with corrected article: https://doi.org/10.56068/JBWU4159

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