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MATERNAL and CHILD HEALTH and AIDS
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DOI: 10.21106/ijma.600**COMMENTARY | EMERGENCY PRACTICE****Factors Affecting Paramedic Personnel in the Assessment and Management of Emergency Pediatric Patients within the Prehospital Settings in the United Kingdom**Carl Dowling, BSc[✉]

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[✉]Corresponding author email: carl.dowling@nhs.net**ABSTRACT**

A paramedic's role in the United Kingdom is to primarily respond and provide emergency medical care to patients in the community. Pediatric patients form a small percentage of ambulance call-outs per year, which impacts a paramedic's confidence and competence when implementing effective healthcare protocols due to few attempts and existing opportunities to address pediatric patients' needs. There are also pre-existing gaps and barriers in pediatric emergency paramedic education and the lack of exposure to that specific patient group for emergency medical service healthcare providers in the prehospital settings when responding to pediatric medical emergencies. Further guidance and support in paramedic practice and education could be advantageous in providing effective tools and knowledge to improve pediatric emergency care in prehospital settings.

Keywords: • Emergency Medical Services • Paramedics • Pediatric • Emergency Care • Barriers to Pediatric Education • Lack of Exposure

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I. Background and Introduction

The World Health Organization¹ (WHO) states frontline healthcare providers attend to acutely ill and injured people worldwide, where they assess and manage children and adults with medical, traumatic, surgical, and obstetric emergencies. National Health Service (NHS) England² follows the NHS improvement elective and emergency care directorate which provides national support and guidance in urgent and emergency care services in the United Kingdom (UK). The NHS responds to approximately more than 110 million urgent calls or emergency visits every year, which is managed by the 999 emergency call system or the NHS 111

urgent call system.² Mohammed et al.³ highlight the WHO considers maternal/child morbidity and mortality as a high public health and humanitarian concern. Quayle⁴ explains that the Office for National Statistics reported that in 2019 there were 2,390 infant deaths (under 1 year of age) and 907 child deaths (1 – 15 years of age) in the UK. There are potential gaps in pediatric education along with a lack of consistent exposure, which has a direct impact on a paramedic's competence and confidence when attending to pediatric patients out in the prehospital setting. Wolfe et al.⁵ state due to the increase in demand for emergency medical services, the NHS is undergoing a substantial reform,

whereby the quality of care delivered to pediatric patients is variable and sometimes poor. This is a result of the fragmentation of services, insufficient emphasis on healthcare promotion and prevention, due to the lack of exposure, and inadequate access to fundamental education to achieve an effective balance in access and expertise.⁵

2. Paramedic Educational Barriers

The current standard for being able to practice as a paramedic in the UK is the successful completion of an approved degree in paramedic science or completing an apprenticeship degree. These are aimed at giving undergraduates the foundation of the underpinning theory in addition to the vital hands-on experience of a total of 1,500 hours out in practice with an assigned mentor. The current academic degree has been designed to provide graduates with the tools to diagnose and deliver effective medical interventions. However, various barriers within the current educational system can impact a paramedic's training in pediatric emergency care. These include the lack of pediatric educational content and a lack of pediatric patient exposure in practice. According to Fowler et al.,⁶ pediatric patients are comprised of the minority in a paramedic's workload, thus causing this specific patient group to evoke feelings of low confidence, anxiety, and discomfort when the paramedics are attending, managing, and or evaluating pediatric patients. Hansen et al.⁷ explained that the Children's Safety Initiative – Emergency Medical Services carried out a three-phase Delphi survey on patient safety in pediatric emergencies, which involved various levels of providers including physicians, nurses, and prehospital providers Emergency Medical Technicians (EMT) and Paramedics. Results were gathered from a total of 737 respondents which included paramedics – 50.8%, EMTs – 22%, and physicians – 11.4%. The main educational priorities which were highlighted as gaps in knowledge in the survey included pediatric airway management, responder anxiety, and general skills.⁷ According to the survey, the top three needs in decision-making which were highlighted in gaps with pediatric patients among healthcare providers were knowing when to alter plans mid-course,

knowing when to perform an advanced airway, and assessing pain in pediatric patients.⁷ The National Health Service and other private EMS providers in the UK have addressed these concerns by providing a book/app for healthcare providers known as the Joint Royal Colleges Ambulance Liaison Committee (JRCALC). The JRCALC is a set of guidelines and protocols which have been derived from expert advice and practical guidance to assist EMS providers in difficult and challenging situations. There is a range of topics within the JRCALC, including resuscitation, medical emergencies, trauma management, obstetric care, major incidents, and staff well-being. There is also a pediatric page for age section that provides the average weight of a child depending on their age. This forms part of the cornerstone in the clinical management of a pediatric patient, as it can help deliver effective drug dosages, airway sizes, Direct Current (DC) shock energies, and fluid boluses in an emergency.

However, there have been various issues over the years with paramedics in the use of the JRCALC, as the book gets updated every three years and certain protocols are essentially outdated once the book gets published. Additionally, unlike the book, the app updates automatically, but it is not always practical where there have been ongoing issues loading and updating the app on certain devices and servers. According to Gregory⁸ paramedics continuously feel the JRCALC can cause them to deviate from their clinical decision-making. Paramedics worry about the possible consequences of following their clinical judgment, as the JRCALC was originally intended to support their decisions and not replace them. Over the years there has been a regulation in paramedic practice that has caused greater professional accountability within their clinical decision-making process and has brought on a stronger fear of being punished if they do not follow professional conduct. There have been various studies linking stress and anxiety with paramedics when attending pediatric patients which can impact their practice in terms of safety and efficacy which will be used in this article.

3. Lack of Exposure to Pediatric Emergency Call Outs

Cushman et al.⁹ found that stress and anxiety among healthcare providers in the prehospital setting when dealing with pediatric patients come from a lack of experience, which leads to errors in their practice. Due to the lack of frequent exposure to pediatric patients, paramedics have requested more training to improve their confidence, as children's healthcare needs have been known to be complex and diverse in nature. Hoyle et al.¹⁰ stated there was an electronic questionnaire given out randomly to 10,530 nationally certified paramedics to assess their safety culture and attitudes. The results gathered included 1,043 responses with 1,014 paramedics who met the inclusion criteria that were aware of the case where paramedic personnel provided an incorrect pediatric drug dose.¹⁰ Approximately 58.5% of paramedics felt that their paramedic education did not include enough pediatric training. Additionally, 66% administered a pediatric drug within the past year. However, when a paramedic estimated the weight of the pediatric patient 54.2% of them used length-based tape, with 35.8% asking the parent or guardian and 2.5% using the book/app based on estimated weight and height for that specific age group.¹⁰ As per trust guidelines, a paramedic will need to prove competency in resuscitation protocols for children and infants once every 12 months. Priyantha et al.¹¹ completed a study assessing the knowledge and attitudes toward resuscitation with Advanced Life Support (ALS) providers in Sri Lanka. The study concluded that out of 411 participants, 10% demonstrated inadequate ALS scores and only 8% were confident in giving ALS drugs in a resuscitation attempt.¹¹ Since the outbreak of COVID-19, there has been a greater emphasis on self-directed online learning. In previous studies, self-directed learning has reduced study retention for up to six months. Paramedics have requested more effective strategies to improve their pediatric education to help fill the gap in knowledge due to a lack of exposure. Passali et al.¹² explained that paramedics who attend up to five cardiac arrests a year are more likely to maintain greater skills and knowledge of ALS protocols. According to the National Cardiac arrest Audit¹³ (NCAA) for 2019/2020 out of 13,208 arrests

that were reported in hospital, only 166 were with patients under the age of 16 years old. According to Kingsley et al.¹⁴ the National and Regional Registry Data indicate that the incidence of out-of-hospital cardiac arrests for the under-one year of age is 47-72 cases per 100,000. Additionally, the findings published by the London Ambulance Service (LAS) which serves a population of approximately 9 million people, reports that in the year 2018 – 2019, LAS clinicians carried out resuscitation on 4,004 patients, where only 54 were for patients under one year of age.¹⁴ Hetherington and Jones¹⁵ believe a stronger focus on paramedic education in terms of reflective practice can help some of the ongoing issues relating to pediatric emergency care. Introducing innovative solutions such as further development of guidelines could help contribute to mitigating barriers paramedics face in pediatric patients.¹⁵

4. Conclusion and Global Health Implications

Part of a paramedic's role is to continuously extend their education through additional learning. Paramedics are encouraged to reflect on their practice, whereby they can meet the needs of their scope of practice. Gaps in knowledge and education for emergency pediatric care have been documented and additional training and support could be advantageous in providing effective assessment and management for the critically-ill pediatric patient. Further encouragement in the use of the support books and apps relating to JRCALC could prove to be beneficial for paramedics to fully understand and comply with local guidelines and national protocols regarding pediatric care in a pediatric emergency. More research is needed on this topic in order to capture updated considerations on the topic. Healthcare systems in the United Kingdom will continue to change and adapt to maintain the standard of care as stated by the NHS improvement elective for the prehospital setting.

Compliance with Ethical Standards

Conflicts of Interest: The author declare no competing interests.

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Key Messages

- ▶ Paramedics are aware of the low frequency of pediatric patient callouts and are in need of more updated and improved training and guidance when responding to pediatric emergencies in the prehospital setting.
- ▶ Previous research on this topic has provided evidence of paramedics' reduced confidence and competence in pediatric patient groups.
- ▶ Healthcare systems and educational facilities need to adapt to fill the gaps in knowledge in paramedic education with pediatric patients in the prehospital setting.

References

1. World Health Organization. *Health Topics: Emergency Care*. WHO; 2022. Accessed April 22, 2022. https://www.who.int/health-topics/emergency-care#tab=tab_1
2. NHS England. Urgent and emergency care: about urgent and emergency care. NHS 75 England. Published 2022. Accessed April 22, 2022. <https://www.england.nhs.uk/urgent-emergency-care/about-uec>
3. Mohammed AA, Bocher T, Magan MA, et al. Experiences from the field: a qualitative study exploring barriers to maternal and child health service utilization in IDP settings Somalia. *Int J Womens Health*. 2021;13:1147-1160. doi: 10.2147/IJWH.S330069
4. Quayle G. Child and infant mortality in England and Wales: 2019. Office for National Statistics. Released February 24, 2021. Accessed April 27, 2022. <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/childhoodinfantandperinatalmortalityinenglandandwales/2019>
5. Wolfe I, Sigfrid L, Chanchlani N, Lenton S. Child health systems in the United Kingdom (England). *J Pediatr*. 2016 Oct;177S:S217-S242. doi: 10.1016/j.jpeds.2016.04.058
6. Fowler J, Beovich B, Williams B. Improving paramedic confidence with paediatric patients: a scoping review. *Australas J Paramedicine*. Published February 4, 2018. Accessed June 10, 2022. <https://ajp.paramedics.org/index.php/ajp/article/view/559>
7. Hansen M, Meckler G, Dickinson C, et al. Children's safety initiative: a national assessment of pediatric educational needs among emergency medical services providers. *Prehosp Emerg Care*. 2015;19(2):287-91. doi: 10.3109/10903127.2014.959223
8. Gregory P. JRCALC: advice or requirement. *J Paramed Pract*. 2013;2(1). <https://doi.org/10.12968/jpar.2010.2.1.46147>
9. Cushman TJ, Fairbanks JR, O'Gara GK, et al. Ambulance personnel perceptions of near misses and adverse events in pediatric patients. *Prehosp Emerg Care*. 2010;14(4):477-84. doi: 10.3109/10903127.2010.497901
10. Hoyle DJ, Crowe PR, Bentley AM, Beltran G, Fales W. Pediatric prehospital medication dosing errors: a national survey of paramedics. *Prehosp Emerg Care*. 2017;21(2):185-191. doi: 10.1080/10903127.2016.1227001
11. Ralapanawa DM, Jayawickreme KP, Ekanayake EM, Kumarasiri RVP. A study of the knowledge and attitudes on advanced life support among medical students and medical officers in a tertiary care hospital in Sri Lanka. *BMC Res Notes*. 2016;9(1):462. doi: 10.1186/s13104-016-2270-5
12. Passali C, Pantazopoulos I, Dontas I, et al. Evaluation of nurses' and doctors' knowledge of basic & advanced life support resuscitation guidelines. *Nurse Educ Pract*. 2011;11(6):365-9. doi: 10.1016/j.nepr.2011.03.010
13. National Cardiac Arrest Audit. Key Statistics from the National Cardiac Arrest Audit 2019/20. Accessed November 24, 2022. <https://www.icnarc.org/DataServices/Attachments/Download/314173a1-1145-eb11-912d-00505601089b>
14. Kingsley P, Merefield J, Walker RG, Chapman FW, Faulkner M. Out-of-hospital resuscitation of a 3 month old boy presenting with recurrent ventricular fibrillation cardiac arrest: a case report. *Scand J Trauma Resusc Emerg Med*. 2021;29(1):58. doi: 10.1186/s13049-021-00871-9
15. Hetherington J, Jones I. What factors influence clinical decision making for paramedics when attending to paediatric emergencies in the community within one ambulance service trust. *Br Paramed J*. 2021;6(1): 15-22. doi: 10.29045/14784726.2021.6.6.1.15

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