



Literature review of the use of simulation for the training of paramedics in relation to caring for pediatric patients

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ABSTRACT

BACKGROUND

Paramedics face unique challenges when managing paediatric emergencies due to limited clinical exposure, insufficient training, the unpredictable prehospital environment, and scarce resources [1]. These factors increase anxiety and medical error risk, especially during rare, high-stakes events [2]. Simulation-based education (SBE) provides a safe, controlled environment that bridges the gap between knowledge and practice by allowing learners to rehearse decision-making and technical skills.

AIM

This review assesses the current state of paediatric simulation literature, evaluates the effectiveness of SBE in paramedic training using the Kirkpatrick evaluation framework, and identifies directions for future research.

METHODS

A comprehensive search was conducted across PubMed, PsycINFO, CINAHL, ERIC, and Scopus for studies published between 2003 and 2023, using keywords and MeSH terms related to paramedics, prehospital care, paediatrics, and simulation. The review followed PRISMA 2020 guidelines, and methodological quality was appraised using the Joanna Briggs Institute checklists. Studies were categorised according to the four Kirkpatrick levels.

FINDINGS

A total of 227 articles were identified, and upon removing duplicates, 184 were screened, and 60 were assessed for eligibility, following which 46 were excluded. In the remaining 14 studies, the use of SBE was generally reported to have had a positive impact on paramedics' confidence and competence in performing several procedures (Table 1). Several studies reported that paramedics often felt uncomfortable providing care to children, made fewer errors, and wished they had more such training opportunities. No studies reported on how the training interventions contributed to improving actual patient care to fulfil the criteria of Kirkpatrick level 4. The full details of the findings have recently been reported [3].

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CONCLUSION

Simulation shows promise in improving paramedics' readiness for paediatric emergencies, especially knowledge, skills, and confidence. Future studies should use longitudinal designs to determine whether simulation training improves patient safety and clinical outcomes.

KEYWORDS

SIMULATION, PAEDIATRICS, PRE-HOSPITAL, PARAMEDIC, EMERGENCY MEDICAL SERVICE

TABLE 1 - Retrieved Studies Pertaining to Paramedic Simulation-Based Education in Relation to Pediatric Patient Care Classified According to the Kirkpatrick Framework [2]

	Study Focus – Findings Summary	Number of Studies
<i>Kirpatrick Level 1</i>	Participants’ reaction: High rating of simulation-based courses, wish for more regular and improved pediatric training opportunities using highly realistic simulation, appreciation for interprofessional collaboration. Perceived improved comfort in performing specific airway management procedures, such as needle cricothyrotomy.	3
<i>Kirpatrick Level 2</i>	Knowledge acquisition: Increased knowledge assessment scores and higher reported level of confidence in treating pediatric patients, and improved triage assessment accuracy skills.	11
<i>Kirpatrick Level 3</i>	Behavioural changes: Observed better adherence to specific protocols, enhanced skills in laryngeal mask airway insertion, improved teamwork and management of pediatric emergencies, and a reduction in errors.	4
<i>Kirpatrick Level 4</i>	Benefits for patients: No study designed to evidence this level of impact.	0

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AUTHOR CONTRIBUTIONS

All authors contributed equally and validated the final version of record.

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DECLARATIONS

CONFLICTS OF INTERESTS

The Authors declare that there is no conflict of interest.

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REGISTRATION

No registration applicable.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICAL APPROVAL

Ethical approval for this study was not required.

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