Implementation strategies in pediatric emergency management: a scoping review protocol

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Abstract

Background: Behaviour change is not simple, and the introduction of guidelines or protocols does not mean that they will be followed. As such, implementation strategies are vital for the uptake and sustainability of changes in medical protocols. Medical or mental emergencies may be fatal, especially in children due to their unique physiological needs. In pediatric emergency settings, where timely decisions are often made, practice change requires thoughtful considerations regarding the best approaches to implementation. As there are many studies reporting on a wide variety of implementation strategies in the pediatric emergency setting, we aim to identify and map their characteristics, especially when successful, in pediatric emergency management (PEM).

Methods: We will conduct a scoping review to identify various implementation strategies in PEM using the Arksey and O’Malley framework. We will search Medline (Ovid), Embase (Ovid), Cochrane Central (Wiley) and CINAHL (Ebsco) for implementation studies among the pediatric population (≤21 years) in a pediatric emergency setting. Two pairs of reviewers will independently select studies for inclusion and extract data. We will perform a descriptive, narrative analysis on the characteristics of the identified implementation strategies.

Discussion: We will present specific characteristics and outcome measures of all included studies in a tabular form. The results of this review are expected to help identify and characterize successful implementation strategies in PEM.

Background

It is well documented that a delay in response to medical emergencies may lead to
fatal outcomes; which may be heightened in children due to their unique physical and psychosocial needs [1]. Likewise, the requirements to manage pediatric emergencies differ from adults because of their unique needs in medication, equipment, staff and pediatric-specific policies and protocols [2]. Children are often vulnerable to receiving treatments based on adult guidelines because a significant percentage of pediatric emergencies are managed in the adult or general emergency department (ED) [3]. Thus, there is a need to identify implementation strategies that can help promote guidelines or protocols targeted towards this subpopulation in emergency settings. There is evidence that the quality of care in pediatric emergencies has improved with the implementation of evidence-based guidelines in pediatric emergency management (PEM) [4, 5]. To continue this trend, and implement it in other areas of care, we first must identify successful implementation strategies and identify patterns of success among these strategies. In general, implementation strategies are methods or techniques used to enhance the uptake and sustainability of a program or practice [6]. They can be categorized into the following classes: 1) dissemination strategies (including developing messages and materials, distribution of evidence-based information), 2) implementation process strategies, 3) integration strategies, and 4) capacity building and scale-up strategies [7]. These strategies can interact with one another within a framework, or be used independently, to promote research uptake [7]. Successful implementation strategies in this context, therefore, are strategies that lead to an increase in the uptake or utilization of guidelines or protocols into routine practice [8]. Although, the preferred outcome in implementation research is to promote the overall quality of health care, the success of implementation strategies is in being able to positively influence healthcare professional and organisation
behaviour to accept or utilize evidence-based practices [8].

While some recent studies examining the effect of implementing PEM guidelines have found positive outcomes [4, 5, 9], others have reported no significant effects on the outcomes [10]. It is unclear if this is a result of poor implementation strategies, or lack of reporting on what entailed the implementation strategies. For example, Corwin et al. [9] examined the effect of implementing Pediatric Emergency Care Applied Research Network (designed to reduce unnecessary neuroimaging in children presenting with mild traumatic brain injury) on the use of computed tomography (CT) scan in pediatric ED. They found a decrease in the rate of head CT scan use after the guideline was implemented using provider feedback and electronic decision support to prompt health providers to adopt the pathway. And as such, they adopted integration strategies, which include instituting reminder systems to improve uptake of guidelines [7]. A before and after study [10], which examined the effect of implementation of a pain guideline in the pediatric ED found that the pain protocol did not reduce time to analgesia administration. They utilized capacity-building and scale-up strategies, which include training the ED physicians and nurses before the implementation of the guideline [7].

To better understand the characteristics of successful implementation strategies in PEM, the aim of this scoping review is to identify the various implementation strategies and characterize the successful ones in PEM.

Methods

We will use a multidisciplinary team, with expertise in PEM, pediatrics, research methodology and implementation science, to identify evidence to answer our review question: What are the characteristics of successful implementation strategies used
in PEM?

We will adopt Arksey and O’Malley’s 5-stage framework to conduct the scoping review [11], by identifying and stating our research questions, eligibility criteria, search strategy, study selection, charting included data, collating and summarizing our results. We will use PRISMA Extension for a scoping review (PRISMA-ScR) [12] to report our results, and the protocol is registered in the Open Science Framework platform, https://osf.io/h6jv2.

Study eligibility criteria

This review will focus on studies conducted in a PEM setting, reporting evidence used on individuals expected to be under pediatric care (e.g. 21 years and below [13], who were managed in an emergency setting. Our focus is on controlled studies that applied a protocol/guideline or a specific treatment or treatment plan in an emergency setting compared to before implementation or to another setting in which the implementation strategy was not applied. Our intervention of interest will be any implementation strategies as described earlier [7]. Literature will be limited to peer-reviewed, full-text articles published in English. There will also be no limits on the date of publication. We will exclude studies that do not mention any implementation strategy in the application of protocols/guidelines/treatment/treatment plans in the management of the pediatric emergencies.

Search strategy

A medical librarian has designed and will execute a literature search strategy in MEDLINE (Ovid), see appendix A. The search strategy will also then be adapted for other bibliographic databases: Embase (Ovid), Cochrane Central (Wiley) and Cinahl
(Ebsco). All retrieved records will be imported into an Endnote (X8).

**Study selection**

Two pairs of reviewers will independently screen identified citations for eligibility using a two-stage sifting approach to review the title, abstract, and full-text article. We will record the number of ineligible citations at the title and abstract screening stage, and both the number and reason for ineligibility at the full-text articles. Disagreements will be resolved by discussion between reviewers or by involving another reviewer when necessary.

**Data extraction**

We will develop data extraction forms in MS Excel (Microsoft Corporation, Redmond, WA, USA) and pilot them on a small selection of studies. For each included study, data will be extracted by one reviewer and checked by another for errors. Disagreements will be resolved by discussion between reviewers or by involving another reviewer when necessary. We will extract the following data:

- **Study details:** First author, year of publication, country, study design, study period, study objective (what is being implemented)
- **Study population details:** Number of participants, mean age/age range of participants
- **Intervention:** Use of any of the implementation strategies; dissemination strategies (including developing messages and materials, distribution of evidence-based information), implementation process strategies, integration strategies, capacity building and scale-up strategies, the numbers and types of implementation strategies used.

**Results**

Number/proportion of participants after intervention implementation, effect estimate measured (e.g., percentage/proportion/mean difference/odds ratio/hazards ratio/relative risk/ risk difference). This is a direct effect on providers.

Number/proportion of patients receiving intervention after implementation, effect estimate measured (e.g., percentage/proportion/mean difference/odds ratio/hazards ratio/relative risk/ risk difference). This is an indirect effect on providers.

**Data analysis**
We will present specific characteristics and outcome measures of all included studies in a tabular form. The analysis of the extracted data will be descriptive. A summary of different types of PEM implementation strategies, the types of study designs, and the direct and/or indirect effects produced will be presented in a narrative format.

Discussion

To the best of our knowledge, this will be the first systematic scoping review identifying implementation strategies in PEM. This scoping review will provide an evidence-base map of various implementation strategies that have been used in PEM, and more importantly, characterize successful implementation strategies. Following our preliminary literature search on this study question, although we expect a significant number of studies to meet our inclusion criteria, we also anticipate diversities in the implementation strategies used in PEM. This review will follow standard accepted methods for scoping reviews and will be reported according to the new PRISMA guidelines. In addition, the inclusion of an experienced systematic review team, including an expert in implementation science, will provide adequate guidance to the reviewers during study selection, data extraction and interpretation of the results. Even so, while the search strategy was clearly defined and relatively extensive, we anticipate some limitations in the scoping review to capture all the available studies related to PEM. Because of our inclusion criteria, studies may be omitted if not indexed in the databases we searched, full-text not available, or if reported in other languages other than English.

Taken together, the scoping review will help to identify successful implementation
strategies in PEM, which will help to prioritize approaches and measures while implementing protocols or guidelines in pediatric emergency settings.

Knowledge dissemination strategy

We will submit reports from this study for peer-reviewed publication in appropriate academic journals. There will also be presentation of our findings at provincial, national and international scientific meetings/conferences.

Abbreviations

CT
Computed Tomography
ED
Emergency Department
PEM
Pediatric Emergency Management
PRISMA
Preferred Reporting Items for Systematic Reviews and Meta-Analyses

Declarations

Ethics approval and consent to participate: Not applicable.
Consent for publication: Not applicable.
Availability of data and material: Not applicable.
Competing interests: The authors declare that they have no competing interests.

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Author’s contributions

TPK conceived the study. AA, AMAS and KS contributed to study conceptualisation.
AA drafted the protocol. AMAS and the medical librarian designed the search
strategy, which was reviewed by KS, AA and TPK. AA, AMAS, MJ, GO, OL and KS will be involved in study screening and data extraction. All authors read and approved final protocol

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Supplementary Files

This is a list of supplementary files associated with the primary manuscript. Click to download.

Literature search strategy - appendix A.docx
PRISMA-Extension ScR-checklist.docx