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Pain in hospitalized children: Effect of a multidimensional knowledge translation strategy on pain process and clinical outcomes

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ABSTRACT

Hospitalized children frequently receive inadequate pain assessment and management despite substantial evidence to support effective pediatric pain practices. The objective of this study was to determine the effect of a multidimensional knowledge translation intervention, Evidence-based Practice for Improving Quality (EPIQ), on procedural pain practices and clinical outcomes for children hospitalized in medical, surgical and critical care units. A prospective cohort study compared 16 interventions using EPIQ and 16 standard care (SC) units in 8 Canadian pediatric hospitals. Chart reviews at baseline (time 1) and intervention completion (time 2) determined the nature and frequency of painful procedures and of pain assessment and pain management practices. Trained pain experts evaluated pain intensity 6 months post-intervention (time 3) during routine, scheduled painful procedures. Generalized estimating equation models compared changes in outcomes between EPIQ and SC units over time.

EPIQ units used significantly more validated pain assessment tools ($P < 0.001$) and had a greater proportion of patients who received analgesics ($P = 0.03$) and physical pain management strategies ($P = 0.02$). Mean pain intensity scores were significantly lower in the EPIQ group ($P = 0.03$). Comparisons of moderate (4–6/10) and severe (7–10/10) pain, controlling for child and unit level factors, indicated that the odds of having severe pain were 51% less for children in the EPIQ group (adjusted OR: 0.49, 95% CI: 0.26–0.83; $P = 0.009$). EPIQ was effective in improving practice and clinical outcomes for hospitalized children. Additional exploration of the influence of contextual factors on research use in hospital settings is required to explain the variability in pain processes and clinical outcomes.

1. Introduction

A significant proportion of hospitalized children receive inadequate pain assessment and management [21,28,49,50,54]. This is particularly apparent within the context of procedural pain [11,28,48–50]. Moderate to severe pain in children has long been associated with short and long-term physiological and psychological adverse effects. Poorly managed procedural pain in infants can alter pain processing and perception [4,46] and can negatively impact physiological, social and neurocognitive developmental outcomes [18]. Conversely, effective pain management strategies are associated with more rapid and full recoveries and decreased costs to the health care system [10]. The undertreatment of procedural pain in hospitalized children remains a major concern despite exponential growth in pain research, effective evidence-based pain management strategies, validated pain assessment tools, and evidence-based pain standards and guidelines [1,2,51,54,56].

The challenge is not solely one of knowledge generation but also of knowledge translation (KT) [5,45]. KT is defined as a process that reduces the gap between research and practice through the dissemination and exchange of research evidence and its application to clinical practice to improve health outcomes, quality of care and health care systems [5]. A wide variety of evidence-based, multidimensional KT strategies exist. Multidimensional KT strategies employ a combination of methods implemented simultaneously, as opposed to a single strategy, such as an educational session or reminder; however, their effectiveness in

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improving clinical practice and patient outcomes is variable [16]. This study addressed the gap between research and practice in the assessment and management of procedural pain in children through the implementation and evaluation of a multidimensional KT intervention, Evidence-based Practice for Improving Quality (EPIQ) [34].

The EPIQ intervention integrates research evidence, tailored KT strategies, and continuous quality improvement methods to improve pain assessment and management and clinical outcomes for hospitalized infants and children. EPIQ consists of 2 phases. Phase 1: the Preparation Phase, establishes a group of health care professional facilitators to promote practice change at the unit level, training them to implement EPIQ and identifying a pain practice aim as the focus of improvement. Phase 2: the Implementation and Change Phase, plans, develops and implements change processes by health care professionals using selected KT strategies and monitoring improvement. EPIQ was originally developed and effectively implemented to reduce nosocomial infection and bronchopulmonary dysplasia in neonatal intensive care units (NICUs), but it has not been widely tested for other patient problems and in other populations [34].

In this study, EPIQ was adapted and implemented across a broad national, hospitalized pediatric population and unit type, resulting in additional applicable outcome data. The purpose of this study was to evaluate the effectiveness of EPIQ in improving pain processes (ie, pain assessment and management) and clinical outcomes (ie, pain intensity) in pediatric hospital units in Canada.

2. Methods

2.1. Study design

A prospective cohort comparative design with repeated measures was implemented over 15 months in 32 hospital units, across 8 Canadian tertiary, pediatric hospitals. Research Ethics Board approval was obtained at each participating site and affiliated university. Sociodemographic and pain practice process outcome data were collected at baseline (time 1) and at intervention completion (time 2). Clinical outcome data were collected 6 months post-intervention (time 3).

2.2. Participant inclusion and allocation

Participating hospitals met the following inclusion criteria in at least 4 of their patient care units: (1) distinct geographic location and administrative structure; (2) a minimum of 15 beds per unit; (3) provision of care for children exposed to painful procedures for diagnostic or therapeutic purposes; and (4) implementation of pharmacological, physical and psychological interventions to manage pain. As part of national hospital accreditation, tertiary pediatric hospitals in Canada must have pain management policies in place, so it would be unlikely to find a naive hospital; however, variation does occur across hospital units. The last criterion ensured a common cadre of recommended pain management practices while providing the opportunity to study differences in their implementation. Pediatric emergency care units were excluded

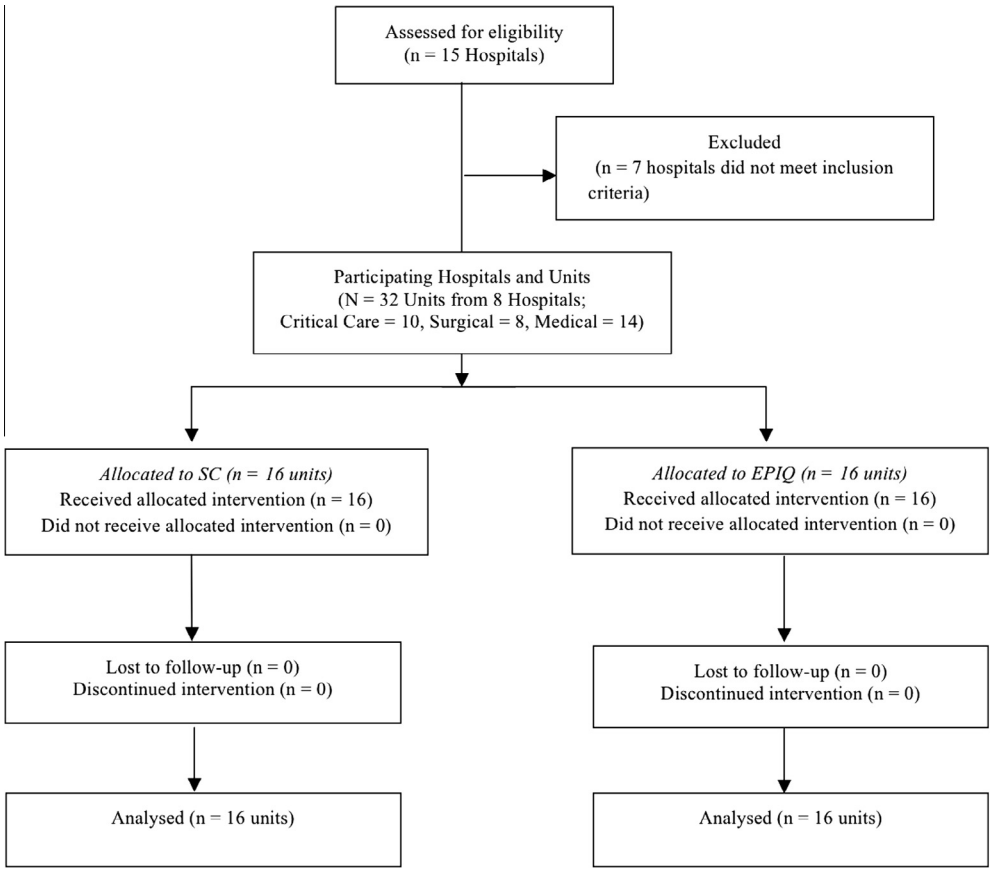

Fig. 1. Study flow diagram.