

## Randomised controlled trial

# Installation of safety devices reduces the risk of home injury in children

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Commentary on: **Phelan KJ**, Khoury J, Xu Y, *et al*. A randomized controlled trial of home injury hazard reduction: the HOME injury study. *Arch Pediatr Adolesc Med* 2011;**165**:339–45.

## Implications for nursing practice

- Installation of simple safety equipment such as stair gates, cabinet locks and smoke detectors can significantly reduce the exposure to safety hazards in the home and the rate of medically attended injuries.
- Families should receive education regarding the risk of home injury in children.

## Implications for nursing research

- Research is needed to further identify the best mode of intervention delivery and the contextual effects that influence intervention effectiveness in different cultures and settings.
- A cost–benefit analysis is recommended.

## Context

The home is a principal setting for injury mortality and morbidity, especially for those younger than 15 years of age.<sup>1</sup> The specific types and causes of childhood injuries vary according to age and development. Fires and burns, inhalation and suffocation and drowning are the leading causes of unintentional home injury death while falls account for the highest number of medically attended non-fatal injuries.<sup>2</sup> The overall economic burden of home injuries is enormous, with the annual cost of these injuries to society estimated to be over \$50 billion for children in North America alone.<sup>3</sup>

Home injuries are complex in causation and complicated to prevent as they are associated with significant changes over time as children mature. Little is known about the reasons why caregivers adopt home safety practices and young children are exposed to varying hazards, with varying vulnerabilities, influenced by the physical and cognitive–social characteristics of their stage of development.<sup>4</sup> With each new developmental stage, new injury hazards emerge.

Identifying and applying effective safety systems to reduce injury represents a significant challenge and there is an inconsistent evidence base surrounding the prevention of home injuries in children. Given the burden of the clinical problem, the current study of a home safety intervention that installed and maintained safety devices in all intervention homes was warranted.

## Methods

This study sought to test the efficacy of installing safety devices in the homes of young children on total injury

rates and on injuries deemed modifiable by the installation of these devices. The authors conducted a nested, prospective, randomised controlled trial of mothers and their children from birth to 3 years participating in the Home Observation and Measures of the Environment (HOME) study; a birth cohort examining the developmental effects of exposure to prevalent environmental neurotoxicants.

Of 8878 prenatal patients, 1263 (14.2%) were eligible, 413 (32.7%) agreed to participate and 355 were randomly assigned to the intervention (n=181) or control (n=174) groups. The intervention was the installation of multiple passive safety measures (eg, stair gates, cabinet locks and smoke detectors) to reduce exposure to injury hazards. Injury hazards were assessed at home visits by trained research assistants using a validated survey. The main outcome measures, assessed by telephone (quarterly in the first year and twice a year thereafter) and annual home visit interviews, were modifiable and medically attended injuries (ie, telephone calls, office visits, urgent care and emergency visits for injury). Injury events were classified as modifiable before the start of the trial according to whether the resulting injury could have been altered by one of the installed interventions.

## Findings

Intervention and control groups were demographically similar and had similar exposure to hazards in the home. At the completion of the study, homes of children in the intervention group had significantly fewer injury hazards and these children had a 70% reduction in the rate of modifiable and medically attended injury (2.3 compared with 7.7 injuries per 100 child-years). The authors suggest that extrapolation of these results to a large-scale implementation of this type of intervention could result in a 26% reduction in all medically attended, housing-related injuries.

## Commentary

Despite the huge impact in terms of morbidity, mortality and cost, there have been few high-quality studies looking at home injury in children.<sup>5,6</sup> Fewer studies have had injury as an outcome and they have yielded conflicting results. This study by Phelan and colleagues is welcome in that it was carefully designed with an appropriate injury outcome and sufficiently powered to detect a difference in injury rate. The results demonstrate that home safety interventions that install and maintain safety devices

result in a significant reduction in medically attended injury. Nurses are in a unique position to advocate for the installation of these home safety devices to families both formally and informally.

Given the burden of home injury in children in terms of medically attended visits and cost, intervention programs should be at the forefront of public health strategy. Sadly, this is not the case and there remains a huge discrepancy between both research funding and social programming in injury prevention when comparing the burden of injury to other diseases.<sup>7</sup> In the context of these results, while promising, there is still further work to do. It will be important to identify the best mode of intervention delivery in different cultures and settings in the 'real world', and the cost-benefit of the most appropriate approach.

Competing interests None.

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