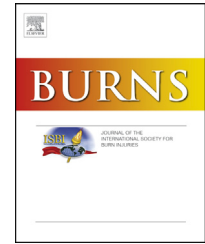


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Teaching safety at a summer camp: Evaluation of a fire safety curriculum in an urban community setting



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ABSTRACT

Objective: To evaluate the effectiveness of the Danger Rangers Fire Safety Curriculum in increasing the fire safety knowledge of low-income, minority children in an urban community setting.

Methods: Data was collected from child participants via teacher/researcher administered pre-, post-, and retention tests. A self-administered questionnaire was collected from parents pre- and post-intervention to assess fire/burn prevention practices. Paired t-tests were conducted to compare pre-, post-, and retention test mean scores by grade group. McNemar's test was used to determine if there was a change in parent-reported prevention practices following the intervention.

Results: The first/second grade group and the third grade group scored significantly higher on the post- and retention test as compared to the pre-test ($p < 0.0001$ for all comparisons). There was no significant change in scores for the pre-k/k group after the intervention. There was a significant increase in 2 of 4 parent-reported fire/burn-related prevention practices after the intervention.

Conclusion: Fire safety knowledge improved among first to third grade children, but not among pre-kinder and kindergarten children who participated in the intervention. This study also showed that a program targeted towards children and delivered in a classroom setting has the potential to influence familial prevention practices by proxy.

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1. Introduction

Unintentional fire/burn related injury in children is a leading cause of injury morbidity and mortality in children in the

United States. In 2010, fire/burn related incidents were ranked as the fourth leading cause of injury-related death in children 1–4 years old and the third leading cause of injury-related death in children ages 5–9 years old [1]. The Centers for Disease Control and Prevention estimate that over 300

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children are treated in an emergency room for burns on a daily basis in the United States [2]. Socio-demographic risk factors for unintentional fire/burn related injuries include young age [3–6], male gender [3,5,6], non-white ethnicity [3,6,7], living in urban areas [3], crowding [7], and low socioeconomic status [3,6,7].

The severity of this issue has led to the implementation of several curriculum-based fire/burn injury prevention efforts for elementary school-aged children in the United States. These include Project Burn Prevention (school component) [8], Learn not to Burn [9], and the Burn Prevention Program [10]. The Project Burn Prevention school component was implemented on a citywide scale and was taught by classroom teachers throughout the year (at the discretion of the teachers) [8]. The Learn not to Burn Curriculum randomly stratified schools in the state of North Carolina and used a pre- and post-test design with comparison groups [9]. The Burn Prevention Program used the pre- and post-test design on a classroom level and did not have a comparison group [10]. Both the Burn Prevention Program and Project Burn Prevention showed a significant increase in fire safety knowledge, while the Learn not to Burn program showed no significant change in fire safety knowledge [8–10]. None of these programs were evaluated for their effectiveness on minority, low-income populations, which are at greater risk for fire/burn related injuries [3,6,7] or looked at specific behavioral changes related to the educational intervention.

We aimed to evaluate the Danger Rangers Fire Safety Curriculum, an effort that aims to address this limitation. The Danger Rangers program educates children in pre-kindergarten to third grade regarding general fire safety and existing fire safety hazards that may be present in their own environment [11]. To our knowledge, the fire safety portion of the Danger Rangers curriculum had not been previously evaluated. We examined the effect of the Danger Rangers Fire Safety Curriculum on fire safety knowledge and household fire/burn related prevention practices in a sample of minority, mostly low-income pre-kindergarten to third grade children in an urban Texas community setting based on pre-, post-, and retention test data collected in 2007.

2. Methods

2.1. Study design

This study used a single-group, pre- and post-test design to determine the efficacy of the intervention on knowledge-related outcomes, as well as parent reported fire/burn related prevention practices.

2.2. Participants

The Danger Rangers Fire Safety Program was delivered to 166 children in pre-kindergarten to third grade for which written informed parental consent was obtained. The classrooms were divided into pre-kindergarten to kindergarten, first to second grade, and third grade per curriculum design. Typical age ranges for children in these grade levels in the United States are as follows: 3–4 years old for

pre-kindergarten, 4–5 years old for kindergarten, 5–6 years old for first grade, 6–7 years old for second grade, and 7–8 years old for third grade [12].

2.3. The Danger Rangers Fire Safety Program

The Danger Rangers Fire Safety Curriculum, created by Educational Adventures in collaboration with the American Association of Health Educators, Topics Education, and classroom teachers [11], is available for digital downloading, and in print both nationally and internationally through Safe Kids coalitions. Components of the curriculum include Danger Rangers' cartoon DVDs, storybooks, and activity books. The program delivered was age appropriate with separate curricula for grades pre-kindergarten to kindergarten, 1st to 2nd, and 3rd. All age groups had the opportunity to interact with a professional firefighter who discussed fire safety and reiterated messages from the classroom curriculum. Learning activities for the pre-kindergarten to kindergarten age group included matching pictures on fire safety, as well as practicing responding to a fire. Learning activities for the 1st to 2nd grade age group included a pledge to follow fire safety rules, writing and illustrating a book featuring fire safety rules, learning about 911 (the emergency medical services telephone number), and how to make a call, learning about important kitchen safety rules, and creating and explaining their family fire escape plan. Learning activities for the 3rd grade age group included discussing fire safety for different times of the year and learning fire safety tips through a song [11]. Further information pertaining to the curriculum can be obtained by contacting the Danger Rangers' marketing company, Mighty Kids Media [13].

The program was delivered for four hours a day at a summer day camp, for one week (Monday through Friday) out of the total 6-week duration of the camp. Community leaders representative of the participants' cultural backgrounds were chosen as teachers for the camp and given a 4H training session on delivery of the program.

2.4. Data collection procedures

Data collection consisted of two approaches: teacher/researcher-administered fire safety knowledge tests for the child participants and self-administered questionnaires for the parents of the child participants. A pre-test was delivered to students by research staff and teachers prior to initiation of the fire safety curriculum. A post-test was delivered in the same manner at the end of the week after the full curriculum was administered, and a retention test was delivered three weeks later while the children were still attending the summer day camp. A parent questionnaire, containing demographic data and informational questions regarding previous injuries and current prevention practices for fire/burn related injuries was given to parents on the first day, prior to program onset. These questionnaires were filled out by parents and returned on-site. This same parental questionnaire was delivered at three weeks after the intervention. In addition, a survey was given at the end of the intervention week to elicit feedback on children's engagement during the program as measured by parental report.

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