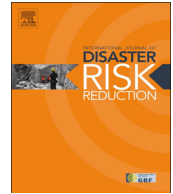




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Review Article

Evaluations of disaster education programs for children: A methodological review

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ABSTRACT

The purpose of this methodological literature review was to investigate how scholars and practitioners currently measure and judge the effectiveness of disaster education programs for children through evaluation. From a systematic search of the published and gray literature, 35 studies were identified and analyzed to develop a categorization of the operational components of the existing body of research, including the types and sources of evaluations, research methods and designs, research participants, outcome indicators, approaches to analysis, and research limitations. A significant finding is that most of what is known about the effectiveness of disaster education programs for children is based on the results of quantitative studies with children that generally focused on measuring children's knowledge of disaster risks and protective actions and child reports of preparedness actions. The majority of descriptive and quasi-experimental studies concluded that programs were effective based on the portion or positive change in children's correct answers on surveys, and most correlational studies concluded positive outcomes such as household preparedness were associated with children's participation in disaster education programs. However, many of the studies had significant methodological limitations. While there is evidence of valuable knowledge change, there is still very limited empirical evidence of how disaster education programs facilitate children's roles in household preparedness, their self-protective capacities, or their likelihood of preparing for disasters as adults. In addition to the need to identify and refine program theory and meaningful outcome indicators, the authors suggest several other opportunities for future research.

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1. Introduction

Research has found that advanced preparations for disasters can save lives, reduce injuries and prevent damage to property and critical infrastructure, enabling communities to recover more quickly [60,50,73]. Disaster education, which includes education on disaster risks, mitigation and preparedness strategies, is one approach to reducing the negative consequences of disasters [42,70]. According to the [75]-2015 *Hyogo Framework for Action*, the objective of disaster education is 'to build a culture of safety and resilience at all levels,' in order to reduce the adverse social and economic impacts of hazards. Disaster education programs and media have historically targeted adults with information on disaster risks and ways to prepare their families, such as creating family emergency plans, purchasing home and rental insurance, and stockpiling food, water and supplies (Mileti et al. 2004; [20]). Despite these longstanding education efforts, household preparedness levels have remained low and generally unchanged, even while the costs and dangers of catastrophic disasters have increased [48], indicating public education is failing to motivate adults to take preparedness measures.

Over the last decade, emergency management agencies, schools and non-governmental organizations have increasingly targeted children as an audience for disaster education [79,67,65,43]; UNISDR 2007b; [41,37]. According to the United Nations Children's Fund [76,19], disaster education programs for children intend to 'contribute to a drastic shift in mentalities and perceptions as well as behavioral change towards a more proactive preventative approach to disasters.' Recently, the U.S. Federal Emergency Management Agency [23] and UNICEF [64] have documented a wide range of disaster education programs for children globally, including formal and informal community, school-based and extracurricular programs supported by government or private sector funding. The increasing development and investment in disaster education programs for children reflect an international consensus that these educational initiatives produce some gain in individual and community resilience to disasters [82]. However, several authors conclude there is very little formal evaluation of these programs and their effectiveness achieving desired learning and behavioral outcomes [62]; [64]; Federal Emergency Management Agency [22]; [60].

Although research in this area is growing, there is currently no scholarly consensus on what counts as credible evidence of effectiveness of disaster education

programs for children (for a related discussion, see [16]). In a case study of school-based disaster education in 30 countries, [64] concluded, 'assessment of student learning is the least considered and least developed element of disaster risk reduction education.' One area requiring further examination is the development of measurable program outcomes that explicitly link children's learning to improvements in disaster preparedness, and outcomes during and after disasters. Another is the identification of practical and effective evaluation methodologies, particularly age-appropriate data collection methods to assess indicators of children's disaster resilience.

The purpose of this methodological literature review was to investigate how scholars and practitioners currently measure and judge the effectiveness of disaster education programs for children through evaluation. The extent of the existing body of research on disaster education for children is not well defined. The few commonly cited studies of disaster education for children, particularly those by Ronanet al., have reported preliminary findings based on both correlational [56,58,61] and quasi-experimental studies [57,59]. However, as these authors themselves conclude, more research is necessary to identify causal relationships between children's education and improvements in individual and community disaster resilience. Since many disaster education programs have been developed by non-formal educators, such as emergency management agencies and child protection organizations, program evaluations may exist in the gray literature in the form of government reports, internal studies and white papers ([55,10]). Therefore, the review presented here results from a broad and systematic search for both published and unpublished studies that evaluate the impacts and implementation of disaster education programs for children.

To characterize the current state of evaluation of disaster education programs for children, the studies were analyzed to develop a categorization of the operational components of the existing body of research, including the types and sources of evaluations, research methods and designs, research participants, outcome indicators, approaches to analysis, and research limitations. In particular, this study examines the types of outcome indicators used to measure program impacts. It also examines the data collection methods used in studies involving children to identify promising practices. In addition, the categorization of research limitations reported in the studies is used to identify common research constraints and possible

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