Research Article

Community First Aid Training for Disaster Preparedness: A Review of Education Content

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Abstract. Disasters pose a substantial risk to people's health and well-being on a global scale. Community-based training on the initial response to traffic accidents has a considerable impact on reducing morbidity and mortality. There is no information on the most effective type of community-based training for such incidents or on how to integrate this into disaster response. The goal of this study was to characterize the content of first aid training and its effect on providing assistance during a disaster. The MEDLINE, PsycINFO, Scopus, and Web of Science databases were searched. The terms "basic life support" OR "bleed control" OR "cardiopulmonary resuscitation (CPR)" OR "first aid" AND "bystander" OR "layperson" OR "public" were used. We chose the general public as our sample. We included only publications that were available in English and published between January 2000 and September 2021 due to time and resource constraints. Four of the included studies were conducted in the United States and one in Indonesia. The sample size ranged from 24 to 465 members of the general public or bystanders. Community members gained increased knowledge and abilities regarding disaster preparedness strategies and procedures. The first aid training content focused on prehospital trauma care, including training on the ABCs, dealing with disasters in the community, calling for help, identifying the location of life-threatening bleeding and applying pressure, and packing a wound and applying a tourniquet for bleeding control. A training program emphasizing both first aid methods and inhibitors of behaviors to help in an emergency was found to be significantly associated with increased rates of assistance during emergency situations.

Keywords: community first aid, training, disaster preparedness, review

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1. Introduction

Disasters pose a substantial risk to people's health and well-being on a global scale [1]. Between 2006 and 2020, natural (such as an earthquake or tsunami) and man-made (such as an industrial accident or terrorism) disasters cost the global economy around USD 1.5 trillion, killed approximately 750,000 people, and impacted almost two billion others (The International Federation of Red Cross and Red Crescent Societies, 2020). The rising frequency and severity of natural disasters produced by natural hazards is

cause for concern (UNISDR, 2020). According to the World Health Organization [2], the majority of deaths that occur during or after a disaster occur in the pre-hospital period, or the time period immediately preceding the patient's arrival at a health facility (pre-hospital). The primary focus of efforts to reduce trauma-related death and morbidity should be on facilities, so that early care may be emphasized in an attempt to attenuate the impact of trauma [3].

The WHO recommends residents to educate themselves about necessary preparedness processes and to pay special attention to vulnerable areas of their communities. Education should be concentrated on the most critical topics and should include preparatory teaching for all community members (WHO, 2015). The word "disaster preparedness" refers to actions made to increase life safety in the case of a disaster, such as protective measures implemented in the event of an earthquake, hazardous materials leak, or terrorist attack [4]. Additionally, it encompasses measures to strengthen the capacity to respond to emergencies, contain disaster damage and disruption, and engage in post-disaster repair and early recovery activities (International Federation of Red Cross and Red Crescent Societies, 2016). Initiatives for disaster preparedness and response have shifted away from individual efforts and toward communal resilience [5].

First aid training is a critical component of pre-hospital care, with the purpose of educating the general population on how to deal with crises without relying on advanced medical technologies [6]. Prior research indicates that community-based training in the initial response to traffic accidents has a considerable impact on morbidity and mortality reduction [7,8]. In certain countries, such as Taiwan, community-based first aid training has developed into a mandatory government program that is administered nationwide and updated annually for the general population [6]. Another study shown that implementing a disaster awareness and readiness training program in collaboration with community health volunteers led by primary health care staff can significantly increase household disaster awareness and preparedness[9].

Preparedness and understanding were discovered to be associated with prior disaster experience and risk perception. Community engagement involving culturally competent individuals and collaborations between universities, public health agencies, and community-based organizations is generally preferred to risk communication practices when it comes to achieving preparedness intervention program goals [10]. There is no information on the most effective type of training for such an incident in the community or on how to integrate it into the disaster response. The goal of this study is to characterize the content of first-aid training and its effect on providing assistance during a disaster.

2. Methods

The purpose of this review was to address a specific research issue of the first-aid training and emergency assisting literature; in other words, this study seeks to map out the content of first-aid training and its impact on disaster preparedness. As a result, a scoping review is a better fit for this work. Additionally, a study of the literature on first aid training and emergency assistance demonstrates that a variety of research designs—including interviews, focus groups, and survey studies—qualify for inclusion in this review, demonstrating that a scoping review is the more appropriate method.

Recognize pertinent sources and search phrases. Multiple search phrases were employed to encompass the scope of the issues being investigated as well as the variety of terminology used in journals and research domains. MEDLINE, PsycINFO, Scopus, and Web of Science databases were searched (Core Collection). The terms ”basic life support” OR ”bleed control” OR ”cardiopulmonary resuscitation (CPR)” OR ”first aid” AND ”bystander” OR ”layperson” OR ”public” were all used.

2.1. Inclusion and exclusion criteria

We chose the general public as our sample. ’The public’ is defined as everyone who is not engaged as a first aider in the emergency services. Given the scarcity of Indonesian research in this area, and in order to capture the broadest possible range of potential barriers and enablers, we chose to widen the scope of our inquiry to include articles from other settings that are broadly compatible with the Indonesian. Specifically, countries with formal first-aid training programs. We included only publications that were available in English and published between January 2000 and September 2021 due to time and resource constraints.

This discussion resulted in the development of two exclusion criteria. To begin, we eliminated publications that focused primarily on medical professionals; our search identified multiple such studies despite using terms such as ’public’, ’layperson’, and ’bystander’. Several of these publications also include training statistics for the general public. Second, we excluded studies that were solely concerned with first aid in schools or the workplace. Thirst, we omitted studies that focused exclusively on the use of automated external defibrillators (AEDs) or that did not provide a separate analysis of AED and CPR.

2.2. Procedures

The three authors conducted the literature search, and JP examined abstracts independently for compliance with the inclusion criteria. There were only a few assessment disagreements (1%), which were all handled by conversation. The review process is depicted in Figure 1, including the number of duplicates deleted and the number of cases rejected at each level.

Two reviewers (independently) assessed the methodological quality of all the selected research. We used the Cochrane Effective Practice and Organization of Care Review Group's quality criteria [11] since they provide verified checklists for each study design type covered in our review. Stability and reliability of outcome measures were also important criteria for randomized controlled trials. Participants were protected from contamination by blinding them to their own group's allocation during follow-up and blinding the evaluation process. A study was classified as low risk of bias if all quality criteria were met, and high risk if two or more criteria were missing or unclear. When three or more criteria were not met, were partially met, or were unclear, studies were classified as having a high risk of bias. Certain difficulties of quality regarding eligibility surfaced during the assessment process in studies in which bias was manifested clearly. The group of reviewers agreed on a cut-off point for inclusion between studies having a risk of bias and studies that were unquestionably skewed.

Due to the fact that no single data extraction form is appropriate for all purposes, we customized the Best Evidence Medical Education Collaboration's (BEME) coding sheet [12] to our review's requirements. The extracted data included information on the technique, participants, setting, educational characteristics, assessment aspects, and study findings.

3. Results

Five studies were included in the review (Figure 1). The review's conclusions are given individually for the two subject areas, namely training efficacy and instructional content. We documented the type of first aid administered, the study site, the design, sample size, measure, conclusions, and educational content for each study.

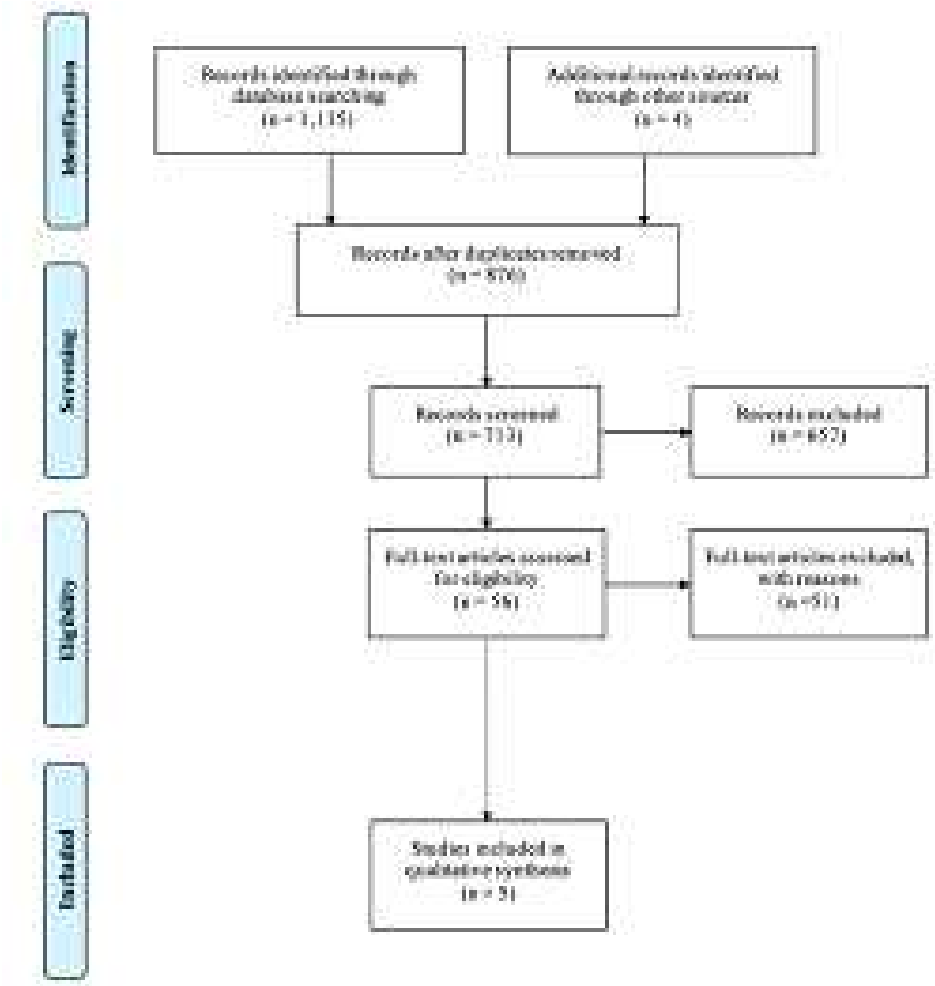

Figure 1: PRISMA flow chart.

3.1. Characteristics of included studies

Four studies were undertaken in the United States of America and one in Indonesia. The sample size ranged from 24 to 465 members of the general public or bystanders. [13] discovered that both groups improved their confidence in their ability to control severe bleeding following the class, utilizing anonymous pre- and post-course surveys. CM confidence was 36.1 percent without a TFA kit compared to 57.0 percent with one (p=0.008), and MP confidence was 53.8 percent without a TFA kit compared to 87.6 percent with one (p=0.001). [14] reported that community members gained increased knowledge and abilities regarding disaster preparedness strategy and procedures. [15] discovered an improvement in all five major categories of first aid: bleeding control (56.9 vs. 79.7 percent). Scene management (376.6% vs. 59.5%), airway and breathing (43.4 vs. 51.6%), recovery posture (13.1 vs. 43.4%), and victim transport (88.2 vs. 94.3

percent). Goralnick et al. (2018) discovered that after a one-hour instruction, laypersons can successfully apply tourniquets [16] found that 57% of participants rated the course as outstanding and 39% as good (Table 1).

4. Educational contents

The overall first aid training content focus on prehospital trauma care, including ABC's training, how to deal with disaster in the community, how to call for help, identify the location of life-threatening bleeding and apply pressure, pack a wound and apply a tourniquet for bleeding control (Table 2).

5. Discussion

While first aid training appeared to improve the quality of first aid procedures for bleeding emergencies, it did not result in an increase in assisting rates. Bystanders' presence and the ambiguity of events identified as impediments to providing assistance. A training program emphasizing both first aid methods and inhibitors of emergency helping behavior was found to be significantly associated with increased helping rates during a chest pain emergency [17] Although generalization from the four research is difficult, it looks likely that standard first aid training increases objectively evaluated skill capabilities more than it creates a positive attitude and a likely helpful response to situations on the side of trainees. Only data for single-victim emergencies are available. Additionally, the findings are confined to training at a few educational levels and to the assessment of training effectiveness within one month of the intervention. Additionally, the data is insufficient to account for either case-to-case variability or variability among components of competence.

First aid is a broad term that refers to assistance in a range of situations. When possible, it is critical for the validity of the outcome measures to collect a large sample of performance. When conducting new randomized controlled trials, it is critical to examine the reliability and validity of the outcomes to be measured. Apart from the advice above, we direct readers to [18].'s International Handbook of Research in Medical Education for an in-depth discussion of developing valid and reliable outcome measures.

The curriculum, on the other hand, does not specify which first aid procedures kids should learn, how frequently and at what levels first aid training should be provided, or which courses or recommendations should be followed [19] This is left to the teacher's and school's discretion. Only 13% of interviewees cited school as the source of their

Table 1: Characteristics of included studies

Author, Years	Country	Sample	Design	Measure	Findings
Andrade et al., 2019	USA	80 community members (CM) and 60 medical professionals (MP).	Anonymous pre- and post-course surveys	assess personal exposure to gun violence knowledge of bleeding control techniques willingness to intervene in a bleeding emergency	Both groups demonstrated improved confidence in their ability to stop severe bleeding after the class CM confidence was 36.1% without versus 57.0% with a TFA kit(p=0.008) and MP confidence was 53.8% without versus 87.6% with a TFA kit(p=0.001).
Subandi et al., 2019	Indonesia	24 local people chosen from the disaster-prone area	pre- and post-test control design	knowledge and skill for disaster preparedness	Improved knowledge and skills obtained by the community members on the strategy and procedure for disaster preparedness
Delaney et al., 2018	USA	One hundred and fifty-four motorcycle taxi riders	Pre- and post-survey tests	Knowledge, skills equipment and supplies for prehospital providers	Improvement was measured across all five major first aid categories: bleeding control (56.9 vs. 79.7%), Scene management (37.6 vs. 59.5%), airway and breathing (43.4 vs. 51.6%), recovery position (13.1 vs. 43.4%), and victim transport (88.2 vs. 94.3%)
Goralnick., 2018	USA	465 laypersons	randomized clinical trial	Correct tourniquet application.	Laypersons can successfully perform tourniquet application afterundergoing a 1-hour course
Smith et al., 2016	USA	100 bysider	Pre- and post-survey tests	The “Becoming an Active Bystander” training course is to strengthen the role and ability of the public to save lives and decrease the probability of death by taking few, specific helping actions when at the scene of an unexpected emergency incident, including technological disasters, natural disasters, and other life-threatening emergencies.	57% of the participants rated the course to be excellent and another 39% rated it to be good

Table 2: First aid training content

Author, Years	Education content
Andrade, 2019	A combat application tourniquet: hemostatic gauze and bandages, gloves, a flashlight, a marker, and trauma shears
Subandi et al., 2019	How to deal with disaster in the community
Delaney et al., 2018	Principles and definitions of prehospital trauma Scene safety ABC's Fracture splinting
Goralnick, 2018	How to call for help Assess those affected Identify the location of life-threatening bleeding and apply pressure Pack a wound Apply a tourniquet
Smith et al., 2016	Module 1: Provides participants with an overview of how bystanders have responded in recent emergencies and the valuable role that they can play. Module 2: Assessing the Situation. Module 3: Providing Initial Care. Module 4: Working with Uniformed Responders on the scene. Module: Offering Comfort. Module 6: Preparing to Be an Active Bystander.

first aid instruction, a significantly lower rate than in a comparable Swedish study [20]. This percentage appears to be quite low, given that first aid is a required component of the curriculum at all national mandated levels. Given that individuals who mentioned school as a source of first aid training were younger, this outcome could be explained by recall bias. First aid education has the potential to reach the great majority of the population, and data suggests that it can be taught at any age [20–22] Future research should evaluate the types and amounts of first aid training that are actually provided in the school system, as well as any impediments to such training.

6. Conclusion

In conclusion, based on the included research, first aid programs that include teach participants how to overcome inhibitors of emergency helping behavior may result in improved assistance and greater helping rates for single-victim emergencies. This review identifies several potential topics of further investigation. It would be particularly beneficial to explore the barriers to and facilitators of learning and practicing first-aid skills, particularly with respect to patients suffering from symptoms such as burns, chemical poisoning, and bleeding, which receive less attention in the literature than CPR.

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