

Original Research Article

Emergency Injury Care (EIC) through community volunteers in rural Bangladesh.

Abstract

Background: The purpose of Emergency Injury Care (EIC) is to stabilize casualties with life-threatening or limb-threatening injury in an emergency situation until treatment by medical professionals. Injuries such as drowning, road traffic accidents, burns, falls, cuts, suffocations, violence, suicides are the leading causes of morbidity and mortality and disability worldwide. Through this study community volunteers were developed to provide EIC during any emergency situation in rural areas of Bangladesh. This paper describes the assessment of EIC provided by volunteers in one of the PRECISE project areas.

Methods: This was a cross sectional study. Under the PRECISE program to provide EIC in the community, volunteers such as school teachers, community swimming instructors, crèche care givers and government health care providers were trained to provide emergency services during injury emergencies. Doctors have provided the training. The paper has used separate estimation of simple frequencies for each component of the study.

Results: Volunteers provided EIC among 1,362 casualties July and October 2008. Among them 52.5% (n=742) were male and 45.5% (n=620) were female. A total of 79 casualties were provided immediate EIC after burn injury, of them 46 (60%) were treated immediately with normal running water. Volunteers provided EIC to 925 casualties with cut injury, of them 873 casualties were treated with antiseptic, of them 40 were washed with clean water before starting further treatment. A total of 621 casualties were wrapped with bandage and 261 were given analgesics. Of all casualties with cut injuries 153 were referred to hospital or village doctors for further treatment. The volunteers also advised some casualties using antibacterial ointment and taking Anti Tetanus Serum (ATS) for the prevention of tetanus.

Conclusion: Bangladesh is a developing country where injury rates are very high and has in adequate emergency medical systems. Correct assessment, treatment decision and timely and safely transfer of patient to proper health care provider can improve the outcomes of life threatening injuries.

Keywords: Emergency Injury Care, Volunteers, training, Bangladesh.

Background:

The purpose of Emergency Injury Care (EIC) is to stabilize casualties with life-threatening or limb-threatening injury in an emergency situation until treatment by medical professionals. By promptly providing EIC in site it is possible to minimize the consequences of serious injury, including long-term disability and mortality. In preventive medicine or primary care, emergency medical care focuses on the provision of immediate or urgent medical interventions. The availability of health care providers and medical services in rural areas is challenging in most developing countries. However, incorporation of basic level of emergency health care into the health care system can contribute to the well-being of the population as well in reducing avoidable deaths and disability[1-2]. Effective emergency medical care is essential for any health related emergencies and an essential part of medical services for both high income and low income countries [3].

Injury is the one of the leading cause of morbidity and mortality and disability worldwide [4-5]. Drowning, road traffic accidents, burns, falls, cuts, suffocations and intentional injuries are major contributors to injury [4, 6]. In global mortality injury contributes 10% of total deaths [7] and in 2002 injury alone account 14% of the burden of the diseases among the adults worldwide [8]. The World Health Organization reported 90% of the injury related deaths are occurring in low and middle income countries [9]. The populations living in South East Asian countries are the most vulnerable for injury [10]. Among all age groups, injury is the fifth leading cause of death in the world and accounts for 10~30% of all hospitalization [11]. Among all injury deaths about one quarter occurred in south East Asia [12] and in Bangladesh, injury is major health problem and account for 13% of morbidity and 2.9% of mortality [13].

In low and middle income countries children grow up without adult supervision and exposed to higher levels of environmental hazards than those in high income countries. In Bangladesh access to emergency medical care is poor in rural areas and people lack of knowledge and skills in basic first aid [4]. Study findings shows that only 12.5% injury victims sought hospital treatment for minor cases and 61% had no access of medical help before death [14]. This study was a part of the Prevention of Child Injuries through Social Intervention and Education (PRECISE) program. Through this study community volunteers were developed to provide EIC during any emergency situation in rural areas of Bangladesh. This paper describes the assessment of EIC provided by volunteers in one of the PRECISE project areas.

Methods:

The study consisted of one cross-sectional assessment conducted from July to October 2008 following Emergency Injury Care training.

Study Setting

Under the PRECISE program to provide EIC in the community, volunteers such as school teachers, community swimming instructors, crèche care givers and government health care providers were trained to provide emergency services during injury emergencies. EIC training was implemented in three rural Upazila (sub-district unit of Bangladesh) and one urban area of Bangladesh. This study represents data collected from one of the project areas of PRECISE program in Bangladesh. Community volunteers who have at least high school education and aged between 18 to 35 years and have been living in a large community of at least 500 populations were selected.

Two doctors from the local Government hospital were selected as trainers with the permission of the Directorate General of Health services (DGHS) Bangladesh. A training of the trainers (TOT) was conducted for the selected doctors. Some emergency medical specialists were also recruited and provided technical support during the development of the trainers.

A manual was developed with the support of emergency medical specialists, injury specialists and training specialists. The manual took into consideration the volunteers' educational level, language skills and easy was designed to be easily understandable with sufficient illustration. The manual was revised after pre testing in the field areas.

The training was provided for 3 consecutive days from 9.00 to 15.00. Pre-training and post-training tests were conducted to assess the knowledge of the trainees. During the training the primary management of the most common injuries like falls, cuts, fractures, burns and wounds were covered. The training was highly focused on practical sessions and all the trainees spent most of their time in the practical session. Special attention was given during the training of cardio-pulmonary resuscitation (CPR) and the recovery position. All trainees repeatedly practiced to perform CPR and recovery accurately. Manikins were used during the training sessions. The trainees were also requested to practice skills at home. In the next day morning session all trainees demonstrated what they had learned the previous day and trainers corrected all skills if they made any mistakes. Manuals were provided to all trainees during the training sessions.

Crèche care givers, community volunteers were requested to deliver EIC in limited areas (150 houses covering 500 people surrounding the volunteer's houses) and school teachers were requested to deliver services in school environments and the people living surrounding the school. A simple form was developed and tested. All volunteers were also trained to complete the form after providing EIC.

A first aid box with sufficient essential medications and materials such as topical antiseptic, analgesics, hand sanitizer, gauze, bandages, latex gloves were provided. The volunteers refilled the first aid box after providing emergency services in the community. All volunteers were requested to complete the service form after providing any emergency injury services in the community. Project supervisors collected forms from the volunteers every month during their regular field visit.

Selection of Participants

The EIC program was the part of PRECISE which was provided in three rural upazilas of Bangladesh since 2005 to 2010 and all the volunteers were selected from the PRECISE program. From the program areas 88 female Crèche caregivers, 36 male community swimming instructors and 100 primary school teachers were trained as volunteers to provide EIC. All the volunteers were residence of the PRECISE program area.

A group of 15 to 20 volunteers were invited to receive the training at the CIPRB local office. The training continued consecutively for 3 days from 9.00 am to 3.00 pm. Two trainers conducted the training alternatively and total 224 volunteers were trained within 1.5 months.

With the support of our existing program staff, data on EIC services were collected from 136 community volunteers those who provided services in the first 3 months after receiving training. Among the service providers 83 (61%) were crèche care givers who were female volunteers, 48 (35%) were school teachers, and 5 (4%) were Community swimming instructors.

Methods of measurement

A reporting form was designed by the investigator to collect EIC service information provided by volunteers in the community. After translation to local Bengali language, the form was tested in the project areas. After necessary revisions, the form was distributed among the volunteers during training sessions. During the training session volunteers was oriented about filling up the reporting form. The form also contained information on date,

time, type and place of occurrence etc. The volunteers were also requested to complete the forms with the information about the services they provided and referral of the casualties after providing the EIC.

Data collection and processing

All service forms from the volunteers were collected at the end of the every month during a joint cluster meeting with other PRECISE activities. Data were collected from the volunteers following the training and for the months July, August and September. All collected data were primarily checked by the project supervisors and sent to the CIPRB head office for further entry and to be input into a database using SPSS software. Experienced team managers and senior researchers have checked quality of data both randomly and purposively at the field and at the data input system.

Primary Data Analysis

Data analysis was performed using SPSS version 11.5 (Statistical Package for the Social Sciences, Inc., Chicago, IL). It involved separate estimation of simple frequencies for each component of the study. Due to the small nature of the study, advanced analysis were not considered appropriate.

Ethical issues

Ethical clearance was obtained from the ethical committee of Centre for Injury Prevention and Research, Bangladesh (CIPRB)

Results:

Of the total 191 injured people, 41 (21.5%) did not seek any type of treatment for their injury but almost all of these cases were simple. Only 23.3% of injury cases who sought any type of medical treatment, went to the hospital. All severe cases, 40% of the moderate cases, and only 12.5% of minor cases were attended to at a hospital for treatment of their injuries. Allopathic quack or medicine shop owners were consulted by 42% of the injury patients. Most of the educated people preferred hospital treatment for moderate injury cases. In injury deaths, 61.1% had no opportunity to receive treatment before death.

Volunteers provided EIC among 1,362 casualties July and October 2008. Among them 52.5% (n=742) were male and 45.5% (n=620) were female. Volunteers provided most EICs among the casualties with cut injury (68% of all casualty n=925) and followed by fall injury (14.3%, n=195). Most of the EICs were provided during day time from 07.00 to 19.00 as most the incidence occurred in the day time. Home was found to be the most common place for injury and 55% (n=529) casualties received EIC services that were happened at home. The volunteers provided different types of EICs among the casualties like wash with clean water, antiseptic dressing and bandage of the wounded area and even CPR. In some cases volunteers also provided analgesics for pain relief. After providing necessary EIC the volunteers also referred casualties for further treatment to doctors, hospitals and paramedics.

Table 1: Mechanism of injury

Mechanism of injury	Frequency	Percent
Drowning	8	.6
RTI	33	2.4
Fall	195	14.3
Burn	79	5.8
Cut	925	67.9
Animal Injury	25	1.8
Electrocution	4	.3
Falling object	38	2.8
Suicide	2	.1
Machine Injury	15	1.1
Suffocation	3	.2
Violence	16	1.2
Unconsciousness	1	.1
Fracture	4	.3
Others	14	1.0
Total	1362	100.0

A total of 79 casualties were provided immediate EIC after burn injury, of them 46 (60%) were treated immediately with normal running water. The volunteers also treated 36 burned casualties with antiseptic dressing. Of all casualties 26 were wrapped with bandage and 18 were referred to health facilities for better treatment. Volunteers also provided 15 casualties with analgesic (Paracetamol) as pain relief. In some cases volunteers recommended applying anti-bacterial ointment in the burned area.

Volunteers provided EIC to 925 casualties with cut injury, of them 873 casualties were treated with antiseptic, of them 40 were washed with clean water before starting further treatment. A total of 621 casualties were wrapped with bandage and 261 were given analgesics. Of all casualties with cut injuries 153 were referred to hospital or village doctors for further treatment. The volunteers also advised some casualties using antibacterial ointment and taking Anti Tetanus Serum (ATS) for the prevention of tetanus.

Volunteers provided EIC to 8 drowning casualties, of them 3 were successfully treated with CPR at the site of injury. After being rescued from the water the other 5 casualties were provided necessary EIC and referred for further medical treatment.

With fall injuries, 195 casualties received EICs from the volunteers, of them 135 received antiseptic dressing in the wounded areas, 84 casualties wrapped their wounded area with bandage & 65 casualties recommended analgesic as pain killer. A total of 27 fall injured casualties were referred to the hospitals or village doctor for further medical facilities.

A total of 33 RTI casualties were provided EIC by the volunteers. Among the injured 30 were provided with antiseptic wash and 16 were wrapped with bandage. One casualty was splinted with bamboo and referred to hospital for further treatment. Volunteers given 15 casualties analgesics, of all RTI casualties 11 were referred to hospital for further treatment.

A total of 38 casualties were hurt with falling objects, of them 35 treated with antiseptic dressing, 23 wrapped with bandage, 11 treated with analgesia. A total of 10 casualties were referred to medical facilities for further treatment.

Among all casualties 15 were injured with machinery, of them all were treated with antiseptic dressing. Nine casualties were wrapped with bandage and seven provided analgesics. A total of 7 casualties were referred for further treatment.

Number of injuries due to animal was 25, of them 18 received antiseptic dressing, 12 wrapped with bandage, 12 received analgesics, 5 were referred for further treatment.

A total of 16 casualties were injured due to violence, among them 14 were treated with antiseptic dressing, 6 wrapped with bandage and 7 were given analgesia. Of the casualties 5 were referred for further treatment.

Among 1,362 casualties 246 patients were referred for further treatment, of them 32 to a registered doctor, 71 to hospital and 143 to a paramedic or village doctor.

Table 2: Emergency Injury Care provided and referral

Cause of Injury	Number of Casualties	Types of Emergency Injury Care							Referral		
		Wash with water	Dressing with antiseptic	Bandage	Antibacterial ointment	Medications	CPR	Recovery position	Doctor	Hospital	Paramedic
Drowning	8	0	0	0	0	0	3	5	0	3	1
RTI	33	2	30	16	0	15	0	0	2	3	6
Fall	195	20	135	84	1	65	0	0	5	13	9
Burn	79	46	36	26	4	15	0	0	2	0	16
Cut	925	40	873	621	5	261	0	0	20	37	96
Animal Injury	25	4	18	12	0	12	0	0	0	3	2
Electrocution	4	1	0	0	0	1	0	0	0	2	0
Falling object	38	1	35	23	0	11	0	0	1	4	5
Suicide	2	0	0	0	0	0	0	0	0	1	0
Machine Injury	15	0	15	9	0	7	0	0	2	1	4
Suffocation	3	0	0	0	0	0	0	3	0	1	0
Violence	16	1	14	6	0	7	0	0	0	1	4
Unconsciousness	1	0	0	0	0	0	0	0	0	0	0
Fracture	4	0	4	1	0	2	0	0	0	2	0
Others	14	1	11	3	0	11	0	0	0	0	0
Total	1362	116	1171	801	10	407	3	8	32	71	143

Discussion:

The study was one of the components of PRECISE program which was the largest child injury prevention program in Bangladesh. This study was one of the first attempts to assess the feasibility of providing EIC through community volunteers in rural areas of Bangladesh. Common places for injury in rural areas are in the home, agricultural setting, street and playground. The volunteers provided most of their EIC services in the community where they lived or worked and most of the services was provided during day time from 07.00 to 17.00.

For managing burn casualties, placing the affected area under normal running water is considered as the first course of primary management [15], in this study 60% (n=47) volunteers managed burn casualties with normal running water before providing further treatment or referring to medical facilities.

Volunteers provided EIC among 8 drowning casualties at the site of injury; of them three were treated with CPR. During the training all volunteers were trained to provide CPR and Recovery position. Those casualties treated with CPR and volunteers who administered CPR were interviewed by the investigator after the incidence. The volunteers said that there were no life signs (unconscious and absence of breathing) among the drowning casualties after rescue from water; they immediately provided chest compression and mouth to mouth ventilations. By providing at the site and rapidly after submersion all drowning casualties that received CPR survived. All the drowning casualties were less than 10 years of age. The rest of the drowning cases were provided necessary EIC at the site and were referred to better medical facilities. In Bangladesh among the children 18,000 die and 68,000 are victims of non-fatal drowning each year, mostly in rural areas [4]. By developing community volunteers in the rural areas it is possible to minimize drowning death and drowning related disability.

Volunteers primarily diagnosed 4 casualties with fracture. The volunteers fixed the fractured area with bamboo stick and then referred them to the hospital for getting further medical support. In rural Bangladesh very few people understand the complications of fractures and sometimes they seek medical help from traditional healers. In this study the rural people listened to the volunteer's advice and went to medical facilities rather than taking help from traditional healer.

Correct assessment, treatment decision and timely and safely transfer of patient to proper health care provider can improve the outcomes of life threatening injuries. After providing primary treatment the volunteers referred 246 casualties to hospitals, paramedics and registered doctors. The volunteers provided necessary EIC to the casualty prior referring for further treatment. There were some seriously injured casualties due to road traffic accidents, burns, machine injury; volunteers referred them immediately after providing necessary EIC, in some cases volunteers also accompanied casualties to the medical facility.

The selection of suitable participants from the community was important for the success of the program. School teachers, community swimming instructors, Crèche care givers were selected as volunteers for providing EIC in the intervention area. Most of them were adolescent and young adults. All volunteers in this study also had wide range of acceptance in the community. In PRECISE, program teachers and other volunteers actively participated for different injury prevention activities.

After the training programs no refresher training was provided among the volunteers. Further research is needed to identify the optimal intervals between basic training and refresher training and skills that need to be improved in low resources settings.

Bangladesh is a disaster prone area, every year massive destructive disaster like cyclones, flood, earthquake affect Bangladesh. Unfortunately most of the Bangladeshi people do not have access to pre-hospital care in rural areas as a result many victims may needlessly die at the scene or during the first few hours following injury [14]. So by developing community EIC volunteers it is possible to provide minimum injury care during any emergency health

situation. It is also possible to minimize mortality, morbidity as well as long term disability among the injury victims.

Conclusion:

Bangladesh is a developing country where injury rates are very high and has in adequate emergency medical systems. Access to registered physicians and health care centers is very difficult in rural areas of Bangladesh and an emergency medical system is not yet established. Through developing community volunteers it is possible to stop the progress of severity of any injury and also save lives. By developing community volunteers a minimum level of post-injury care is possible. Three days training was effective as well as low cost, so this could be a suitable model for low income countries like Bangladesh. This study can contribute to the development of general healthcare strategies for rural populations in Bangladesh. There is more scope for further research in this area for researchers in Bangladesh.

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