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From bystanders to immediate responders – how to enable civilians to respond to mass casualties

Degree Project in Medicine

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Abstract

"From bystanders to immediate responders – how to enable civilians to respond to mass casualties"

Background

The number of prehospital deaths due to accidental injuries are high, and might be preventable if bystanders are prepared and could act quickly during the gap in time from incident to the arrival of the Emergency Medical Services (EMS). During Mass Casualty Incidents (MCI) multiple individuals require assessment and treatment simultaneously, placing greater strain on EMS response times, therefore actions from bystanders are even more important. The World Health Organization has urged every country to have a "culture of preparedness" amongst civilians such as educational programs yet there is no such preparedness in Sweden.

Aim

This study aims to investigate the willingness of Swedish civilians to act during emergencies and MCI. It also identifies the possible areas for further development and a foundation for future educational initiatives for civilians.

Methods

A descriptive, explorative, cross-sectional survey conducted through a self-selection web questionnaire which was distributed from Gothenburg Sweden between Sept and Oct 2018. Individuals 15 – 75 years of age and living in Sweden were included.

Results

1246 individuals responded to the questionnaire, of which 1234 were included. The respondents were distributed into two groups based on their prior medical knowledge, the medical knowledge (MK) group (n=558), and the no medical knowledge (NMK) group (n=676). Overall a high willingness to respond to emergencies were observed among all groups. Having categorized the measures bystanders could conduct on the scene of an incident into treatment, assessment, and organization and logistic, the willingness of respondents in the treatment category increased from 72% initially to 91% when they were offered necessary education beforehand. The corresponding numbers in the assessment category were 50% and 83%, and in the organization & logistics category 52% and 78%, respectively. In the NMK group there was a statistically significant change ($p<0.001$) in individual's attitude from initial negative or neutral to positive, in all 20 statements, when they were offered necessary education.

Conclusions

There is a great will to act in emergencies and MCI among civilians in Sweden who participated in the survey, but public education and thus knowledge is missing. A curriculum for what civilians should be able to do during emergencies and MCI, and what they should be

taught, needs to be investigated by experts in the subject. Future studies need to focus on evaluation of education programs following implementation of such a curriculum.

Keywords: bystanders, disaster medicine, immediate responders, mass casualties, preventable deaths, prehospital, trauma

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Abbreviations

MCI: Mass Casualty Incidents

EMS: Emergency Medical Services

RTA: Road Traffic Accidents

WHO: World Health Organization

GTD: Global Terrorism Database

GTI: Global Terrorism Index

CPR: Cardio Pulmonary Resuscitation

MK: Medical Knowledge

NMK: No Medical Knowledge

VGR: Region Västra Götaland

SD: Standard Deviation

ATLS: Advanced Trauma Life Support

Introduction

The number of crises, disasters and major emergencies has been steadily increasing globally during the past decades (1). One characteristic of these incidents is the sudden, simultaneous injury of multiple persons, as a result, they are also referred to as Mass Casualty Incidents (MCI). The cause of MCI can vary due to local, national and international sociopolitical and geographical factors. Based on the cause, MCI can be divided into natural or man-made incidents. Natural emergencies consist of earthquakes, flooding and climate-related incidents, while man-made emergencies result from human carelessness or intentional desire to harm and destroy. Incidents such as road traffic accidents (RTA), violent demonstrations, and acts of social violence such as hate crimes and acts of terror are some of the major causes in this group. Regardless of the cause, the problem regarding MCI is the same: per definition a number of casualties whose needs for a short period of time vastly exceeds the resources available in the local healthcare system (2).

To increase our resources, there have been studies to evaluate the emergency response plans of Emergency Medical Services (EMS), who are trained first responders, as well as the response from hospitals. The outcome shows that the most critical point in management of MCI is a gap in time, between the time an incident occurs and when EMS can reach the victims. The response time may increase following MCI as a result of external factors such as traffic jams, or internal factors such as lack of emergency plans, both of which may worsen the medical outcomes (3–6) .

In England a retrospective study in 1994 (7), showed that 40 % of prehospital deaths due to accidental injury were potentially preventable. The study was repeated in 2017 (3) in the same place, with the same result, i.e. high rates of prehospital deaths due to trauma that would potentially be preventable. Recommendations from the studies included broader first

aid training for civilians and increased basic public knowledge such as simple airway management, which could be lifesaving. The response time for EMS was in these studies referred to as a therapeutic window, and was suggested to be a window of opportunity for bystanders on the scene to act, which could influence the outcome (3,7,8).

Causes of injuries and mass casualties

Injuries

According to the World Health Organization (WHO), injuries and acts of violence are a great public health problem (9). They cause 5.8 million fatalities per year, which is equivalent to a death every 5th seconds. Injuries alone cause 10% of world deaths and result in 32% more fatalities/year/million than deaths from malaria, tuberculosis and HIV/AIDS combined.

The leading causes of injuries, which claim lives globally, are RTA and homicide (9). About 1.2 million people die in RTA globally every year (1).

Social violence

Violence is defined by WHO as an intentional threat or use of physical force intended to harm (9). One third of the 800 000 deaths per year due to injuries and violence in Europe are caused by intentional violence (10). WHO has divided violence into three groups; self-directed violence, interpersonal violence and collective violence (11). Collective violence is the only group resulting in MCI and is divided into political, economic and social violence. Political violence includes war and war related conflicts. Economic violence aims to disturb economic activity of a sole individual or in a larger context e.g., a group or a country. Social violence, which take place in civilian environment, and in some cases with civilians as a target, will be the main focus of this paper. Social violence is violence committed to advance

a social agenda, which can be carried out by a single person, larger groups or even states, and may include violent protesting, crimes of hate, mob violence and terrorist acts (11).

Mass shootings

Mass shootings are shootings where more than four people are involved (12). They are another type of social violence and could in some cases also be called a terrorist act, when the shooting has a broader purpose and is intended to frighten people or put light on a political message (13). In the Western world, the United States of America (USA) has the highest incidence of mass shootings, particularly in the past decades. There have been over 70 mass shootings across the USA since 2016. The deadliest year for mass shootings in modern US history is 2017, which included the Las Vegas shooting with 58 fatalities and over 500 injured (13). The most devastating mass shooting in Europe during the present decade is the terror attack in Paris (November 2015), which claimed 130 lives in total. Another mass shooting claiming many lives occurred in Norway 2011 when a lone shooter killed 68 people (14).

Terrorism and hate crimes

Terrorism is not a new phenomenon, but the modern version formed after the Second World War is more violent (15). Defining terrorism is complicated, since there is no internationally accepted definition. This also complicates the gathering of data regarding terrorism and terrorism-related incidents. The Global Terrorism Database (GTD) does not have a definition for terrorism, instead several coded criteria is used to cover a broad range of definitions of terrorism through a combination of inclusiveness and filtering (16). According to GTD most terrorism-related incidents during 2016 were in Asian and African countries e.g., Iraq, Afghanistan, India, Nigeria and Somalia. In Europe in 2016, the United Kingdom (UK) has the highest number of terrorism-related incidents (n=104) to compare with 61 cases in the

USA, 41 in Germany, 26 in France, and 16 in Sweden (15). The Global Terrorism Index, GTI, is based on data from the GTD and produced by the Institute for Economics & Peace and Vision for Humanity, a non-partisan think tank. In their new report published in December 2018 they state that there were 79 countries in 2016 and 67 countries in 2017, which had at least one death due to terrorism. These two figures are the two highest numbers since 2002. The worldwide deaths due to terrorism have decreased since the peak in 2014, although the number of countries affected have increased since 2010 (16), including European cities such as Moscow, Norway, Burgess, Paris, Brussels, Nice, München, Berlin, London, St Petersburg, Manchester, Catalonian and Åbo (14). In Sweden the most recent event was the terror attack in Stockholm 2017 with five fatalities and 15 injured (15).

With 66 fatalities and 127 attacks in the USA and Western Europe carried out by far-right groups and individuals between 2013-2017, far-right terrorism and hate crimes are considered a growing threat according to the GTI. These acts of social violence often with background in e.g., extreme nationalism are in most cases carried out by sole actors (16). An example of a hate crime with racial motives in Sweden, is the school attack in Trollhättan in 2015, where three people were killed by a sole perpetrator using a sword as a weapon (17).

Despite risk factors for being affected by injuries and violence, such as age (young), and gender (male) in low- and middle income regions (9,18,19), acts of collective social violence can happen almost everywhere. Crimes of hate and terrorist acts are most likely to be carried out in densely populated locations where the acts will have the highest impact, for example mass gatherings, concerts, holiday celebrations and public transport in rush hour (20, 21).

Natural disasters

Natural disasters such as wildfires, floods, windstorms and earthquakes can also unexpectedly claim many victims. In 2018 there have, for instance, been great wildfires raging over both the USA and Europe. The number of fatalities due to natural disasters vary but have during the last years been between 10 000 - 20 000 per year worldwide, a major peak of fatality was in 2010 with almost 300 000 deaths worldwide (22).

Preparedness and prevention of injuries and violent acts

Emergencies might be inevitable, but they can be mitigated by risk and vulnerability analysis, adequate planning, and proper preparedness. In the WHO report from 2007 "Mass Casualty Management Systems" (1) strategies and guidelines are provided for all levels of response regarding MCI. In this report community response is stated as one level of response, in which the importance of 'a culture of preparedness' is emphasized. Focusing on the adequate mental preparedness and awareness to create a culture of thinking and acting based on risk analysis, and risk management, could prepare the public to respond to a MCI in the best possible way. As civilians are in many cases the first line of response on the scene of an emergency, their contribution and knowledge could change the outcome of an accident, and consequently the number of lives saved. The WHO suggests that in order to involve the public and create awareness and adequate preparedness, educational programs such as first aid, simple search and rescue, information regarding emergency plans, and repeated training need to be used and conducted locally for best results. Based on these strategies and guidelines, the passive attitude towards responding to emergencies and MCI, and the expectation that it is someone else's responsibility to act, need to change (1).

A goal established by WHO is to prevent injuries and violent acts from happening in the first place. Injury prevention has shown to be effective and possible, demonstrated by the decline of injury rate in most of the high-income countries. The main reason for this success is the financial capability of high-income countries, which is necessary for implementation of prevention strategies. Primary prevention is to implement strategies for safer environments and overall safety measures, including counter terrorism movements. Secondary prevention is improvement in the healthcare section (11).

Reaction to injuries and mass casualties

The structure of healthcare organization is based on three main entities; 1. primary or pre-hospital care at the scene of emergency; 2. ambulance care, care during transportation to definitive care; and 3. hospital care, where definitive treatment can be delivered. The pre-hospital care from EMS is delivered by trained first responders (23). In general, the response time the time it takes to get to the patient is decisive for the outcome of the patient's medical condition. Most of the prehospital organizations, irrespective of their country and origin, try to respond as fast as they can and put much effort into reducing their response time. However, a response time of about 10-20 minutes can often be registered depending on the size of the city, its infrastructure and traffic situation (24).

A waiting time of 10-20 minutes leaves a gap in time, a therapeutic window, where victims cannot receive a proper care while waiting for EMS. If there is only one or a few victims, the EMS will reach the site of emergency in a reasonable time. But in a mass casualty situation e.g., a major traffic accident, natural disaster, or a terror attack on several sites in one city at once, the response time will increase and consequently the time to when the victim get proper care (24-28).

Bystanders reaction to injuries and mass casualties

Studies from recent global incidents have shown a willingness among the civilians to act and fill this gap in time (26-30). This indicates that bystanders may be an invaluable resource, acting quickly to increase the likelihood of survival prior the arrival of EMS (24,26-30). Bystanders here refer to civilians who are at the scene of an emergency. There is an ultimate question whether civilians can be adequately trained to stabilize and maintain a victim's condition until EMS arrive.

Types of injuries in mass casualty incidents

Irrespective of the cause, MCI result in several casualties with various types of injuries and diverse management needs. Shootings result in injuries caused by bullets piercing through parts of the body, limbs, organs etc. Detonation of explosives causes rapid pressure waves, which results in blast injuries, life-threatening injuries involving lungs and hollow viscera, multiple skeletal damages and organ system damages. All these injuries may result in massive life-threatening hemorrhages (6). RTA may for instance result in head, neck and back injuries, skeletal injuries, fractures, crush damage and major bleeds (31), and the type of injuries caused by natural emergencies is strictly related to the type of incident (32,33).

Initiatives globally to influence the outcome of mass casualty scenarios

The recent incidents in the USA, e.g., Boston marathon bombings in 2013 and mass shooting at Sandy Hook Elementary School in 2012 , have resulted in numerous efforts to create multidisciplinary guidelines. The American College of Surgeons brought together senior leaders from medical, law enforcement, fire and rescue, EMS first responders and military experts, and formed a committee in 2013 which resulted in "the Hartford Consensus" (26). Their guidelines aim to create a national policy to enhance survivability from intentional mass casualty and active shooter events. The number one most preventable cause of death

after both military and civilian injuries is external hemorrhage. As a goal the committee stated that no one should die from uncontrolled bleeding (26,34-37). Experience from the US army and pre-hospital health care shows that the use of hemostatic dressing and tourniquets as fast as possible after injury is lifesaving (35,38,39). Three levels of response were identified by "the Hartford Consensus": 1. immediate response, 2. professional first response, and 3. trauma team response. Lay bystanders represent the immediate responders. Multiple steps, such as education, empowerment and access, need to be taken into consideration to enable bystanders to effectively help hemorrhaging patients (26,27,34-37,40). Consequently, there are currently several resources available for bystanders to learn how to be effective immediate responders, such as different 'stop the bleed' courses in the USA (40-42). In San Antonio, Texas in 2017 the first evaluation of the content and length of a 'stop the bleed' course was made (43). Among the conclusions from the study were that just a short course, one hour, is sufficient for civilians to both feel comfortable to stop bleedings using tourniquets and pressure, and for them to perform it correctly (43).

What can be expected from bystanders

The Hartford consensus suggests that civilians need to be prepared for trauma resembling what the military is prepared for. In a similar way citizenAID, a charity initiative from the UK initiated by experts in both civilian and military trauma care, aims to teach civilians how to act during ongoing violence and how to treat victims with help from an app with flowcharts (35,44). This, together with the guidelines from WHO, suggests that civilians could be a good source of primary help at the scene of an incident, conducting other measures than bleeding control and CPR (26,34-36,44).

Managing airways is for example relatively simple and could be lifesaving (45,46). Fracture stabilizing and neurovascular assessment, could potentially save someone's limb, if acting in

time. However, the coverage of early management of e.g., open fractures in pre-hospital care is limited and little has been published on the subject (47). Back or neck injuries, spinal injuries, could result in paralysis. Stabilizing the spine and knowing when to move or not to move a victim could lead to a better outcome (48). Shock is a state where every second is important and knowing how serious shock is perceived and what to do could reduce fatalities. Shock due to bleeding lead to disrupted oxygen flow to the organs and tissues and can result in cardiac arrest, untreated shock due to bleeding almost always ends in death (49). Drowning caused 38 000 deaths in Europe 2002, and among children aged 5-14 years it is the third leading cause of death in Europe (10). Knowing how to act in such a situation could be a step towards less fatalities.

In addition, during a major incident or MCI, there is a need for organization on the scene. Some areas should be reserved for injured and some for deaths. Ambulances need parking, and unauthorized persons should be prevented to enter the area, etc. The knowledge of these points may ease EMS works and their entrance to the area. Investigating the reasonable tasks for bystanders, what they might be able to do and or are comfortable to do has not yet been conducted. Any investigation regarding this area would have a high impact on national and global preparedness in responding to any kind of major incident or MCI.

Initiating the research in Sweden and current situation

According to GTI, far-right terrorism and hate crimes are a growing threat in Western Europe (16). The UK government have urged their citizens to be attentive when in Sweden due to increased threat of terrorism, in their travel advice from November 2018 they state; “terrorists are very likely to carry out attacks in Sweden” (50).

Recent publications point out that the state of preparedness within the Swedish healthcare is not acceptable. There exists a lack of resources and professional engagement with MCI preparedness is limited (51). One way to minimize the impact of these shortcomings and limitations and the incident itself is to advocate a new approach at the scene of an incident by using available citizens. Previous studies have examined the trauma responses for MCI but largely focus on the professional personnel, the EMS, the triage system and the definite trauma care in the hospitals. However, studies examining the civilian response to injuries, major emergencies and MCI are lacking. Most of the previous studies have been conducted in the USA, originating from research from the US army and not much has been done in Europe. Besides a lack of research to ascertain bystanders' capability to perform tasks, their willingness to act in a MCI has never to our knowledge, been investigated, globally or in Sweden. There have been some initiatives to teach civilians hemorrhage control (35-37,41-44), but broad civilian teaching initiatives have not been discussed.

Aims

This study aims to investigate the willingness of Swedish civilians to act during emergencies and MCI through a web distributed questionnaire. It also aims to identify the possible areas for further development and a foundation for future educational initiatives for civilians.

Specific research questions

- What are Swedish civilians willing to do if they are first on the scene of an emergency?
- Do their attitudes and willingness change by receiving necessary education?

Methods

Study overview

This is a descriptive cross-sectional study, conducted through a self-selection web questionnaire in Sweden during September - October 2018. The questionnaire is structured, (includes only closed ended questions) and investigates the willingness of participants to act when they are on the scene of an emergency.

Study population

Participants were aged 15-75 and living in Sweden, referred to here as civilians. People under 15 years of age and over 75 were excluded. Depending on their occupations, and eventual activity in voluntary organizations, they were divided into two groups ‘Medical Knowledge’ and ‘No Medical Knowledge’.

Medical Knowledge (MK) group

In this group there are three subgroups. The first group consists of registered healthcare personnel: doctors and registered nurses. The second group are people who have had health care education but are not registered healthcare personnel: assistant nurses, students in healthcare professions, military, police officers, firefighters, people working at sea etc. Lastly, the third group consist of people active in voluntary organizations with medical association such as: Red Cross, Hemvärnet, SMS Lifesaver, Swedish Lifesavers, cardiopulmonary teachers, and similar organizations, are included in this group.

No Medical Knowledge (NMK) group

This group consists of people with no medical knowledge, either from education, occupation or voluntary organizations. Though they might be active in voluntary organizations e.g., the scouts, but not in voluntary organizations with medical association or education.

Study site

The survey was conducted digitally from Gothenburg, Sweden, and the questionnaire could reach people all over Sweden.

Recruitment

Initial power calculated a need for at least 200 respondents, statistical power of 0.8 medium effect size of 0.3 and α significance level of 0.05. The questionnaire was sent out digitally using self-selection, and was distributed via email, and social media mostly using Facebook, where it was shared widely. People were asked to continue to share the link to the questionnaire and to ask people in their surroundings to respond. In the end the initial link was shared over 100 times, on Facebook alone. The questionnaire was also sent out with the monthly email from the Swedish Red Cross foundation.

Data collection and preparation

The questionnaire

As no validated questionnaire were available, a new structured questionnaire was made for this survey in May 2018, by a working group on the Unit of Security and Preparedness VGR. This working group consisted of one trauma surgeon and disaster medicine specialist, one Professor and registered nurse with pre-hospital background and one registered nurse with pre-hospital and dispatching background, all with over 20 years of experience. The working

group discussed and designed several questions based on an extensive literature search, focusing on the recent MCI worldwide. Questions were formed as statements, and the answers were based on a Likert scale, 1-7, where 1 means complete disagreement and 7 means complete agreement. The number of statements were limited to maximum 20 to enable high response rate.

The questionnaire with all statements was sent to 14 experts to validate and evaluate the statements, out of 14, 13 responded: three surgeons, two anesthesiologists and eight emergency and internal medicine doctors. In this way all statements were tested on their feasibility. Later, some statements were translated into simpler sentences and medical terms were made easy to understand for civilians, this was done by the author with help from a professor in statistics. The final questionnaire was made with Google Forms, which after being tested on people from the study population for seven days were sent out in Swedish, (*Appendix A*), English translation (*Appendix B*). All the 20 statements were closed-ended. Each statement had two alternatives: a) and b) were a) stands for "what you would be willing to do now" and b) stands for a hypothetical question, "what you think you would be willing to do if you would have had necessary education first". In an information section prior to answering the statements in the questionnaire it is described that education here refers to an education for civilians, which at this time is not available, and the content of such an eventual education is not yet stated.

Statements addressed the following topics: 1) simple life sustaining actions; 2) cardiopulmonary resuscitation (CPR); 3) shock; 4) drowning accident; 5) stop bleeding; 6) use aid to stop bleeding; 7) stabilize bone fractures on arms and legs; 8) neurovascular assessment; 9) fracture positioning; 10) triage at mass casualty scenario; 11) stabilize neck

and lower back; 12) act on vital indication; 13) use cervical collar; 14) evacuate or stay inside; 15) act against a perpetrator; 16) hot, warm and cold zones at emergencies; 17) organize scene of accident; 18) high-risk accidents; 19) secure scene of accident; 20) civil law matters regarding accidents and disasters.

It was mandatory to answer all the statements on a Likert scale from 1-7, it was not possible to skip statements. The respondents could leave a comment after answering all the statements, when they also reviewed their age, gender, occupation, and eventual activity in voluntary organization. Completion of the questionnaire took approximately 10 minutes.

All data collected from the questionnaires was automatically transferred to an excel file. Each respondent got the time they answered as their ID, to ensure the anonymous participation.

Data analysis

All data obtained was controlled after the end of the survey and was coded in the statistical program IBM SPSS Statistics version 25. Final data was thereafter analyzed in the same program. The main part of the statistical analyzes were descriptive data (means, frequencies). The statements were distributed by their relevance in to three categories; Treatment, Assessment and Organization and Logistics, see description below. Dividing the questions into the categories were done by the same group that formed the questionnaire. In each of the three categories mean, median and standard deviation (SD) were calculated for each question, a total for each category was also calculated, both for all respondents and for the NMK group.

In the NMK group calculations were made to see how many individuals went from being negative: Likert scale 1-3, or neutral: Likert scale 4, on the a) alternative “what you are willing to do now” to being positive: Likert scale 5-7 on the b) alternative “after necessary

education" in the same statements, calculations were made in the different categories. The McNemar-Bowker test of symmetry was used for category comparisons and calculating a P value. Statistical significance was defined as $P < 0.05$, and 95% confidence intervals were obtained when necessary.

Cronbach's alpha was used to measure the reliability, or internal consistency of the questionnaire. It tests to see if multiple-question Likert scale surveys are reliable. These questions measure latent variables, hidden or unobservable variables like: a person's conscientiousness, neurosis or openness, characteristics that can be very difficult to measure in real life. Cronbach's alpha measures if the test designed is accurately measuring the variable of interest. High reliability means it measures the desired questions.

Treatment

Statements which firstly involve acting or treating a patient were included in this group. Statements included: 1) simple life sustaining actions; 2) CPR; 4) drowning accident; 5) stop bleeding; 6) use aid to stop bleeding; 7) stabilize fractures; 11) stabilize neck and lower back; 13) cervical collar.

Assessment

In this group statements regarding assessing an injury or situation were included: 3) shock; 8) neurovascular assessment; 9) fracture positioning; 10) triage at mass casualty scenario; 12) vital indication; 14) evacuate or stay inside.

Organization and Logistics

Statements which involve the organization and logistics around accidents and disasters were included in this group, and also the last statement which is a question regarding civil law

matters during accidents and emergencies: 15) act against a perpetrator; 16) hot warm and cold zones; 17) organize scene of accident; 18) high-risk accidents; 19) secure scene of accident; 20) civil law matters regarding accidents and disasters.

Ethical considerations

No ethical approval was needed for the survey. Participation in the survey was voluntary. No personal data was saved apart from gender, age, occupation and eventual activity in voluntary organizations. The result was transferred to an excel file and saved at the Unit of Security and Preparedness at VGR.

Results

Characteristics of the respondents

There was a total of 1246 who responded to the questionnaire. Twelve respondents were not registered correctly in the web form, leaving 1234 respondents who were included in the study. The respondents were 62 % (n =759) female and 38 % (n =475) male, there was a higher representation of female respondents within all groups. The age distribution had a culmination at 26-30 years of age. The majority of the respondents, 76% (n=934) were working, 16% (n=198) were students, 5% (n=59) were pensioners, 2% (n= 24) were unemployed and 2% (n=19) had other activities. When specifying their occupation, the respondents have filled in over 200 different occupations. Distribution of all the respondents presented as frequencies are seen in Table 1.

Table.1 Distribution of the respondents.

	Sample	**Entire survey population (n = 1234)**
Sex	Female	62%
	Male	38%
Age (years, mean = 39)		
	15-25	13%
	26-35	34%
	36-45	21%
	46-55	18%
	56-65	10%
	66-75	4%
Occupation	Working	76%
	Student	16%
	Pensioners	5%
	Other	3%

Validity and Reliability of the survey

Cronbach's alpha was used to measure the reliability, the value for Cronbach's alpha is between 0-1, a value above 0,60 is acceptable and a value over 0,8 is considered good. The Cronbach`s Alpha measured for the questionnaire was 0,95.

Medical knowledge (MK) group

Out of all the respondents, 45% (n=558) were in the MK group. Consisting of registered healthcare professionals: doctors and registered nurses (n=91), and not registered professionals who have had healthcare education (n=467), the remaining (n=251) are active in voluntary organizations with medical association. The distribution of occupation for the MK group is presented in Table 2. For this survey, the civilians with no medical background are the center of interest, therefore the data for the MK group will not be presented for itself, but will be included when data is shown for all the respondents, and will be compared with data from the NMK group.

Table 2. Distribution of occupation for the Medical Knowledge group.

Sub groups	**Sample**	**Medical Knowledge group (n = 558)**
Registered healthcare professionals	Doctors	5%
	Nurses	11%
Not registered	Assistant nurses	14%
	Military	4%
	Firefighters	2%
	Healthcare students	12%
	Other	7%
Active in voluntary organization with medical association	Red Cross, Hemvärnet, SMSlifesaver, Other	45%

No Medical Knowledge (NMK) group

In this group 55% of all the respondents (n=676) are included. The group consists of people with occupations were medical care is not involved. They are also not active in voluntary

organizations with medical association. The distribution of occupations for the NMK group are presented in Table 3.

Table 3. Distribution of occupation for the No Medical Knowledge group.

Occupation	**Sample**	**No Medical Knowledge group (n = 667)**
Working		**79%**
	Pedagogs and Socialworkers	11%
	Logistics ans Industry	6%
	Administration and Communication	6%
	IT	4%
	Service	3%
	Engineer	3%
	Animal care	3%
	Not specified and Other	44%
Student		**14%**
	Behavior science, psychology, pedagogy	3%
	Communication	2%
	Engineer and Technical education	2%
	Highschool	1%
	Other	6%
Pensioners		**4%**
Others		**3%**

Treatment

Results of the answers in the treatment category for all the respondents and the NMK group are presented as frequencies, means, medians and standard deviations in Table 4. Treatment was the category with the highest number of positive responses over all. Both among all the respondents and in the NMK group, with a total of 72% respectively 61% being positive initially in the a) alternative: willing to do now, increasing to 91% and 89% in the b) alternative: after necessary education. (5-7 on the Likert scale counted as positive.)

For the statement; "You are willing to perform simple life sustaining actions before EMS arrives", the initial response from 92% of all the respondent were positive, in the NMK group 87% were positive, increasing to respectively 97% and 96% in the b) alternative: after necessary education. A simple life sustaining action would e.g., be to manage an airway. Other statements with similar results were the ones regarding CPR and stop bleeding, both with a high percentage being positive already in the a) alternative, "willing to do now", increasing to positive percentages close to 100% in the b) alternatives. The results were similar for all respondents and the NMK group, but with lower percentage being positive in the a) alternatives for the NMK group.

The questions regarding stabilizing fractures, neck and lower back and use of cervical collar had the lowest numbers of positive response both for all the respondents and in the NMK group, both in the a) and b) alternatives. For example in the statement: "You would be willing to stabilize neck and lower back…" the numbers being positive were 47% for all the respondents and 27% in the NMK group, increasing to 82% and 77%, although for being the statement with the lowest positive numbers in the treatment category, the majority were still positive in the b) alternative.

Table 4. Distribution of frequencies, means, medians and standard deviations within the NMK group and all the respondents, in the treatment category. The values without parentheses represents the NMK group (n = 676), the values in parentheses represents the values from all the respondents (n = 1234). Answers 1-3 on the Likert scale count as negative, 4 as neutral and 5-7 as positive.

Treatment	Negative 1-3	Neutral 4	Positive 5-7	Mean	Median	Standard Deviation
Simple life sustaining actions	6% (4%)	7% (4%)	87% (92%)	6.04 (6.37)	7.0 (7.0)	1.38 (1.17)
After education	2% (2%)	2% (1%)	96% (97%)	6.62 (6.7)	7.0 (7.0)	0.95 (0.91)
CPR	9% (5%)	7% (4%)	84% (91%)	5.95 (6.31)	7.0 (7.0)	1.46 (1.26)
After education	1% (2%)	2% (1%)	97% (97%)	6.66 (6.74)	7.0 (7.0)	0.88 (0.84)
Drowning accident	24% (16%)	17% (13%)	59% (71%)	4.88 (5.38)	5.0 (6.0)	1.86 (1.78)
After education	7% (6%)	4% (4%)	89% (90%)	6.18 (6.27)	7.0 (7.0)	1.42 (1.42)
Stop bleeding	6% (3%)	8% (5%)	86% (92%)	6.02 (6.36)	7.0 (7.0)	1.38 (1.17)
After education	3% (3%)	3% (2%)	94% (95%)	6.58 (6.69)	7.0 (7.0)	1.14 (0.10)
Use aid to stop bleeding	18% (10%)	14% (11%)	68% (79%)	5.19 (5.75)	5.0 (7.0)	1.72 (1.60)
After education	6% (4%)	3% (2%)	91% (94%)	6.39 (6.52)	7.0 (7.0)	1.34 (1.18)
Stabilize fractures	48% (34%)	17% (14%)	35% (52%)	3.73 (4.51)	4.0 (5.0)	2.00 (2.09)
After education	9% (8%)	7% (6%)	84% (86%)	5.89 (6.06)	7.0 (7.0)	1.63 (1.60)
Stabilize neck and lower back	60% (42%)	13% (11%)	27% (47%)	3.18 (4.12)	3.0 (4.0)	2.00 (2.25)
After education	13% (11%)	10% (7%)	77% (82%)	5.54 (5.82)	6.0 (7.0)	1.80 (1.72)
Cervical collar	46% (34%)	14% (11%)	40% (55%)	3.82 (4.54)	4.0 (5.0)	2.04 (2.15)
After education	11% (10%)	7% (5%)	82% (85%)	5.84 (6.03)	7.0 (7.0)	1.73 (1.67)
Mean 'willing to do now'	27% (19%)	12% (9%)	61% (72%)	4.85 (5.42)	5 (6.5)	1.73 (1.68)
Mean 'after education'	6% (6%)	5% (3%)	89% (91%)	6.21 (6.35)	7.0 (7.0)	1.36 (1.18)

The average percentages in the NMK group who went from initially being negative or neutral to positive after being offered necessary education in the treatment category were 79%, and the change was statistically significant P <0.001 for all statements, results are presented in Table 5.

Table 5. Percentages of respondents in the NMK group (n = 676) who were negative (1-3) or neutral (4) in the a) alternative "willing to do now" became positive (5-7) on the b) alternative, "after necessary education", regarding the statements in the treatment category.

Treatment	Percentages who went from negative or neutral to positive	P value
Simple life sustaining actions	86%	<.001
CPR	86%	<.001
Drowning accident	79%	<.001
Stop bleeding	74%	<.001
Use aid to stop bleeding	82%	<.001
Stabilize fractures	79%	<.001
Stabilize neck and lower back	71%	<.001
Cervical collar	74%	<.001
Mean	**79%**	

Assessment

Results of the answers in the assessment category for all the respondents and the NMK group are presented as frequencies, means, medians and standard deviations in Table 6. In the assessment category the number of respondents being positive initially were lower compared to the treatment category, with 50% for all the respondents respectively 34% in the NMK group, it increased to 83% and 80%, in the b) alternative, after necessary education.

For the statement regarding neurovascular assessment, the initial number being positive for all the respondents were 30%, in the NMK group it was 15%, in the b) alternative the number being positive increased to 76% respectively 73%.

The statement with the highest positive numbers after being offered necessary education were the statement regarding shock, with 91% being positive among all the respondents, and 89% being positive in the NMK group.

Table 6. Distribution of frequencies, means, medians and standard deviations within the NMK group and all the respondents, in the assessment category. The values without parentheses represents the NMK group (n = 676), the values in parentheses represents the values from all the respondents (n = 1234). Answers 1-3 on the Likert scale count as negative, 4 as neutral and 5-7 as positive.

Assessment	Negative 1-3	Neutral 4	Positive 5-7	Mean	Median	Standard Deviation
Shock	39% (24%)	18% (14%)	43% (62%)	4.16 (4.98)	4.0 (5.0)	1.87 (1.91)
After education	7% (5%)	4% (4%)	89% (91%)	6.12 (6.29)	7.0 (7.0)	1.42 (1.33)
Neurovascular assessment	73% (55%)	12% (14%)	15% (31%)	2.63 (3.49)	2.0 (3.0)	1.70 (2.01)
After education	16% (14%)	11% (10%)	73% (76%)	5.34 (5.60)	6.0 (6.0)	1.82 (1.79)
Fracture positioning	64% (49%)	12% (11%)	24% (40%)	3.06 (3.83)	3.0 (4.0)	1.91 (2.18)
After education	14% (14%)	11% (8%)	75% (78%)	5.43 (5.63)	6.0 (7.0)	1.80 (1.81)
Triage at mass casualty scenario	40% (27%)	18% (14%)	42% (59%)	4.00 (4.79)	4.0 (5.0)	1.94 (1.97)
After education	11% (10%)	8% (6%)	81% (84%)	5.69 (5.92)	6.0 (7.0)	1.72 (1.64)
Vital indication	39% (26%)	16% (13%)	45% (61%)	4.09 (4.84)	4.0 (5.0)	2.00 (2.02)
After education	12% (10%)	12% (9%)	76% (81%)	5.53 (5.80)	6.0 (7.0)	1.71 (1.65)
Evacuate or stay inside	47% (37%)	16% (17%)	37% (46%)	3.76 (4.22)	4.0 (4.0)	2.01 (2.01)
After education	10% (10%)	5% (5%)	85% (85%)	5.89 (5.94)	7.0 (7.0)	1.67 (1.69)
Mean 'willing to do now'	51% (36%)	15% (14%)	34% (50%)	3.62 (4.36)	4 (4.5)	1.91 (2.02)
Mean 'after education'	12% (10%)	8% (7%)	80% (83%)	5.62 (5.86)	6 (7)	1.69 (1.66)

The average percentages in the NMK group who went from initially being negative or neutral to positive after being offered necessary education in the assessment category were 73%, and the change was statistically significant P<0.001 for all statements, results are presented in Table 7.

Table 7. Percentages of respondents in the NMK group (n = 676) who were negative (1-3) or neutral (4) in the a) alternative "willing to do now" became positive (5-7) in the b) alternative "after necessary education", regarding the statements in the assessment category.

Assessment	Percentages who went from negative or neutral to positive	P value
Shock	84%	<.001
Neurovascular assessment	69%	<.001
Fracture positioning	69%	<.001
Triage at mass casualty scenarios	71%	<.001
Vital indication	64%	<.001
Evacuate or stay inside	79%	<.001
Mean	**73%**	

Organization and Logistics

Results of the answers in the organization and logistics category for all the respondents and the NMK group are presented as frequencies, means, medians and standard deviations in Table 8. In the organization and logistics category the overall numbers being positive initially were 52% for all the respondents and 41% in the NMK group, increasing to 78% respectively 74% in the b) alternative, after necessary education.

Table 8. Distribution of frequencies, means, medians and standard deviations within the NMK group and all the respondents, in the organization and logistics category. The values without parentheses represents the NMK group (n = 676), the values in parentheses represents the values from all the respondents (n = 1234). Answers 1-3 on the Likert scale count as negative, 4 as neutral and 5-7 as positive.

Organization and Logistics	**Negative 1-3**	**Neutral 4**	**Positive 5-7**	**Mean**	**Median**	**Standard Deviation**
Act against a perpetrator	48% (41%)	15% (14%)	37% (45%)	3.72 (4.11)	4.0 (4.0)	2.03 (2.10)
After education	22% (19%)	12% (12%)	66% (69%)	5.03 (5.18)	5.0 (6.0)	1.92 (1.93)
Hot, warm and cold zones	36% (27%)	17% (13%)	47% (60%)	4.20 (4.79)	4.0 (5.0)	2.02 (2.01)
After education	17% (14%)	11% (9%)	72% (77%)	5.32 (5.54)	6.0 (6.0)	1.88 (1.82)
Organize scene of accident	31% (23%)	12% (11%)	57% (66%)	4.63 (5.10)	5.0 (5.0)	2.05 (1.98)
After education	11% (10%)	6% (6%)	83% (84%)	5.85 (5.97)	7.0 (7.0)	1.69 (1.66)
High-risk accidents	52% (40%)	16% (16%)	32% (44%)	3.43 (4.10)	3.0 (4.0)	1.96 (2.12)
After education	22% (19%)	14% (11%)	64% (70%)	4.95 (5.22)	5.0 (6.0)	1.98 (1.97)
Secure scene of accident	28% (20%)	12% (10%)	60% (70%)	4.69 (5.24)	5.0 (6.0)	1.98 (1.91)
After education	13% (11%)	4% (4%)	83% (85%)	5.82 (5.95)	7.0 (7.0)	1.75 (1.71)
Civil law matters regarding accidents and disasters	75% (61%)	11% (13%)	14% (26%)	2.47 (3.10)	2.0 (3.0)	1.66 (1.97)
Get education in this?	10% (8%)	11% (9%)	79% (83%)	5.73 (5.87)	6.0 (7.0)	1.62 (1.57)
Mean 'willing to do now'	45% (35%)	14% (13%)	41% (52%)	3.86 (4.41)	4 (4.5)	1.95 (2.02)
Mean 'after education'	16% (13%)	10% (9%)	74% (78%)	5.45 (5.62)	6 (6.5)	1.81 (1.78)

The average percentages in the NMK group who went from initially being negative or neutral to positive after being offered necessary education in the organization and logistics category were 62%, and the change was statistically significant P <.001 for all statements, results are presented in Table 9.

Table 9. Percentages of respondents in the NMK group (n = 676) who were negative (1-3) or neutral (4) in the a) alternative "willing to do now" became positive (5-7) in the b) alternative "after necessary education", regarding the statements in the organization and logistics category.

Organization and Logistics	Percentages who went from negative or neutral to positive.	P value
Act against a perpetrator	52%	<.001
Hot warm and cold zones	55%	<.001
Organize scene of accidents	69%	<.001
High-risk accidents	51%	<.001
Secure scene of accident	69%	<.001
Civil law matters	77%	<.001
Mean	**62%**	

Compare MK group with NMK group

The MK group hade higher positive responses both in the a) alternatives and in the b) alternatives compared with the NMK group, but the increase from the number of people being negative or neutral in a) who changed into being positive in b) was not significant for the MK group.

Table 10. Percentages being positive in the Medical Knowledge group in the different categories.

Category	Percentages of respondents in the MK group being positive (5-7) In a) alternative - willing to do now	Percentages of respondents in the MK group being positive (5-7) In b) alternative - after necessary education
Treatment	86%	93%
Assessment	69%	86%
Organization and Logistics	65%	82%

Table 11. Percentages being positive in the No Medical Knowledge group in the different categories.

Category	Percentages of respondents in the NMK group being positive (5-7) In a) alternative – willing to do now	Percentages of respondents in the NMK group being positive (5-7) In b) alternative - after necessary education
Treatment	61%	89%
Assessment	34%	80%
Organization & Logistics	41%	74%

Discussion

To our knowledge this is the first survey that has explored civilians' willingness to respond to major emergencies and MCI, regarding treatment, assessment and organization and logistics. It is also the first study to investigate Swedish civilians' attitudes towards medical responses in emergencies. The answers from all the respondents (n=1234) and the NMK group (n=676) showed an overall high willingness to act and respond to emergencies and MCI. These results are partly in line with a survey conducted in Sweden in 1997 which investigated civilians preparedness for disasters (52), though there were only one question regarding medical preparedness, weather people were willing to buy a first aid kit, and this was one of the things people were most willing to do. This support our findings that there is an overall willingness to be prepared for medical emergencies among civilians in Sweden.

The survey in this study found a stronger willingness to act in statements regarding treatment than in statements involving assessing injuries and situations and statements regarding getting involved in the organization and logistics around emergencies. In the treatment category the statements which had the highest positive percentages, among all the respondents, were not surprisingly simple life saving measures, CPR and hemorrhage control. Which all are things that supposedly most people have heard of before. Over 90% were positive in performing these tasks after being offered necessary education. Answers which are between 5-7 on the Likert scale counts as positive. More advanced skills like fracture-, neck and back stabilizing had lower positive percentages. Even so, over 80% of all the respondents were positive in these statements after being offered necessary education. Results from the other two categories; assessment and organization and logistics, had lower positive percentages, the overall number being positive for the assessment category following necessary education was 83%, respectively 78% in the organization and logistics category.

The statement in the assessment category with the highest number of percentages being positive following education among all the respondents was the one regarding shock, with 91%. Despite the fact that it can be assumed that most civilians are not familiar with the concept of shock. This might indicate that there is a great trust in a possible education, and the amount of knowledge and skills that is possible to learn in such education. Another statement in the assessment category that might indicate this trust, is the statement regarding triage at mass casualties which almost doubled from 42% initially to 81% following necessary education for respondents in the NMK group.

According to the results in the organization and logistics category the number of people who would be willing to act against a perpetrator following education was surprisingly high with 69%. It is considered surprisingly high due to the fact that acting against a perpetrator is associated with great danger for your own life, and that people who usually act against a perpetrator are armed policemen. This shows that it is also important for future discussions to include what might not be reasonable for civilians to do, and when acts from civilians could be more dangerous and hurtful than helpful.

The higher positive results regarding treatment might indicate that civilians think they can do most regarding treatment, and furthermore that it might be what civilians are most interested in learning, how to treat victims while waiting for professional help. Assessing injuries and situations could be argued to be more complex actions both to perform in real life and to understand and imagine while answering a questionnaire, and might therefore have lower positive percentages in our survey. The same thoughts may be applicable on the organization and logistics category. With this being said the numbers being positive in the assessment and organization and logistics category still was higher than what initially might be expected.

In this survey it was found that initially 68% of the respondents in the NMK group were positive regarding the statement using aid to stop bleeding in the treatment category, which increased to 91% when the respondents were offered necessary education. This can be compared with a study in Texas, USA in 2017 (43), where before attending a 'stop the bleed' course, the number of participants who would feel comfortable using a tourniquet, which is an aid to stop bleeding, were 64%. Following training it increased to 96%. In the study they also found that most civilians were not comfortable responding to a traumatic medical emergency. Multiple barriers to act were identified, the most common one being not feeling adequately trained. These results is partly in line with the results from our study which shows that respondents think they would be more comfortable responding to an emergency following education. Unfortunately, studies dealing with assessment and organizational issues could not be found and thus had no data to compare with our study. One reason for this might be the lack of such studies, although they might exist in other languages than English.

The results in this study shows that among the respondents in the NMK group who were negative or neutral in the first alternative, "willing to do now", a significant number changed into being positive in the second alternative, "after necessary education" (the mean numbers for treatment was 79%, respectively 73% for assessment and 62% for organization & logistics). This change was statistically significant ($p<0.001$) in all 20 statements. Showing that people with no previous medical knowledge would feel more comfortable acting in emergencies, and think that they would act to a greater degree, if having had necessary education beforehand.

These results were consistent with a study performed in California, USA in 2005 (53) where people who had experienced natural disasters were included. The study from California

showed that both expected and actual performance of first aid was higher if the person had previous education in first aid, and that first aid was performed more frequently if the person had had training recently or repeated training. This is also supported in a study from Norway (45) where they investigated the response from civilians before the arrival of EMS, which showed that people with previous first aid training or people who worked in healthcare acted in a much greater degree, than people who had no previous knowledge. Together it supports the results and aims of this study: that an educational initiative is needed in order for civilians to be able to respond to emergencies and MCI.

The answer to the question whether civilians are willing do to other measures than bleeding control and CPR, is evident from this study to be: Yes, they are. Bleeding control is the measure which has been most discussed in previous studies as an important task for civilians to be able to perform. The importance of implication of bleeding control is e.g., stated in the Hartford consensus (34,35,36,37), though they also talk about the overall possibility for bystanders to act as immediate responders, and the importance of enabling civilians through education, empowerment and access. In the UK project citizenAID (44) measures such as initial triage, bleeding control, airway management, fracture stabilizing and management after acid attacks are suggested as possible to be performed by civilians, even without previous education, merely with the help of an illustrative app. In the studies from England (3,7,8) which investigated possible preventable prehospital deaths they suggest that managing an airway, among other first aid skills should be taught to civilians. Knowledge of these skills among civilians is also supported in the study (45) from Norway, and in the review (46) from 1999 on recommendations for first aid skills among the public .

Though the focus of the study was the NMK group, the results from the MK group shows that people with previous training and knowledge also think that they would do more, if they would have received necessary education regarding handling emergencies and disasters beforehand. The percentage of respondents in the MK group being positive increased in all categories after being offered necessary education, though the increase was not as high or significant as it was in the NMK group. This probably due to more people feeling confident in doing tasks now, with the knowledge they already have.

In this study the majority of the respondents were young. This could be due to a numbers of reasons, which are further discussed in limitations. The question 'to where the education should be aimed', and if people can learn to perform tasks at a young age, should be further discussed. In both the WHO report (1) and an article on the importance of bleeding control knowledge (27), which suggested that education need to start in high school at the latest, it is stated that the education system has an important role to play in preparedness. Furthermore in an article from Resuscitation in 2015 (54), young people were found to be more capable of learning new skills and were more willing to perform CPR, compared to senior people, which supports the idea that it is important to educate and train children and young people.

In the WHO report on MCI strategies and guidelines (1) it is clearly stated that all countries should have a community preparedness, which is recommended to address education in first aid, search and rescue and knowledge of emergency plans. This together with our survey which shows that the Swedish civilians who responded were overall positive to acting during emergencies and MCI should be enough for a foundation for further discussion regarding how to achieve a civilian preparedness in Sweden.

Strengths and Limitations

The strengths in this study firstly includes the large number of respondents (n=1234) which is over 1000 more respondents than what was calculated to be needed. Secondly, the wide range of questions, from all three categories: treatment, assessment and organization and logistics.

Limitations when the questionnaire was formed, include the literature search solely included articles in English, and influences from personal experiences within the working group might have impacted the choice of questions. The statements grade of difficulty varied, this partly because it, in some cases, was hard to transfer all the medical terms to common Swedish without losing the content of the statement, resulting in some sentences being long and complex. It might also be because part of the content and context in some of the statements are hard to understand if one never has been in contact with the subject of emergencies before. However, in this study we tried to provide clear explanations and clarify the questions to simplify the answering to the questionnaire.

Limitations regarding the distribution of the study is mostly due to the use of self-selection. The choice of making a self-selection web-based questionnaire was based on time and financial support for the study. However, in order to have a randomized sample size, other methods would have to be used, and consequently more time and resources would be needed. Limitations of using a self-selection questionnaire is that it is impossible to know who decided to answer the questionnaire and who did not, and it cannot fully be compared to a randomized sample size, even though in a lot of studies it is. In this study it can be discussed if the people who responded already have an interest regarding civilian response to emergencies, since they took the time to complete the survey, this can be a possible source of bias. The sample size has a skew gender and age distribution, with more women and young.

Though it can be discussed if one of the reasons for this is that young women might be more willing to respond during an emergency (55).

In surveys where participants answer questionnaires, the reliability of the answers can be discussed. In this questionnaire it can be argued that is it easy to respond positively, since it is considered as a good thing to want to help other people. However, what disagrees with this assumption is that the results in the harder statements or the ones which might not be in questions for civilian education, show a lower positive percentages. It cannot be known how true the answers in the questionnaire would reflect the acting in a real emergency situation, that is merely a supposition

Regarding the data and statistics it can be discussed that calculations such as the McNemar-Bowker test cannot be used due to the sample size not being randomized, although the McNemar-Bowker test was used in this study (43) where the participants also were recruited using self-selection and thus not a randomized sample. With this in mind, the outcome of the test showed that there was a significant difference in all the 20 statements.

One limitation in interpreting the result on the population, might be thought to be that statistics tests based on variables for age and gender were not made, however this was not made due to the focus of this study being civilians as a group.

Future studies

This study has with a broad number of questions and subjects opened up for further discussions regarding what is reasonable or not for civilians to do during emergencies and MCI, and these results should be further discussed among experts in the subject.

Comparative studies in other countries might provide additional insights to the impact of educational, cultural, religious and socio-economic differences in the perception of citizens in MCI situations. It would of course be of great interest, if possible, to measure the willingness and outcome of civilian response in real emergencies and MCI, this however is hard to do.

There is a need for future studies to evaluate what a curriculum for civilian education should consist of, in which ways it should be taught, when it should be taught, how will its impact on the individuals' knowledge be, and finally what are the costs? In Sweden, the school curriculum allows 7-9th grader to learn CPR and first aid. It would be interesting to implement and evaluate an educational curriculum on the national level. The study (52) showed that people in Sweden were most willing to prepare if it did not cost any money, took little time, and did not demand any major commitment. This should be considered when discussing the shape of an eventual future educational invite. In the future it is also important to have different levels of education. Educating people who already has a lot of knowledge, in how to act if they happen to be on the scene of emergency could potentially improve the outcome for victims and also give the community more resources in case of MCI.

Conclusion and implementations

There is a great overall willingness to act in emergencies and MCI among civilians in Sweden who participated in the survey, but public education and thus knowledge is missing. The willingness to act increases significantly, in all statements in the survey, among people with no previous medical knowledge, if they are offered necessary education. A curriculum and guidelines for civilian preparedness needs to be investigated and stated by experts in the subject, both in Sweden and in other countries.

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Populärvetenskaplig sammanfattning

”Från åskådare till aktör – att möjliggöra civilas agerande vid masskadescenarion”

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Antalet dödsfall som sker till följd av skador orsakade av olyckor, innan patienter har hunnit nå sjukhus är många. Det har visat sig att minst 40% av dessa dödsfall hade gått att förhindra, om åskådare på olycksplatsen hade haft en beredskap och kunskap om hur de kan agera för att hjälpa den skadade innan professionell sjukvård är på plats. Enkla åtgärder som att hålla en fri luftväg eller stoppa en blödning, kan vara livsavgörande för den skadade. Masskadescenarion kan ha många olika orsaker, och sker över hela världen. Naturkatastrofer, stora trafikolyckor och socialt våld så som terrordåd, masskjutningar och hatbrott, kan alla leda till många skadade under en begränsad tid, vilket överväldigar sjukvården och leder till katastrofläge. Agerandet från de civila på plats under masskadescenarion blir ännu viktigare än vid olyckor med enstaka skadade, då tiden det tar för första hjälpen personalen att ta sig till platsen ökar. Trots uppmaningar från Världshälsoorganisationen att det ska finnas en beredskap bland civilbefolkningen för dessa typer av händelser, så finns det ingen sådan beredskap eller kunskap i Sverige.

Studien genomfördes mellan september och oktober 2018 i Göteborg. En webbaserad explorativ, självrekryterande enkät distribuerades och spreds, främst via sociala medier. Svenska invånare mellan 15 – 75 år inkluderades. Målet med studien var att undersöka civilas inställning och vilja till att hjälpa till om man är först på plats vid en stor olycka eller katastrof.

Resultatet av studien visade att det finns en stor vilja bland civilbefolkningen i Sverige att hjälpa till vid olyckor och katastrofer, och att viljan blir ännu större, runt 90% på många av frågorna om de svarande blev erbjudna lämplig utbildning utformad för civilbefolkning. Av de 1246 som svarade på enkäten, inkluderades 1234. Av dem så räknades 676 till gruppen ”ingen medicinsk kunskap”. Bland dessa kunde det ses en statistisk signifikant skillnad ($p<0.001$) på alla frågor mellan de olika alternativen a och b, där a är: vad man skulle vara villig att göra nu, och b är: vad man tror att man hade varit villig att göra, efter lämplig utbildning. Viljan att hjälpa till ökade alltså markant och signifikant om de svarande hade blivit erbjudna utbildning.

Slutsatsen är att viljan att hjälpa till vid olyckor och masskadescenarion finns, men att utbildning och i förlängningen kunskap saknas. Ett curriculum för vad som ska läras ut måste tas fram av experter inom området. Samt att framtida studier behöver fokusera på att utvärdera hur utbildningsplaner och träning ska se ut, hur det bäst ska läras ut, och till vilka det ska läras ut. I Sverige är hjärt- och lungräddning och första hjälpen en del av kursplanen i årskurs 7-9, men vad som ingår i utbildningen är ej fastställt nationellt eller utvärderat. En idé kan vara att ta fram ett nationellt curriculum för vad allmänheten ska lära sig angående agerande vid masskadescenarion och olyckor som till en början kan läras ut i skolan, och därefter utvärderas.

References

1. World Health Organization. Mass casualty management systems strategies and guidelines for building health sector capacity [Internet]. Geneva: World Health Organization; 2007. [cited 2018 Dec 14]. Available from: https://www.who.int/hac/techguidance/MCM_guidelines_inside_final.pdf

2. Ben-Ishay O, Mitaritonno M, Catena F, Sartelli M, Ansaloni L, Kluger Y. Mass casualty incidents - time to engage. World J Emerg Surg WJES [Internet]. Published online 2016 Feb 3 [cited 2018 Dec 14];11. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4741018/

3. Oliver GJ, Walter DP, Redmond AD. Are prehospital deaths from trauma and accidental injury preventable? A direct historical comparison to assess what has changed in two decades. Injury. 2017 May 1;48(5):978–984.

4. Lockey DJ, MacKenzie R, Redhead J, Wise D, Harris T, Weaver A, et al. London bombings July 2005: The immediate pre-hospital medical response. Resuscitation. 2005 Aug 1;66(2):ix–xii.

5. Turner CDA, Lockey DJ, Rehn M. Pre-hospital management of mass casualty civilian shootings: a systematic literature review. Crit Care [Internet]. 2016 Dec [cited 2018 Nov 7];20(1). Available from: http://ccforum.biomedcentral.com/articles/10.1186/s13054-016-1543-7

6. Khorram-Manesh A. Europe on Fire; Medical Management of Terror Attacks - New Era and New considerations. Bull Emerg Trauma. 2016 Oct;4(4):183–185.

7. Hussain LM, Redmond AD. Are pre-hospital deaths from accidental injury preventable? BMJ. 1994 Apr 23;308(6936):1077–1080.

8. Oliver G, Walter D, Redmond A. Prehospital deaths from trauma: Are injuries survivable and do bystanders help? Injury. 2017 May 1;48(5):985–991.

9. World Health Organization. Injuries and violence: the facts [Internet]. Geneva: World Health Organization; 2010. [cited 2018 Dec 7]. Available from: https://www.who.int/violence_injury_prevention/key_facts/en/

10. Sethi D et al. Injuries and Violence in Europe: Why They Matter and what Can be Done. WHO Regional Office Europe, Denmark: World Health Organization; 2006.

11. Krug EG et al. World report on violence and health [Internet]. Geneva: World Health Organization; 2002. [cited 2018 Dec 8]. Available from: https://www.who.int/violence_injury_prevention/violence/world_report/en/chap1.pdf

12. Moffat BS. Medical Response to Mass Shootings. In: Lynn M, Lieberman H, Lynn L, Pust GD, Stahl K, Yeh DD, et al. Disasters and Mass Casualty Incidents: The Nuts and Bolts of Preparedness and Response to Protracted and Sudden Onset Emergencies [Internet]. New York: Springer International Publishing; 2019 [cited 2018 Dec 17]. p. 71–74. Available from: https://doi.org/10.1007/978-3-319-97361-6_7

13. Stanford University. What makes a mass shooting count as terrorism? [Internet]. Rochester: Futurity; 2017 [updated 2017 Oct 13; cited 2018 Dec 15]. Available from: https://www.futurity.org/mass-shooting-las-vegas-terrorism-violence-1573452/

14. Castells M, Bouin O, Caraça J, Cardoso G, Thompson J, Wieviorka M. Europe's Crises. Hoboken: John Wiley & Sons; 2018.

15. Max Roser, Mohammed Nagdy and Hannah Ritchie. Terrorism [Internet]. Oxford: Our World in Data; 2018. Published online July 2013 [updated 2018 Jan; cited 2018 Nov 8]. Available from: https://ourworldindata.org/terrorism

16. Institute for Economics & Peace and Vision of Humanity. Global Terrorism Index 2018 Measuring the impact of global terrorism [Internet]. Sydney: Vision of Humanity; 2018. [updated 2018 Dec 5; cited 2018 Dec 9]. Available from: http://globalterrorismindex.org/

17. Erlandsson Å, Meloy JR. The Swedish School Attack in Trollhättan. J Forensic Sci. 2018;63(6):1917–1927.

18. Kumpula, Heli & Paavola, Meri. Injuries and risk-taking among young people in Europe - The European Situation analysis [Internet]. Helsinki: National Public Health Institute; 2008. [cited 2018 Dec 15]. Available from: www.adrisk.eu.com

19. Sorenson SB. Gender Disparities in Injury Mortality: Consistent, Persistent, and Larger Than You'd Think. Am J Public Health. 2011 Dec;101(Suppl 1):353–358.

20. World Health Organization. Health Emergency and Disaster Risk Management Mass Gatherings [Internet]. Geneva: World Health Organization; 2017. [updated 2017 Dec; cited 2018 Dec 11]. Available from: https://www.who.int/hac/techguidance/preparedness/risk-management-mass-gatherings-december2017.pdf

21. Joint Counterterrorism Assessment Team (JCAT). Planning and Preparedness Can Promote an Effective Response to a Terrorist Attack at Open-Access Events [Internet]. Washington: Office of the Director of National Intelligence; 2018 [updated 2018 Mar 30; cited 2018 Dec 11]. Available from: https://www.dni.gov/files/NCTC/documents/jcat/firstresponderstoolbox/First-Responders-Toolbox---Planning-Promotes-Effective-Response-to-Open-Access-Events.pdf

22. Statista. Fatalities from natural disasters worldwide 2017 Statistic [Internet]. New York: Statista; 2018. [cited 2018 Dec 14]. Available from: https://www.statista.com/statistics/510952/number-of-deaths-from-natural-disasters-globally/

23. National Academies Press (US). Crisis Standards of Care: A Systems Framework for Catastrophic Disaster Response. Washington: National Academies Press; 2012. Chap 6. Prehospital Care Emergency Medical Services (EMS) [Internet]. [cited 2018 Dec 11]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK201058/

24. Mell HK, Mumma SN, Hiestand B, Carr BG, Holland T, Stopyra J. Emergency Medical Services Response Times in Rural, Suburban, and Urban Areas. JAMA Surg. 2017 Oct 1;152(10):983–984.

25. Glass TA. Understanding Public Response to Disasters. Public Health Rep. 2001;116(5):69-73.

26. Jacobs LM, McSwain NE, Rotondo MF, Wade D, Fabbri W, Eastman AL, et al. Improving survival from active shooter events: The Hartford Consensus I. J Trauma Acute Care Surg. 2013 Jun;74(6):1399–1400.

27. Haider AH, Haut ER, Velmahos GC. Converting Bystanders to Immediate Responders: We Need to Start in High School or Before. JAMA Surg. 2017 Oct 1;152(10):909.

28. Kellermann AL, Peleg K. Lessons from Boston. N Engl J Med. 2013 May 23;368(21):1956–1957.

29. McNulty E, Ashkenazi I, Leonard JM, Barry CD. The Role of Bystanders in Mass Casualty Events: Lessons from the 2010 Haiti Earthquake. J Def Stud Resour Manag. 2012 Oct 29 ;01(02):1-5.

30. Walls RM, Zinner MJ. The Boston Marathon Response: Why Did It Work So Well? JAMA. 2013 Jun 19;309(23):2441.

31. Markogiannakis H, Sanidas E, Messaris E, Koutentakis D, Alpantaki K, Kafetzakis A, et al. Motor vehicle trauma: analysis of injury profiles by road-user category. Emerg Med J EMJ. 2006 Jan;23(1):27–31.

32. Doocy S, Daniels A, Packer C, Dick A, Kirsch TD. The Human Impact of Earthquakes: a Historical Review of Events 1980-2009 and Systematic Literature Review. PLoS Curr [Internet]. 2013 Apr 16 [cited 2018 Dec 20];5. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3644288/

33. 33.Ahern M, Kovats RS, Wilkinson P, Few R, Matthies F. Global Health Impacts of Floods: Epidemiologic Evidence. Epidemiol Rev. 2005 Jul 1;27(1):36–46.

34. Jacobs LM, Sinclair J, Rotondo M, Burns K, McSwain N, et al, Joint Committee to Create a National Policy to Enhance Survivability from Mass Casualty Shooting Events. Active Shooter and International Mass-Casualty Events: The Hartford Consensus II. Bull Am Coll Surg. 2015 Sep;100(1 Suppl):35–39.

35. Jacobs LM, Joint Committee to Create a National Policy to Enhance Survivability from Intentional Mass-Casualty and Active Shooter Events. The Hartford Consensus III: Implementation of Bleeding Control--If you see something do something. Bull Am Coll Surg. 2015 Jul;100(7):20–26.

36. Jacobs LM, Joint Committee to Create a National Policy to Enhance Survivability from Intentional Mass Casualty and Active Shooter Events. The Hartford Consensus IV: A Call for Increased National Resilience. Bull Am Coll Surg. 2016 Mar;101(3):17–24.

37. Levy MJ, Jacobs LM. A Call to Action to Develop Programs for Bystanders to Control Severe Bleeding. JAMA Surg. 2016 Dec 1;151(12):1103.

38. Butler FK, Blackbourne LH. Battlefield trauma care then and now: a decade of Tactical Combat Casualty Care. J Trauma Acute Care Surg. 2012 Dec;73(6 Suppl 5):S395-402.

39. National Association of Emergency Medical Technicians (NAEMT). Guidelines and Curriculum [Internet]. Clinton: NAEMT; 2018. [updated 2018 Aug 01; cited 2018 Nov 10]. Available from: http://www.naemt.org/education/naemt-tccc/tccc-mp-guidelines-and-curriculum

40. Goolsby C, Jacobs L, Hunt RC, Goralnick E, Singletary EM, Levy MJ, et al. Stop the Bleed Education Consortium: Education program content and delivery recommendations. J Trauma Acute Care Surg. 2018 Jan;84(1):205–210.

41. Forsyth KL, Lowndes BR, Prytz E, Jonson C-O, Sztajnkrycer MD, Heller SF, et al. Improving Instructions to Stop the Bleed. Proc Hum Factors Ergon Soc Annu Meet. 2017 Sep;61(1):588–592.

42. American College of Surgeons. BleedingControl [Internet] Chicago: American College of Surgeons; 2016-2018. [cited 2018 Nov 10]. Available from: https://www.bleedingcontrol.org/

43. Ross EM, Redman TT, Mapp JG, Brown DJ, Tanaka K, Cooley CW, et al. Stop the Bleed: The Effect of Hemorrhage Control Education on Laypersons' Willingness to Respond During a Traumatic Medical Emergency. Prehospital Disaster Med. 2018 Apr;33(02):127–132.

44. CitizenAID. About Us [Internet]. Wolverhampton: citizenAID; 2017. [cited 2018 Dec 12] Available from: https://www.citizenaid.org/copy-of-home

45. Bakke HK, Steinvik T, Eidissen S -I., Gilbert M, Wisborg T. Bystander first aid in trauma – prevalence and quality: a prospective observational study. Acta Anaesthesiol Scand. 2015 Oct;59(9):1187–1193.

46. Eisenburger P, Safar P. Life supporting first aid training of the public—review and recommendations. Resuscitation. 1999 Jun 1;41(1):3–18.

47. Quinn RH, Macias DJ. The Management of Open Fractures. Wilderness Environ Med. 2006 Mar 1;17(1):41–48.

48. Bernhard M, Gries A, Kremer P, Böttiger BW. Spinal cord injury (SCI) - Prehospital management. Resuscitation. 2005;66(2):127–139.

49. Brouhard R. 7 Steps to Treat Shock Due to Bleeding [Internet]. New York: Dotdash; 2018. [updated 2018 Aug 2; cited 2018 Dec 12]. Available from: https://www.verywellhealth.com/how-to-treat-for-shock-1298296

50. The UK Government. Sweden travel advice [Internet]. London: Open Government Licence; 2018. [updated 2018 Nov 13; cited 2018 Nov 14]. Available from: https://www.gov.uk/foreign-travel-advice/sweden

51. Björnstig U. Pre-hospital emergency care in Sweden. IATSS Res. 2004;28(2):24–31.

52. Larsson, G. and Enander, A. Preparing for disaster: public attitudes and actions. Disaster Prevention and Management, 1997; Vol. 6 No. 1, pp. 11-21.

53. Kano, M., Siegel, J.M., & Bourque, L.B. First-aid training and capabilities of the lay public: A potential alternative source of emergency medical assistance following a natural disaster. Disasters, 2005; 29, 58–74.

54. Böttiger, B. W. & Van Aken, H. Kids save lives – Training school children in cardiopulmonary resuscitation worldwide is now endorsed by the World Health Organization. Resuscitation, 2015; 94, A5-A7.

55. Högstedt Åsa. Motivational factors for joining the SMS Lifesaver service – Characteristics of CPR volunteers serving out of hospital cardias arrest cases. [master's thesis]. Gothenburg: Gothenburg University Sahlgrenska Academy; 2017.

Appendices

Appendix A

Vad är Du beredd att göra vid stora olyckor eller katastrofer?

Med detta frågeformulär vill vi få veta mer om vad privatpersoner är beredda att göra om det inträffar en svår olycka. Insatser som görs, innan blåljuspersonal anländer, kan vara av stor betydelse för dem som drabbats av allvarliga skador.

Denna utforskande undersökning genomförs i samarbete med Västra Götalandsregionen och en Läkarstudent vid Göteborgs universitet, för att kartlägga allmänhetens benägenhet till att agera vid olyckor och katastrofer. Vad Du som civilperson är beredd att göra om Du är först på plats, samt om Du tror att ditt agerande hade ändrats efter genomgången utbildning för civilpersoner. (Det finns ingen sådan utbildning i Sverige, och vi vet i dagsläget inte hur en sådan utbildning skulle se ut, så detta är en hypotetisk fråga.)

För att delta ska Du vara mellan 15-75år och bosatt i Sverige. Deltagandet är frivilligt. Inga personuppgifter sparas.

Tack för din tid, varje bidrag är värdefullt!

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* Required

UNIVERSITY OF GOTHENBURG

Du kommer att få ta ställning till 20 påståenden om hjälpinsatser vid olyckor, där det antas att Du är först på plats.

Svara på en skala från Håller inte alls med (1) till Håller helt med (7).

Varje fråga har a) och b)

a) vad Du är beredd att göra nu.

b) försök uppskatta vad Du tror att Du hade varit beredd att göra om Du hade fått utbildning utformat för civilpersoner.

1. **1a. Du är beredd att genomföra enkla livsuppehållande åtgärder på plats efter en svår olycka tills vårdpersonalen anländer. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

2. **1b. Som ovan om Du har fått utbildning. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

3. **2a. Du är beredd att utföra Hjärt- och Lungräddning. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

4. **2b. Som ovan om Du har fått utbildning. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

5. **3a. Du är beredd att bedöma hotande chock* och med enkla medel hantera chock. ***
   *Chock= ett livshotande tillstånd som kan uppstå vid tex stora blödningar, eller infektioner i blodet. Blodtrycket och blodflödet sjunker så mycket att blodet inte kan pumpas ut normalt vilket gör att kroppen inte får tillräckligt med syre och näring.
   Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

6. **3b. Som ovan om Du har fått utbildning. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

7. **4a. Du är beredd att hantera en drunkningsolycka. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

8. **4b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

9. **5a. Du är beredd att stoppa en blödning genom att komprimera/lägga tryckförband över blödningen. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

10. **5b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

11. **6a. Du är beredd att bedöma behovet av och använda hjälpmedel för att stoppa svåra blödningar på armar och ben. ***
Tex snöra ett bälte runt ett blödande ben.
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

12. **6b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

13. **7a. Du är beredd att stabilisera skelettskador på armar och ben. ***
Tex att stabilisera en bruten arm eller ett brutet ben.
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

14. **7b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

15. **8a. Du är beredd att försöka bedöma risk för komplikationer vid skelettskador på armar och ben. Tex när en hand inte får tillräckligt med blodtillförsel i samband med en bruten arm, eller att det finns nervskador. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

16. **8b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

17. **9a. Du är beredd att försöka bedöma behovet av när en skelettskada på arm eller ben behöver återföras till rätt läge, av sjukvårdspersonal. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

18. **9b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

19. **10a. Du är beredd att vid scenarion med många skadade personer, s.k masskadescenarion, prioritera patienters behov av vård och evakuera patienter utan livshotande eller stora skador från området. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

20. **10b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

21. **11a. Du är beredd att försöka tillämpa principerna för hur man stabiliserar nacke och ländrygg. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

22. **11b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

23. **12a. Du är beredd att rädda livet på en annan person när omständigheterna utgör tvingande skäl att vidta en viss åtgärd, för att rädda personens liv trots att det kan innebära att patienten får framtida men. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

24. **12b. Som ovan om Du har fått utbildning.**
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

25. **13a. Du är beredd att hantera en nackkrage, ett hjälpmedel som används för att stabilisera nacken efter skada. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

26. **13b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

27. **14a. Du är beredd att agera och har kunskap om när man ska stanna kvar inomhus och gömma sig, respektive utrymma en byggnad, tex vid en skolattack. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

28. **14b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

29. **15a. Du är beredd att agera mot en gärningsman, att göra gärningsmannen inkapabel att utföra sin gärning, vid pågående dödligt våld, tex skolattack. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

30. **15b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

31. **16a. Området kring en allvarlig händelse delas in i livsfarliga, farliga, och relativt säkra områden. Du är beredd att hjälpa till att ta hand om skadade i alla dessa områden. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

32. **16b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

33. **17a. Du är beredd att bygga upp en skadeplats med tex avspärrningar, uppsamlingsplatser och områden för bortförsel av skadade. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

34. **17b. Som ovan om Du har fått utbildning.**
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

35. **18a. Du är beredd att agera och hjälpa till vid högrisk olyckor såsom explosioner, kemutsläpp, bränder och terror? ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

36. **18b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

37. **19a. Du är beredd att själv säkra en olycksplats/sammarbeta med personal som säkrar en olycksplats. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

38. **19b. Som ovan om Du har fått utbildning. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

39. **20a. Du har kunskaper om civilrättsliga omständigheter och offentlig rätt i samband med insatser vid olyckor och katastrofer. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

40. **20b. Du tycker det är rimligt att Du får utbildning i detta. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

41. **Synpunkter eller kommentarer på enkäten?**

Sakfrågor

42. **Ålder? ***

43. **Kön?**
Mark only one oval.

- ◯ Kvinna
- ◯ Man

44. **Sysselsättning? ***
Mark only one oval.

- ◯ Student
- ◯ Arbetslös/arbetssökande
- ◯ Yrkesarbetande
- ◯ Pensionär
- ◯ Other:

45. **Student, vad studerar Du? Arbetslös, tidigare yrke/utbildning? Yrkesarbetande, vad jobbar du med? Pensionär, tidigare yrke?**

46. **Om utbildning inom vård och hälsa - specialitet?**

47. **Är Du eller har Du varit aktiv inom någon av dessa frivillig organisationer? ***
Mark only one oval.

- ◯ Röda Korset
- ◯ SMSlivräddare
- ◯ Hemvärnet
- ◯ Annan organisation
- ◯ NEJ

48. **Om annan organisation, vilken?**

TACK!

Tack för din tid, ditt bidrag är värdefullt för att kartlägga behovet för allmänna utbildningar!

Vid frågor om undersökningen kontakta: patricia.plegas@gmail.com

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Appendix B

What are you willing to do in case of a major accident or disaster?

With this questionnaire we would like to know more about what civilians are willing to do in case of major accidents.
Efforts that are made before emergency medical services arrives, can be of great importance for those who suffer from severe injuries.

This exploratory survey is performed in collaboration with Västra Götalandsregionen and a Medical student at Gothenburg University, to investigate civilians willingness to act in accidents or disasters. What you as a civilian are willing to do if you are first on the scene, and if you think that your way of acting would change after going through education for civilians. (There is no such education in Sweden right now, and at this point we do not know what the education would consist of, so this is a hypothetical question.)

You must be between 15-75 years of age and living in Sweden to participate. Participation is voluntary. No personaldata is saved.

Thank you for your time, every contribution is valuable!
If you have questions regarding the survey please contact:
patricia.plegas@gmail.com

Responsible Doctor:
Amir Khorram-Manesh Trauma Surgeon Disaster medicin Sahlgrenska Universityhospital

* Required

UNIVERSITY OF GOTHENBURG

You will now take a stand in 20 statements about emergency assistance in case of accident, assuming that you are the first one on the scene.

Answer on a scale from Totally disagree (1) to Totally agree (7).

Every question has a) and b)

a) what you are willing to do now.

b) try and estimate what you think you would be willing to do if you would have had education for civilians.

1. **1a. You are prepared to implement simple life sustaining actions on the scene of a severe accident until professional healthcare arrives. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagre	◯	◯	◯	◯	◯	◯	◯	Totally agree

2. **1b. As above if you have had education. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

3. **2a. You are prepared to execute Cardiopulmonary resuscitation. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

4. **2b. As above if you have had education. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

5. **3a. You are prepared to asses threatening shock* and by simple means handle shock. ***
   *Shock = a life threatening state which can occur during severe blood loss, or infections in the blood. The blood pressure and blood flow decrease so much that the blood can not be pumped out as normal which leads to the body not getting enough oxygen and nutrients.
   Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

6. **3b. As above if you have had education. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

7. **4a. You are prepared to handle a drowning accident. ***
   Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

8. **4b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

9. **5a. You are prepared to stop a bleeding by putting direct pressure/dressing over the bleeding. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

10. **5b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

11. **6a. You are prepared to assess the need for and use aid to stop severe bleedings on arms and legs. ***
E.g tie a belt around a bleeding leg.
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

12. **6b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

13. **7a. You are prepared to stabilize bone fractures on arms and legs. ***
E.g to stabilize a broken arm or a broken leg.
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

14. **7b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

15. **8a. You are prepared to try and assess the risk for complications due to bone fractures on arms and legs. E.g when a hand cannot get sufficient blood flow due to a broken arm, or weather there is nerve damage. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

16. **8b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

17. **9a. You are prepared to try and assess the need for when a bone fracture on a arm or leg needs to be placed in the right position, by hospital personnel. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

18. **9b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

19. **10a. In scenarios with a lot of injured people, s.c. mass casualty scenario. You are prepared to prioritise patients need of care and evacuate patients without life threatening or major injuries from the area. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

20. **10b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

21. **11a. You are prepared to use the principles to stabilize neck and lower back. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

22. **11b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

23. **12a. In a severe situation you are prepared to take action to save a persons life, even though it can result in the person getting damaged for life. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

24. **12b. As above if you have had education.**
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

25. **13a. You are prepared to handle a cervical collar, an aid which is used to stabilize the neck after injury. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

26. **13b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

27. **14a. You are prepared to act and have knowledge on when to stay inside and hide or when to evacuate a building, e.g under a school attack. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

28. **14b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

29. **15a. You are prepared to act against a perpetrator, and make the perpetrator incapabel of carryng out their mission, during ongoing deathly violence, e.g a school attack. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

30. **15b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

31. **16a. The area around a serious event are divided into lethal, dangerous, and relatively safe areas. You are prepared to help and take care of wounded in all those areas. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

32. **16b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Stämmer inte alls	◯	◯	◯	◯	◯	◯	◯	Stämmer helt

33. **17a. You are prepared to organize the scene of an accident with e.g barrieres, collection points and areas for discharge of the wounded. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

34. **17b. As above if you have had education.**
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

35. **18a. You are prepared to act and assist at high-risk accidents like explosions, chemical emissions, fire and terror? ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

36. **18b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

37. **19a. You are prepared to secure the place of an accident either on your own or together with professionals. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

38. **19b. As above if you have had education. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

39. **20a. You have knowledge on civil law matters and public rights regarding efforts during accidents and disasters. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally aggre

40. **20b. You think it is reasonable that you get educated in this. ***
Mark only one oval.

	1	2	3	4	5	6	7	
Totally disagree	◯	◯	◯	◯	◯	◯	◯	Totally agree

41. **Comments on the questionnaire?**

Content

42. **Age? ***

43. **Gender?**
Mark only one oval.

- ◯ Woman
- ◯ Man

44. **Occupation? ***
Mark only one oval.

- ◯ Student
- ◯ Unemployed/job-seeker
- ◯ Working
- ◯ Pensioner
- ◯ Other:

45. **Student, what are you studying? Unenployed, earlier profession/education? Working, what do you do? Pensioner, earlier profession?**

46. **If education in healthcare - which specialty?**

47. **Are you or have You been active in any of these volountary organisations? ***
Mark only one oval.

- ◯ Red Cross
- ◯ SMSlifesaver
- ◯ Hemvärnet
- ◯ Other organisation
- ◯ NEJ

48. **If other organisation, which?**

Thank you!

Thank you for your time, your contribution is valuable to investigate the eventual need for civil educations.

Questions regarding the survey please contact: patricia.plegas@gmail.com

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