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Determination of individual preparation behaviors of emergency health services personnel towards disasters

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ABSTRACT

Objective: To determine certain behaviors regarding preparation of Canakkale 112 ambulance service personnel towards emergency situations and disasters.

Methods: This study is an epidemiological descriptive study. The population of the study consists of 281 people working for Command Control Center and Emergency Medical Services Station of Canakkale 112 Ambulance Service. About 176 people agreed to participate in the study were interviewed within the scope of the study. Necessary information was obtained by a survey. In the statistical analysis of the study, descriptive statistics, Mann–Whitney, Kruskal–Wallis and *Chi*-square tests were used.

Results: The participation rate of the study was 62.6% (176 people). The participants were in the range of 17–64 years of age. The average age of the participants was (31.6 ± 9.1) years. About 54% of the participants (95 people) were under the age of 29 and 54% of them (95 people) were male, 23.3% of them (41 people) held a bachelor degree and 35.7% (63 people) of them were Emergency Medical Technicians, respectively. In the study, a statistical relationship was found between some questions of the survey and some variables such as age, gender, degree, membership status for non-governmental organizations, experience of emergency situations, being trained against disasters and desire to have such a training ($P < 0.005$).

Conclusions: As a result of the study, a significant relationship was found between being trained related to disaster and emergency situations and development of positive attitudes about training for disasters and emergencies. This indicates that people, no matter what educational level they are in, have to be trained for disasters and emergencies.

1. Introduction

Disasters are natural, technological or human related events affecting human lives by interrupting their daily lives and social activities and causing physical, economic and social losses. Disaster cannot be overcome by means and resources of a community; however, they often need help from outside^[1]. People had to face both human related and natural disasters all

over the world. However, especially in recent years, there is a rapid increase in the frequency of occurrence of disasters and loss of property and lives due to these disasters^[1–5].

20th century is called “century of disasters” due to the disasters occurred in this century and tragedies took place after these disasters^[6]. In the first quarter of 21st century, the public has witnessed a large number of large-scale disasters. In 2004, the earthquake happened in Indonesia with a magnitude of 9.1 and tsunami caused by this earthquake in Indian Ocean caused about 230000 casualties in 14 countries. Eight months after this incident, America was exposed to one of history's most severe hurricanes. Katrina Hurricane killed 1883 people and resulted in 125 billion US dollars economic damage^[7]. Another earthquake with a magnitude of 9 happened in Japan in the month of March in 2011. In addition, Fukushima Nuclear Power Plant was

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damaged by the earthquake and has led to radioactive contamination. In addition to these, many earthquakes, hurricanes, typhoons, floods, forest fires and so on occurred in this period^[8].

The substantially increased devastation caused by the disasters led governments and international organizations to find alternative solutions. In particular, as a result of the studies conducted by the United Nations, policies created in order to prevent losses caused by disasters were adopted all over the world and implemented as far as possible^[9]. The ultimate aim of these policies is to bring communities become more resilient against disasters. One of the most important aspects of a disaster resistant community is individuals prepared for disasters. Taking personal precautions against disasters by each individual and making the necessary preparations allow sustaining lives by reducing death and injuries that may arise after the disaster^[10–12]. However, preparation of people who have responsibilities in the field of disaster and emergency response is more important since they directly affect the lives of others besides themselves.

The staff of emergency medical services is one of the most important people needed in emergency situations and especially disasters. These people have an important role in terms of providing emergency services immediately after disasters, and then delivering these services in the field hospitals as well as improving health level of the public. The staff of emergency medical services should train other people in terms of preparation for emergencies and disasters. In other words, the level of preparedness of emergency medical services personnel is a factor affecting the number of deaths and injuries caused by disasters. This study was designed to determine some behaviors of Canakkale 112 ambulance service personnel towards emergency situations and disasters.

The main aim of having emergency personnel who have certain responsibilities and roles in the society, and keeping people prepared for emergency situations and disasters is minimizing the damage caused by disasters. The systematic

diagram given in **Figure 1** shows the conceptual framework of a person's individual preparation process against disasters. Disaster preparedness process program consists of five dimensions: policy development, legal arrangements on local, regional and national scale; vulnerability assessment, determination of damage may be caused by potentially dangerous situations; disaster planning, taking measures, giving response and improvement efforts against designated hazards in accordance with available resources; education and training, development of knowledge and skills of individuals against the dangers; monitoring and evaluation, including testing of prepared plans with real-time applications and elimination of deficiencies^[13]. Education and training are divided into three size in itself as institutional, social and individual preparation process. The individual preparation process and conceptual framework that forms the main logic of the study is given under education and training section of preparation process for disasters (**Figure 1**). The individual becomes aware of the danger that could harm him/her first, and determines the preparation options by analyzing the danger. Thereafter, tools that can minimize the danger are equipped, and relevant training programs are received. Resources obtained are used when the danger is encountered and preparations get started for future disasters.

Health workers and their families should be safe for health workers in order to produce services after disasters. They do have a responsibility of encouraging people to be trained and be well-prepared for emergency situations and disasters in the pre-disaster period. In society, the awareness of being prepared for emergency situations and disasters should be the life style of individuals to create the culture of “safe life”. This concept should be a part of people's lives by converting knowledge into behaviors. Basic information about disasters should be taught to everyone and appropriate behavioral changes should be provided^[13]. Thus, life and property losses caused by disasters can be reduced. Simple measures that can be taken in the pre-disaster period may help to survive in the aftermath of a disaster. For example, the fall of goods that are not fixed may cause injuries and even deaths during a disaster^[13,14]. In the Marmara earthquake, 50% of the injuries and 3% of the deaths were caused by the displacement of the non-structural materials^[5].

The participation of all segments of society, formation of awareness and behavior changes are needed in order to cope with disasters. The vulnerability of the population against disasters can be reduced by taking necessary precautions with conscious individuals and making preparations to minimize the damages^[5].

Although disasters are frequently encountered in Turkey, the absence of disaster preparedness and precautions as well as the lack of disaster culture are conditions reducing the society's resistance to disasters. In a personal level, the lack of education, illiteracy and ignoring the importance of safety are other challenges restraining the preparations^[13].

2. Materials and methods

This descriptive study was conducted with Command Control Center and 17 EMS stations of Emergency Medical Services of Canakkale 112 Ambulance Service. Data were collected from 176 (62.6%) people accepted to participate in the survey in December 2011 by sealed envelope technique. The preliminary testing of the survey was conducted at Hacettepe University

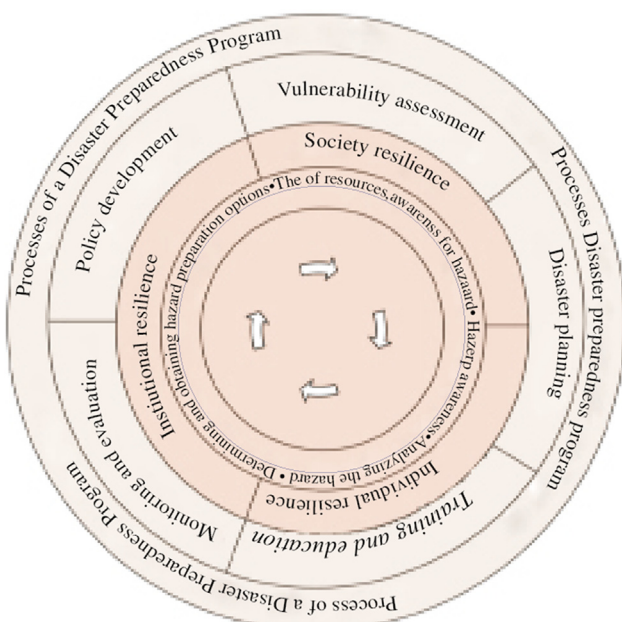


Figure 1. Individual disaster preparedness process program. Source: Adapted from Mark E. Keim and Paul Giannone^[13].

Hospital Emergency Department on November 28th, 2011. Written permission was obtained from Health Directorate of Canakkale and verbal permission was received from the participants.

2.1. Survey

In the study, a questionnaire developed by the researchers including 24 questions (10 questions about socio-demographic characteristics and 13 closed-ended and 1 open-ended questions) was used.

2.2. The socio-demographic information of the survey

Age, gender, degree, membership status for a non-governmental organization related to disasters (NGOs), experience of emergency situations, being trained for disasters, desire to have such training and desire to be educated for individual preparation for disasters and emergency situations were evaluated.

2.3. The questions related to current disaster preparedness behaviors of individuals

Participants were asked 13 questions given below. Participants were classified as prepared and not prepared for each question.

We organized meetings with households about what can be done against emergencies and disasters; We do have a fire extinguisher at home; We wrote down the emergency numbers on a piece of paper nearby the phone; I saved important numbers on my cell phone; I know the place of all utility systems in our house; I know how to shut these systems down; I prepared an emergency kit that can be helpful after emergency situations and disasters; I do have a flashlight in my room; I fixed the items that can be harmful for people; I placed heavy objects on lower shelves in the cabinets; We do have a common meeting point to meet after a disaster; I learned that whether the building that I live was built according to the building regulations; The house I live in has natural disaster insurance.

2.4. Analysis

Participants were asked 13 questions about the behavior of individual disaster preparedness. Existing disaster preparedness index was prepared by giving “1” point to the questions answered as “yes” and “0” point to the questions answered as “no”. In this regard, the lowest score that can be received was 0, while the highest score was 13, respectively. The participants below the average were defined as “unprepared” and those above average score were defined as “prepared”. In data analysis, in addition to SPSS 15.0 statistical software package program, descriptive statistics, Mann–Whitney *U*, Kruskal Wallis and *Chi*-square tests were used.

3. Results

3.1. Socio-demographic information

The average age of the participants (176 people) was (31.6 ± 9.1) years (median = 29, min. – max. = 17–64). About

46% of the participants (81 people) were male, 31.2% of them hold bachelor and graduate degree and 35.7% (63 people) were emergency medical technicians, respectively (Table 1).

3.2. Existing disaster preparedness

The disaster preparedness levels of individuals were given in Figure 2. More than 70% of the participants knew the place of utility systems and how to shut these systems down. About 30% of the participants had checked whether their houses were built according to building regulations and conducted a meeting, insured their houses, determined meeting points, obtained a flashlight and placed objects properly (Figure 2).

3.3. Existing disaster preparedness index

According to K–S test ($P < 0.000$), existing disaster preparedness index was not distributed normally. Scores of the participants ranged from 1 to 13 points and their average score was 5.11 ± 3.20 (Figure 3). It has been determined that 1.7% of the participants ($n = 3$) scored 13 points, while 5.7% ($n = 10$) of them scored 0 points, respectively. According to average scores of the participants, 58% ($n = 102$) of them were classified as unprepared group (5 points and less) while 42% of them ($n = 74$) were classified as prepared group (6 points and higher), respectively.

3.4. The relationship between current disaster index questions and variables

In the study, individual disaster preparedness questions and nine variables categorized in them were analyzed. *Chi*-square test results ($P(x^2) < 0.05$) of the existing relationship between variables and index were given below:

Table 1

Some socio-demographic characteristics of the participants (Canakkale, 2011).

| Characteristics ($n = 176$) | Number | Percentage |
|--|--------|------------|
| Age | | |
| 17–29 years | 95 | 54.0 |
| 30–64 years | 81 | 46.0 |
| Average ± SD: 31.6 ± 9.1, median: 29, Youngest: 17, Oldest: 64 | | |
| Sex | | |
| Male | 81 | 46.0 |
| Female | 95 | 54.0 |
| Degree | | |
| Middle school | 11 | 6.3 |
| High school | 69 | 39.2 |
| Two-year degree | 41 | 23.3 |
| Bachelor | 41 | 23.3 |
| Graduate | 12 | 6.8 |
| PhD/Expertise | 2 | 1.1 |
| Profession | | |
| Practicing physician | 17 | 9.7 |
| Paramedic | 23 | 13.1 |
| Emergency medical Tech. | 63 | 35.7 |
| Nurse | 28 | 15.9 |
| Officer | 9 | 5.1 |
| Driver | 29 | 16.5 |
| Midwife | 5 | 2.8 |
| FTR | 1 | 0.6 |
| Anesthesia technician | 1 | 0.6 |

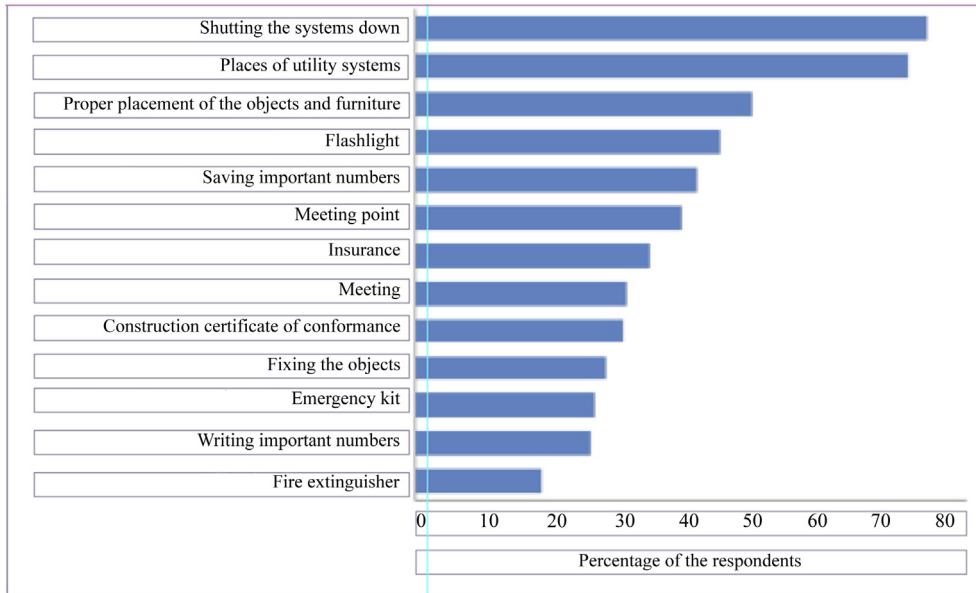


Figure 2. Disaster preparedness levels of individuals.

- Age: The rate of writing the important numbers on a piece of paper, knowing the place of utility systems and how to shut them down, having a flashlight and checking certificate of conformance of the construction were statically higher in those 30-year-old and older compared to those 29-year-old and younger.
- Sex: The rate of knowing the place of utility systems and how to shut them down, preparing emergency kit, having a flashlight and knowing the meeting points was statically higher in males compared to females.
- Degree: The rate of insuring houses was higher in those holding at least two year college degree compared to those graduated from high school or holding a lower degree.
- Membership of an NGO: The rate of fixing objects was statically higher in those who have a membership to an NGO.
- Experiencing an emergency situation: The rate of having fire distinguisher and placing objects properly was statically higher in those who experienced an emergency situation before compared to those haven't experienced yet.
- Experiencing a disaster before: No correlation was found.
- Being trained for disasters: The rate of conducting meetings, writing and saving important numbers, having a flashlight, placing objects properly and knowing the meeting point was

- statically higher in those who have been trained about disasters compared to those who have not been trained.
- Desire to be trained: The rate of saving important numbers was statically higher in those who wish to be trained for emergency situations and disasters.

3.5. The relationship between variables and existing disaster preparedness index prepared/unprepared groups

In the study, individual disaster preparations and nine variables categorized in them were analyzed. Eight of these variables were analyzed by Mann-Whitney U test and one variable

Table 2

The significant statistics between variables and current disaster preparedness index.

| Variables | Mean | Mean rank | Sum of ranks | U | P |
|--|------|-----------|--------------|--------|-------|
| 29-year-old and younger | 95 | 79.97 | 7597.5 | 3037.5 | 0.016 |
| 30-year-old and older | 81 | 98.50 | 7978.5 | | |
| Male | 81 | 102.25 | 8282.5 | 2733.5 | 0.001 |
| Female | 95 | 76.77 | 7293.5 | | |
| High school and lower | 80 | 86.45 | 6916.0 | 3676.0 | 0.625 |
| High school or higher | 96 | 90.21 | 8660.0 | | |
| NGO (Yes) | 19 | 99.82 | 1896.5 | 1276.5 | 0.303 |
| NGO (No) | 157 | 87.13 | 13679.5 | | |
| Experiencing an emergency (Yes) | 64 | 92.12 | 5895.5 | 3352.5 | 0.475 |
| Experiencing an emergency (No) | 112 | 86.43 | 9680.5 | | |
| Experiencing an disaster (Yes) | 63 | 91.37 | 5756.0 | 3379.0 | 0.576 |
| Experiencing an disaster (No) | 113 | 86.90 | 9820.0 | | |
| Trained for disaster (Yes) | 64 | 104.63 | 6696.0 | 2552.0 | 0.001 |
| Trained for disaster (No) | 112 | 79.29 | 8880.0 | | |
| Desire to be trained for disasters (Yes) | 154 | 85.95 | 13236.0 | 1301.0 | 0.077 |
| Desire to be trained for disasters (No) | 22 | 106.36 | 2340.0 | | |

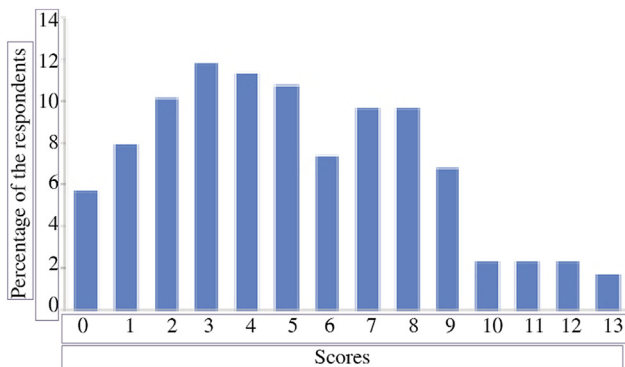


Figure 3. The total score of the current disaster preparedness index of participants.

was analyzed by Kruskal–Wallis test. The relevant statistics excluding profession group, in which Kruskal–Wallis test was employed, were presented in Table 2. The statistical relationship between variables and index ($P < 0.05$) was given below:

- Age: The current disaster preparedness index was statistically higher in those 30-year-old or older compared to those 29-year-old or younger.
- Gender: The current disaster preparedness index was statistically higher in males compared to females.
- Degree: No relationship was found.
- Membership status for NGOs: No relationship was found.
- Experiencing an emergency situation: No relationship was found.
- Experiencing a disaster: No relationship was found.
- Being trained for disasters: The current disaster preparedness index was statistically higher in those trained for disasters.
- Desire to be trained: No relationship was found.
- Profession: There was no relationship between doctor, paramedic, emergency medical technician, nurse, driver and others in terms of current disaster preparedness index.

4. Discussion

The emergency personnel are expected to go to the disaster scene immediately and work effectively. However, this expectation is valid only when these people and their families are safe. If emergency personnel or their first-degree relatives are harmed, then they are expected to rescue themselves and their relatives first, and then fulfill their duties and responsibilities for others^[15]. This also applies to the 112 ambulance service staff. Preventing damages caused by disasters depends on preparedness level of these people and their families.

Participants are well-educated and trained people for disasters and emergency situations as part of their jobs. They are expected to create a positive attitude in preparation for emergencies. However, according to our findings, there are serious deficiencies in individual disaster preparedness of the participants included in the study. For example, only 26.1% of the participants have an emergency kit to be used in case of an emergency or disaster. This rate was found as 17.4% for ambulance service personnel working in the same region^[16] and 5.6% for patients and their relatives in another city, respectively^[17]. Although this rate shows that 112 ambulance personnel are more deliberate compared to normal people, the percentage of showing positive attitude is very low. While 34.1% of the study group stated that their houses were insured, this ratio was found as 9.2% in another study previously conducted with regular people^[17].

There is a relationship between age of the personnel and having important numbers in case of an emergency, knowing the place of all utility systems and how to shut them down, having a flashlight in the room in order to illuminate the surroundings after the disaster, checking the compliance of the house by “construction certificate of conformity”. It is thought that people gets more experienced as they get older and they develop positive attitudes towards disasters and emergencies. However, the results of a study conducted with 198 patients and their relatives admitted to Akdeniz University Faculty of Medicine in 2003 are not consistent with our findings. On the contrary, the preparedness level of younger people for disasters and emergencies were found to be higher compared to older people^[18].

There is a relationship between genders of the participants and knowing the meeting point, having a flashlight in the room in order to illuminate the surroundings after the disaster, preparing the emergency kit to be used in case of an emergency until help is arrived, knowing the place of all utility systems and how to shut them down. Male participants developed more positive attitudes compared to females towards disasters. Since males have to deal with repairs at home, they know the utility systems and how to shut them down better than females. However, it is expected to have no difference between opposite sexes in terms of other matters. Since the average age of male participants is higher than females, it is thought that the higher positive attitudes males may be due to their ages rather than gender types.

There is a relationship between experiencing an emergency and having fire distinguisher at home and placing heavy objects to the lower shelves in the cabinets. Experiencing any emergency before led individuals to develop more positive behaviors in case of emergency situations. According to a study conducted with personnel of Kocaeli 112 emergency unit, there is a correlation between experiencing an emergency situation before and developing positive behaviors in terms of preparedness for emergencies^[19].

The presence of insuring the house and higher degree level were found to be correlated with each other. It was not expected to find no relationship between degree level and other behaviors towards disaster and emergency situations. In fact, the positive behaviors of people should increase as their educational level. In another study, a relationship was found between degree level and developing positive behaviors regarding disasters^[18,20–22].

Maintaining safety of himself/herself and relatives of an individual in case of a disaster and emergency is the main duty and responsibility of a person. According to this and another study, it has been seen that health care workers are not well-prepared individually for disasters^[16,23]. Health care workers, no matter what degree they hold, should be trained for individual preparation for disasters and emergency situations and it has been suggested that a training module should be developed for them.

Conflict of interest statement

The authors report no conflict of interest.

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Disclaimer

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