

## Assessment of Disaster and CBRN Knowledge and Attitudes of First and Emergency Aid Program Senior Students

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<b>ABSTRACT</b>	
<p><b>Corresponding Author</b> Gülseren GÜNAYDIN</p> <p><b>DOI</b> <a href="https://10.48121/jihsam.1222312">https://10.48121/jihsam.1222312</a></p> <p><b>Received</b> 21.12.2022</p> <p><b>Accepted</b> 06.02.2023</p> <p><b>Published Online</b> 30.04.2023</p> <p><b>Keywords</b> CBRN, First and Emergency Aid, First Aid, Emergency Aid.</p>	<p><i>This study was carried out to examine the knowledge and attitudes of the last year students of the first and emergency aid program about disaster and CBRN.</i></p> <p><i>All of the students (84 people) studying at Gümüşhane University SHMYO in the spring semester of the 2019-2020 academic year were included in the study and constitute the sample of the study. Written consent was obtained from the participants for the study, and our research was conducted in accordance with ethical rules. In order to carry out the research; The necessary institutional permission from the Gümüşhane University SHMYO Directorate and the ethics committee approval (number 2019/1) to conduct the research were obtained from the Gümüşhane University Scientific Research and Publication Ethics Committee. In order to collect data and examine the disaster and CBRN (Chemical-Biological-Radiological-Nuclear) knowledge level and attitudes of the senior students of the first and emergency aid program, a survey form prepared by the researcher within the scope of the literature was used.</i></p> <p><i>The senior students enrolled in the first and emergency aid program stated receiving disaster- (76.2%) and CBRN-related (79.8%) education, and 89.3% reported attending these practices. They were aware of having 75% and 100% additional roles and responsibilities during and after the disasters, respectively. Moreover, 51.2% of the participants remarked that they primarily engaged in therapy and health practices, whereas 63.1% indicated that they were partially ready in case of a disaster.</i></p> <p><i>In line with the data obtained within the scope of the study, the senior students studying in the first and emergency aid programs have previously received training on disaster and CBRN issues and participated in exercises, they have a large role during and after the disaster, they mainly do treatment and health practices, in case of any disaster. However, it was concluded that they were partially ready.</i></p>

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## INTRODUCTION

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There are several disasters taking place in today's world. Recent disasters originating from human involvement with nature have been especially devastating. Societies must take substantial measures against disasters in addition to their subsequent effects since the societal harm caused by disasters has been increasing gradually. In this context, a disaster might be defined as a natural or human-induced occurrence that results in physical, financial, and social losses for all or a part of society, halts or interrupts life and human activities, and affects the society with a low coping capacity ([www.afad.gov.tr](http://www.afad.gov.tr)). The detailed analysis of the ensuing disasters indicates that human-made tragedies such as energy and power conflicts and global technical accidents stand out within the scope of the consequences of disasters. The deployment of chemical and biological warfare agents in recent battles has drawn particular attention. These conditions emerge as a threat or danger of inevitable consequence of intentional CBRN material usage (chemical, biological, radiological, and nuclear) as weapons in acts of terrorism and sabotage or by the unintentional release of CBRN materials used as byproducts or intermediates in industrial production, the health sector, laboratories, and scientific research (AFAD, 2023). Hence, it is crucial to build an effective disaster management system, identify local and national resources, and use them accordingly to properly manage disasters and be affected by them with minimal loss. In this regard, being in a disaster-ready state will contribute to communities recovering from disasters with less harm (Guerdan, 2009). Considering these scenarios, efficient

personnel and the readiness of those personnel stand out as critical elements in disasters. A Turkish medical emergency team consists of an emergency medical technician (EMT), physician, emergency care technician (ECT, Paramedic), ambulance, and driver for delivering first and emergency medical aid services. In addition, there is also the disaster unit established under the provincial health branch directorates and the national medical rescue team (NMRT-UMKE), running its operation under this unit, providing medical emergency aid services (Aslantaş and Tabuk, 2021:46). In this context, based on the Van Earthquake that occurred in 2011, in the first hours of the event, by AFAD; Civil Defense Search and Rescue Units Directorates in 11 provinces and search and rescue, health and first aid personnel (8243 people) from 48 provinces and 39 institutions quickly reached the earthquake area and intervened (AFAD, 2023). This shows that we are at a very important level in terms of training effective personnel as a country. Several studies reported that nurses are among the health professionals not fully prepared to respond to disasters (Labrague et al., 2016:101-103; Çelik, 2010:44-51; Özcan, 2013:31; Taşkıran, 2015:52-60). Similarly, another study indicated that the disaster preparedness of the health workers was moderate (Tan & Acımuş, 2022:110-112). However, a separate study focusing on disaster preparedness reported that the perceptions of disaster preparedness of 112 health workers at all stages were at a high level (Aslantaş and Tabuk, 2021:53). This study, therefore, aimed to assess the disaster and CBRN knowledge and attitudes of the senior students enrolled in the first and emergency aid program.

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## MATERIALS AND METHODS

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### Purpose of the Research

This study was carried out to examine the knowledge and attitudes of the first and emergency program senior students about disaster and CBRN.

### Research Sample

The research sample consists of senior students (84 individuals) enrolled in the first and emergency aid program at Gümüşhane University VSHS during the spring semester of the 2019–2020 academic year.

### Research Ethical Standards

The study participants provided their written consent, enabling the study to conduct in compliance with ethical standards. The Gümüşhane University Scientific Research and Publication Ethics Committee issued its approval (number 2019/1) for the research

project, and the University VSHS Directorate provided the required institutional permission to carry out the research.

### Data Collection and Analysis

The data of the study were collected by face-to-face interview technique with those who agreed to participate in the study. A survey form prepared by the researcher within the scope of the literature was used in order to collect the data and examine the level of knowledge and attitudes of the first and emergency program senior students about disaster and CBRN. In the data collection form; It consists of two parts in total, the part consisting of questions to determine the demographic characteristics of the participants and the questions to determine the knowledge and attitudes of the participants about disaster and CBRN. Data were collected by face-to-face interview technique through

the data collection form, the collected data were numbered and data were entered and analyzed using the IBM SPSS Statistics 21 package program. Frequency,

percentage, arithmetic mean and chi-square tests were used in the analysis of the data.

**RESULTS**

Below is a summary of the study's findings in the form of a ratio and frequency (in parenthesis). Accordingly, the following data represents participants' demographic features. For the distribution of the gender variable, the female and male student rates were 63.1% (n=53) and 63.9% (n=31), respectively. Regarding the age-variable distribution, however, the rates of 9.5% (n=8), 41.7% (n=35), 17.9% (n=15), 15.5% (n=13), 13.1% (n=11), and 2.4% (n=2) correspond to the ages of 19, 20, 21,

22, 23, and 24, respectively. Regarding the marital status variable distribution, all participants were single; as a result, the rate was 100% (n=84). Finally, the distribution of the educational level variable was as follows; only 4.8% (n=4) of the students were high-school graduates, whereas 82.1% (n=69) of the students had an associate degree and 13.1% (n=11) had an undergraduate degree.

**Table 1.** Distribution of participants by variable “What does the term ‘disaster’ mean to you?”

VARIABLE	N	%	TOTAL	
What does the term ‘disaster’ mean to you?	Natural disasters such as earthquakes, landslides, soil sliding, etc.,	11	13.1	84
	A widespread pandemic disease with a high transmission rate, such as swine flu, bird flu, etc.,	0	0.0	
	Terrorist acts with biological, chemical, or explosive agents,	0	0.0	
	Human casualties due to wreckages in coal and gold mining,	0	0.0	
	All	72	86.9	

Table 1 displays the distribution of the participant responses to the variable question "What does the term ‘disaster’ mean to you?" Accordingly, 13.1% of students (n=11) responded that the term 'disaster' refers to earthquakes and landslides-like incidents, while 86.9% of students (n=72) replied that disaster means all incidents, including earthquakes, pandemics, terrorist attacks, mining wreckage, etc. When the following question "What characteristics should an event

possess to qualify it as a disaster?" was posed to the participants, the distribution of the responses for this query was as follows: 20.2% (n=17) of students responded that 'It should interrupt regular life,' while 89.8% (n=67) of students replied 'all' option, meaning that 'It should interrupt regular life, it should result in the inadequacy of existing local resources, increase in psychological and social problems, and cause economic crises.'

**Table 2.** Distribution of participants by variable “Have you ever experienced any disaster throughout your life?”

VARIABLE	N	%	TOTAL	
Have you ever experienced any disaster throughout your life?	Yes	28	33.3	84
	No	56	66.7	

As depicted in Table 2, participants responded to the query "Have you ever experienced any disaster throughout your life?" with the following ratios;

students who replied ‘yes’ were 33.3% (n=28), whereas it was 66.7% (n=56) for ‘no’ response.

**Table 3.** Distribution of Participants by Disaster-Related Education Variable

VARIABLE	N	%	TOTAL	
Receiving Disaster-Related Education	Yes	64	76.2	84
	No	20	23.8	

Table 3 illustrates the distribution of students who received disaster-related education; as a result, 76.2% (n=64) of the students responded with ‘yes’, whereas 23.8% (n=20) of them replied that they did not receive any disaster-related education.

Considering the distribution of the responses given to the query "Have you ever participated in a disaster drill before?", 89.3% (n=75) of the students replied with ‘yes’, whereas 10.7% (n=9) responded with ‘no’. However, the answers given the variable "Which disaster drill did you participate in?" indicated that

the percentage of students who responded 'fire' was 29.8% (n=25), 'earthquake' was 47.6% (n=40), and 'other/did not participate' was 22.6% (n=19). The distribution of the responses to the variable **"Is there a disaster plan for the place where you live?"** revealed that the rates of students who responded as 'yes', 'no', and 'no reply' were 21.4% (n=18), 20.2% (n=17), and 58.3% (n=49), respectively. When the students were asked **"Whether they reviewed a Disaster Plan or not,"** %11,9 (n=10) of them replied yes, whereas

%88,1 (n=74) responded no for this variable. The distribution of the student responses to the variable **"Do you have an emergency bag (go bag) where you reside"** resulted in 16.7% (n=14) affirmatively, whereas 83.3% (n=70) negatively. Finally, for the variable of **"Would you like to prefer a course on Emergency Aid and Disaster Management in the Curriculum?"**, 94.0% (n=79) of the students responded with 'yes', whereas only 6.0% (n=5) replied 'no'.

**Table 4.** Distribution of participants by variable "What does the term 'CBRN' imply to you?"

VARIABLE		N	%	TOTAL
<b>What does the term 'CBRN' imply to you?</b>	Chemical, Biological, Nuclear, Reactive	11	13.1	
	Radioactive, Biological, Chemical, Nuclear	7	8.3	84
	Chemical, Biological, Radioactive, Nuclear	66	78.6	

When the distribution of the variable **"What does the term 'CBRN' imply to you?"** is examined, the rate of students choosing the response 'Chemical, Biological, Nuclear, Reactive' was 13.1% (n=11); however, the response rate was 8.3% (n=7) for 'Radioactive, Biological, Chemical, Nuclear' and 78.6% (n=66) for 'Chemical, Biological, Radioactive, Nuclear.'

According to the distribution of the variable **"Have you ever received education on CBRN issues?"** the rate of the student responses as 'yes' was 79.8% (n=67), whereas it was 20.2% (n=17) responded as 'no'. When asked **"Where did those who received education on CBRN issues?"** the participants gave two different answers: 92.6% (n=62) and high school (7.4%, n=5). The percentage of students who answered 'yes' and 'no' to the question about the distribution of the variable **"information about the characteristics of**

**CBRN agents"** was 34.5% (n=29) and 15.5% (n=13), respectively; however, 50% (n=42) of the students responded this query 'partially'. Analysis of the participant distribution on the **"preliminary education and practice about CBRN"** variable revealed that 95.2% (n=80) of the students had preliminary education and practice, whereas 4.8% (n=4) of them had none. Regarding the distribution of the **"knowledge about medical intervention in CBRN attacks"** variable, the rates of students who responded as yes and no were 89.3% (n=75) and 10.7% (n=9), respectively. Finally, when taking into account the distribution of the variable **"knowing what to do in the event of a CBRN attack, either actual or probable,"** 67.9% (n=57) of the students responded positively, while 32.1% (n=27) of them answered negatively.

**Table 5.** Distribution of participants by variable "Information about syndromes and symptoms ensuing from exposure to the CBRN agents"

VARIABLE		N	%	TOTAL
<b>Information about syndromes and symptoms ensuing from exposure to the CBRN agents</b>	Yes	36	42.9	
	No	7	8.3	84
	Partially	41	48.8	

As depicted in Table 5, when the distribution of the variable **"Information about syndromes and symptoms ensuing from exposure to CBRN agents"** is examined, the rates of students who responded as 'yes' and 'no' were 42.9% (n=36) and 8.3% (n=7), respectively. However, 48.8% (n=41) of the students replied to this query as 'partially.' Considering the student distribution for the **"Awareness on how to protect themselves from any CBRN attack"** variable, the rate of students who said 'yes'

and 'no' were 48.8% (n=41) and 51.2% (n=43), respectively.

Regarding the distribution of the **"The weapon with which you are most familiar in today's world"** variable, while 22.6% (n=19) of the students responded with the nuclear weapon, 48.8% (n=41) of them replied to other option (atomic bomb, AK-47, Rocket, Bullet, etc.). However, 28.6% (n=24) of the students posed no response to this query.

**Table 6.** Distribution of participants by variable “Using equipment in any CBRN attacks and retaining information about their attributes”

VARIABLE		N	%	TOTAL
<b>Using equipment in any CBRN attacks and retaining information about their attributes</b>	Yes	20	23.8	84
	No	14	16.7	
	Partially	50	59.5	

As displayed in Table 6, an assessment of the student distribution for the "Using equipment in any CBRN attacks and retaining information about their attributes" variable indicated that the percentage of students who

responded affirmatively and negatively were 23.8% (n=20) and 16.7% (n=14), respectively. However, 59.5% (n=50) of the students answered this query as 'partially'.

**Table 7.** Distribution of Participants by Variable "Are you aware of the early warning system?"

VARIABLE		N	%	TOTAL
<b>Are you aware of early warning system?</b>	Yes	44	52.4	84
	No	11	13.1	
	Partially	29	34.5	

According to the distribution of the variable "Are you aware of any early warning mechanism?" as shown in Table 7, the percentage of students who responded with 'yes' and 'no' was 52.4% (n=44) and 13.1% (n=11), respectively. However, 34.5% (n=29) of the students answered this query with the 'partially' option.

75.0% (n=63) and 23.8% (n=20) of the students agreed and disagreed, respectively, when asked about the roles of paramedics during the disaster. However, all students 100.0% (n=84) agreed that paramedics have a role in the post-disaster period. The distribution of the students for the “As a paramedic, are you prepared for disasters?” variable was as follows; 36.9% (n=31) of the students responded with 'yes', whereas 14.3% (n=12) replied 'no'. However, 48.8% (n=41) of the students responded with 'partially ready' for the disasters. The distribution of student responses to the query "What roles do you think a paramedic plays in a disaster" displayed that 51.2 (n=43) of students responded with 'treatment/care,' 36.9% with 'search and rescue,' and 11.9% (n=10) selected 'other' option (consultant, coordinator, educator, administrator). Finally, the answers given to the query “Who is the responsible authority for CBRN or Disasters?” was as follows; 4.8% (n=4) of the students responded with State and 2.4% (n=2) with AFAD; however, a sizable portion, 92.9% (n=78), of the students believed that all governmental bodies (State, AFAD, Ministry of Interior, non-governmental organizations, etc.) were responsible authorities for disasters.

Considering the student distribution for the variable of "Whether the public has information of shelters in any CBRN attack", the response rates of students for 'yes' and 'no' were 61.9% (n=52) and 38.1% (n=32), respectively. Similarly, in the distribution of answers given according to the variable "Where is the safe places for the public if there is any CBRN attack?", the response rates of the students were 93.1% (n=41) for shelter and 6.9% (n=3) for safe zones. Regarding the student distribution for the variable "Whether waste management is essential after the CBRN Attacks", 88.1% (n=74) of the students replied with 'yes', whereas 11.9% (n=10) answered with 'no'. Participants answered three sub-queries for the “When do paramedics have a critical role to play?” variable. For instance, when asked about the roles of paramedics in the pre-disaster period, 34.5% (n=29) of the students agreed, whereas 64.3% (n=54) disagreed. Contrarily,

## DISCUSSION

This study aimed to evaluate the disaster and CBRN knowledge and attitudes of the first and emergency aid program senior students.

perspective, the universities serve as the primary basis for the sizable mass of First and Emergency Aid Students to receive their education in CBRN. Suryantoa et al. (2018) reported that health-related education contributes positively to individuals' knowledge levels. Another study by Mozafari et al. (2021) concluded that education comprehensively improved the personal degree of knowledge. Abellson et al. also emphasized that receiving education assertively influenced skill development. Hasan, Uddin and Younos stated in their study in 2020 that nursing students in Bangladesh have

The current study revealed that 76.2% and 79.8% of the first and emergency aid senior students studying at the university received disaster-related and CBRN-related education, respectively. In addition, 89.3% of the participants attended disaster drills. When asked where they received their education on CBRN- and disaster-related topics, 92.6% of them referred to the universities in which they enrolled. From this

low level of disaster knowledge and the reason for this is poverty and they have difficulty in reaching quality education because of this situation. Carter, Drury and Amlot stated in their studies in 2020 that having preparedness information in CBRN events would result in a positive development. According to Güner (2016), individuals who attended the disaster drills had a greater level of disaster-related medical knowledge than those who did not.

In another conclusion, the current study ascertained that 88.1% of the First and Emergency Aid students never reviewed a disaster plan, and 78.5% of them were unaware of the availability of a disaster plan for the region in which they resided. The current study also discovered that 83.3% of the students did not have an emergency bag in their residence. In a survey conducted among 112 health professionals, Tan and Acımiş (2021) reported that they posed a moderate disaster preparedness level. The current study participants also opined that the significance of paramedics would increase during (75%) and immediately after the disasters (100%).

Considering the distribution for the variable "What roles do you think a paramedic plays in a disaster", 51.2% of the First and Emergency Aid Students responded with 'treatment/care' and 36.9% with 'search and rescue.' The remaining 11.9% of students replied 'other' option (consultant, coordinator, educator, administrator). Güner (2016) reported that the

professions, including Emergency Medical Technician and Ambulance and Emergency Care Technician groups, had a higher degree of disaster-related medical knowledge. Gündüz and Ersoy (2022) also found that, in addition to regular education, individuals with medical response experience had a higher degree of knowledge than those without experience.

Regarding the variable "Are you prepared for the disaster?", the study found that 63.1% of respondents were only partially ready for the disasters. Aslantaş and Tabuk (2021) reported that the 112 station employees had a high perception of preparedness at all stages of the disaster. As another variable, "Awareness on how to protect themselves from any CBRN attack", 48.8% of the students indicated their preparedness (yes responses). Similarly, Dinçer and Kumru (2021) reported that merely 23.2% of the participants responded that they were aware of the application procedures in case of a CBRN attack. Regarding the variable "Who is responsible for CBRN attacks or disasters?", a minority of the students responded to this query as State (4.8%) and AFAD (2.4%); however, the vast majority (92.9%) indicated that all institutions, including State, AFAD, Ministry of Interior, non-governmental organizations, and similar bodies, were responsible. Therefore, it is safe to say that almost all First and Emergency Aid students' opinions converged that all public entities and citizens are accountable for CBRN attacks and disasters.

## CONCLUSIONS

In line with the data analyzed, the current study concluded that the senior students in the first and emergency aid program previously received disaster- and CBRN-related education participated in their drills, had more responsibility during and after the disaster, primarily carried out treatment and health procedures, and was only partially ready for any disaster. According to the study findings and in line with other literature, providing the necessary disaster- and CBRN-related

education at regular intervals and conducting drills periodically in light of this training will significantly improve the knowledge of employees and students. This study recommends regularly supplementing the necessary theoretical and practical disaster-related practices with additional training activities, such as working under challenging conditions, advisory and guiding, and social and psychological training, for health providers to serve effectively in disasters.

## Conflict of Interest

The author indicate no conflict of interest.

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