EVALUATION OF DISASTER PERCEPTION LEVELS OF UNIVERSITY STUDENTS: A SAMPLE APPLICATION STUDY

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Abstract

Disasters are important events that are difficult to predict and occur in various ways, often with high destructive power. Earthquakes, floods, droughts, major industrial accidents, famine, technological accidents, epidemics, etc. are only a few of the major types of disasters that mankind has been exposed to from past to present. In recent years, natural and unnatural disaster events have been observed both in Turkey (Düzce-earthquake, 1999; Giresun-Dereli-flood-flood, 2020; Kahramanmaraş-Pazarcık-earthquake, 2023) and in many other parts of the world (Sumatra-tsunami, 2004; Ecuador-earthquake, 2016; USA-hurricane-storm, 2023). The impact of disasters is often not limited to one region but can spread over a wide area. As a matter of fact, the impact of this destruction can be reduced at some point thanks to various measures that can be taken before the disaster. For example, identification of regional risks, early warning systems, crisis management, emergency action plans, etc. can be considered within the scope of these measures. Another important issue is to increase the level of disaster awareness of society. Especially in regions where disaster risk maps have been prepared, such awareness raising activities can be carried out to make the reaction of the society against disasters more controlled and conscious. The aforementioned issues constitute the main objective of this study.

This study was conducted to evaluate the disaster awareness levels of Gümüşhane University central campus students. The research population consists of 18113 students and the sample number consists of 309 students. Convenience sampling method was used for data collection. The data obtained were analyzed using SPPS 25 statistical program. In the study, a 5-point Likert scale was used to measure disaster risk perception. In the study, frequency analysis test, Kruskal Wallis test and Mann Whitney U test were performed. As a result of the analysis, it was analyzed at 5% level of significance (p<0.05) and it is stated in the tables as arithmetic mean, standard deviation and percentage of the number of individuals. Accordingly, as a result of the non-parametric Mann Whitney-U test, no significant difference was found between the groups. As a result of the non-parametric Mann Whitney-U test conducted to determine whether the disaster risk perception sub-

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dimension scores of the students differed significantly according to the gender variable, a statistically significant difference was found between the groups at the $p<0.05$ level in favor of the group exposed to disaster.

Keywords: Disaster, Disaster awareness, Emergency, Earthquake

Üniversite Öğrencilerinin Afet Algı Düzeylerinin Değerlendirilmesi: Örnek Bir Uygulama Çalışması

Öz

Afetler, öngörülmesi zor ve çeşitli şekillerde ortaya çıkan, çoğu zaman tahribat gücü yüksek önemli doğal-doğal olmayan olaylardır. Deprem, taşkın, kuraklık, büyük endüstriyel kazalar, kıtlık, teknolojik kazalar, salgınlar vb. geçmişten günümüze insanoğlunun maruz kaldığı büyük afet türlerinden yalnızca birkaçıdır. Son yıllarda gerek Türkiye'de (Düzce-deprem, 1999; Giresun-Dereli-sel-taşkın, 2020; Kahramanmaraş-Pazarcık-deprem, 2023) gerekse dünyanın birçok bölgesinde (Sumatra-tsunami, 2004; Ekvador-deprem, 2016; ABD-hortum-fırtına, 2023) çeşitli afet olayları yaşanmaktadır. Afetlerin etkisi çoğu zaman bir bölge ile sınırlı kalmayıp geniş bir alana yayılım gösterebilmektedir. Nitekim afet öncesinde alınabilecek çeşitli tedbirler sayesinde bu tahribatın etkisi bir noktada azaltılabilir. Örneğin bölgesel risklerin tespit edilmesi, erken uyarı sistemleri, kriz yönetimi, acil eylem planları, vb. bu tedbirler kapsamında değerlendirilebilir. Bir diğer önemli husus ise toplumun afet farkındalık düzeylerinin artırılmasıdır. Özellikle afet risk haritası çıkarılmış bölgelerde bu tür farkındalık artırma çalışmaları yapılarak toplumun afet karşısında göstereceği tepki daha kontrollü ve bilinçli hale getirilebilir. Bahsi geçen hususlar bu çalışmanın ana hedefini oluşturmaktadır. Bu çalışma Gümüşhane Üniversitesi merkez kampüs öğrencilerinin afet bilinç düzeylerini değerlendirmek amacıyla yapılmıştır. Araştırma evreni 18113 öğrenciden, örneklem sayısı ise 309 öğrenciden oluşmaktadır. Verilerin toplanmasında kolayda örnekleme yöntemi kullanılmıştır. Elde edilen veriler SPPS 25 istatistik programı kullanılarak analiz edilmiştir. Çalışmada afet risk algısını ölçmek için 5'li Likert ölçeği kullanılmıştır. Çalışmada frekans analizi testi, Kruskal Wallis testi ve Mann Whitney U testi yapılmıştır. Analiz sonucunda %5 anlamlılık düzeyinde ($p<0,05$) analiz edilmiş ve tablolarda aritmetik ortalama, standart sapma ve birey sayısının yüzdesi olarak belirtilmiştir. Buna göre non-parametrik Mann Whitney-U testi sonucunda gruplar arasında anlamlı bir fark bulunmamıştır. Öğrencilerin afet risk algısı alt boyut puanlarının cinsiyet değişkenine göre anlamlı bir farklılık gösterip göstermediğini belirlemek amacıyla yapılan non-parametrik Mann Whit-ney-U testi sonucunda gruplar arasında afete maruz kalan grup lehine $p<0,05$ düzeyinde istatistiksel olarak anlamlı bir farklılık bulunmuştur.

Anahtar Kelimeler: Afet, Afet bilinci, Acil durum, Deprem

Introduction

According to the Regulation on Disaster and Emergency Response Services, disaster is defined as "natural, technological or human-induced events that cause economic, physical and social losses to the whole or a certain part of the society and interrupt normal life and human activities. Secondary disaster refers to events such as landslides, earthquakes, explosions, dam collapses and fires caused by disaster-causing events. In general, disasters are events that are difficult or impossible to cope with local means, require national or international intervention, are difficult to predict, cause large-scale damage and deaths (Hoyois et al., 2007).

Mankind has been struggling with disasters since the day it existed. Especially after the industrial revolutions, rapid and uncontrolled increase in urbanization has left mankind vulnerable to natural disasters. However, significant progress has been made in combating natural disasters with developing technology. Turkey is one of the countries where natural disasters are frequently experienced due to its geographical location (Aras et al., 2021). The number of people affected by natural disasters such as earthquakes, floods, landslides, droughts, forest fires, is high in Turkey. For example, in 2016, 323 natural disasters resulted in loss of life and property. Of these events, 25% were floods, 22% were storms and strong winds, 20% were landslides, 18% were tornadoes, 7.4% were lightning, 0.9% were avalanches and 6.7% were other disasters. In 2016, 83 people lost their lives as a result of disasters (Ersoy et al., 2017). According to the data of "Overview of 2019 in the Scope of Disaster Management and Nature-Borne Event Statistics" published by AFAD in 2020; Turkey is located on the Mediterranean-Alpine-Himalaya, one of the most effective earthquake belts in the world. Approximately 20% of the earthquakes occurring in the world occur in this belt. A destructive earthquake occurs approximately every five years in Turkey (Afet İstatistikleri (afad.gov.tr)).

Disaster mitigation is of vital importance especially for countries prone to disaster potential. At this point, there are different disaster management approaches. The main purpose of these approaches is to prevent possible disasters.

Two basic components are very important in preventive works. These are preparation and education (Baldwin, 1994). Pre-disaster preparation phase should be planned for unpredictable situations such as disasters when, where, how and at what severity level. Issues such as determination of gathering areas for emergencies, formation of a crisis management team, conducting drills, risk assessments, creation of funds for such situations must be done within the scope of preliminary work. Another important issue is training. The full realization of any situation without prior information/training may not be at the desired level. Early identification of deficiencies in training or information, where feedback can be received and mutual communication and interaction can be established, are useful practices to increase the desired level of success. For example, AFAD provided disaster awareness training to approximately 55,803,620 people in 11 months within the scope of Disaster Education Year 2021 in Turkey. During this training process, approximately 18,169 people were trained as disaster trainers (www.afad.gov.tr). Although disasters do not occur in a clear time frame, it is difficult to deal with disasters due to their diversity and uncertainty. However, increasing the capacity to combat disasters can be achieved by increasing the awareness of all stakeholders (Gerdan, 2014). Therefore, every study is of vital importance. There are many studies on disaster types in the literature. Moe et al. (2006) conducted a study on public project management and critical success factor on an integrated approach to natural disaster management. Demirkaya (2007) conducted a study on primary school students' perception of earthquake concept and their views on earthquakes. Ersoy (2013) conducted a study within the scope of the disaster report in the world and Turkey. Ersoy et al. (2017) statistically evaluated the natural disaster losses occurring in the world and Turkey in 2016. Şen and Ersoy (2017) evaluated the level of knowledge of hospital disaster team on disaster preparedness. Varol (2018) examined disaster management, disaster education and disaster awareness in the American sample. Fallah et al. (2018) conducted a case study on the role of non-governmental organizations in disaster man-

agement. Torani et al. (2019) conducted a study on the importance of   educa-
tion in disasters and emergencies. Yeşildal (2020) conducted a study on the role
and capacity of local governments in combating natural disasters. Aras et al. (2021)
conducted a study on determining the level of disaster awareness of health sciences
faculty students. Şahan and Dinç (2021) examined the effect of disaster training in
disaster training center on secondary school students. Gündüz and Akyüz (2022)
examined the disaster awareness of emergency health services workers in the case
of Batman. Ceren (2021) conducted an evaluation study on disasters and humani-
tarian aid activities. Ghasemzadeh et al. (2021) conducted a qualitative research to
evaluate urban flood resilience by emphasizing social,   economic and institutional
dimensions. Akkuş (2022) conducted a study on the effects of natural disasters on
social history within the scope of a local example (Floods in and around Edirne in
the period 1931-1941 and their consequences).

In this study, the subject of disasters, which often cause serious material and
moral losses, was addressed. With this study, students' disaster perception levels
were addressed. There are many studies on the subject in the literature. However,
in this study, it is considered to be an important study in terms of AFAD providing
disaster training to approximately 56 million people in 2021, after the
Kahramanmaraş-Pazarcık earthquake in 2023, and addressing the identified
deficiencies comprehensively. In the conclusion and recommendation part of the
study, some solution-oriented suggestions that can be taken within the scope of
combating disaster in general were made.

1. Material and Methods

This study was conducted to reveal the differences in disaster risk perceptions of
university students. The research sample consists of Gumushane University central
campus students. The scale used in the study was developed by Özdemir (2018).
In the study, 7 questions were asked to the participants to determine their
demographic information and 22 propositions were used in the scale prepared to

determine the disaster risk perception. The scale is based on a 5-point Likert scale: "1: Strongly disagree, 2: Disagree, 3: Undecided, 4: Agree, 5: Strongly agree".

The survey form used in the study was applied as an online survey via Google Forms. Simple random sampling method, which is one of the data sampling methods, was used. Simple random sampling method means that every possible combination of items in the universe has an equal probability of being found in the sample (Kerlinger & Lee, 1999). The questionnaire was administered to 309 students between 15.09.2023-25.09.2023. The questionnaire consists of two parts. The first part includes information on demographic characteristics, disaster knowledge and disaster exposure of the students participating in the survey; the second part includes 5-point Likert-type statements to measure students' disaster risk perception. The data collected as a result of the research were evaluated electronically with the help of SPSS 25 statistical program. Non parametric tests were used since the data did not show normal distribution. In this context, Kruskal Wallis test and Mann Whitney U test were used in the evaluation of the data. The study data were analyzed at 5% significance level ($p < 0.05$) and are presented in the tables as arithmetic mean, standard deviation and percentage of the number of individuals. In the Mann Whitney U test, the significance value (p) is not tested at the 0.05 level. In the comparisons made, the result obtained by dividing 0.05 by the number of paired groups to be compared is accepted as an indicator of significant difference (Field, 2009). Normality test was applied to the data obtained. It was concluded that the data did not show normal distribution. The hypotheses used in the study are given below.

H1: There is a significant relationship between disaster risk perception and preparedness levels of university students on the basis of different variables.

H2: Disaster risk perception levels of university students are adequate.

H3: There is a significant relationship between disaster risk perception level scores of university students and their awareness.

H4: There is a significant relationship between university students' exposure to disasters and disaster risk perception.

2. Findings

In this section, the demographic analyses of 309 respondents and the frequency, percentage values, Mann Whitney U and Kruskal Wallis test results of their responses to other statements related to disaster risk perception are presented. The results of the analysis are presented in tables below.

Table 1. Frequency and Percentage Values for Gender Variable

Groups	f	%	%$_{gec}$	%$_{yig}$
Male	150	48,5	48,5	48,5
Female	159	51,5	51,5	100,0
Total	309	100,0	100,0	

When the distribution of the students according to their gender is analyzed in Table 1, it was determined that 48.5% (n=150) were male and 51.5% (n=159) were female. More than half of the participants in the study consisted of women.

Table 2. Frequency and Percentage Values for Marital Status Variable

Group	f	%	%$_{gec}$	%$_{yig}$
Single	279	90,3	90,3	90,3
Married	30	9,7	9,7	100,0
Total	309	100,0	100,0	

When the distribution of students according to their marital status is analyzed in Table 2, it is concluded that 90.3% (n=279) are single and 9.7% (n=30) are married. According to this result, it was determined that the majority of the participants were single.

Table 3. Frequency and Percentage Values for Age Variable

Groups	f	%	%$_{gec}$	%$_{yig}$

18-23 age between	228	73,8	73,8	73,8
24-29 age between	42	13,6	13,6	87,4
30-34 age between	18	5,8	5,8	93,2
35-40 age between	17	5,5	5,5	98,7
41 and above	4	1,3	1,3	100,0
Total	309	100,0	100,0	

As can be seen in Table 3, 73.8% (n=228) of the university students in the sample group are in the 18-23 age group; 13.6% (n=42) are in the 24-29 age group; 5.8% (n=18) are in the 30-34 age group; 5.5% (n=17) are in the 35-40 age group; and 1.3% (n=4) are in the 41 and above age group.

Table 4. Frequency and Percentage Values for the Variable of Educational Background

Groups	f	%	$\%_{gec}$	$\%_{yig}$
PhD	8	2,6	2,6	2,6
License	61	19,7	19,7	22,3
Associate degree	231	74,8	74,8	97,1
Master's Degree	9	2,9	2,9	100,0
Total	309	100,0	100,0	

As can be seen in Table 4, 2.6% (n=8) of the university students who participated in the survey stated that they received a doctorate, 19.7% (n=61) a bachelor's degree, 74.8% (n=231) an associate degree, and 2.9% (n=9) a master's degree. According to this result, the majority of the participants in the study are associate degree students.

Table 5. Frequency and Percentage Values for Department Variable

Groups	f	%	$\%_{gec}$	$\%_{yig}$
Occupational Health and Safety	140	45,3	45,3	45,3
Emergency Aid and Disaster Management	10	3,2	3,2	48,5
Civil Engineering	5	1,6	1,6	50,2
Health Management	19	6,1	6,1	56,3

Social Services	3	1,0	1,0	57,3
Nursing	1	,3	,3	57,6
Other	131	42,4	42,4	100,0
Total	309	100,0	100,0	

According to Table 5, 45.3% (n=140) of the students studied occupational health and safety, 3.2% (n=10) emergency aid and disaster management, 1.6% (n=5) civil engineering, 6.1% (n=19) health management, 1.0% (n=3) social services, 0.3% (n=1) nursing, and 42.4% (n=131) other departments.

Table 6. Frequency and Percentage Values for Disaster Knowledge Variable

Groups	f	%	$\%_{gec}$	$\%_{yig}$
Yes	197	63,8	63,8	63,8
No	8	2,6	2,6	66,3
Partially	104	33,7	33,7	100,0
Total	309	100,0	100,0	

According to Table 6, when the distribution of the statements related to students' disaster knowledge was analyzed; it was concluded that 63.8% (n=197) of the participants said yes, 2.6% (n=8) said no and 33.7% (n=104) said partially to the question of whether they had knowledge about the concept of disaster. According to the results of the study, it was determined that more than half of the participants had disaster knowledge.

Table 7. Frequency and Percentage Values for Disaster Exposure Variable

Groups	f	%	$\%_{gec}$	$\%_{yig}$
Yes	112	36,2	36,2	36,2
No	197	63,8	63,8	100,0
Total	309	100,0	100,0	

As can be understood from Table 7, 36.2% (n=112) of the university students who constitute the sample group have been exposed to disasters, while 63.8% (n=197)

have not been exposed to disasters. According to the results of the study, the majority of the participants were not exposed to disasters.

Table 8. Arithmetic Mean, Standard Deviation and Standard Error Values of Disaster Risk Perception Scale Subscales

Dimensions	N	$\overline{\mathrm{x}}$	*ss*	$\mathrm{Sh}_{\overline{\mathrm{x}}}$
Disaster Risk Perception	309	3,9962	,03665	,64418

In Table 8, the scores obtained from the sub-dimensions of the 5-point Likert Scale are presented. Accordingly, the arithmetic mean of the disaster risk perception sub-dimension scores was calculated as =3,9962, the standard deviation as ss=0,03665, and the standard error of the arithmetic mean as $\mathrm{Sh}_{\overline{\mathrm{x}}}$ =0,64418.

Table 9. Mann Whitney U Test Results to Determine Whether Disaster Risk Perception Subdimension Scores Differentiate According to Gender Variable

Score	Groups	N	$\overline{x}_{sira}$	$\sum sira$	U	z	p
Disaster Risk Per-ception	Woman	150	156,57	24385,00			
	Man	159	153,52	24410,00	11690,000	-,300	,765
	Total	309					

In Table 9, as a result of the non-parametric Mann Whitney-U test conducted to determine whether the disaster risk perception sub-dimension scores of university students differ significantly according to gender variable, no significant difference was found between the groups (U=11690.00; Z=-.300; p=.765>.05). Özdemir (2018) found that there was no significant difference in the level of risk perception in terms of gender in his study. Mızrak and Aslan (2020) found that gender and school type had a significant effect on disaster risk perception.

Table 10. *Mann Whitney U Test Results to Determine Whether Disaster Risk Perception Subdimension Scores Differed According to Marital Status Variable*

Score	Groups	N	$\bar{x}_{sira}$	$\sum_{sira}$	U	z	p
Disaster Risk Perception	Married	30	163,68	4910,50			
	Single	279	154,07	42984,50	3924,500	-,560	,575
	Total	309					

As can be seen in Table 10, as a result of the non-parametric Mann Whitney-U test conducted to determine whether the disaster risk perception sub-dimension scores of university students differ significantly according to the marital status variable, no significant difference was found between the groups (U=3924,500; Z=-,560; p=,575>.05). In a study conducted by Kundak et al. (2014), it was determined that marital status of individuals is effective in the measures taken against disasters. In a study conducted by Tercan (2023), it was determined that marital status variable has a significant effect on disaster risk perception.

Table 11. *Kruskal Wallis-H Test Results to Determine Whether Disaster Risk Perception Subdimension Scores Differ Differentiate According to Age Variable*

Score	Groups	N	$\bar{x}_{sira}$	x^2	sd	p
Age	18-23 age	228	150,38			
	24-29 age	42	174,88			
	30-34 age	18	149,94	3,705	4	,447
	35-40 age	17	163,88			
	41 age and above	4	194,63			

As can be understood from Table 11, as a result of Kruskal Wallis-H, which was conducted to determine whether the mean rankings of the sub-dimension of disaster risk perception of university students showed a significant difference according to the age variable, the difference between the mean rankings of the age groups was not found statistically significant (x^2=3,705; sd=4; p=,447>,05). Özdemir (2018) found that the risk perception level of the participants did not

show a significant difference according to their age groups. Tercan (2023) found that the age variable has a significant effect on disaster risk perception.

Table 12. *Kruskal Wallis-H Test Results to Determine Whether Disaster Risk Perception Subdimension Scores Differ Differentiate According to Educational Background Variable*

Score	Groups	N	$\bar{x}_{sira}$	x^2	sd	p
Education Status	Associate Degree	231	155,50	,555	3	,907
	License	61	152,29			
	Master's Degree	9	143,83			
	PhD	8	173,69			

As can be understood from Table 12, as a result of Kruskal Wallis-H, which was conducted to determine whether the mean rankings of the sub-dimension of disaster risk perception of university students showed a significant difference according to the educational status variable, the difference between the mean rankings of the educational status groups was not found statistically significant (x^2=,555; sd=3; p=,907>,05). In their study, Şahin et al. (2018) found that students studying at faculties gave more accurate answers to the questions asked within the scope of disaster awareness than students studying at vocational colleges. Al Khalaileh et al. (2012) found that there was no significant difference between the level of education and disaster perception.

Table 13. *Kruskal Wallis-H Test Results to Determine Whether Disaster Risk Perception Subdimension Scores Differ Differentiate According to Department Variable*

Score	Groups	N	$\bar{x}_{sira}$	x^2	sd	p
Section	Occupational Health and Safety	140	146,35	8,235	6	,221
	Emergency Aid and Disaster Management	10	220,45			
	Civil Engineering	5	189,00			
	Health Management	19	164,66			
	Social Services	3	186,00			
	Nursing	1	113,00			
	Other	131	156,16			

As can be seen from Table 13, as a result of Kruskal Wallis-H, which was conducted to determine whether the ranking averages of university students' disaster risk perception sub-dimension showed a significant difference according to the department variable, the difference between the ranking averages of the department groups was not found statistically significant (x^2=8,235; sd=6; p=,221>,05).

Table 14. Kruskal Wallis-H Test Results to Determine Whether Disaster Risk Perception Subdimension Scores Differentiate According to Disaster Knowledge Variable

Score	Groups	N	$\bar{x}_{sira}$	x^2	sd	p
Disaster Information	Yes	197	171,73	19,777	2	,001
	No	8	150,94			
	Partially	104	123,62			

As can be seen from Table 14, as a result of Kruskal Wallis-H, which was conducted to determine whether the mean rankings of the disaster risk perception sub-dimension of the university students showed a significant difference according to the disaster knowledge variable, the difference between the mean rankings of the disaster knowledge groups was found statistically significant (x2=19,777; sd=2; p=,001<,05). After this process, complementary comparison techniques were used to determine from which groups the significant difference determined after Kruskal Wallis-H originated. Since there is no special test technique used for this purpose, Mann Whitney-U, which is preferred in pairwise comparisons, was applied. As a result of the analyses, it was determined that the difference between the group that answered yes and the group that partially answered in favor of the group that answered yes (U=7052,500; z=-4,447; p=,001<05).

Table 15. Mann Whitney U Test Results to Determine Whether Disaster Risk Perception Subdimension Scores Differentiate According to Disaster Exposure Variable

Score	Groups	N	$\bar{x}_{sira}$	$\sum_{sira}$	U	z	p
Disaster Risk Perception	Yes	112	177,67	19899,50			
	No	197	142,11	27995,50	8492,500	-3,365	,001
	Total	309					

As can be seen from Table 15, as a result of the non-parametric Mann Whitney-U test conducted to determine whether the disaster risk perception sub-dimension scores of the students differed significantly according to the gender variable, a statistically significant difference was found between the groups at the p<0.05 level in favor of the group exposed to disaster (U=8492,500; Z=-3,365; p=,001<.05). In their study, Uğur and Işık (2020) found that there was no significant difference in perceptions towards disaster preparedness policies according to gender status variable.

3. Conclusion

This study was conducted to determine the disaster awareness levels of university students.

When some results obtained from the analysis were compared with studies conducted in the literature, it was seen that there were similar (Özdemir, 2018) and different results (Mızrak and Aslan, 2020). In addition, disaster risk perception subscale scores do not show a significant difference according to gender variable. While no significant difference was found as a result of the analysis for the marital status variable of the students, in a similar study (Tercan, 2023), it was observed that the marital status variable had a significant effect on disaster risk perception. In the study, it was observed that university students did not show a significant difference according to the age variable in the literature (Özdemir, 2018) and there were similar results (Tercan, 2023). While there was no significant difference in the mean ranks of the sub-dimension of disaster risk perception of university students according to the educational status variable, Al Khalaileh et al. (2012)

found that there was no significant difference between educational level and disaster perception.

The results obtained from the analysis and similar studies in the literature on the subject were compared. It has been observed that there are some differences between the results of the analysis and the studies conducted in the literature. This situation can be based on many reasons. Technological change, increase in natural disasters, continuity of educational and instructive activities, etc. are among the most important reasons for the emergence of differences in these results. One of the most effective solutions in combating natural or unnatural disasters is the level of disaster awareness.

Therefore, the researchers, recommend the implementation and development of the following points, taking into account the analysis results obtained from the study:

➢ Disaster simulation trainings should be provided,

➢ Mass drills should be planned before a disaster,

➢ Pre-disaster risk mapping should be done and information trainings should be provided on protective and preventive practices.

➢ General information (seminar) should be given about the ways of intervention in case of a disaster,

➢ Information on machinery-equipment that can be used in case of a disaster should be given,

➢ Information should be given about possible risks (secondary or tertiary risks) during a disaster

➢ Personal protective equipment should be introduced and information should be given about their use against possible risks in the process of response to the incident at the time of disaster,

➢ Disaster active warning systems should be implemented,

➢ Project competitions should be planned within the scope of combating disasters,

> ➤ Trainings should be given about shelter, health, transportation, protection and other risks after the disaster.

> ➤ Programs for return to normal life after disaster should be prepared,

By implementing the mentioned recommendations, the number of labor force with increased competence level can be increased. The most important factor in defining an event as a disaster is human presence. Fighting against nature is of course difficult and often impossible. However, it is thought that increasing the awareness of combating disasters and the evolution of today's technologies in this direction can reduce the severity of the damage that may arise to some extent.

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