



COMPARISON OF DISASTER AND EMERGENCY PLANS PREPARED FOR SCHOOL, DORMITORY AND HOSPITAL: BURDUR SAMPLE, TURKEY

Aysun GÜZEL 

*Burdur Mehmet Akif Ersoy University, Faculty of Health Sciences, Department of Emergency Aid and Disaster Management.
Burdur, Turkey.*

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*Correspondence: Aysun GÜZEL

Address: Burdur Mehmet Akif Ersoy University, Faculty of Health Sciences, Department of Emergency Aid and Disaster Management.15100, Burdur, Turkey
E-mail: ayurdakul@mehmetakif.edu.tr

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ABSTRACT

The aim of this research is to prepare disaster and emergency plans for different institutions such as schools, dormitories, and hospitals and to identify the similarities and differences between these plans. Research data were collected between January and June in 2018. The research is a descriptive methodological research and the contents of disaster plans collected from three different schools, dormitories and hospitals in Burdur/Turkey. Because all institutions are in the same province, many of the hazards are shared in all of them. As for different ones, mass suicide and mass drug use are encountered in the plans prepared for schools and dormitories; In the plans prepared for the hospitals, lake accidents, armory explosion, strike, traffic accidents, angry patient relatives, marble quarry accidents were detected. Some hazards that may lead to disasters vary by the type of institutions, but many hazards are common because all institutions are in the same province.

1. INTRODUCTION

Turkey is a developing country with a population of around 78 million where many disasters, especially earthquakes, occur frequently.¹ It is located above one of the world's active seismic belts, Alp-Himalaya, and 42% of the surface is located in the first-degree seismic zone.² When the earthquakes in the country were examined, 17,000 more people died in the 1999 Kocaeli earthquake¹, 644 people died in the 2011 Van earthquake³, and they left behind a considerable amount of material loss.^{1,2} Despite the deaths and financial losses in the disasters experienced in Turkey, disaster preparedness and damage reduction studies; disaster recovery and rehabilitation process during

and after disasters are still insufficient.⁴

Poor and unregulated construction is important determinant of mortality during natural disasters, especially in lower-income countries, when badly-built houses, offices, schools, dormitories, workplaces and health facilities collapse and kill people.⁵ School, dormitory and hospital safety are ethical imperative. Particularly, a basic framework for safety recognizes three main stages: safe facilities, disaster management, and disaster prevention and risk reduction education. The first task provides safety from disasters. Thousands of schoolchildren, teachers, hospital employees have died in major earthquakes and schools or hospitals have damaged or destroyed. The overall impact collapsed the school system and children have

remained out of school during the past 20 years. Deaths, injuries and collapsed buildings are similar for hospitals and dormitories. A particular challenge is how to make critical infrastructure more resilient so that hospitals, dormitories and schools do not collapse on children and the sick and are able to serve communities in the aftermath of disasters. Hospitals, dormitories and schools and other priority public facilities are adopting innovative approaches to promote enforcement of building codes and compliance with land use plans.⁶

Disaster and emergency situations are events that adversely affect human health and cause many deaths.⁷ The World Health Organization (WHO) describes disaster as events large enough to necessitating for external assistance, and the emergency situations as events that can be interfered with by local capacity.⁸ In order to be able to distinguish between disasters and emergencies, it is necessary to be able to determine what quantitative and qualitative changes transform the emergency situations into the disasters, whether the disaster is truly catastrophic or not and to what extent, and what are the functional qualities that make the emergency turn into catastrophic situations.⁹ Determination of these variables and enabling disaster plans to be activated in time is possible through damage reduction and disaster preparedness practices.¹⁰

Deaths, injuries, illnesses, disabilities and psychological problems are encountered during disasters and emergencies. These situations which require medical intervention put the health institutions to the forefront in disaster and emergency preparations.⁷ Disaster and emergency plans starting from the smallest units, households, carried out in schools, dormitories, other public institutions, workplaces, and communities, take the pressure of health institutions.¹¹ In particular, disaster and emergency plans in schools and dormitories, and practices for these plans raise the knowledge and awareness of the students and the

staff, in addition, it reveals the deficiencies in these institutions.¹² The scope of the disaster plans and the target audience vary according to the organizations' preparation plans. While protecting students and staff from physical injuries and providing continuity of education is the aim of the disaster plans in schools¹³, the aim of disaster plans in hospitals is to reduce death and injury to least by providing effective medical care.¹⁴ Laws, social security, public health, out-of-hospital emergency services and co-operation between institutions are important while preparing disaster plans even though it differs throughout institutions.¹⁵

The short term aim of this research is to prepare disaster and emergency plans for different institutions such as schools, dormitories, and hospitals and to identify the similarities and differences between these plans. The long-term objective is to identify deficiencies related to the preparation and implementation of disaster and emergency plans, and the solution proposals designed to complete these deficiencies to lead the Turkey's disaster management policies.

2. METHODS

Design and Setting

Research data were collected between January and June in 2018. The research is a descriptive methodological research and the contents of disaster and emergency plans collected from three different schools, three different dormitories and three different hospitals in Burdur, Turkey.

"Disaster and Emergency Planning Guide for Health Organizations" and created in Turkey in 2009 has been used as a guide in order to prepare hospital disaster and emergency plan.¹⁶ Additionally, "Guide to Preparing Risk Management And Emergency Plan in Business and Public Institutions" and written in Turkey in 2018 has been used as a guide in order to prepare for school and dormitory plans.¹⁷

Sample Selection and Data Collection

In order to collect the research data, firstly the institutions in Burdur were interviewed and three schools, three dormitories, and three hospitals were selected by lot among the voluntary institutions. 8 students for each of the 9 institutions and 72 volunteer students in total participated in data collection. The separation of 72 learners into groups of 8 people, the formation of groups, and then determining which group will collect data from which institution has been done by lot. The grouped students met with their assigned organization to prepare the disaster and emergency plan and announced that they would give the organization a copy of the plan they prepared.

To prepare the disaster and emergency plans, the following steps were applied respectively; Obtaining information about the total number of buildings and the number of personnel in them; Creating a list of hazards that can be seen in Burdur; Getting information about where and when these hazards are seen, and making forms on historical events for the loss of life, property and business continuity caused by these hazards; Creating emergency profile forms of all hazards for life, property and business continuity according to the historical event forms; Establishing risk analysis tables according to the severity and frequency of occurrence of the hazards in the emergency profile forms; Creating red flag forms for the emerging risks in the risk analysis tables; Sorting of the hazards according to the degree of urgency with the help of red flag forms; Creating an incident command system; Establishing mutual assistance protocols; Plotting the building; Designating evacuation plans of the building, meeting points, and internal and external intervention plan.

Internet (literature review) was used during the preparation of historical event forms for hazard lists and hazards. The hazards that were seen in Burdur were written in detail. Emergency profile forms of all hazards (for life, property and business

continuity) were included information on the severity of the hazards and the frequency of occurrence, the area to be affected, the total number of people that may be affected and the estimated time for evacuation. The entire building had been investigated to create red flag forms and the situations that might cause damage during disasters are listed. Incident command system determines the tasks of employees during the disaster. Therefore, the training status of the employee and first aid, fire fighting and evacuation information has been learned. The needs of the related institution during the disaster were determined and mutual assistance protocols were established with the relevant institutions.

The preparation of the disaster plans lasted about 6 months. Before the planning started, the students were informed about the preparation of the plan. During the process, students were informed repeatedly at every stage.

Data Analysis

The evaluation of the data obtained from institutions' disaster and emergency plans data obtained from establishments was carried out by the researcher.

3. RESULTS

In the findings of this research, tables related to lists of hazards that may affect organizations, the order of hazards by severity of influence and frequency, risk analysis table based on severity and frequency of hazards, deficiencies determined for disaster prevention in establishments according to the risk analysis table are provided.

When the tables are created, the collected data from organizations that serve the same purpose but are different from each other is presented as a whole. The data obtained from the disaster and emergency plans of the three schools were combined and integrated into one. The same procedure was carried out in the dormitories and hospitals.

Table 1. List of Disasters and Hazards that May Cause Emergency in Schools, Dormitories, and Hospitals (Burdur, 2018)

Disasters and Emergency Hazards		
Schools	Dormitories	Hospitals
Earthquake	Earthquake	Earthquake
Flood	Flood	Flood
Food Poisoning	Food Poisoning	Food Poisoning
Landslide	Landslide	Landslide
Epidemics	Epidemics	Epidemics
Erosion	Erosion	Erosion
Lightning	Lightning	Lightning
Drought	Drought	Drought
Storm	Storm	Storm
Grasshopper infestation	Grasshopper infestation	Grasshopper infestation
Hail	Hail	Hail
Fire	Fire	Fire
Famine	Famine	Famine
Terror	Terror	Terror
CBRN*	CBRN*	CBRN*
Forest fire	Forest fire	Forest fire
Cyber attack	Cyber attack	Cyber attack
Power cut	Power cut	Power cut
Mass deaths due to extreme heat or cold	Mass deaths due to extreme heat or cold	Mass deaths due to extreme heat or cold
<i>Mass suicide</i>	<i>Mass suicide</i>	<i>Lake accidents</i>
<i>Mass drug use</i>	<i>Mass drug use</i>	<i>Armory explosion</i>
		<i>Strike</i>
		<i>Traffic accidents (Mass Emergencies)</i>
		<i>Angry patient relatives</i>
		<i>Marble quarry accidents</i>

* Chemical, Biological, Radiological, Nuclear.

Table 1 presents the hazards that may create disasters and emergencies in schools, dormitories, and hospitals. Because all institutions are in the same province, many of the hazards are shared in all of them. As for different ones, mass suicide and mass drug use are encountered in the plans prepared for schools and dormitories; In the plans prepared for the hospitals, lake accidents, armory explosion, strike, traffic accidents, angry patient relatives, marble quarry accidents were detected.

The data in Table 2 are necessary for the formation of the risk analysis in Table 3. The severity of the hazards involved in the lists created for each organization is determined as "4 disaster; 3 critical; 2 limited; 1 insignificant " and the occurrence

frequency is "4 High; 3 Sometimes; 2 Rarely; 1 None'. Although the severity and frequency of all the hazards listed in Table 1 are considered in the disaster and emergency plans, Table 2 contains the top 10 hazards considered to be the most dangerous. Among these hazards, the severity and frequency of earthquakes were found to be highest for all three institutions and ranked first. It has been observed that the mass drug use is among hazards that may cause disasters and emergency in schools and dormitories, and traffic accidents are hazards that can create disasters and emergencies in hospitals (Table 2).

Table 2. Breakdown of Hazards by Severity of Influence and Frequency (Burdur, 2018)

	Schools						Dormitories						Hospitals					
	S*			F**			S*			F**			S*			F**		
	L ¹	P ²	B ³	L ¹	P ₂	B ³	L ¹	P ²	B ³	L ¹	P ₂	B ₃	L ¹	P ²	B ³	L ¹	P ₂	B ³
Earthquake	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Fire	2	2	3	2	2	2	3	2	3	3	3	3	3	2	2	2	2	2
Storm	2	2	3	3	3	3	1	2	2	2	2	2	2	2	2	2	2	2
Flood	2	3	2	2	2	2	2	3	2	2	2	2	3	2	3	2	2	2
Landslide	2	2	1	2	2	2	2	1	1	2	2	2	2	1	1	2	2	2
Terror	4	4	4	1	1	1	4	4	4	1	1	1	4	4	4	1	1	1
CBRN***	2	1	1	2	2	2	3	2	2	2	2	2	3	2	2	2	2	2
Power cut	1	1	2	2	2	2	1	1	2	2	2	2	4	3	4	2	2	2
Mass drug use	2	1	1	2	2	2	2	1	1	2	2	2						
Traffic accidents													2	2	3	3	3	3

¹L:Loss of Life, ²P:Loss of Property, ³B:Business Continuity.

*Severity of influence: 4 Disaster; 3 Critical; 2 Limited; 1 Insignificant.

**Frequency levels: 4 High; 3 Sometimes; 2 Rarely; 1 None.

***Chemical, Biological, Radiological, Nuclear.

In table 3, the multiplication of the severity and the frequency of occurrence shows which hazards are risky for which institution. Regions with 16 and 12 points are at very high risk, regions with 9 and 8 points are at high risk, regions with 6 and 4 points are medium risk, and regions with 3, 2 and 1 points are low risk (Table 3). Earthquake hazard has been found at a very high level in all three of the loss of life, loss of property and business continuity that can be seen in schools, dormitories, and hospitals. Fire hazard has been found to be highly risky in terms of life loss and business continuity in dormitories, also storm hazard for business continuity in schools, traffic accidents for business continuity in hospitals, and power cut for life loss and business continuity in hospitals were at high risk (Table 3).

Table 4 mentions situations in disaster and emergency plans for schools, dormitories, and hospitals that have not yet been taken into account despite the risks involved. While determining the conditions for detecting the hazards and risks, all the buildings and all the floors in the buildings are visited and general problems, guide boards, emergency exit and doors, doors and doorways, fire

precautions, ventilation of closed workplaces, illumination of the environment and other aspects were examined. The free state of lockers, bookshelves, and shelves and that these materials have not been rendered hazardous by any structural support; The heavy objects are not removed from the high racks; No precautions have been taken to prevent the glass from being shaken or broken during an explosion; The objects that could fall or break during an earthquake are not fixed; Monitors, projection equipment, computers, etc. are not fixed in such a way that they will not fall during a quake and do not constitute a danger; Emergency exit routes and doors are not properly marked; the surfaces of transparent or semi-transparent doors are not protected against breaking; these kinds of situations are a danger in all three institutions (Table 4). In all three schools and three hospitals with disaster and emergency plans, the occupational health and safety unit was established and an occupational safety specialist was recruited. There was no work related to the occupational health and safety in the dormitories. It has been determined that the number of situations that may cause danger during any disaster and

Table 3. Risk Analysis Table Based on Severity and Frequency of Hazards (Burdur, 2018)

	(LL¹, LP², BC³)			
Severity* Frequency	High (4)	Sometimes (3)	Rarely (2)	None (1)
Disaster (4)	(4*4: 16) Earthquake (School; LL, LP, BC) Earthquake (Dormitory; LL, LP, BC) Earthquake (Hospital; LL, LP, BC)	(4*3: 12)	(4*2: 8) Power cut (Hospital; LL, BC)	(4*1: 4) Terror (School; LL, LP, BC) Terror (Dormitory; LL, LP, BC) Terror (Hospital; LL, LP, BC)
Critical (3)	(3*4: 12)	(3*3: 9) Fire (Dormitory; LL, BC) Storm (School; BC) Traffic Accidents (Hospital; BC)	(3*2: 6) Fire (School; BC); Fire (Hospital; LL) Flood (School; LP); Flood (Dormitory; LP); Flood (Hospital; LL, BC) CBRN (Dormitory; LL); CBRN (Hospital; LL) Power cut (Hospital; LP)	(3*1: 3)
Limited (2)	(2*4: 8)	(2*3: 6) Fire (Dormitory: LP) Storm (School, LL, LP) Traffic Accident (Hospital, LL, LP)	(2*2: 4) Fire (School, LP, BC); Fire (Hospital, LP, BC) Storm (Dormitory, LP, BC); Storm (Hospital, LL, LP, BC) Flood (School, LL, BC) Flood (Dormitory, LL, BC) Flood (Hospital, LP) Landslide (School, LL, LP) Landslide (Dormitory: LL) Landslide (Hospital, LL) CBRN (School, LL) CBRN (Dormitory, LP, BC) CBRN (Hospital, LP, BC) Power cut (School; BC) Power Cut (Dormitory: BC) Mass Drug Use (School: LL); Mass Drug Use (Dormitory: LL)	(2*1: 2)
Insignifi- cant (1)	(1*4: 4)	(1*3: 3)	(1*2: 2) Storm (Dormitory: LL) Landslide (School; BC) Land- slide (Dorm, LP, BC) Landslide (Hospital, LP, BC) CBRN (School, LP, BC) Power Cut (School, LL, LP) Power Cut (Dormitory, LL, LP) Mass Drug Use (School, LP, BC); Mass Drug Use (Dormitory, LP, BC)	(1*1: 1)

¹LL: Loss of Life, ²LP: Loss of Property, ³BC: Business Continuity.

16, 12 points area: Very high risk; **9, 8 points area:** High risk; **6, 4 points area:** Moderate risk; **3, 2, 1 points area:** Low risk.

Table 4. Deficiencies Determined for Disaster Prevention in Establishments According to the Risk Analysis Table (Burdur, 2018).

	S ¹	D ²	H ³
Is the place of the first aid materials such as fire-fighting cabinets, fire extinguishers, etc. clearly marked?	No	No	
Are the lockers, bookshelves and shelves in the free state rendered safe by any structural support?	No	No	No
Are heavy objects removed from high racks?	No	No	No
Are there any precautions against possible shaking or breaking of glass in case of explosion?	No	No	No
Are bookshelves and other dangerous objects distant from the sitting areas?	No	No	
Is the hanging clocks, maps and fire extinguishers fixed to wall to prevent from falling?	No	No	
Are the objects that may be shaken and fallen during an earthquake fixed?	No	No	No
Are the items around the door fixed so that they do not obstruct the entrances and exits?	No	No	
Are the papers or any other materials that could easily catch fire near the electric or flammable heaters removed?	No	No	
Did the electronic devices such as the monitor, the projection device, and the computer were fixed in a way that they would not fall down and would not pose a hazard?	No	No	No
Are the all kinds of containers carrying any kind of chemical substance protected against breakage?	No		No
Are hanging electrical equipments protected against falling?	No	No	
Are the tubes containing dangerous gas and flammable substance fixed in such a way that it does not fall during the quake?	No		No
Is the water and heating pipes reinforced against quakes?	No	No	
Are the number of emergency exit ways and doors, their dimensions and locations in accordance with the nature of the work done, the size of the workplace and the number of employees?	No	No	
Are the railed and revolving doors used for the emergency exit door?	No	No	
Are the emergency exit routes and doors properly marked?	No	No	No
Is there any back-up lighting system on the emergency exit routes that will provide adequate illumination in the event of a power failure?	No	No	
Are the surfaces of transparent or translucent doors protected against breakage?	No	No	No
Are the doors on the escape routes marked appropriately?	No	No	
Can mechanical doors be opened manually in any power cut?	No	No	
Is it taken into account that steps are not slippery and made from the proper material?		No	No
Are there any antiskid tapes on the steps?			No
Are the stairs lit up? Are they fed by backup energy during any emergency?	No	No	
Are there instructions about the fire situations and is it accessible?	No	No	
If the broken ventilation system is dangerous for the health of the employees, does it have a warning system in case of malfunction?	No	No	
Is there a lighting system that will provide urgent and sufficient illumination where any failure in the lighting system may pose a risk to employees?	No		
Is the occupational health and safety unit established?		No	
Do you have an occupational safety specialist?		No	

* Conditions that are inappropriate or incomplete for any of the establishments are provided on the table.

** The regions painted with gray mean "yes".

¹School, ²Dormitory, ³Hospital.

emergency situation is lower in hospitals than in the other two institutions. The number of cases that could cause danger in the schools and dormitories were found as 25 and 11 in hospitals (Table 4).

When the disaster and emergency plans are prepared, the related institutions are visited and the situations that have not been pre-cautioned yet despite the risks are presented in Table 4. Table 5 identifies situations that may pose a risk and which damage reduction measures should be taken and also the emergency levels of these measures are given. Emergency levels were classified as "4 Very urgent; 3 Urgent; 2 Must be done; 1 It will be good if it is done". No precautions have been taken to prevent the glass from being shaken or broken during the explosion; Furniture, shelves, and objects in the racks are not fixed; The heavy objects are not removed from the high racks; Cabinets, televisions, and monitors in unfixed state are dangerous; The fact that the surfaces of the doors are not protected against breakage are among the risky situations that should be done to reduce damage in all three organizations (Table 5). It has been determined that the risks in schools and hospitals which require damage reduction application are less in number compared to the dormitories. There were 8 cases requiring loss reduction applications in schools and hospitals, and 12 cases in dormitories. It has been determined that the emergency levels of damage reduction practices in hospitals are higher than the levels of schools and dormitories (Table 5).

3. DISCUSSION

In this study, disaster and emergency plans were made in nine institutions serving three different areas, and the results were compared.

In a survey conducted in Turkey, it was determined that 92.8% of the hospitals in the study had a written disaster plan.¹⁸ In various researches for hospital disaster planning, it was found that having a disaster plan is not enough and it determined that practices should be done for the contents of this

plan; and also it found that there are deficiencies in disaster plans about crisis room, evacuation plans, additional ambulance, and communication.^{18,19,20} The Regulation for Implementation of Hospital Disaster and Emergency Plan (HAP) in Turkey was published in the Official Gazette on 20/03/2015. This regulation states that the plans prepared in the hospitals should be updated once a year and that the table top exercise should be applied at least once during the year and the field exercise should be done once per year.²¹ The fact that hospitals are among the most needed services in disasters and that hospital personnel are among the most expected to work¹⁹ contributes to the importance of hospital disaster plans. Although there are some deficiencies and problems, hospitals in Turkey mostly have disaster plans. In spite of this situation, studies on preparation of disaster plans in schools, dormitories, and other institutions are still in its infancy and there is no legal requirement for disaster planning²³. This situation shows that Turkey, where many disasters such as earthquakes are experienced²⁴, is inadequate in disaster planning.

More than 1,500 people were dead in the earthquake that erupted in Burdur at 00.05 am in 1914, two-thirds of the houses were destroyed, and the remaining were severely damaged²⁵ Although there is no clear information about the status of schools²⁵, it is possible that they have become unusable. In the Erzincan earthquake that took place in 1992, 43 schools and 10 dormitories were damaged and 23 female students were dead. During the Kocaeli earthquake that took place at 3.02 am in 1999, 43 schools were destroyed and 381 schools were damaged. No students were dead in the schools because the students were at home. In the Bingöl earthquake that took place in 2003, 22 schools were damaged, 4 schools were destroyed, 84 students and 1 teacher were dead and 114 students residing in the country have survived from the wreckage. The 2011 Van earthquake occurred on Sunday when students were at home and 500 schools were affected by the

Table 5. Damage Reduction Studies to be Performed in Establishments to Prepare for Disaster (Burdur, 2018).

Hazard	Damage Reduction Studies	Emergency Level*		
		S ¹	D ²	H ³
No measures have been taken to prevent the windows from being shattered and injure people in a quake or explosion.	Glasses can be covered with a protective film, the support brackets can be made put in front of glass materials.	3	3	4
Trashcans or freestanding items on the floor are not fixed.	Free objects must be immobilized.		2	
Preventive measures have not been taken to prevent objects in lockers, bookshelves and shelves from falling down.	Lockers must be locked and a safety band must be set up in front of the bookshelves.	4	4	4
The container carrying the chemical remains unprotected against spills and breaks.	There should be a suitable room for chemical substances, bottles etc. The caps must have a lock system..	4		4
Heavy objects are not removed from high racks.	Heavy objects must be stored on the bottom shelves or fixed securely.	4	4	4
The lockers, bookshelves and shelves in the free state can cause danger.	Free lockers, televisions and monitors should be fixed.	4	4	4
The hanging clocks, maps and fire extinguishers aren't fixed to wall to prevent from falling?	Hanging objects should be fixed to the wall.	4	4	
The sign boards are not in the appropriate height and position for the standpoint.	The sign boards should be positioned accordingly to standpoint.	3		
The surfaces of the doors are not protected against break-age.	Door surfaces must be made from break resistant materials.	2	3	3
The doors are opening inward.	The doors should be adjusted to open outwards to facilitate the evacuation in case of earthquake or etc.		4	
The fire sensor is faulty	The fire sensor must be repaired urgently.		4	
There is no ventilation system.	The ventilation system must be installed.		3	
No occupational health and safety unit exists.	Occupational health and safety unit should be established		3	
There is no occupational safety specialist.	Occupational safety experts should be recruited.		3	
The step surfaces are made of slippery material.	The surface of the steps must be covered with a non-slip material.			4
There are no anti skid tapes on the steps.	Anti skid tapes should be placed on the steps.			4

*Emergency Level: 4 Very urgent; 3 Urgent; 2 Must be done; 1 It will be good if done.

**For gray painted areas, the relevant organization has taken appropriate measures.

¹School, ²Dormitory, ³Hospital.

earthquake.¹ All of these losses that occurred in various provinces of Turkey were experienced after the earthquakes and the whole region was affected by the tremor. Depending on the damage caused by the earthquakes, it is expected it to be at the top of the hazard lists and risk tables. In this study, it is seen that man made and technological hazards such as mass suicide and mass drug use in schools and dormitories, lake accidents, armory explosion, strikes, traffic accidents, angry patient relatives and marble quarry accidents in hospitals have been put on the hazard list as well as natural hazards such as earthquakes. In a survey conducted by examining the world literature, it was found that the suicide level increased by 100% among the students in the 10-14 age group between the years 1980-1996²⁶, another study found that the suicide level increased in the adolescents in Turkey between 1992-2004 (especially in female students),²⁷ In a study conducted, it was emphasized that the number of studies on drug use in Turkey is inadequate and there is no clear information, but drug use rates are increasing among students both in Turkey and in the World.²⁸ This may cause students to affect each other and may lead the suicide attempts and drug use to turn into emergency situations or disasters. These results show that the different hazards seen in different institutions can turn into disasters for another one. The disaster response capacity of the region and the institution also can affect this situation. Preparing disaster plans in accordance with the disaster occurrence frequency and the response capacity to these disasters is very important in terms of the feasibility of the plans.¹⁸

The frequency of meteorological disasters such as floods in Turkey is higher than earthquakes. The total loss of life, property and business continuity due to earthquakes is more than the loss of total life, property and business continuity during the flood.²⁹ Among the hazards that can be seen in institutions in this research and which may cause disaster, it can be seen that earthquakes have the

highest frequency and severity and ranked first in schools, dormitories, and hospitals. Likewise, earthquake hazard has been found at very high levels in all three of the loss of life, loss of property and business continuity that can be seen in schools, dormitories, and hospitals. In one study, it was emphasized that earthquakes could be seen due to active faults in Burdur province, but the intervention capacity of this province might be insufficient during the earthquake.² When the other hazards that are common in Burdur are examined, it has been determined that the danger of fire is high risk in terms of life loss and business continuity in the dormitories, business continuity of storm hazard in schools, business continuity in traffic accidents and loss of life in hospitals and business continuity. Investigation of the hazards seen in the region and the institutions that prepared the disaster plan in the past years; This data obtained as a result of the preparation of historical event forms for the loss of life, property and business continuity shows that it is important in other hazards as well as in the earthquake. In the schools in Turkey, the Ministry of National Education's 2009 "Fire Prevention and Extinguishing Directive"³⁰ while the Ministry of Health has found the "Fire Prevention and Extinguishing Directive" dated 2008³¹, there is no directive covering fire fighting in the country. Reducing the risk of fire, which is common in dormitories, can be prevented by the laws governing the dormitories. The storm is a meteorological disaster and is frequent in the province of Burdur. In addition to direct demolition, direct breakage and damage to lighting systems³², high-altitude schools (especially the university campus far from the city center) cause problems such as glass breakage and collapse of ceilings. In this situation, while the schools that see them are holiday, business continuity is also prevented. After a traffic accident in a region, the wounded are first transported to the nearest hospital and then to other hospitals. If the number of injured patients exceeds the capacity of the hospitals in the region,

they are referred to the nearest other hospital outside the injured province.³³ Turkey Statistical Institute (TURKSTAT) according to 2009 data, Burdur is a small village with a total population of 251,550.³⁴ At the center of the province of Burdur there is only one state hospital and the largest one is Bucak, a state hospital and a private hospital. For this reason, it is possible that a large traffic accident that can be seen in Burdur province may affect the business continuity of the hospitals in Burdur center and districts. It is not expected that the traffic accidents in Burdur province will affect the continuity of work of schools and dormitories. Hospitals equipped with vital equipment such as respiratory devices, portable monitors, portable infusion pumps, portable ultrasonic devices, vacuum devices and computers are powered by electricity.³⁵ Because of this, the inability to find a solution to the electricity interruption in the hospital in a short time for any reason causes the living people of the electrical devices to lose their lives and the business continuity to deteriorate. While there is no loss of life in schools and dormitories during the electricity interruption, business continuity is negligible. These threats cause loss of life, property and business continuity at different levels for different organizations, suggesting that disaster plans need to be prepared for all organizations separately.

Costly equipment, communication, and infrastructure systems in buildings and are expressed as non-structural elements and are damaged during earthquakes. Material damage caused by buildings during the earthquake can reach up to 75% of building cost. This causes the building to become unusable and the business continuity to disappear. Unstable devices cause death and injuries to people.³⁶ In this study, the lockers, bookshelves and shelves which are in the free state; Heavy objects on high racks; Protective materials, unreinforced glass, unfixed goods; Non-fixed monitors, projection equipment, computers, etc. vehicles; Unsuitable emergency exit routes and gates have been found to be hazardous to all three

of the institutions. It has been determined that harm reduction practices are inadequate in all three institutions. It has been determined that the number of situations that may cause danger during any disaster and emergency situation in this study is lower in hospitals than in the other two institutions. In hospitals in Turkey, the establishment of disaster and emergency plans has been made compulsory by law, but there is no such practice for schools and dormitories. This shows that disaster plans made in hospitals contribute to damage reduction practices (even though it was done because of necessity). Making disaster plans compulsory in schools and dormitories, where students often spend their time during periods when schools are open, can reduce the loss of life and property that can occur after the disaster.

Take precautions against breaking glass; Taking preventive measures to prevent falling objects in lockers, bookshelves and shelves; Removal of heavy objects from high racks; Fixing free-standing lockers, televisions and monitors; Such as the protection of the surfaces of the doors against breakage, are considered within the scope of damage reduction studies. In this study, the applications mentioned in all three organizations preparing the disaster plan are missing and creating risks. Again, in this study, it was determined that the risky situations in schools and hospitals which require harm reduction application are less in number than in the countries. One of the most important laws that contribute to the implementation of harm reduction practices in schools and hospitals is the "6331 Occupational Health and Safety Law" adopted in Turkey in 2012.³⁷ With this law, occupational health and safety boards have been established in the school³⁸ and in the hospitals³⁹ to increase danger and risk appraisal and employee safety practices in the buildings. There was no informational literature on occupational health and safety practices in dormitories. In support of the literature, in this study, the occupational health and safety unit was established in three schools and three hospitals

where the disaster plan was prepared and the occupational safety specialist was procured. There is no study on occupational health and safety in the dormitories. This situation explains why the loss mitigation efforts in the country are insufficient compared to other organizations. In this study, it was determined that the urgency levels of harm reduction practices in hospitals were higher than the urgency level of harm reduction practices that should be done in schools and in the country. Hospitals are among the first institutions needed during disasters. Harm reduction studies in hospitals increase the capacity of the intervention work by reducing the exposure to the hospital. This reduces the loss of life between personnel in the hospital or injuries outside the hospital.⁴ As can be seen, it is important to prevent the loss of lives of staff, patients, wounded and patients in the hospitals. In addition to ensuring the safety of people in hospitals, hospitals and staff working in hospitals have an important role to play in emergency medical interventions during disasters. This supports the idea that the harm reduction work done in hospitals is more urgent. The harm reduction works done in schools and in the country are also as important as the hospitals in order to prevent the loss of life of the students and staff and to sustain the community health.

4. CONCLUSION

In this study, which disaster and emergency plans of three different schools, three hospitals, and three dormitories and in total nine institutions in Burdur province of Turkey are prepared and evaluated;

Some hazards that may lead to disasters vary by the type of institutions, but many hazards are common because all institutions are in the same province.

Among the identified hazards for institutions, the severity and frequency of earthquake are the highest among all three organizations and in the first rank.

Earthquake hazard has a very high risk in all three

of the loss of life, loss of property and business continuity that can be seen in schools, dormitories, and hospitals. Other hazards have different levels of influence on related institutions.

There are a number of situations that can create a risk during a disaster due to improper disaster preparedness plan. All institutions have many of the same or different hazards that need to be regulated for damage reduction.

There are regulations on occupational health and safety in three schools and three hospitals where disaster and emergency plans are prepared, but there is no regulation for dormitories. Situations that may create a hazard during any disaster are fewer in hospitals than two other institutions.

Potential hazards in schools and hospitals that require harm reduction are fewer than in dormitories. The emergency level of harm reduction practices seen in hospitals is higher than in schools and dormitories.

Emphasis should be given to making the disaster and emergency plans in schools and dormitories mandatory, and also to fire extinguishing guides and occupational health and safety applications in dormitories and other institutions. While this reduces the loss of life and property that can be seen during disasters and emergencies, it can also help these institutions take an active role in disaster response studies.

Limitations of the Study: Information on the identity of personnel working in the incident command system within disaster and emergency plans; Building evacuation plan, building internal and external intervention plan and determination of assembly points are all proprietary information for institutions. This information, which is specific to the relevant institutions, has not been presented in this study.

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REFERENCES

- Ersoy Ş, Koçak A. Disasters and earthquake preparedness of children and schools in Istanbul, Turkey. *Geomatics, Natural Hazards and Risk*. 2016;7(4):1307-1336. <https://doi.org/10.1080/19475705.2015.1060637>
- Kaya Ş. Burdur Fayının Paleosismolojik Özellikleri (Paleosismological Properties of Burdur Fay) [yüksek lisans tezi/master's thesis]. Denizli, Türkiye: Pamukkale Üniversitesi, Fen Bilimleri Enstitüsü Jeoloji Mühendisliği Anabilim Dalı;2015. <http://hdl.handle.net/11499/653>
- Güney D. Van earthquakes (23 October 2011 and 9 November 2011) and performance of masonry and adobe structures. *Nat. Hazards Earth Syst. Sci.* 2012;12:3337-3342. <https://doi.org/10.5194/nhess-12-3337-2012>
- National Association of Public Hospitals and Health Systems. Hospital staffing and surge capacity during a disaster event. *Research Brief*. 2007;1-6. https://essentialhospitals.org/wpcontent/uploads/2014/10/May2007_Research_Brief.pdf
- Centre for Research on the Epidemiology of Disasters (CRED). The Human Cost of Natural Disasters. 2015. Available at: file:///C:/Users/USER/Downloads/The_Human_Cost_of_Natural_Disasters_CRED_v2017.pdf. Accessed April 3, 2019.
- Department for International Development. Reducing the Risk of Disasters – Helping to Achieve Sustainable Poverty Reduction in a Vulnerable World: A DFID policy paper. 2006. Available at: https://www.preventionweb.net/files/2067_VL108502.pdf Accessed April 3, 2019.
- World Health Organization, United Nations International Strategy for Disaster Reduction. Disaster Risk Management for Health. England: World Health Organization, United Nations International Strategy for Disaster Reduction. http://www.who.int/hac/events/drm_fact_sheet_overview.pdf. Published 2011. Accessed August 17, 2018.
- Ethiopia Public Health Training Initiative. Disaster Prevention and Preparedness. Ethiopia: Ethiopia Public Health Training Initiative. https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/ln_disaster_prev_final.pdf. Published 2006. Accessed August 17, 2018.
- Fischer HW. The sociology of disaster: definitions, research questions, & measurements continuation of the discussion in a post-september 11 environment. *IJMED*. 2003;21(1):91-107. <http://www.ijmed.org/articles/82/download/>
- United Nations Secretariat of the International Strategy for Disaster Reduction and the United Nations Office for Coordination of Humanitarian Affairs. Disaster Preparedness for Effective Response. Geneva, Switzerland: United Nations Secretariat of the International Strategy for Disaster Reduction and the United Nations Office for Coordination of Humanitarian Affairs. https://www.unisdr.org/preventionweb/files/2909_Disasterpreparednessforeffectiveresponse.pdf. Published 2008. Accessed August 17, 2018.
- Sutton J, Tierney K. Disaster preparedness: concepts, guidance, and research. Talk presented at: Fritz Institute Assessing Disaster Preparedness Conference Sebastopol; November 3 and 4, 2006; California. Available at: <http://www.fritzinstitute.org/pdfs/whitepaper/disasterpreparedness-concepts.pdf>. Accessed September 6, 2018.
- Shibutse PI, Omuterema S, China S. Frequency and severity of fire disasters in secondary schools in Kenya. *IJRSET*. 2014;3(11):17646-17650. https://www.ijrset.com/upload/2014/november/78_FREQUENCY.pdf
- International Finance Corporation. Disaster and Emergency Preparedness: Guidance for Schools. Washington, USA: International Finance Corporation. <https://www.ifc.org/wps/wcm/connect/8b796b004970c0199a7ada336b93d75f/DisERHandbook.pdf?MOD=AJPERES>. Published 2010. Accessed August 17, 2018.
- United Nations Development Programme. Guidelines For Hospital Emergency Preparedness Planning. New Delhi, India: United Nations Development Programme. http://asdma.gov.in/pdf/publication/undp/guidelines_hospital_emergency.pdf. Published 2008. Accessed August 17, 2018.
- Council on School Health. Disaster planning for schools. *Pediatrics*. 2008;122(4):895-901. <http://pediatrics.aappublications.org/content/pediatrics/122/4/895.full.pdf>
- İl Afet ve Acil Durum Müdürlüğü. Sağlık Kuruluşları İçin Afet ve Acil Yardım Planlama Rehberi (Guide for Disaster and Emergency Planning for Health Care Organizations). İstanbul, Türkiye: İl Afet ve Acil Durum Müdürlüğü. <http://www.guvenliyasam.org/wp-content/uploads/2016/02/Saglik-Kuruluslari-icin-Afet-Acil-Yardim-Planlama-Rehberi.pdf>. Published 2009. Accessed August 17, 2018.
- Bostan S, Yıldız E. İşletmeler ve Kamu Kurumlarında Risk Yönetimi ve Acil Durum Planı Hazırlama Rehberi. 1. Baskı. Nobel Akademik Yayıncılık. 2018.
- Top M, Gider Ö, Tas Y. An investigation of hospital disaster preparedness in Turkey. *JHSEM*. 2010;7(1):1-19. <https://doi.org/10.2202/1547-7355.1781>
- Balçık PY, Demir İB, Ürek D. Ankara'da seçilen bazı hastanelerde afet yönetimine ilişkin mevcut durum değerlendirilmesi (Evaluation of the current status regarding disaster management in several hospitals selected in ankara). *Hacettepe Sağlık İdaresi Dergisi*. 2014;17(1):46-58. <http://fs.hacettepe.edu.tr/saglikidaresidergisi/dosyalar/17.1.3.pdf>
- Dursun R, Görmeli CA, Görmeli G, Öncü MR, Karadaş S, Berktaş M, Şehitoğulları A. Disaster plan of hospital and emergency service in the van earthquake. *JAEM*. 2012;11:86-92. <http://akademikaciltip.com/sayilar/201/buyuk/86%20-%2092%20-1.pdf>
- Hastane Afet ve Acil Durum Uygulama Yönetmeliği (Hospital Disaster and Emergency Implementation Regulations), 2015. Sağlık Bakanlığı Web Site. Available at: <http://www.saglik.gov.tr/TR,1789/hastane-afet-ve-acil-durum-planı-hap-hazırlama-kilavuzu.html>. Accessed September 07, 2018.
- Guerdan BR. Disaster Preparedness and Disaster Management: The development and piloting of a self-assessment survey to judge the adequacy of community-based physician knowledge. *J Clin Med*. 2009;6(3):32-39. <https://www.aapsus.org/wp-content/uploads/Disaster-Preparedness-and-Disaster-Management.pdf>
- Özmen B, Gerdan S, Ergünay O. Okullar için afet ve acil durum yönetimi planları (Disaster and emergency management plans for schools). *EJOIR*. 2015;3(1):37-52. <http://dergipark.gov.tr/download/article-file/62461>
- Işık Ö, Özer N, Sayın N, Mishal A, Gündoğdu O, Özçep F. Are women in turkey both risks and resources in disaster management? *Int. J. Environ. Res. Public Health*. 2015;12:5758-5774. doi: <https://dx.doi.org/10.3390%2Fijerph120605758>
- Sezer C. 1914 Isparta-Burdur depreminde hilâl-i ahmer cemiyeti'nin yapmış olduğu yardımlar (Ottoman red crescent association's aid in 1914 Isparta - Burdur earthquake). *Süleyman Demirel Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*. 2014;1(19):17-34. <http://dergipark.gov.tr/download/article-file/215138>
- Galaif ER, Sussman S, Newcomb MD, Locke TF. Suicidality, depression, and alcohol use among adolescents: A review of empirical findings. *Int J Adolesc Med Health*. 2007;19(1):27-35. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3134404/>
- Coskun M, Zoroglu S, Ghaziuddin N. Suicide Rates among Turkish and American Youth: A Cross-Cultural Comparison. *Arch Suicide Res*. 2012;16(1):59-72. <https://doi.org/10.1080/13811118.2012.640612>
- Evren C, Ogel K, Demirci AC, Evren B, Yavuz BG, Bozkurt M. Prevalence of lifetime tobacco, alcohol and drug use among 10th grade students in İstanbul. *Bulletin of Clinical Psychopharmacology*. 2014;24(3):201-210. doi: <https://doi.org/10.1016/j.ajp.2013.11.016>
- Ergünay A. Türkiye'nin afet profili (Turkey's disaster profile). *TMMOB Afet Sempozyumu*. 1995; Türkiye. <http://www.imo.org.tr/resimler/ekutuphane/pdf/3885.pdf>
- Milli Eğitim Bakanlığı Yangın Önleme ve Söndürme Yönergesi (Ministry of Education Fire Prevention and Extinguishing Directive), 2009. Milli Eğitim Bakanlığı Mevzuat Web Site. Available at: http://mevzuat.meb.gov.tr/html/9_0.html. Accessed September 07, 2018.
- Yangın Önleme ve Söndürme Yönergesi (Fire Prevention and Extinguishing Directive), 2008. Sağlık Bakanlığı Web Site. Available at: <http://www.saglik.gov.tr/TR,11257/saglik-bakanligi-yanigin-onleme-ve-sondurme-yonergesi.html>. Accessed September 07, 2018.
- Çiftçi A, Altundağ E, Bulut Ö, Uysal HH. Burdur ili elektrik dağıtım şebekesinde meydana gelen arızalara genel bir bakış ve çözüm önerileri (A General Overview of Failures Taken Place in Electrical Distribution Network of Burdur Province and Solution Suggestions). 4. Ulusal Meslek Yüksekokulları Sosyal ve Teknik Bilimler Kongresi; Mayıs 11-13, 2017; Burdur, Türkiye. <http://dergipark.gov.tr/download/article-file/311082>
- Sethi D, Zwi A. Traffic accidents another disaster? *Eur J Public Health*. 1999;9(1):65-67. <http://dx.doi.org/10.1093/eurpub/9.1.65>

34. Çatlak B, Sütü S, Kılınc AS, Bağ D. Burdur ilinde bebeklerin emzirilme durumu ve beslenme örüntüsü (Breastfeeding and nutrition patterns of babies in Burdur). Pamukkale Tıp Dergisi. 2012;(3):115-122. https://www.journalagent.com/ptd/pdfs/PTD-35220-RESEARCH_ARTICLE-KILINC.pdf
35. Holland EL, Hoaglan CD, Carsstead MA, Beecher RP, Porteous GH. How Do I Prepare for OR Power Failure? The Official Journal of the Anesthesia Patient Safety Foundation. <https://www.apsf.org/article/how-do-i-prepare-for-or-power-failure/>. Published 2016. Accessed August 17, 2018.
36. Mondal G, Jain SK. Design of non-structural elements for buildings: A review of codal provisions. The Indian Concrete Journal. 2005;22-28. http://www.iitk.ac.in/nicee/RP/2005_NonStructural_Code_ICJ.pdf
37. İş Sağlığı ve Güvenliği Kanunu (Occupational Health and Safety Law), 2012. Çalışma ve Sosyal Güvenlik Bakanlığı Web Site. Available at: <http://www.isgum.gov.tr/Default.aspx?Ink=165>. Accessed September 07, 2018.
38. Sivrikaya O. Türkiye’de yükseköğretim kurumlarında iş sağlığı ve güvenliği eğitiminde güncel durum (Current situation in occupational health and safety education in higher education institutions of Turkey). Yükseköğretim ve Bilim Dergisi. 2016;6 (2):151-162. <http://oaji.net/articles/2016/593-1476796762.pdf>
39. Özkan Ö, Emiroğlu ON. Hastane sağlık çalışanlarına yönelik işçi sağlığı ve iş güvenliği hizmetleri (Occupational health and safety services towards hospital health employees). C.Ü.Hemşirelik Yüksekokulu Dergisi. 2006;10(3):43-51. <http://eskidergi.cumhuriyet.edu.tr/makale/1480.pdf>