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Original Article / Özgün Araştırma

The Evaluation of Level of Knowledge of Staffs in the Hospital Disaster and Emergency Plan and Associated Factors

Eylem Kuday Kaykisiz[1], Hatice Öntürk[2], Koray Okur[3]

1 Department of Emergency Medicine, Bitlis State Hospital, Bitlis, Turkey ORCID: 0000-0002-4699-4691
2 BitlisEren University School of Nursery, Bitlis, Turkey ORCID: 0000-0002-6206-2616
3 Bitlis Provincial Health Directorate, Bitlis, Turkey ORCID: 0000-0002-5502-4187

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Abstract

Objective: The aim of this study is to determine the level of knowledge of all original and reserve staff about hospital disaster and emergency plan (HDEP) and to investigate the associated factors.

Method: 144 staffs in HDEP of 7 hospitals in Bitlis province included in this descriptive study. Knowledge of levels about HDEP of staffs were evaluated with a face-to-face interview accompanied by a questionnaire form. $p<0.05$ was considered as statistically significant.

Results: 66% of participants were male, the mean age was 34.03 and 62.5% were university graduates. 63.2% of those were volunteer for HDEP. 75% of those knew their duties and 69.4% of them knew the term of duty in HDEP correctly. 6.5% previously met a disaster; 87.5% had previously participated in a disaster-related training or exercise. The cut-off point for the level of knowledge is determined as 7 according to average and median values. According to this, 69.4% of individuals were evaluated as 'adequate'. The rate of adequacy of those who were assigned as volunteers in the HDEP, who knew their position and duty, who had previously experienced disaster and who had previously participated in the in service training or practice were found to be statistically significant.

Conclusion: In order to encourage personnel to participate in internal and external disaster training and exercises, to increase the frequency of training and exercise and to show the necessary sensitivity in order to inform the personnel, to support the training with video or practice, to be hanged in visible places of the codes and telephone numbers to be searched and evacuation procedures to be applied at the time of disaster in each floor in order to inform the staff andto be voluntarily based on volunteer selection in HDEP are important to be prepared for disaster preparedness.

Keywords: Disaster; hospital disaster and emergency plan; practice.

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Yazışma Adresi / Correspondence: *Eylem Kuday Kaykisiz, Bitlis State Hospital, Department of Emergency Medicine, 13000, Bitlis, Turkey*
e-mail: eylemkuday@hotmail.com

Hastane afet planı kapsamında görevli personelin bilgi düzeyleri ve etkileyen faktörlerin değerlendirilmesi

Öz

Amaç: Bu çalışmanın amacı, Bitlis İlindeki tüm hastanelerde hastane afet planı (HAP) çerçevesinde görev alan tüm asil ve yedek personelin hastane afet planına ilişkin bilgi düzeyinin saptanması ve bilgi düzeylerini etkileyen faktörlerin araştırılmasıdır.

Yöntemler: Bitlis ili sınırlarında 7 adet devlet hastanesinin HAP' nında yer alan 144 personel tanımlayıcı tipteki bu çalışmaya dâhil edilmiştir. Yüz yüze yapılan anket sonuçlarına göre personelin HAP konusunda bilgi düzeyleri ve etkileyen faktörler değerlendirilmiştir. P<0.05 istatistiksel anlamlı kabul edilmiştir.

Bulgular: Çalışmaya dâhil edilen kişilerin %66'sı erkek, yaş ortalaması 34,03 ve %62,5 üniversite mezunu idi. %63,2'si HAP için gönüllü idi. %75'i HAP' taki görevini; %69,4 ü ise HAP' taki görev süresini doğru biliyordu. %26,5'u daha önce bir afetle karşılamış; %87,5'u ise daha önce afet ile ilgili bir eğitim veya tatbikata katılmıştı. Bilgi düzeyine ilişkin kesim noktası ortalama ve medyana göre 7 olarak belirlenmiştir. Buna göre bireylerin %69,4'ü 'yeterli' değerlendirilmiştir. HAP' ta gönüllü olarak görevlendirilen, pozisyonunu ve görev süresini bilen, daha önce afet ile karşılaşan ve daha önce kurum içi afet eğitim veya tatbikatına katılanların yeterli olma oranı istatistiksel olarak anlamlı düzeyde yüksek saptandı.

Sonuç: Kurum içi veya dışı afet eğitim ve tatbikatlarına katılım için personelin cesaretlendirilmesi, eğitim ve tatbikat sıklığının arttırılması ve personele duyurulması konusunda gerekli hassasiyetin gösterilmesi, gerekirse video veya pratik ile eğitimlerin desteklenmesi, personelin bilgilenmesi amacıyla afet anında uygulanacak tahliye prosedürleri, aranacak kod ve telefon numaralarının her katta görülebilir yerlere asılması ve HAP' ta görev alacak personel seçiminde gönüllülüğün esas alınması afete hazırlıklı olunmasında önemli bir yer oluşturmaktadır.

Anahtar kelimeler: Afet; hastane afet planı; gönüllülük; tatbikat.

INTRODUCTION

The disaster defined as the results of natural, technological or human made events that create physical, economical and social loses for people, affect communities by interrupting daily life and human activity[1]. The affected community cannot overcome its own resources in case of disaster and also it can trigger anoher disaster risk by disrupting the ecological system[2]. The first feature of disaster is being natural, the second one is causing life and property loses and the another one is becoming in limited time and the last one is not disrupted by humans after its occurence[3]. It is known that some disasters occur more frequently than the others of the earth. Turkey is among the regions with risk about natural disasters such as earthquake, flood, landslide, avalanche and rock falls and drought[4]. Other than natural disasters, number and effects of human-made disasters like terrorism, migration and accidents are increasing in Turkey. The research was carried out in Bitlis province of Turkey, located in the eastern region and estimated population is around 350,000. It is located in Southeast Anatolia earthquake zone and 1st degree earthquake zone[5]. Due to its geological and meteorological nature, it is at risk in terms of natural disasters such as avalanches and earthquakes as well as at risk of terrorist attacks and mass accidents. The most affected creature by the effects caused by disasters is man and the health sector therefore plays a critical role in disaster management in order to minimize both the death and disability. The maintaining health services without interruption should be the first aim in any case[6]. For this reason, all hospitals in Bitlis province should be resistant and prepared to disasters.

Disaster plan is a systematic procedure include strategic action plans and clearly defined where, what, how and with whom the responsibilities of the staff should be done, not only a disaster but also before and after a disaster[7]. In Turkey, 'Disaster and Emergency Response Regulations' which came into force in 2013, loaded responsibility to institutions about preparations for disasters[8]ve and 'Hospital Disaster and Emergency Plans (HDEP) Implementing Regulations' with a number of 29301 came into force in 20159. In the same year, the hospital disaster and emergency plan preparation guide was published[6]. It is aimed to prevent or mitigate the risks associated with disasters and emergencies of hospitals, and to be resistant to disasters by hospital disaster plans. It is also aimed to minimize the illness, disability and deaths by ensuring that the most possible number of people reach the health service urgently and effectively[6]. For all these reasons, it is important to prepare and implement to a HDEP.

The aim of this study is to determine the level of knowledge of all original and reserve staff about HDEP and to investigate the associated factors.

METHOD

This descriptive study was carried out in 7 provincial hospitals in Bitlis. The universe of study were composed by the disaster teams in these hospitals. Number of all originale and reserve staffs in hospital disaster team was 240 but 144 participants volunteered to participate in the study. After the ethical approval of BitlisEren University with a number of 2019/2-IV and with a date of 21.02.2019, data were obtained with a face-to-face interview accompanied by a questionnaire form with the staffs volunteered to participate in the study between 01.03-01.04.2019.

The questionnaire was prepared based on the knowledge of the HAP and the literature. After the opinions of the experts were taken, the questionnaire was finalized. The questionnaire consisted of three parts. An informed consent form in the first part, descriptive questions about sociodemographics data of participants and trainings and practices attended by participants about HDEP in the second part and questions that measuring level of knowledge about HDEP were included. The participants were asked to answer totally 10 questions that measure the knowledge level of participants and it is expected to respond as 'true', 'false' or 'don't know'. The median and average values of the total scores were calculated by giving '1' point to each correct answer given to questions and this value is considered to be the cut-off value. The highest and lowest scores were scored as 10 and 0 respectively.

Table 1. The sociodemographic characteristics of participants (n=144)

		Min-Max	mean±SD
Age (year)		20-58	34,03±8,47
		n	%
Age	<35 years	87	60.4
	≥35 years	57	39.6
Sex	Female	49	34.0
	Male	95	66.0
Educational status	Underhigh school graduates	3	2.1
	High school graduates	48	33.3
	University graduates	90	62.5
	Over university graduates	3	2.1

Statistical Analysis

Data were evaluated using IBM SPSS Statistics 22 for statistical analysis (SPSS IBM, Turkey). Continuity (Yates) Corrected Chi-Square test and Fisher Full Chi-Square test were used to evaluate qualitative data as well as descriptive statistical methods (mean, standard deviation, median, frequency, percentage). $p<0.05$ was considered as statistically significant.

Table 2. The demographics of participants about hospital disaster and emergency plans (HDEP) (n=144)

		n	%
Employment in HDEP	Volunteer	91	63.2
	Resignation	53	36.8
Knowing about position in HDEP	Yes	108	75.0
	No	36	25.0
Knowing about term of duty in HDEP	Yes	100	69.4
	No	44	30.6
The status about disaster experience	Yes	38	26.4
	No	106	73.6
The status about participation in internal disaster training or practice	Yes	126	87.5
	No	18	12.5
*Previously attended internal disaster training or exercises (n=126)	Hospital disaster and emergency planning training	70	55.6
	Basic disaster awareness training	29	23.0
	Training about fire	99	78,6
	Triage training	26	20.6
	Search and rescue training	10	7.9
	Training about CBRN**	21	16.7
	Disaster practice	49	38.9

*Multiple options marked.
** CBRN: Chemical Biological Radiation and Nuclear Hazardous Substances

RESULTS

The study was carried out with 144 subjects consisted of 49 women (%34) and 95 men (%66). The ages of individuals vary between 20 and 58 years, with a mean of 34.03 ± 8,47 years. It was found that 60.4% (n = 87) of the individuals were under 35 years of age, 66% (n = 95) of them were male and 62.5% (n = 90) of them were university graduates (Table 1).

It was found that 63.2% (n = 91) of the individuals were voluntarily assigned to HDEP, 75% (n = 108) were aware of their position and 69.4% (n = 100) were aware of their terms of duty in the HDEP, 26.4% (n = 38) had previously experienced a disaster and 87.5% (n = 126) had previously participated in internal disasters training or practices. Further, it is concluded that 55.6% (n = 70) of the individuals who have participated in the in-house training or practice received hospital disaster plan training, 23% (n = 29) received basic disaster awareness training, 78.9% (n = 99) received fire training, 20.6% (n = 26) received triage training, 7.9% (n = 10) received search and rescue training, 16.7% (n = 21) received training about 'Chemical Biological Radiation and Nuclear Hazardous Substances', 38.9% (n = 49) participated in disaster practice. The characteristics of individuals related to disaster planning are shown in Table 2 (Table 2).

When the responses of the individuals to the questions measuring their knowledge level about HDEP are evaluated, it has been concluded that the questions about where they

reach the HDEP plan, who the manager is and the evacuation procedures are highly answered correctly and the questions about the place of triage area, where the plans are hanged, the way to be followed in case of nuclear war, radioactive or chemical substance contamination are highly answered incorrectly. The response rates of the questions are shown in Table 3 (Table 3).

Table 3. Distribution of individuals' hospital disaster planning knowledge level rates (n=144)

Questions about HDEP to evaluate level of knowledge	**True**	**False**	**Don't know**
	n (%)	**n (%)**	**n (%)**
Knowing how to get to the HDEP*	110 (%76.4)	4 (%2.8)	30 (%20.8)
Knowing who the coordinator is	111 (%77.1)	7 (%4.9)	26 (%18.1)
Knowing the evacuation procedure in case of disaster	107 (%74.3)	15 (%10.4)	22 (%15.3)
Knowing the evacuation procedure according to the health status of the patients	91 (%63.2)	16 (%11.1)	37 (%25.7)
Knowing the evacuation procedure in case of flooding	103 (%71.5)	6 (%4.2)	35 (%24.3)
Knowing the evacuation procedure in case of fire, demolition, explosion	99 (%68.8)	15 (%10.4)	30 (%20.8)
Knowing the triage classification	106 (%73.6)	6 (%4.2)	32 (%22.2)
Knowing the triage area of the hospital in case of a disaster	64 (%44.4)	10 (%6.9)	70 (%48.6)
Knowing where emergency escape and evacuation plans are on the floors	86 (%59.7)	4 (%2.8)	54 (%37.5)
Knowing where the gathering place will be in case of nuclear war	68 (%47.2)	5 (%3.5)	71 (%49.3)
Knowing how to intervene to patients with a radioactive or chemical substance	38 (%26.4)	3 (%2.1)	103 (%71.5)

*HDEP: Hospital disaster and emergency plan

The knowledge level of individuals about HDEP ranged from 0 to 11, with an average of 6,90±3,24 and a median of 7. Therefore, the cut-off point for the level of knowledge is determined as 7 according to the average and the median. According to this cut-off value, 30.6% (n=44) of the individuals were classified as insufficient by taking them below 7 points and 69.4% (n=100) were classified as sufficient by taking them 7 points and over. Additionally, the Cronbach Alpha internal consistency coefficient of the HDEP knowledge level was determined as 0,871 for this study.

According to age groups and gender distribution, there was no statistically significant difference between individuals' adequacy status (p>0,05). The adequacy of university graduates and over-graduates (77.4%) was found to be significantly higher than those with high school graduates (54.9%) (p=0.009; p<0.01) (Table 4).

The adequacy rate of the individuals who were assigned voluntarily in the HDEP (94.5%) than those assigned with official letter (26.4%); the adequacy of individuals who know the position (88.9%) than those who do not know (11.1%); the adequacy of individuals who know the duration of the duty (92%) than those who do not know (18.2%); the adequacy rate of the individuals who experienced disaster before (92.1%) than those who did not meet (61.3%) and individuals who participated in the internal disasters training or practice before (78,6%) than those who did not participate (5.6%) were found to be statistically significant higher (p=0,001; p<0,01). Adequacy of individuals according to the characteristics of hospital disaster planning is shown in table 5 (Table 5).

Table 4. The evaluation of adequency of participants respect to sociodemographics characteristics.

General characteristics		adequency status		Test value	P value
		insufficient	sufficient		
		n (%)	n (%)		
Age	<35 years	24 (%27.6)	63 (%72.4)	χ^2=0.594	p=0.441
	≥35 years	20 (%35.1)	37 (%64.9)		
Sex	Female	15 (%30.6)	34 (%69.4)	χ^2=0.001	p=1.000
	Male	29 (%30.5)	66 (%69.5)		
Educational status	high school graduates and under graduates	23 (%45.1)	28 (%54.9)	χ^2=6.845	p=0.009**
	university graduates and over-graduates	21 (%22.6)	72 (%77.4)		

χ^2: Continuity (Yates) corrected Chi-Square Test **p<0.01

DISCUSSION

As a result of our study, the knowledge level of one third of HDEP staff is insufficient; it was concluded that being a part of the education and practices on disaster and having a high level of education had positive effects on the level of knowledge.

It is reported that the importance of volunteering in creating disaster awareness and need to be supported in previous studies[10-12]. In our study, 63.2% of the staffs voluntarily served in the HDEP and the level of knowledge of staffs was significantly higher. The status of volunteering was also important in terms of knowing the position and term of duty in the HDEP and it was concluded that these parameters had a positive effect on the level of knowledge. In the literature, in a study conducted by Şenet all, it was reported that the rate of personnel who knew the position and term of duty in the HDEP was 53.6% and knowing the position and term of duty in HDEP has been reported to increase the level of knowledge[12].

In our study, the rate of participation in training and practices was 87.5%. Şenet all reported this rate as 27%. In another study, it was found that there was very little participation. This low level of participation is attributed to the insufficient frequency of training and practices and to the failure to announce the training and practices to the personnel[11,12]. HDEP should be reviewed regularly and all staff should be given regular training[13,14]. Finding only a written HDEP is not enough to be prepared for disaster[15]. Additionally, the plan must also be supported with practices to evaluate it's effectiveness[16]. In a study, it was reported that the practices had a positive effect on the personnel, thus they felt more like a part of the team and were more enthusiastic[10]. Bartley et all concluded that training with videos about HDEP has achieved a positive effect on the level of knowledge[17]. In our study, the level of knowledge about HDEP, which is higher than current studies, can be attributed to the similarly high rate of participation in education and training.

At the time of the disaster, a competent coordinator who knows the plan very well should ensure the coordination and the chief physician conducts this work in the hospitals where the study is carried out[18]. Lack of knowledge about coordinator may trigger a second crisis in cases of disaster, where panic and chaos predominate. In a previous study, this rate was reported as 20%, while our study was highly correct.

According to HDEP preparation manual, different evacuation procedures should be applied according to the type of disaster and the situation of the patients in disaster and emergency situations. While horizontal discharge position is preferred in cases such as fire, explosion and collapse; In case of flooding or flooding, vertical evacuation procedure should be performed. Patients should also be classified and evacuated according to their mobility status. Şenet all reported a very low level of knowledge between 5-17%[12]. In our study, the knowledge about evacuation procedures ranged from 63 to 74%.

In case of disaster, many wounded patients are referred to hospitals, especially the nearest hospital. It is vital to classify patients and to begin treatment as quickly as possible by performing triage in order to perform the medical intervention that the injured need in the shortest time. In addition, if the capacity of hospitals is insufficient, triage is continued in the areas determined by the hospital[18]. In a study published in 2017, it is reported that the rate of people who knew triage classification was 10% and the rate of people who know the area to be applied triage in case of capacity overflow is 31,4%[12]. In our study, these rates were relatively higher. In addition to increasing the trainings and practices about HDEP, the

selection of HDEP personnel from emergency services may increase the rate of knowing about triage classification.

Table 5. Evaluation of the adequacy of individuals according to the characteristics associated with HDEP.

Characteristics associated with HDEP		Adequacy status		test value	p value
		insufficient	sufficient		
		n (%)	n (%)		
Employment in HDEP	Volunteer	5 (%5.5)	86 (%94.5)	$^{1}\chi^{2}$=70.007	p=0.001**
	Resignation	39 (%73.6)	14 (%26.4)		
Knowing about position in HDEP	Yes	12 (%11.1)	96 (%88.9)	$^{1}\chi^{2}$=73.353	p=0.001**
	No	32 (%88.9)	4 (%11.1)		
Knowing about terms of duty in HDEP	Yes	8 (%8)	92 (%92)	$^{1}\chi^{2}$=75.027	p=0.001**
	No	36 (%81.8)	8 (%18.2)		
The status about disaster experience	Yes	3 (%7.9)	35 (%92.1)	$^{1}\chi^{2}$=11.084	p=0.001**
	No	41 (%38.7)	65 (%61.3)		
The status about participation in internal disaster training or practice	Yes	27 (%21.4)	99 (%78.6)	$^{1}\chi^{2}$=36.206	p=0.001**
	No	17 (%94.4)	1 (%5.6)		
The status of disaster practicing (n=126)	Yes	4 (%8.2)	45 (%91.8)	$^{1}\chi^{2}$=7.140	p=0.008**
	No	23 (%29.9)	54 (%70.1)		

$^{1}\chi^{2}$: Continuity (Yates) Düzeltmeli Ki-Kare Test

$^{2}\chi^{2}$: Fisher Tam Ki-Kare Test
**p<0.01
*HDEP: Hospital disaster and emergency plan

CONCLUSION

As a result of our study, the knowledge level of one third of HDEP staff is insufficient and it was concluded that being a part of the education and exercises on disaster and having a high level of education had positive effects on the level of knowledge. In order to encourage personnel to participate in internal and external disaster training and exercises, to increase the frequency of training and exercise and to show the necessary sensitivity in order to inform the personnel, to support the training with video or practice, to be hanged in visible places of the codes and telephone numbers to be searched and evacuation procedures to be

applied at the time of disaster in each floor in order to inform the staff and to be voluntarily based on volunteer selection in HDEP are important to be prepared for disaster preparedness.

FOOTNOTES

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Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors. BitlisEren University approved the study with a date of 20.09.2018 and number of 2018/7-II.

Informed Consent: Written informed consent form was obtained from all the participants of the study.

Authors' contribution: EKK performed the concepts, study design, data collection; HÖ analysis, literature research and statistical analysis, KO article's drafting and manuscript editing and all authors have seen and approved the final version of manuscript.

Conflicts of interest: The authors have no conflict of interests to declare.

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