

## Evaluating the Real-World Impact of Desk-Based Disaster Preparedness: A Case Study of the Covid-19 Pandemic

### Masa Başı Afet Hazırlık Süreçlerinin Sahadaki Etkilerinin Değerlendirilmesi: COVID-19 Pandemisi Örneği

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#### ABSTRACT

**Aim:** The aim of this study is to evaluate the effectiveness of disaster management and preparedness activities based on the experience of compliance with the pandemic plan in a university hospital.

**Material and Methods:** The study was designed as a descriptive, cross-sectional investigation. A total of 645 employees from various professional groups working at a university hospital voluntarily participated in the study. The data were collected using a survey method. The Awareness Level Regarding the Pandemic Process Questionnaire was distributed via email. Descriptive statistics were calculated, and for the analysis of numerical variables, the "Student's t-test" was used if the variables were normally distributed, while the "Mann Whitney U test" was applied if the distribution was non-normal. For categorical variables, the "chi-square test" was employed.

**Results:** Survey completion rates were higher among nurses, while the lowest response rates were observed among other healthcare personnel. The proportion of employees with moderate or higher knowledge of the institution's pandemic plan was found to be 85%, whereas the rate of those with a high level of knowledge was 57%. Knowledge of the pandemic plan was significantly higher among women, those who received direct information, individuals informed by the infection control committee, participants in online training sessions, those aware of how to access procedure and guideline information, and employees who had previously participated in various in-hospital informational sessions or drills. Overall, it was observed that a majority of the survey respondents were well-acquainted with the hospital's pandemic plan.

**Conclusion:** Regular information sessions are crucial for updating knowledge and maintaining motivation. The disaster preparedness process, which is among the institutional priorities, will facilitate a comprehensive and effective response practice in real disaster situations when organized in accordance with its intended purpose.

**Keywords:** Disasters, disaster management, online training, hospital disaster preparedness

#### ÖZ

**Amaç:** Bu çalışmanın amacı, bir üniversite hastanesinde pandemi planına uyum deneyimine dayalı olarak afet yönetimi ve hazırlık faaliyetlerinin etkinliğini değerlendirmektir.

**Gereç ve Yöntemler:** Çalışma, tanımlayıcı ve kesitsel bir araştırma olarak tasarlanmıştır. Çalışmaya, üniversite hastanesinde çalışan çeşitli meslek gruplarından toplam 645 çalışan gönüllü olarak katılmıştır. Veriler, anket yöntemiyle toplanmıştır. Pandemi Süreci ile İlgili Farkındalık Düzeyi Anketi, e-posta yoluyla dağıtılmıştır. Tanımlayıcı istatistikler hesaplanmış, sayısal değişkenlerin analizinde, normal dağılım gösteren değişkenler için "Student's t-test" kullanılmış, normal dağılım göstermeyen değişkenler için ise "Mann Whitney U testi" uygulanmıştır. Kategorik değişkenler için ise "ki-kare testi" kullanılmıştır.

**Bulgular:** Anketi tamamlayanların oranı, hemşireler arasında daha yüksek bulunmuş, en düşük yanıt oranı ise diğer sağlık personelinde gözlemlenmiştir. Kurumun pandemi planı hakkında orta veya yüksek düzeyde bilgi sahibi olan çalışanların oranı %85 bulunurken, yüksek düzeyde bilgiye sahip olanların oranı %57 olmuştur. Pandemi planı bilgisi, kadınlar, doğrudan bilgi alanlar, enfeksiyon kontrol komitesinden bilgi alanlar, çevrimiçi eğitimlere katılanlar, prosedür ve kılavuz bilgilerine nasıl erişileceğini bilenler ve daha önce hastane içi bilgilendirme oturumlarına veya tatbikatlara katılanlar arasında anlamlı derecede daha yüksek bulunmuştur. Genel olarak, anketi yanıtlayanların çoğunluğunun hastanenin pandemi planı hakkında iyi bir bilgiye sahip olduğu gözlemlenmiştir.

**Sonuç:** Düzenli bilgilendirme oturumları, bilgilerin güncellenmesi ve motivasyonun sürdürülmesi için kritik öneme sahiptir. Kurumsal öncelikler arasında yer alan afet hazırlık süreci, amacına uygun şekilde organize edildiğinde, gerçek afet durumlarında kapsamlı ve etkili bir müdahale pratiği sağlanacaktır.

**Anahtar Kelimeler:** Afetler, afet yönetimi, çevrimiçi eğitim, hastane afet hazırlığı.

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## Introduction

The importance of disaster preparedness is often discussed after disasters occur. However, there is no standardized definition for the scope and methodology of the disaster preparedness process. In many countries, national regulations have established minimum standards for dealing with disasters. Hospitals' ability to respond rapidly and effectively is crucial in disaster situations. The completion of preparations and raising awareness beforehand are critical for defining roles and ensuring efficient resource use, minimizing chaos and risks.

Mayner and Arbon (2015) examined 110 definitions of disaster to identify the most consistent one, defining it as an event causing widespread harm to a community that exceeds its ability to cope (1). The Centre for Research on the Epidemiology of Disasters (CRED) categorizes pandemics among biological disasters (CRED, 2024) (2). According to the World Health Organization (WHO), a pandemic is defined as an outbreak that occurs globally or in a very large geographical area, crossing international borders, and usually affecting a large number of people (3). On March 11, 2020, the WHO declared COVID-19 as a pandemic, marking the first pandemic caused by a coronavirus in history (4).

When examining the chronology of pandemic preparedness in Turkey, it is noted that the process began in 2004, and the National Pandemic Preparedness Plan was published in 2006 (5). On April 13, 2019, the Presidency published a decree on "Global Influenza Pandemic" detailing the necessary measures for public institutions to take in the event of a pandemic that could affect the majority of the population (6). The decree emphasized the importance of protecting public health, preparing emergency intervention mechanisms, and training and protecting healthcare workers.

However, preparedness plans alone do not ensure successful execution during a disaster. Key factors such as internal communication, information flow, authority, decision-making, coordination, and ongoing review of command structures are crucial for effective implementation (7).

The first pandemic preparedness plan at Hacettepe University Hospitals was enacted in February 2014 under the title "Respiratory Infectious Diseases Pandemic Action Plan (8)." In March 2017, it was updated to the "Hacettepe University Hospitals Pandemic Action Plan (9)." Various revisions were made over time regarding procedural flows, algorithms, and the names of instructions. In line with global developments, the "COVID-19 (2019-nCoV Disease) Infection Control Directive" was added, and on March 2, 2020, the pandemic action plan was finalized (10). Following the detection of the first COVID-19 case in Turkey, the Pandemic Action Plan and the Hospitals' Disaster Plan were activated at Hacettepe University Hospitals on March 11, 2020 (12).

The awareness, knowledge, adherence to the pandemic plan, and challenges faced during its implementation at Hacettepe University Hospitals have not been evaluated. Existing studies mainly assess healthcare workers' preparedness for potential pandemics and their perceptions (13). However, following an actual pandemic, it is essential to treat the experience as a drill, document it, and conduct

evidence-based evaluations to guide process improvements and interventions at the institutional level. This study aims to evaluate the effectiveness of disaster management and preparedness activities based on the experience of adherence to the pandemic plan at a university hospital.

## Material and Methods

This study was designed as a descriptive cross-sectional study. The researchers used a questionnaire to collect data for the study, which included participants' demographic characteristics, the areas they worked in during the pandemic, and their knowledge regarding the pandemic process.

The study population consisted of all academic, auxiliary healthcare personnel, and administrative staff working at Hacettepe University's Adult, Pediatric, and Oncology Hospitals.

Following the declaration of the pandemic in March 2020, a survey titled "Awareness Level of Personnel Working at Hacettepe University Hospitals Regarding the COVID-19 Pandemic Process" was prepared to measure the knowledge of active personnel regarding the pandemic process. Personnel who had not worked actively for more than a year (due to reasons such as maternity leave, unpaid leave, military service, or administrative leave) were excluded from the study. The survey form was sent electronically, and a reminder was sent one week later.

During the pandemic, various departments at Hacettepe University Hospitals, including the Infection Control Committee and Nursing Management, provided training both face-to-face and through practical demonstrations. Disaster preparedness documents were shared via email and text messages, online programs on personal protective equipment were broadcasted, and training modules were made available. Specifically, three online training programs were developed.

The study questionnaire asked participants about their demographic characteristics, the areas in which they worked during the pandemic, and their general knowledge of the pandemic process and the pandemic plan at Hacettepe Hospitals, using a Likert scale for responses. Ethical approval was obtained from the Ethics Committee of Hacettepe University with approval number 35853172-900 and approval 16/06/2020.

## Statistical Analysis

Data analysis was performed using IBM SPSS Statistics 21.0 software (IBM Corp., 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.). Categorical variables are presented as frequencies or percentages, and continuous variables are presented as mean  $\pm$  standard deviation and median (minimum-maximum) values. One-way analysis of variance (ANOVA) and Pearson correlation analysis were used to compare the individual and professional characteristics of employees with their knowledge of and resources related to the pandemic. The chi-square test was used for comparing two categorical variables, while the non-parametric Mann-Whitney U test was applied for continuous variables. A statistical significance level of  $p < 0.05$  was considered.

## Results

At the time of the study, there were 5748 staff members in academic and administrative titles at Hacettepe University Hospitals. Staff on administrative leave and those with less than one year of work experience were excluded from the study. As a result, 1036 individuals did not meet the inclusion criteria, and a questionnaire was sent to 4712 individuals. A total of 645 individuals (13.6%) completed the survey. The largest group of respondents were nurses (23.4%), followed by administrative staff (10.4%), academic staff (10.0%), auxiliary support staff (8.6%), and other healthcare professionals (4.9%).

The distribution of average age, gender, length of employment, and job titles of the 645 respondents is shown in Table 1. Of the respondents, 241/645 (39.1%) had worked in COVID-19 units and/or areas providing outpatient services. A total of 446/640 (69.7%) staff members received direct information about the pandemic. Among those who received direct information, 77.5% were trained by the Infection Control Committee, and 49.7% received training from Hospital Management/Quality Coordination (Table 2). Considering participants with intermediate or high levels of knowledge, the knowledge levels for social distancing (99.3%), personal protective equipment (PPE) (99.2%), hand hygiene (99.0%), surgical mask usage (98.8%), hair-beard regulations (97.5%) were very good. Knowledge of name tags (86.5%) and N95 masks (90.1%) was at a good level. Knowledge of inpatient isolation (83.7%), patient transfer (79.1%), and sample transportation (73.4%) was at an intermediate-to-good level, while knowledge about accessing psychological support (62.3%) and psychological support for children (67.5%) was at an intermediate level (Table 3).

Characteristics n (%)	Results (n=645)
Age (years) Mean (SD)	36.5 (8.9)
Female gender n (%)	445 (68.9)
Years of employment n (%) <sup>*</sup> 0-5	
0-5	187 (29.0)
6-10	101 (15.7)
11-20	244 (37.9)
≥ 21	112 (7.3)
Job description n (%) <sup>**</sup>	
Academic staff	151 (23.5)
Nurse	227 (35.4)
Other healthcare staff	56 (8.7)
Administrative staff	124 (19.3)
Support staff	83 (12.9)

**Table 1.** Demographic Characteristics of the Staff

<sup>\*</sup>n=644, <sup>\*\*</sup>n=641

The knowledge of the pandemic plan of Hacettepe University Hospitals was reported by 642 participants. 24.8% of participants fully knew the plan, 32.9% knew it, 27.1% knew it at an intermediate level, 8.4% did not know it, and 6.9% had no knowledge of it (Table 3). A total of 544 (84.7%) participants had intermediate or higher knowledge of the pandemic plan. When comparing participants' job locations and their knowledge of the Hacettepe University Hospitals' pandemic plan, the highest knowledge level was found among nurses (91.1%), followed by auxiliary staff (82.9%),

academic staff (82.0%), administrative staff (81.9%), and technical staff (76.7%), with intermediate or higher knowledge levels.

Characteristics n (%)	Results (n=645)
Unit Worked in During the Pandemic:	
COVID ward/clinic	241 (39.6)
Non-COVID ward/clinic	173 (28.4)
Operating room	132 (21.7)
Administrative departments	21 (3.4)
Other	42 (6.9)
Knowledge of the Concept of Pandemic Before COVID-19 n (%)	524 (81.6)
Participation in Drills Before COVID-19 n (%)	39 (6.0)
Direct Information Regarding the Pandemic n (%)	446 (69.1)
Source of Pandemic Training Information (n=446)	195 (43.7)
Infection Control Committee only	71 (15.9)
Hospital management only	27 (33.8)
Infection Control Committee and Hospital management	27 (6.0)
Departmental Head of the unit worked	2 (0.4)
Other	
PPE online training viewing n (%)	
All of it	357 (55.8)
Some of it	107 (16.7)
None	176 (27.5)
Knowledge of access to pandemic plan instructions, procedures, and guidelines n (%)	544 (85.7)

**Table 2.** Staff Knowledge and Awareness Regarding the Pandemic

PPE: Personal Protective Equipment

Higher levels of knowledge regarding the Hacettepe University Hospitals' pandemic plan were found among female participants ( $p=0.016$ ), those who had received direct information about the pandemic plan ( $p<0.001$ ), those who received pandemic information from the Infection Control Committee ( $p=0.004$ ), those who had attended online pandemic training ( $p<0.001$ ), those who had previously participated in any drills ( $p=0.023$ ), and those who were familiar with procedures/instructions ( $p<0.001$ ) (Table 4). There was no significant difference in knowledge of the pandemic plan between staff working in the COVID-19 unit (83.6%) and those working in other areas (85.0%). Furthermore, no significant difference was found based on participants' age, length of employment, or knowledge of the pandemic plan ( $p>0.05$ ).

## Discussion

On March 11, 2020, the World Health Organization declared the COVID-19 pandemic due to the SARS-CoV-2 infection. At the same time, the Hacettepe Hospital Pandemic Action Plan and Hospital Disaster Plan were activated. As part of these efforts, informational and training sessions were initially held for academic staff, healthcare personnel, and other administrative staff at the hospital. During these sessions, preventive measures against the pandemic, diagnostic, treatment, and management algorithms set by the Ministry of Health, algorithms established by Hacettepe Infection Control Units, and appropriate usage methods for personal protective equipment were shared regularly with all hospital employees. By June 2020, when this survey was conducted, the Infection Control Committee had conducted 17 training

	n (%)				
	I don't know at all	I know a little	I know moderately	I know	I know completely
Hacettepe Knowledge of the pandemic plan	44 (6.9)	54 (8.4)	174 (27.1)	211 (32.9)	159 (24.8)
Ministry of Health pandemic plan	27 (4.2)	42 (6.6)	158 (24.6)	242 (37.8)	172 (26.8)
Hand hygiene knowledge	3 (0.5)	3 (0.5)	8 (1.3)	54 (8.4)	572 (89.4)
Social distancing knowledge	3 (0.5)	1 (0.2)	5 (0.8)	44 (6.8)	591 (91.8)
Name badge knowledge	56 (8.7)	31 (4.8)	50 (7.8)	79 (12.3)	426 (66.4)
Hair-beard knowledge	6 (0.9)	10 (1.6)	27 (4.2)	58 (9.0)	540 (84.2)
Personal protective equipment knowledge	4 (0.6)	1 (0.2)	23 (3.6)	92 (14.3)	523 (81.3)
Surgical mask knowledge	6 (0.9)	2 (0.3)	16 (2.5)	83 (12.9)	534 (83.1)
N95 mask knowledge	33 (5.1)	31 (4.8)	59 (9.2)	113 (17.6)	407 (63.3)
Inpatient isolation knowledge	59 (9.2)	46 (7.1)	83 (12.9)	137 (21.3)	319 (49.5)
Transfer knowledge	80 (12.5)	54 (8.4)	127 (19.8)	151 (23.6)	229 (35.7)
Sample transportation knowledge	115 (17.9)	56 (8.7)	90 (14.0)	164 (25.5)	217 (33.8)
Psychological support knowledge	174 (27.1)	68 (10.6)	139 (21.7)	102 (15.9)	159 (24.8)
Child support knowledge	93 (21.9)	45 (10.6)	80 (18.9)	75 (17.5)	132 (31.1)

**Table 3.** Staff Knowledge Level Regarding Pandemic Plan and Personal Protection

	Pandemic knowledge exists	No pandemic knowledge	p
Age (years), n (SD)	36.7 (9.6)	36.1 (8.7)	0.57
Female gender, n (%)	385/535 (71.9)	58/97 (59.7)	0.016
Direct information received, n (%)	404/542 (74.5)	40/95 (42.1)	<0.001
Information received from the Infection Control Committee, n (%)	320/405 (79.0)	25/42 (59.5)	0.004
PPE online training watched, n (%)	419/541 (77.4)	44/96 (45.8)	0.001
Participation in drills, n (%)	38/544 (6.9)	1/98 (1.0)	0.023
Knowledge of access to pandemic plan instructions, procedures, guidelines, n (%)	490/537 (91.2)	52/95 (54.7)	<0.001

**Table 4.** Knowledge of the Pandemic Plan of Hacettepe University Hospitals

sessions, the Hospital Quality Coordination had 11, and the Adult Hospital Chief Medical Officer had 6, along with 20 sessions from other units, all focused on reminding employees about new flow charts, necessary precautions, and protection measures.

No study has yet assessed hospital staff's knowledge level regarding informational meetings. This study aimed to measure hospital employees' understanding of the pandemic plan during the pandemic. A total of 645 employees (13.6% response rate) from Hacettepe University Hospitals completed the survey. Nurses were more likely to participate, while other healthcare personnel showed the lowest engagement. Among the respondents, 85% had an average or higher level of knowledge about the hospital's pandemic plan, with 57% demonstrating good knowledge. Knowledge was higher among women, those who received direct information, those informed by the Infection Control Committee, those who participated in online training, those aware of where to access procedures/instructions, and those who had participated in drills.

Labrague et al. (2017) conducted a systematic review of disaster preparedness among nurses between 2006-2016. The study found that prior disaster training led to better individual preparedness and that training and drills were critical for disaster response. It also highlighted the importance of first aid and infection control training for disaster readiness. However, despite knowing that their institutions had disaster preparedness documents, many nurses were unaware of specific protocols or where to access the documents, and a quarter had not read them. Previous studies on the effectiveness of disaster preparedness training have indicated that such training does not sufficiently increase disaster knowledge and awareness (13). For example, a study by Almukhlifi et al. (2021) assessed disaster preparedness among emergency service workers and found that most employees were inadequately prepared (14). Similarly, a systematic literature review by Williams et al. (2008)(15) found that disaster preparedness training was ineffective in improving knowledge and skills related to disaster intervention. Cotanda et al. (2016)

evaluated disaster preparedness training in a pediatric emergency department and concluded that while the training increased knowledge, there was no improvement in responses to practical situations. These results suggest that theoretical knowledge may not always translate directly into practical application (16). Although written instructions are crucial, hands-on online training programs are highly valuable for helping individuals understand the process. Bartley et al. (2007) found that a training video based on disaster drill images contributed to improving knowledge among assistant doctors (17). Our study also shows that employees who participated in online training programs had a better understanding of the pandemic plan process. Therefore, it may be important to include more visual and online training programs in future improvements.

In parallel, a randomized controlled trial by O'Connell (2021) conducted in a children's hospital with various professional groups found that digital training achieved greater success in reaching its goals and had higher satisfaction among participants (18).

In our study, only 6% of participants had previously participated in any drills, which is a low percentage. The World Health Organization's Health Emergency and Risk Management (EDRM) Framework (19) emphasizes the critical importance of preparedness and readiness for disasters, and recommends including disaster planning, development, and implementation in disaster coordination algorithms. According to the Hospital Disaster and Emergency Management Regulation (2020)(20), hospitals are required to conduct at least one desk-based and one field exercise annually with different scenarios. However, participation in drills is voluntary. Our study showed that having participated in a drill resulted in better knowledge and understanding of the general pandemic plan. This suggests that hospital management should place more emphasis on drills after the pandemic period (21).

During the pandemic, participants were highly knowledgeable about essential preventive measures such as hand hygiene, social distancing, and the use of surgical and N95 masks. The high level of knowledge among hospital staff is promising, as they serve as role models for the public. Notably, no significant difference was observed between those working in COVID wards/clinics and those in other units, nor did professional experience significantly impact knowledge levels. Moreover, pandemic management extends beyond disease control to include the psychological well-being of healthcare workers. Understandably, concerns about personal and family health were prevalent, particularly in the early stages of the pandemic. In this study, knowledge about psychological support for employees and their children was among the lowest. Despite expert-led informational efforts, a gap remains, highlighting the need for further initiatives in this area.

### Limitations

One of the significant limitations of this study is the response rate to the survey. Although approximately 650 employees were reached, and the distribution of roles was relatively similar, only 14% of the total staff participated in the survey. It is likely that individuals with more knowledge of the pandemic plan were more inclined to complete the survey.

Therefore, it can be assumed that the level of knowledge about the pandemic plan might be lower across the entire staff group.

### Conclusion

The results of this survey indicate that the majority of participants were well-informed about the hospital's pandemic plan. Both healthcare workers and administrative staff, as well as auxiliary health service workers, demonstrated a good level of knowledge regarding protective measures such as the use of personal protective equipment, hygiene rules, and social distancing. Managing the pandemic is also a psychological process, and employees require further information and guidance in this regard. It has been found that it would be beneficial to provide direct information, preferably through the Infection Control Committee, alongside online briefings during the training process. Regular informational meetings could play a crucial role in updating employees' knowledge and maintaining their motivation. In this regard, organizing the disaster preparedness process in line with institutional priorities will ensure comprehensive and effective response capabilities in actual disaster situations.

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