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Research Article

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Hospital Disaster and Emergency Plan in Biological Disasters (HDEP): Coronavirus (SARS-CoV-2) COVID-19 Pandemic System Model Example

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ABSTRACT

Introduction and Objectives: Man-made disasters can be grouped as technology and violence origin such disasters occur as a result of conscious or unconscious mistakes where chemical, biological, radiological, and nuclear threats are used. It has become significant for hospitals to prepare a plan, which includes information and practical actions, including all situations that require urgency and actions to be taken in emergencies that may occur in workplaces. Coronaviruses are a diverse group of viruses that infect many different animals and can cause mild to severe respiratory infections in humans. Two highly pathogenic coronaviruses of zoonotic origin, the severe acute respiratory syndrome coronavirus (SARS-CoV) and the Middle East respiratory syndrome coronavirus (MERS-CoV), emerged in humans in 2002 and 2012, respectively. At the end of 2019, the emergence of a new coronavirus, SARS-CoV-2, in the Chinese city of Wuhan caused an unusual viral pneumonia epidemic. In this study, hospital emergency management plan is examined to the currently effective pandemic element of COVID-19 disease.

Methods: It reviews the current situation and recommended actions to improve the preparedness of hospitals in five critical hospital roles during disasters: executing planning and coordination, maintaining disaster capacity, training and disaster drills with the broader health and public safety communities, protection hospital and staff, and surveillance as showing. In this context, coranavirus (SARS-CoV-2) COVID-19 hospital disaster emergency plan system model has been tried to be created. While creating the system method, it proposes a model of how the primary diagnosis and intermediate treatments will be handled in the risk method for the emergency room cases and the clinic, by handling confirmed and suspected cases through both the healthcare personnel and the medical supply system.

Results and Conclusions: As a result, the hospital emergency management plan can ease the emergency department workload, protect healthcare personnel, and control cross infection during the COVID-19 outbreak. Each hospital needs to create an emergency plan suitable for its own conditions. Hospitals can take interim measures, including online consultation, zoning, and epidemic priority to relieve pressure on clinical trials, reduce cross-infection, and strengthen protection of high-risk personnel.

Keywords: Hospital Disaster Emergency Plan (HDEP), biological disaster, coronavirus, SARS-CoV-2 (COVID-19) pandemic, CBRN

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INTRODUCTION

Disaster is expressed as a holistic situation of natural or man-made events that require a systematic approach so as to control, interrupt, or stop social life, lead to loss of life and property, and often cannot be overcome with local capacity [1]. The natural or man-made disasters causes the phenomena that leave the most permanent damage on living things, both materially and spiritually. The current days, although technology used extensively in many areas, it also brings with the risks of creating disasters due to misuse. Such disasters usually occur unconsciously and take place in industrial establishments [2]. In this context, chemical, biological, radiological, and nuclear (CBRN) disasters are damaging events belonging to these two sub-types, and the extent of the damage they cause may be large and their effects may be long-term and permanent [3]. For a possible case of such disasters, states should plan in advance what to do at the event and prepare in a large-scale disaster management plan. Hospital disaster and emergency

plan (HAP), developing disaster, and emergency management in hospitals, making hospitals physically and functionally disaster-prepared and resilient, within the framework of plans covering all phases of disaster management at the central and provincial level (IL-SAP) of the national health system are the plans developed by the Ministry of Health, with a standard framework and guide, in order to provide timely, rapid and effective response in case of disaster. The health sector has a great importance in disaster management. Health systems have a vital role to play in responding to these impacts. In addition, whatever the event that affects the society, no matter how the health systems are affected, on the one hand, routine health services have to continue. In terms of health systems, it is necessary to perform an effective response after a disaster, but the essential thing is to strengthen the capacity of health system and disaster risk management; reducing emergency and disaster-related health risks and consequences. The public health emergency/disaster risks faced by countries around the world are widespread and diverse. In this context, health risks and consequences associated with infectious diseases and epidemics, pandemic, unsafe food and water, chemical and radiation pollution, natural and technological hazards, conflicts, climate change, unplanned urbanization, and other factors can be specified. In order for countries and societies to cope with these health risks and their consequences. Today, the proactive approaches are focused on reducing exposure to danger and vulnerabilities, and therefore risks, in the face of all kinds of dangers in terms of ordinary and emergency health services, beyond the understanding of reactive intervention focused on "saving lives" in case of emergency and disaster [4]. The most comprehensive planning and applications between the emergency response plan and the event-specific plans are in question especially during epidemic/pandemic processes. While there is advance preparedness in response to national pandemic plans (for example, the pandemic influenza national preparedness plan), additional plans and tools are also included to support hospital administrators and emergency planning officials in defining and initiating hospital-level rapid response actions during the outbreak may come to the fore [5]. The hospital readiness checklist was developed for these purpose during the COVID-19 pandemic announced by the World Health Organization (WHO) at the beginning of 2020.

METHODS

Biological Disasters

Since the existence of mankind, they have used a number of tools and equipment and many different techniques and methods in the use of violence. Different weapons have been designed and modified for these purpose. While weapons with high destructive power that cause mass deaths were developed on the one hand, some microorganisms that cause disease in humans were reproduced and created a new war terminology, biological warfare. Biological threats are posed by species of living organisms that have all kinds of disease-causing, toxic or deadly properties on humans, animals and plants [6]. Another concept related with the biological hazards is biological agents which are organisms that contain poisons and are prepared to kill living things or make them sick, and their types are bacteria, toxins, and viruses. Humanity has faced many pandemics such as plague, measles, yellow fever, ebola, and SARS. One of the first records of an infectious disease are originated with the devastating plague of Athens, which killed nearly 40,000 people. After that, the deadliest infectious disease outbreaks in history, resulting in ~50 million deaths, were recorded by the black death (1347-1350) [7]. After that, until the 1900s, the plague became the feared biological disaster of many countries from time to time. 1918 Spanish flu (H1N1), 1957 Asian flu (H2N2), 1968 Hong Kong flu (H3N2), and 2009 H1N1 swine flu estimated 50 million, 1.5 million, 1 million, and 300,000 human deaths, respectively [8]. Other worst biological disasters in recent years were the 2013-2016 West African ebola virus disease (EVD) epidemic, affecting three major West African countries: Guinea, Liberia, and Sierra Leone. The ebola virus has demonstrated a high ability to spread through import and local transmission as well as other African countries (Senegal, Nigeria, and Mali) Europe and the United States. However, today, the new type of SARS-CoV-2 is affected all over the world with the deadly pandemic period [9]. Since the early 21st century, three types of coronavirus have affected humanity through deadly pneumonia. The severe acute respiratory syndrome coronavirus (SARS-CoV), which emerged in Guangdong, China, was transmitted to 8,098 people and 29 countries in 2003, while the Middle East Respiratory (MERS-CoV) syndrome coronavirus emerged in Saudi Arabia in 2012 and spread to 27 different countries. But nowadays, a new member of the coronavirus family, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), first reported in December 2019 in Wuhan, China [10,11]. Globally, 1 SARS-CoV-2 first reported in the Wuhan city of China in December 2019 globally, as of 6:15pm CET, 25 March 2022, there have been 476.374.234 confirmed cases of COVID-19, including 6.108.976 deaths, reported to WHO. As of 26 March 2022, a total of 11.054.362.790 vaccine doses have been administered [12-14].

Emergency

According to the definition made in the disaster and emergency response management services regulation published in the Official Gazette dated 18 December 2013 and numbered 28855, "emergency is the events that stop or interrupt the normal life and activities of all or certain segments of the society and that require urgent intervention and the crisis situation created by these events [15]." According to Disaster and Emergency Management Presidency's (AFAD) explanatory disaster management terms glossary, "emergency is defined as all situations and situations that require urgency, which are large but generally on a scale that can be dealt with by local means [16]." We can evaluate emergencies as fire and explosion, hazardous chemical substance release, natural disasters, incidents and accidents that require first aid and evacuation, food poisoning, sabotage, and pandemic.

Contingency Plan

The definition of emergency planning in the glossary of disaster management terms prepared by AFAD is as follows: "Planning the work and procedures before the events occur and during the event; all activities that require timely, rapid and effective implementation". According to the regulation on emergencies at workplaces, an emergency plan is a plan that includes information and practical actions, including the work and actions to be taken in case of emergencies that may occur in the workplace.

Emergency Management

Occupational health and safety management system is a tool used to analyze OHS activities within the framework of a continuous improvement approach by systematically addressing OHS activities in line with the general strategies of organizations. One of the

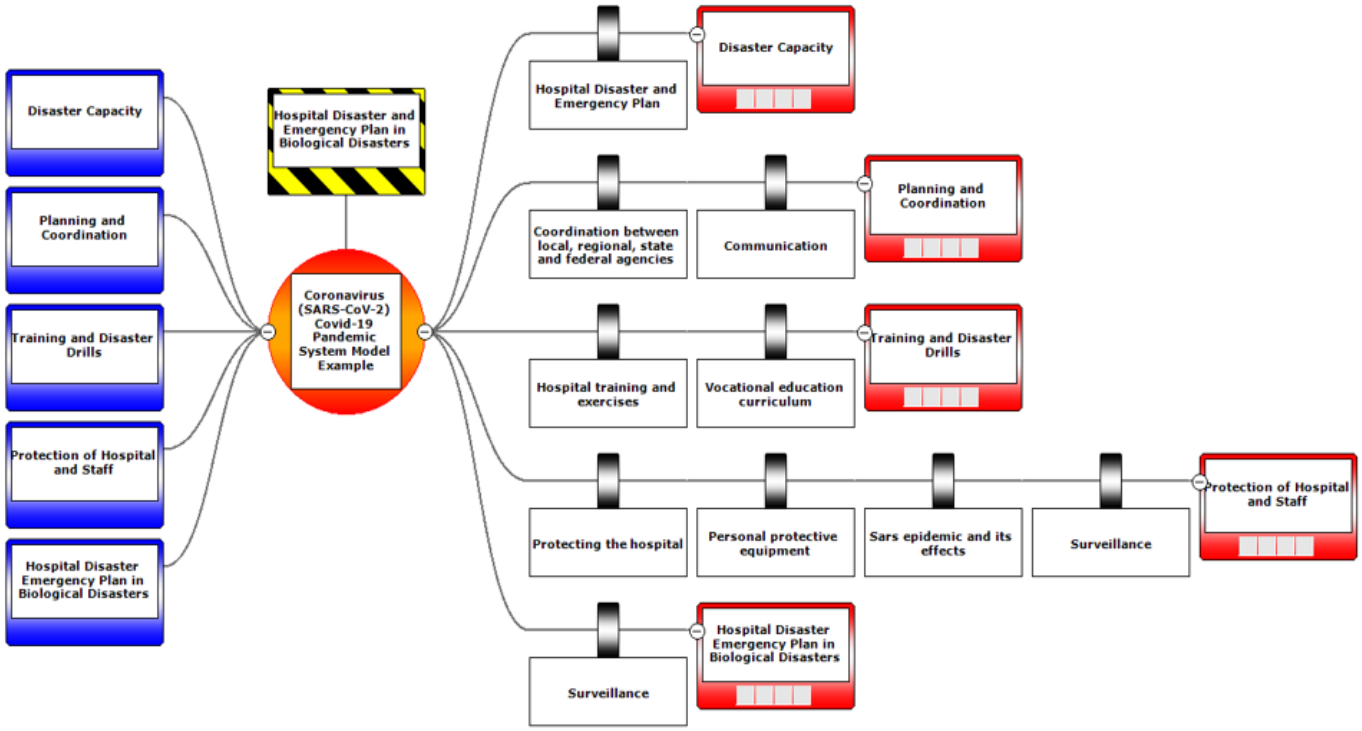

Figure 1. SARS-CoV-2 COVID-19 pandemic system model example

occupational health and safety management systems established in the workplaces is the emergency title. Emergency management includes a successive process consisting of four stages as prevention (taking regulatory physical or operational measures to prevent emergencies or mitigate their effects), preparedness (arrangements and mobilization of all necessary resources to prevent emergencies), response (minimizing the effects of an emergency immediately after it occurs), and regeneration (enovating facilities as soon as possible and making arrangements for the exposed community to recover quickly).

In TS 18001 Standard - Occupational Health and Safety Management Systems (OHSAS) is a standard related to Occupational Health and Occupational Safety determined by the British Standards Institution (BSI), the harmonized version of the internationally accepted occupational health and safety management system standard OHSAS 18001, which is an important resource in this field. The workplaces should do about emergencies as the organization should anticipate the likelihood of events and emergencies occurring, determine what to do in these situations, establish and maintain plans procedures to prevent or reduce possible illness, and injury that may result from them. The organization should review emergency preparedness, plans and procedures to be used in these situations, especially after incidents and emergencies occur. The organization should also try such procedures periodically where practical. It requires a systematic study, assignments are made in the organization within the workplace and it includes a working process within the framework of planning. The issues that workplaces should pay attention to in emergency management. It can be grouped under the some headings as determination of the team that will carry out the emergency work, determining a purpose for the work to be done in emergency situations, preparation of emergency plan and determination of inputs in other studies, planning and implementation of site visits, preparing reports containing deficiencies and presenting them to the employer, working together with the relevant units for the supply of emergency equipment, preparing an emergency plan for workplace by following the emergency plan preparation stages, making necessary plans for the training of emergency teams, planning the exercises, creating and implementing scenarios, and follow-up and control of studies.

Hospital Disaster Plan

It reviews the current situation and recommended actions to improve the preparedness of hospitals in five critical hospital roles during disasters: executing planning and coordination, maintaining disaster capacity, training and disaster drills with the broader health and public safety communities, protection hospital and staff, and surveillance as showin in **Figure 1**.

Evaluations of emergency department disaster preparedness consistently yield the same finding: emergency departments are better prepared than they used to be, but still fall short of where they should be [17]. A 2003 survey by the CDC (Centers for Disease Control and Prevention) provides a comprehensive picture of hospital readiness in the years following 9th September [18]. The severe acute respiratory syndrome (SARS) epidemic in 2003 says a lot about the global healthcare community's shortcomings in recognizing, controlling and transmitting potential infectious diseases. The rapid spread of SARS in early 2003 caught the world off guard and challenged the global public health infrastructure. A clinical syndrome characterized by fever, lower respiratory symptoms, and radiographic evidence of pneumonia SARS is caused by a coronavirus originally transmitted from an animal source. Case-control studies show that Guangdong province of China is the primary focus of infection and transmission. Between November 16, 2002 and February 10, 2003, the disease quietly is spread to provinces in China and neighboring countries before being officially recognized. The disease, which mostly affects adults aged 18-64, spread rapidly by infected travelers and "super-spreaders"–people who can infect others because they have high levels of contact, go undiagnosed for a long time

Table 1. Key concepts of hospital readiness challenges in biological events

Main categories	Sub-categories	
Education & training	Ineffective education	
	Scenic applications	
Resource management	Personnel management	Motivation factors
		Organizational factors
		Individual factors
	Surge capacity (equipment & construction)	
Patient management	Biological triage	
	Treatment management	
Risk communication	Risk perception	
	To inform	
Safety & health	Environmental safety	
	Personal security	
Laboratory & surveillance	Syndromic surveillance system	
	Lab detection feature	

and may have secondary conditions. Hospital (nosocomial) transmission has made healthcare providers, patients, and family members of both groups particularly susceptible. Nosocomial infections are infections that occur in hospitalized patients, healthcare personnel, visitors, and other hospital-associated persons, which have a causal relationship with being in a hospital. Deficiencies in public health infrastructures, both global and local, were evident at every stage of the epidemic. The virus was not reported from China for three months, and then the issuance of alerts was slow. Most warnings about symptoms were not recognized and guidelines for isolation or the use of personal protective equipment were ignored. The SARS outbreak in Toronto was triggered in part by a patient seeking care in the Toronto Emergency Department due to fever and cough. He spent the night in a crowded emergency room awaiting admission of what was then thought to be community-acquired pneumonia. He infected two nearby patients and several hospital staff with SARS during the night. Both this index case and the two patients it infected later died from the disease, resulting in a total of 31 patients and staff. Ironically, the hospital where this incident occurred continues to receive patients admitted to its emergency room [19]. However, the health workers clearly saw the most pain. The aggressive respiratory care provided actually helped spread SARS, while the inadequate availability of isolation rooms and personal protective equipment helped raise the case fatality rate for the disease to 10-15% [20]. According to December 2003 data, there were a total of 8,094 suspected cases of SARS, of which 774 died [21].

Events caused by biological events are a serious threat to the health and safety of citizens and can place a large financial and social burden on the affected community and health systems. The potential consequences and costs of not being prepared for such events can be overwhelming [22]. Biological disasters are a serious threat to the health and safety of citizens and can place a significant financial and labor burden on affected communities and health systems, and the potential consequences and costs of not being prepared for such events can be staggering [23]. In November 2019, a new coronavirus disease 2019 (COVID-19) was first reported and then spread in Wuhan, the capital of China's Hubei province. WHO has named the COVID-19 outbreak associated with the transmission of the novel coronavirus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) a public health emergency of international importance. The pandemic poses a powerful economic threat alongside a public health crisis. The virus has spread rapidly across continents, with more than 2,501,919 confirmed cases and more than 171,741 deaths by April 21, 2020 [24]. Therefore, prompt and appropriate response to such events (anthrax, ebola, COVID-19, etc.) can play an important role in reducing the harmful effects of these events on physical health and greatly reduce their psychological impact [23].

WHO has identified preparedness as an important part of the sustainable development process and emphasized the implementation of necessary activities. Despite these widespread efforts and advances in hospital preparedness to manage biological events, researchers have declared that the majority of hospitals are not yet well prepared for such events and that hospitals face numerous challenges due to the diverse pathophysiology of these events [25]. The health system of each country is responsible for the protection of human safety and health as the first and foremost demand [26]. According to a study conducted during the pandemic process, the main concepts and sub-concepts of hospital preparation difficulties in biological events are given as shown in **Table 1** [27].

SARS-CoV-2 COVID-19 Pandemic

Coronaviruses are a diverse group of viruses that infect many different animals and can cause mild to severe respiratory infections in humans. Two highly pathogenic coronaviruses of zoonotic origin, the severe acute respiratory syndrome coronavirus (SARS-CoV) and the Middle East respiratory syndrome coronavirus (MERS-CoV), emerged in humans in 2002 and 2012, respectively, in 2002 and 2012, turning the emerging coronaviruses causing deadly respiratory diseases into an epidemic [28,29]. At the end of 2019, a new coronavirus, named SARS-CoV-2, emerged in the Chinese city of Wuhan, causing an unusual viral pneumonia epidemic. In 2019, various healthcare facilities in Wuhan reported clusters of pneumonia patients of unknown cause, in Hubei province in China [30]. Similar to SARS and MERS patients, these patients had symptoms of viral pneumonia such as fever, cough, and chest discomfort, and in severe cases, dyspnea and bilateral lung infiltration. Among the first 27 hospitalized patients, most of the cases were epidemiologically linked to the Huanan Seafood Wholesale Market, located in downtown Wuhan, which sells not only seafood but also live animals, including poultry and wildlife. According to a retrospective study, the onset of the first known case dates back to December 8, 2019. On 31 December, the Wuhan Municipal Health Commission informed the public of an outbreak of unidentified pneumonia and notified WHO. This new coronavirus disease, also known as coronavirus disease 2019 (COVID-19), highly contagious new coronavirus disease has spread rapidly all over the world. It overwhelmingly outstripped SARS and MERS, both in terms of the number of infected people and the spatial range of outbreak areas.

The ongoing COVID-19 pandemic has posed an extraordinary threat to global public health. Independent teams of Chinese scientists have determined, through metagenomic RNA sequencing and virus isolation from bronchoalveolar lavage fluid samples from patients with severe pneumonia, that the causative agent of this emerging disease is a never-before-seen betacoronavirus. On January 9, 2020, the result of this etiological identification was made public. The first genome sequence of the novel coronavirus was published on the virological website on January 10, and later, more complete genome sequences identified by different research institutes were published on January 12 through the GISAID database. Subsequently, more patients were identified with no history of exposure to the Huanan Seafood Wholesale Market. A few familial clusters of infections have been

reported, and nosocomial infections have also occurred in healthcare settings. All these cases provided clear evidence of human-to-human transmission of the new virus. As the outbreak coincided with the approach of the first month of the new year, inter-city travel prior to the festival made it easier to contract the virus in China. This novel coronavirus pneumonia soon spread to other cities in Hubei province and other parts of China. Within 1 month, it had massively spread to all 34 provinces of China. At the end of January 15, the number of confirmed cases skyrocketed, with thousands of new cases diagnosed each day. On January 30, WHO declared the novel coronavirus outbreak a public health emergency of international concern. On February 11, the International Committee on Virus Taxonomy named the new coronavirus "SARS-CoV-2" and WHO named the disease "COVID-19" [31].

The COVID-19 outbreak in China reached its peak in February. According to China's National Health Commission, the total number of cases continued to rise sharply in early February, with an average rate of more than 3,000 new confirmed cases per day. China has implemented unprecedentedly stringent public health measures to control COVID-19. The city of Wuhan was closed on January 23, and all travel and transportation connecting the city was blocked. Over the next few weeks, all outdoor events and gatherings were restricted, and 18 public facilities were closed, most in cities and the countryside. Thanks to these measures, the number of new cases per day in China has started to decrease steadily [31].

However, despite the downward trend in China, the international spread of COVID-19 accelerated from the end of February. Large clusters of infection have been reported in an increasing number of countries. The high transmission efficiency of SARS-CoV-2 and the abundance of international travel enabled the rapid spread of COVID-19 worldwide. On March 11, 2020, WHO officially declared the global COVID-19 outbreak a pandemic. Since March, COVID-19 has been effectively contained in China, while the number of cases in Europe, the US and other regions has risen sharply.

As of August 11, 2020, 216 countries and territories from six continents have reported more than 20 million COVID-19 cases and more than 733,000 COVID-19 cases, according to the Johns Hopkins University Center for Systems Science and Engineering's COVID-19 dashboard. The high mortality rate occurred especially when health care resources were inadequate. The USA is the country with the most cases so far [32].

Although genetic evidence suggests that SARS-CoV-2 is probably a natural virus originating from animals, there is no word yet on when or where the virus first entered humans. It has been suggested that the market may not be the first source of SARS-CoV-2 seen in humans, as some of the first reported cases in Wuhan had no epidemiological link to the seafood market. A study from France detected SARS-CoV-2 by PCR (polymerase chain reaction) in a stored sample from a patient with pneumonia at the end of 2019, much earlier than the generally known onset of SARS-CoV-2 there. I thought it might have spread. However, this individual early report cannot provide a robust response to the origin and contamination of SARS-CoV-2, and therefore a false positive result cannot be ruled out. To address this highly controversial issue, further retrospective studies involving multiple bank samples from patients, animals and environments need to be conducted with well-validated assays around the world [33].

SARS-CoV-2 COVID-19 Hospital Disaster Emergency Plan

Confirmed and suspected cases of the 2019 novel COVID-19 alone to deal with the COVID-19 outbreak, tremendous demand has strained both healthcare personnel and the medical supply system. The SARS-CoV-2 emergency department undertakes the task of clinical admission, primary diagnosis and interim treatment for suspected COVID-19 cases. COVID-19 pathogen confirmed human-to-human transmission of severe acute respiratory syndrome coronavirus 2. That is why COVID-19 has expanded the risk of infection through case transport from Wuhan to cities in China and even around the World. The provision of qualified personal protection equipment (PPE) to healthcare personnel plays an important role in avoiding occupational exposure and infection. The US Centers for Disease Control and Prevention recommends gloves, gowns, respiratory protection, and eye protection as standard PPE for healthcare professionals for COVID-19 infection control. However, protective clothing, N95 respirators and goggles are not widely used in clinical practice and are therefore not in bulk stock. Temporary hospital management measures for the protection of medical personnel in conditions of heavy workload and shortage of PPE supply after the outbreak of COVID-19 are discussed.

Patients who apply to the hospital emergency should pass the emergency car park by ambulance or by their own and then pass to the triage area with the guidance of personnel. Afterwhile, the patients who are diagnosed as SARS-CoV-2 with rapid diagnostic test in triage are referred to the polyclinic. At the same time, swab samples are taken from these patients for the PCR test, and they are directed to the relevant laboratory. İf the result is positive, the patient and his contacts are informed and directed to the COVID-19 service. According to the urgency of the patients, the PCR test results can be expected, while they are directed to the blood and x-ray imaging service. According to the result obtained in X-ray, the patients can be referred to the computerized tomography service with physician control **Figure 2**.

Firstly, the hospital should focus on the urgency of treatment, through free online consultation to facilitate online clinical patient triage. Non-emergency patients may be advised to postpone their hospital appointment or visit other non-anti-epidemic hospitals. While applying self-quarantine practices at home to low-suspicion patients, treatment trainings are given and high-suspicion patients are invited to the COVID-19 service. via the green channel. The online clinic effectively alleviates the emergency department workload and facilitates early detection of potential cases.

Secondly, interim visit triage and separation are established. Appointed personnel perform pre-examination and triage to divide visits into low-suspect, high-suspect, and other patients, and ensure that different patients follow specified routines for entering the emergency room, and dividing the emergency room area into high-risk and low-risk zones. For suspected cases, the hospital, an independent fever clinic room, fever observation room and CT examination room are allocated. Cases confirmed by real-time quantitative reverse transcription polymerase chain reaction (qRT-PCR) and/or threshold cycle (CT) are transferred to the quarantine ward, while excluded patients are sent back to other departments or home. The emergency department separation triage system reduces cross-infection by limiting the activity intervals of both patients and emergency service personnel.

Third, the hospital needs to establish a capable command system with the highest priority, implement effective coordination mechanisms, preferably provide PPE and medical devices to the

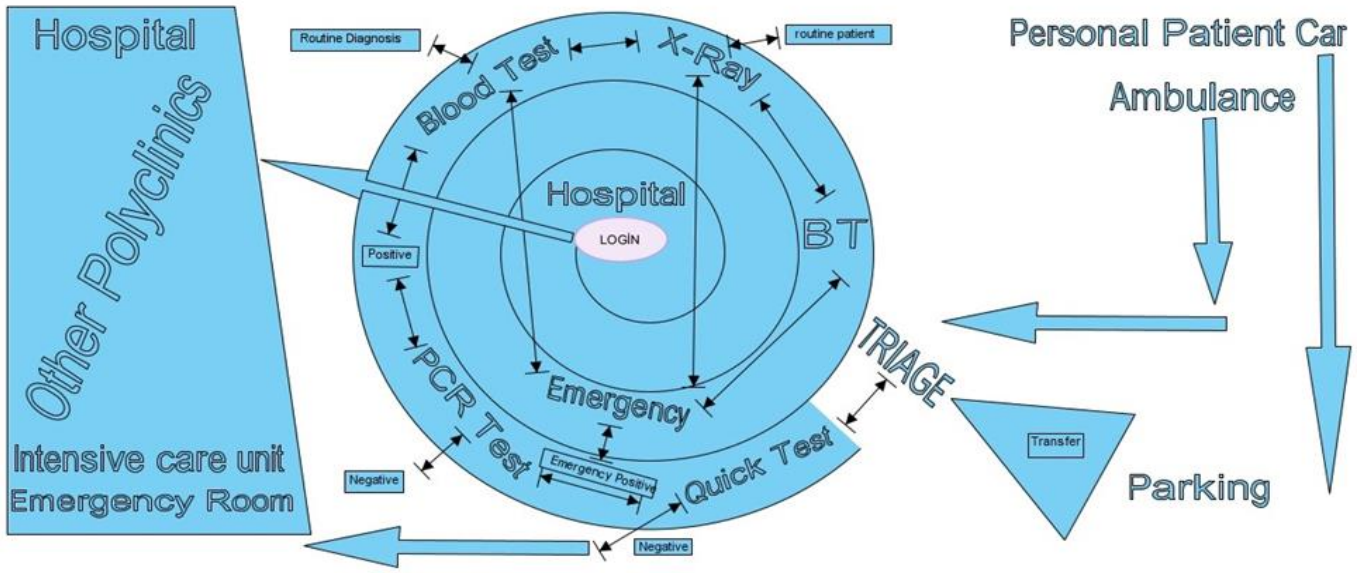

Figure 2. SARS-CoV-2 COVID-19 hospital disaster emergency plan

emergency department, equip triage and high-risk area personnel with standard personal protection, withdraw or postpone non-emergency appointments and operations, and the filiation team sends help. These measures concentrate the limited supply in the hospital, mostly on personnel in need of protection.

DISCUSSION AND CONCLUSION

As a result, the hospital emergency management plan can ease the emergency department workload, protect healthcare personnel and control cross infection during the COVID-19 outbreak. Each hospital needs to create an emergency plan suitable for its own conditions. Hospitals can take interim measures, including online consultation, zoning and epidemic priority, to relieve pressure on clinical trials, reduce cross-infection, and strengthen protection of high-risk personnel. Emergency and disaster preparedness has become an important issue and a global problem. Most hospitals could not continue their routine work for a week due to the disaster and resource shortage. However, the unforeseen epidemic has made temporary PPE preparation impossible, especially for less used PPE, protective clothing and N95 respirators in daily work. Creating a flexible hospital emergency plan can be more practical than having plenty of PPE prepared. However, there may still be some limitations. First, the procurement protocol compromises the protection of the health of low-risk personnel without standard PPE. Second, interim management strategies are unable to withstand large-scale epidemics and long-term PPE shortages. However, management strategies, as a temporary contingency plan, constitute the greatest benefit of extremely limited resources to meet the urgent need. The long-term solution must be a sustainable supply chain.

The biological disaster of COVID-19, which all countries of the world have experienced as a painful experience in recent years, emphasizes the necessity of increasing the capacity of countries' health systems and hospitals with risk management studies for the feasibility of studies against disaster response plans, establishing hospital disaster planning, and being ready for this with the managerial skills of the personnel. The decision mechanisms developed in this context provide great benefits in determining the level of resilience of hospitals against disasters and in designing recovery processes, and in the formation of hospital disaster planning [34]. When the COVID-19 has been considered, it is important to assess whether hospitals are ready to increase their capacity and respond. In this context, very limited researches are available [35]. Within the scope of this study, the main reason why hospitals focus on the COVID-19 example in biological disasters includes a regulation on how work activities for CBRN threats are the management planning applied in hospitals in terms of disaster risk management. As shown in **Figure 1** and **Figure 2**, the applications of emergency services are insufficient. These practices are required by all hospitals to revise similar guidance and strategy planning annually.

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Author contributions: YA: developed the protocol, summarized and analyzed the data, wrote the article, and vouched for it; **NV:** provided support on academic consultancy and administrative process management throughout the entire research process; and **NPC:** made the review and regulation. All authors approve final version of the article.

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