

Managerial Preparation and Process Management in a 3rd Stage Hospital had Became a Pandemic Hospital in the Fight Against the COVID-19 Pandemic: A Study From Turkey

Özgün Araştırma
Research Article

Covid-19 Pandemisine Karşı Mücadelede Pandemi Hastanesi Olan 3. Basamak Bir Hastanede Yönetsel Hazırlık ve Süreç Yönetimi: Türkiye'den Bir Çalışma

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ABSTRACT

Objective: We aimed to present and share the measures taken in pandemic preparedness and management process; the regulations made, the reactions given to emergency events and the new developed strategies

Methods: The pandemic preparation phase, hospital arrangements, physical arrangements, personnel planning, crisis desk establishment for the pandemic process, the management of the patients with suspected/definite Covid-19 diagnosis from the referral to Covid-19 outpatient clinic and Emergency Service, the management of Pandemic Services and Intensive Care Units 0, solutions for urgent problems, also precautions taken for possible contamination of healthcare workers and their health screenings, psychosocial support for healthcare workers and patients, planning's for outpatient clinics, operating rooms. In addition rapid delivery of Covid-19 patients' data to local and central government, PCR and rapid test applications, personnel work and shift systems in all areas, flexible working system, and finally, data including ex rates related to patients were evaluated retrospectively.

Results: Five thousand sixty two patients applied to the Covid-19 polyclinic. For 232 of patients diagnosed with suspected/confirmed COVID-19, treatment was planned and followed-up as outpatients. Three hundred eighty-eight patients were hospitalized,. On the other and, 463 of the patients with a suspected/confirmed diagnosis of Covid-19 who admitted to the emergency service were hospitalized. One hundred sixty nine of inpatients were admitted to intensive care units. Totally the patients who require mechanical ventilation, respiratory support, and intensive care follow-up was found 11.3% and 61.1% respectively. 38 of total 198 hospital staff had infected with Covid-19. Diseases were not mortal.

Conclusion: The pandemic approach is an active, variable and dynamic process, and institutions should always be prepared for such pandemics in addition sharing hospitals' managerial experiences will help to administrations to develop strategies in the ongoing pandemic process and in emerging situations. However, new management processes should be investigated for better results.

Keywords: Covid-19, hospital management, pandemic preparedness management

Öz

Amaç: Pandemiye hazırlık ve süreç yönetiminde alınan tedbirler, yapılan düzenlemeler, acil olaylar karşısında verilen reaksiyonlar ve geliştirilen yeni stratejileri sunmak ve paylaşmaktr.

Yöntem: Pandemiye hazırlık aşamasında, kurulan kurullar, kris masası oluşturulması, alınan kararlar, hastane içinde yapılan, fiziki düzenlemeler, personel hazırlıkları, olası/kesin Covid-19 tanılı hastaların Covid -19 polikliniği ve Acil Servis'ten itibaren yönetimi, Pandemi Servisi ve Yoğun Bakımların yönetimi, hasta sevk ve kabulleri, acil gelişen problemlere karşı geliştirilen çözümler, sağlık çalışanının bulaştan korunması için alınan tedbirler, personel sağlık taramaları, sağlık çalışanına ve hastalara psiko-sosyal destek, poliklinikler, ameliyathanelerin yönetimi. Ek olarak Covid-19 hasta verilerinin hızlı bir şekilde yerel ve merkezi yönetim birimlerine ulaşılması, PCR ve hızlı test uygulamaları, tüm alanlarda personel çalışma ve nöbet sistemleri, esnek çalışma sistemi, ve nihayetinde hastalarla ilgili sonuçları içeren veriler retrospektif olarak değerlendirildi.

Bulgular: Covid-19 polikliniğine toplamda 5062 hasta başvurdu. 232'si olası/kesin Covid-19 tanısıyla tedavisi düzenlenenere ayaktan takibe alındı. 388 hasta hastaneye yatırıldı, Diğer yandan Acil servise başvuran olası/kesin Covid-19 tanılı hastaların 463 ü hastaneye yatırıldı. Bu hastalardan 169'u yoğun bakımlara yatırıldı. Toplam ve mekanik ventilasyon, solunum desteği ve yoğun bakım takibi gerektiren hastalarda mortalite hızı sırasıyla %11,3 ve %61,1 idi. 1982 hastane personelinden 38'inde bulaş görüldü. Personellerde mortalite görülmmedi.

Sonuç: Pandemi süreci aktif, değişken ve dinamik bir süreç olup kurumların her zaman bu tür pandemilere hazırlıklı olması ve hastanelerinin yönetsel tecrübelерini paylaşmaları, devam eden pandemi sürecinde ve yeni gelişebilecek salgın durumlarında hastanelerin yönetmelerinin strateji geliştirmesine yardımcı olacaktır. Ancak daha iyi sonuçlar için yeni yönetim süreçleri araştırılmalıdır.

Anahtar kelimeler: Covid-19, hastane yönetimi, pandemi hazırlık yönetimi

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INTRODUCTION

Covid-19 infection, which was first appeared in Wuhan City of Hubei province of China on December 31, 2019. is aggressive, destructive and spreads worldwide.

The first Covid-19 case was seen on March 9, and the early death related to Covid-19 was seen on March 17, 2020, in our country. All countries in their health systems are struggling with the pandemic in communication with the World Health Organization. Providing adherence to international and national algorithms, preparation, and process management for pandemics may change even between same country hospitals according to the hospital's structure and dynamics. When the literature on the Covid-19 pandemic is examined, it is seen that the vast majority of these are medical researches related to the Covid-19 infection. The number of scientific studies related to the hospitals' administrative preparation and process management is quite limited, which does not cover the full hospital operation.

We aim to present and share measures taken in pandemic preparation and process management, arrangements made, reactions to emergencies, and new strategies improved in a university hospital.

MATERIAL and METHOD

In this study, hospital and physical arrangements, personnel planning, crisis desk establishment for the pandemic process are presented. Also, Covid-19 outpatient clinic, inpatient clinic, emergency service, Intensive Care Units, operation rooms programming is presented. Additionally, precautions are taken for infection protection in healthcare workers, screening for Covid-19 infection, and precautions taken in contaminated clinics. The follow-up of the supply and distribution of personal protective equipment, psychosocial support for healthcare workers, staff system, PCR, and rapid test applications, speed telecommunications network with local and central

health government were presented. Finally, the patients' data internalized with Covid-19 infection between March 15, 2020-May 31, 2020, were presented.

RESULTS

Hospital Management:

University of Health Sciences Turkey Izmir Bozyaka Training and Research Hospital has 570 inpatient capacities.

After the Covid-19 infection was first seen and spread in China, pandemic preparedness planning started in January 2020 in our country. Hospital Pandemic crisis desk was established. Pandemic crisis desk members consisted of hospital directors, infectious diseases, internal medicine, emergency service, anesthesia, intensive care, chest diseases, radiology, otolaryngology, and intensive care unit clinic physicians and nursing department directors. Precautions to be taken, and algorithms to be followed were planned.

Inpatient clinics services for Covid-19 infected patients and healthcare professional's rotating shifts were planned. The personal protective equipment (PPE; face shield or goggles, Facemask, isolation gown, gloves) that the workers should use was determined according to department and Covid-19 contamination risk. All workers were trained on the use of PPE for protection against Covid-19 infection according to Ministry of health guidelines (KHGM, 2020). Initially, there was an uncontrolled demand and consumption of PPE and disinfectant materials without indication due to Covid-19 disease transmission fear. This situation has disappeared by the time with psychosocial support and the repetition of training for PPE use. The PPE stock level of each department was monitored for rational consumption. The Infection Control Committee of the hospital (ICC) repeated the training and controls to prevent unnecessary equipment wastage.

Covid-19 triage and Emergency room Precautions:

The first Covid-19 case was accepted to our hospital on March 15, 2020. For the isolation of patients admitted to the Emergency service, a new separated examination area was created. This area had separated entrance and exit doors that were suitable for air conditioning. Thus, isolation was provided, and contamination risk was reduced. A swab sampling cabin was built in the Covid-19 examination area. A barrier has been created between the healthcare professional and the patient. The professionals working in this area used full protective equipment (N95 or FFP mask, isolation gown, non sterile gloves, face shield or goggles).

Precautions are taken in the radiology unit:

In Covid-19 suspected cases, direct chest radiography or Computerized Tomography (CT) was used after physical examinations. Standard shooting protocols have been created to comply with world standards in tomography devices. Direct X-ray, USG, and CT devices used for Covid-19 patients were separated, and a separate route was planned to access these devices. The devices were cleaned, and the shooting room was air-conditioned for at least 15 minutes after each use. To interpret the images quickly, the number of physicians on duty was increased, and each shot was reported for 15 to 60 minutes.

Planning of Covid-19 inpatient clinics:

By the increase in the number of cases that should be internalized with the diagnosis of Covid-19, isolated Pandemic services were created. Isolation was achieved by placing one patient in the rooms. In the case of necessity, two patients with the exact diagnosis of Covid-19 were hospitalized in the same room. Patient Visit was forbidden. As the number of patients increased, new services were opened. In total, 13 Services with an 8-bed capacity and an Infection Diseases Clinic with a 16-bed capacity were opened as the Covid-19 clinic. The total number of service beds was 120. One Specialist Physician, one Assistant Physician, and two nurses worked in each Pandemic Service.

Planning the intensive care units

Patients who needed intensive care admission on their first admission to the hospital or Covid-19 inpatient clinic follow up are transferred to the 10-bed 3rd Stage Intensive Care Unit of our hospital. Later, the 7-bed 2nd Stage Intensive Care Unit also started to serve Covid-19 patients. Due to the increase in the number of patients with Covid-19, the intensive care bed capacity was increased to 20. In case of need, patients were transferred to other hospital's intensive care units via the Fast Data Network established within the Provincial Health Directorate. After a while, it became necessary to establish an intermediate intensive care unit for critical patients' follow-up. Thereupon, a 12-bed internal medicine-neurology intensive care unit transformed into Covid-19 intermediate intensive care unit. Thus, by closely monitoring the patients, complications were avoided, and the intensive care unit was used more functionally. This Intermediate Intensive Care Unit was so functional, and we thought we had to open it earlier and were a little late in this regard.

Planning the laboratories:

A PCR unit was established in the Microbiology Laboratory of our hospital to study Covid-19 swab samples. Covid-19 PCR machine was placed in an isolated company, and swab samples prepared in a bio safety cabinet. The laboratory has reached the capacity to run around 300 PCR tests per day. PCR tests of 8 other Izmir city hospitals were studied in this laboratory. Rapid antigen and antibody tests were also performed. Personnel's who were carrying these materials were identified and trained following the instructions of the Ministry of Health of the Republic of Turkey. Sample collection areas were created to reduce the risk of contamination. Microbiology department workers used PPE to prevent contamination. Between March 26 and May 15, 2020, 13008 PCR and 1089 rapid antibody tests were performed.

Management of Personnel Planning

All physicians younger than 55 and without any

health excuses were assigned in Covid-19 Triage Polyclinic and Pandemic Services with necessary isolation and break times. At the beginning of the pandemic, some physicians and some other healthcare workers refrained from being assigned in Covid-19 related fields due to fear of the disease's mortal course. Immediately necessary procedures and psychosocial support were provided, and this issue was overcome.

Some of hospital staff states that they are not suitable for working in Covid-19 services because of personal illness. Disease reports of them were evaluated by a commission consisting of Infectious Diseases, Internal Medicine, General Surgery, Cardiology, and Physical Therapy and Rehabilitation physicians. Those whose medical condition is not suitable for working in areas related to Covid-19 were determined.

Specialists worked with 8 hours shifts in the Covid-19 triage polyclinic. More physicians are assigned in case of high number of patient's administration. In the 8-bed Pandemic wards, a specialist physician worked for 8 hours and seven days. After this period, they rested for five days.

Assistant physicians were assigned in pandemic services. After a 24-hour shift, the physician took a rest for 48 hours and left the pandemic service after four shifts. As the symptoms of fatigue and burnout started in the anaesthesia assistant physicians during the pandemic's progress, all surgical unit assistant physicians were assigned to the intensive care unit under an anaesthesiologist's responsibility.

To prevent cross-contamination among nurses, the shift team workers are fixed with the same persons. According to the legislation, more than 40% disabled personnel and pregnant women were on administrative leave. The staff's shift planned to work 24 hours and rest for 72 hours.

To protect the hospital staffs from possible contamination, to ensure resting and to reduce

contact in all institutions throughout the country, those with a disability health report and those over 65 were ensured to stay at home by giving them administrative leave by the central government. Besides, a Flexible Working model was developed so that enough personnel to sustain the hospital's current running worked in the institutions, thus allowing other personnel to rest. Also, taking into account the decrease in hospital income due to the pandemic, the central administration made payments at the highest level to prevent all hospital staff's victimization.

Hospital Staff Transport and Accommodation Planning:

The accommodation planning was made in coordination with the Provincial Health Directorate. The facilities where pandemic workers can stay were planned and announced throughout the province of Izmir. On the days when the central administration declared a curfew, the transportation planning of the healthcare workers and the patients who will be discharged was made by hospital cars.

Management of the Psychological-Social Support for Hospital Staff and Patients:

Especially in the early days of the pandemic, personnel had some concerns such as anxiety, fear of getting infected, and the possibility of infecting their families. These problems were closely monitored. Health worker visits were made by psychiatrist, and psychosocial support was provided. In this process, our employees, who were hospitalized with Covid-19, were closely followed. A polyclinic was also established for psychosocial support for hospital staff, and a psychologist was assigned to this unit. The substructure for online psychotherapy sessions was prepared upon the staffs' demand.

Hospital's Housekeeping Department Management:

Before the Covid-19 suspected case admission started, the need for extra Cleaning and Clinical Support Officers of each unit was determined, and additional staff planned for the necessary services. Cleaning staff in units that patient load decreased,

such as polyclinics and operating rooms transferred to Covid-19 services, Covid-19 imaging areas, Covid-19 triage clinic, and microbiology laboratory. The Infection Control Committee gave special cleaning and hygiene training for Covid-19 infection. A questionnaire was performed after training, and the training was repeated on the unclear subjects.

The number of daily cleaning sessions in pandemic areas and other areas were increased. In Covid-19 areas, apart from routine cleaning, disinfection was provided after patients were discharged. For cleaning, two mobile teams consisted of 6 workers were established, and these teams always cleaned the dynamic areas (such as stair railings, patient sitting areas, toilets). All hospital waste was evaluated as "medical waste," and training was provided to dispose of it. Continuous checks were made, and defects were detected.

Measures in the Cafeteria's

Firstly, the number of tables and chairs in the Central Dining Hall was reduced to maintain physical distance. The arrangement was made so that one person or two people eat at a table to provide physical distance. Time zones were created for lunchtime. Disposable plates, plastic forks, spoons, and knives were used to prevent contamination. Fruits, desserts, soups, etc. were added to the menus so that the staff and patients could get enough calories and vitamins. The meals were distributed to the floors of the personnel working in the pandemic services and ensured that they did not use the dining hall. Thus, the risk of contamination has been reduced.

Management of Outpatient Clinics:

Coherent with the restrictions applied during the pandemic process, there were serious reductions in the number of patients admitted to the non- Covid-19 clinics. It was ensured that a polyclinic from each unit was open in a way that would not cause patient victimization. Under the Ministry of Health instructions for patients over the age of sixty-five, additional "Home Health Care Services" teams were provided to examine these patients at their homes

and continue their treatment without interruption. These teams provided the transfer of patients who needed to be transferred to the hospital.

Management of Personnel Screening for Covid- 19

A polyclinic was opened for symptomatic health personnel, where an infectious disease specialist was assigned. It was ensured that the personnel was easily examined and provided swab samples when needed. PCR and rapid diagnostic tests were used for screening.

Management of Confirmed/Suspected Covid-19 Cases

First examinations of outpatients were made in Covid-19 triage polyclinic. It was conducted coherently with the determined algorithms of the Health Ministry. According to these algorithms:

-Patients with confusion or tachycardia ($>125/\text{min}$) / respiratory distress or tachypnea ($>22/\text{min}$)/or hypotension ($<90/60$)/saturation $<93\%$ were hospitalized.

For patients over 50 years of age who did not have the specified symptoms or had comorbid diseases, a whole Blood tests+ CRP + Ferritin and D-Dimer + Chest X-ray or CT tests were performed.

Patients with normal or mild pneumonia findings in imagining examinations and a blood lymphocyte count of $\geq 800 / \mu\text{L}$ and serum CRP $\leq 40 \text{ mg/L}$, ferritin $\leq 500 \text{ ng/mL}$, D-Dimer $\leq 1000 \text{ ng/m}$ were started on hydroxychloroquine sulfate treatment, and samples were taken for PCR and directed home for follow-up. Fourteen days of isolation were suggested to the patients. All these patients followed every day by the team formed by the Provincial Health Directorate and their family physician via phone. Patients whose PCR test was negative but whose symptoms continued or worsened were re-evaluated at the hospital with their family physicians' direction. Patients with positive PCR tests and showing recovery were treated at home, followed up by their family physicians, and ensured to stay at home quarantine for 14 days. Patients whose symptoms worsened

were re-evaluated at the hospital and were hospitalized and followed up in the hospital when necessary.

Patients with bilateral widespread pneumonia findings on imaging or with blood lymphocyte count <800/ μ L CRP > 40 mg/mL or ferritin > 500 ng/mL or D-Dimer >1000 ng/mL Empirical Treatment: Hydroxychloroquine 1 sulfate and/or Favipiravir + / - Azithromycin treatments were initiated.

For intubated patients or patients with poor general conditions, the emergency department's intensive care area was separated, and isolation was provided with other patients. According to the patients' indication, the patient was admitted to 1st, 2nd, and 3rd step Covid-19 intensive care units.

Inpatients were evaluated twice a day via visits by the service specialists and Infectious diseases specialists. Necessary treatments and discharges of the patients were planned. Favipiravir, cytokine absorption, and immune plasma treatments were provided by central and local administrations fastest. Favipiravir treatments were conducted co-ordinately with the Izmir Provincial Health Directorate. In the case of a positive diagnosed patient in the Covid-19 polyclinics or the services, Provincial Health Directorate informed the patients immediately and contacts determined, and the filiation process was initiated.

It was observed that patients who did not fully comply with the confirmed/suspected Covid-19 patient definition were hospitalized in Pandemic services. When examined, it was concluded that these situations reasoned from the concern that missing out a patient of the Emergency service physicians and emergency Covid-19 polyclinic physicians. The problem was solved by ensuring that the physicians obtain a consultation from Infectious Diseases or Pandemic Service Specialists in case of a patient whose hospitalization was considered.

Management of the Operating Room Services

The process was regulated throughout the Covid-19 pandemic according to the Health Ministry's guidebooks and scientific data. Elective operations and non-urgent local procedures were aborted. Training about Covid-19 was conducted to all operating room staff. There were concerns about treating Covid-19 patients that overcome in a short time.

During this period, urgent cases, along with oncological operations, were executed. A part of the operating room was separated in two; a part was used for Covid-19 negative patients' operations. The other part was used for possible Covid-19 positive patients' operations. All of the patients examined again for any Covid-19 symptoms. It was ensured that all the cases enter the operating room with a mask. Unlike old routine practices, the patient was directly taken to the operating room instead of the preoperative preparation room. For all the cases, operations were conducted with the same and minimum possible number of healthcare workers. Post-op recovery was performed in the operating room. Post-operative suspected/positive Covid-19 patients who in need of ICU were admitted to Covid-19 ICU's and post-operative Covid-19 negative patients who in need of ICU were admitted to clean ICUs. A detailed cleaning was performed in the operating rooms after every operation. All the necessary precautions were taken, and essential practices were performed with the utmost because all cases undergoing surgery could be Covid-19 positive.

Management for Cancer Cases.

Polyclinic services to the cancer patients were continued. The staff that works in the chemotherapy field were worked neither Covid-19 services nor emergency Covid-19 polyclinic. In the chemotherapy field, all the practices were performed with masks, both the personnel and patient.

Management of the Communication.

To quickly communicate, messaging groups were created. The Hospital Manager immediately shared

all notifications from the Ministry of Health and the Provincial Health Directorate, Covid-19 related algorithms, and the notifications made from within the hospital in the relevant groups. These posts were regarded as official notices. Crisis Desk and the messaging group were established to effectively monitor the Public Health Management System (PHMS), which was established to ensure the rapid data flow of Covid-19 cases to the Ministry of Health. Nearly 100% of the results were obtained in the data's immediate entry into the system by sharing the patients' information daily in this group.

Measures to Prevent Personnel Transmission

To protect all the personnel, PPE the whole was provided. Physicians and nurses in charge of pandemic services were ensured to be provided with FFP-2, FFP-3 masks, bonnets, overalls, gloves, and surgical shirts to work. Physicians and nurses in charge of ICUs were ensured to be provided with FFP-2, FFP-3, mask overalls, bonnets, gloves, and boots to work. Nurses are assigned for drug deliveries from the central hospital's pharmacy. Staff from pandemic services and intensive care units was prevented from coming to the pharmacy. On the Ministry of Health's instructions, drug returns from Covid-19 services were not accepted; thus, the risk of transmission was reduced. Special booths were created to take swab samples, reducing the risk of contact and contamination. Maximum attention was paid to ensure that all personnel working in Pandemic Services were worked in shifts and rested. In the other hospital units, personnel numbers were minimized enough to sustain the function of the unit.

Measures taken in the Clinics Which contamination source was Hospital Staff.

Swab samples and quick antigen tests were taken from the person who had contacted infected personnel. Quarantine was implemented for those who had close contact. These people were followed-up by the filiations' team for 14 days. Patients whose health status is appropriate discharged, these units was closed temporally. Covid-19 negative patients in

these clinics were transferred to another hospital to maintain their treatment.

Determining the Potential Source of Covid-19 Infection for Hospital Staff.

In March 2020, the total number of employees working in our hospital was 1838. A total of 38 personnel in 12 units had infected. Twelve of the personnel were treated at hospitals, the rest of them treated as outpatients. The infected personnel's distribution was as follows: 10 physicians, 18 nurses, five cleaning personnel, two officers, two radiology technicians, 1 data entry personnel. All the infected personnel had recovered after their treatment, and they got back to their services. Neither morbidity nor mortality was experienced.

Although it was not possible to determine the exact way of transmission, there was a possibility that physicians that attended congresses at the beginning of the pandemic had played a role in 2 services that experienced the most transmission. Most of the other transmission was personal transmission in the pandemic field workers, and these were thought as an in-hospital transmission.

Medical Device and Supplies Management:

During the Covid-19 pandemic, the supply need for all the clinics primarily determined. PPEs were prepared based on clinic needs and delivered to the health employees to use in the clinics. During this process, all the PPEs delivered to the clinics one by one every day, and it was supplied more if it was needed. Stock depots had worked 24 hours/7 days in this period. Our hospital provided the required sphygmomanometer, thermometer, stethoscope, pulse oximeter, monitor, etc. medical devices.

Training

During the pandemic, all the training about Covid-19 was given with Infection Control Committee nurses by visiting the clinics. Personnel could access this material on Hospital Data Management System or via phone to provide the personnel with all the training material. Orientation training was given to

the healthcare workers who just started working. Supervisor nurses made controls on shifts. Problems quickly detected and solved.

Presentation of the Hospitalized Suspected/Confirmed Covid-19 Cases Briefly:

Among the March 15, 2020-May 31, 2020, 5062 patients applied to the Emergency Covid-19 polyclinic. For 232 of patients diagnosed with suspected/confirmed Covid-19, treatment was planned and followed-up as outpatients. Three hundred eighty-eight patients were hospitalized; in 4674 patients Covid-19 disease ecartation was made. On the other hand, 463 of the patients with a suspected/confirmed diagnosis of Covid-19 who admitted to the emergency service were hospitalized.

A total of 851 suspected/confirmed Covid-19 diagnosed patients were hospitalized with a distribution of 53, 63, 53, and 682 patients, respectively, in the 3rd, 2nd, 1st step intensive care units and Pandemic wards. One hundred ninety-three of the patients were diagnosed as Covid-19 positive. Other patients evaluated as possible Covid-19 cases considering CT scans.

Among in PCR test positive confirmed patients, 13 patients were followed-up in 3rd step intensive care, 16 patients were followed-up in 2nd step intensive care, seven patients were followed-up in 1st step intensive care units the remainder 157 patients were followed-up in the pandemic clinics. Mortality rates in 3rd, 2nd, 1st step intensive care units and Pandemic wards were 76.9%, 75%, 0%, and 0%. The mortality rate of all the Covid-19 positive patients followed-up in the hospital was found 11.3%. In contrast, the mortality rate of the patients who require mechanical ventilation, respiratory support, and intensive care follow-up was found 61.1%.

DISCUSSION

Covid-19 is an urgent global health problem. Quarantine and surveillance practices are stated as important in preventing the disease's spreading also

by the WHO. Until the vaccine has been developed, "Prophylaxis" was considered the most important factor Sohrabi et al. ⁽²⁾. In the pandemic action planning, the pandemic team was created in the early period. The situations that could be encountered were determined, and different plans were prepared considering the number of patients admitted. Before admitting the patients to the hospital, all the personnel primarily informed about Covid-19 and how to protect it got training on using protective equipment. Thus, the risk of panic and transmission in healthcare workers were minimized. Joshua C's review about coping with Covid-19 stress in hospitals stated that team leadership, accurate information, and acting with team spirit are essential factors on personnel's ability to cope with stress Morganstein et al. ⁽³⁾. We also found in our personnel that at the beginning of the pandemic, stress and anxiety levels were high, and by the time with repetitive training and providing with PPE's these concerns seem to pass. Besides, since the beginning of the pandemic, we have helped the staff cope with the stress by assigning psychologists to provide psychological support to healthcare personnel.

In Xu Wang et al.'s review of the hospitals' difficulties in the supply of medical equipment in the Wuhan city Covid-19 epidemic, it is stated that after the SARS epidemic in 2003, China has made a lot of progress in the supply of medical equipment. However, deficiencies can still occur in their systems in a state of emergency and stated that they had received support from other world countries Wang et al. ⁽⁴⁾. Owing to the planning of the Republic of Turkey Ministry of Health and the Provincial Health Directorate of Izmir, there were not any deficiencies or setbacks experienced since the beginning of the pandemic on the matter of providing personnel with PPE. In the early days of the pandemic, there was an excessive tendency to stock PPE with contagion anxiety, but this was prevented by training, mutual discussions, and strengthening the distribution organization.

Hasan Z et al. ⁽⁵⁾ shared their management experiences

in a 3rd stage hospital. They stated that they assigned a team leader in charge of the human resources, clinical arrangements, and financial support. They execute their plans according to the data flow from these leaders Hasan Z et al. ⁽⁵⁾. Likewise, in our hospital, personnel were assigned to be in charge of pandemic services, intensive care units, emergency services, polyclinics, personnel planning, and financial services. Hospital management workers led these teams and achieved coordination. Also, in the mentioned study, it was stated that some factors should be taken into consideration, such as undetected labor losses due to Covid-19 infected personnel and the closure of schools. In our hospital, only the physicians under the age of 55 did not carry a risk for Covid-19 and had no other disorders assigned to reduce the risk of Covid-19 transmission. It was ensured that a physician did not work in a Covid-19 unit for a long time; thus, the risk of contamination and burnout was prevented. Similar strategies were followed in medical secretary and nurse schedule planning. The review also stated that the number of intensive care patient beds was increased by shifting the surgeons and anaesthesiologists to intensive care teams. Likewise, in our hospital, the number of Covid-19 intensive care units was increased by moving internal medicine physicians to intensive care teams.

Wee H. Gan et al. ⁽⁶⁾ focused on a patient safety model for preventing Covid-19 transmission to the healthcare personnel, which depends on the human factor and evaluates the effects of the healthcare system and processes Gan WH et al. ⁽⁶⁾. It is stated that the human element is the most important source of transmission in this model. They stated that measures should be taken in this direction and stated that environmental, administrative, and technological factors interact with healthcare workers. According to this model, the first thing that was made is, dividing the healthcare personnel into two groups of those that work Covid-19 related fields and those that are not. In processes such as deep tracheal aspiration and intubation, which pose a high risk for Covid-19 transmission, procedures

were carried out with full protective equipment. PCR testing for healthcare workers with complaints, measuring employees' fever routinely at hospital entry, conducting training via video conferencing, and organizing mealtimes were suggested. In our hospital, a staff screening polyclinic was established to examine the healthcare personnel and take swab samples easily; when necessary, isolation was provided to prevent transmission. Also, the rapid antigen test was used for screening the healthcare workers.

Collective educative activities were suspended, meal times were arranged, and the hospital's running was sustained with the minimum personnel possible. Also, to prevent environmental factors, visitors were prohibited from visiting the intensive care and Covid-19 wards. Fever measurement was performed in the polyclinic building, and admitted patients were examined in terms of Covid-19. It is observed in the literature that similar measures are taken in other countries of the world Gan WH et al. ⁽⁶⁾.

A consulting line was created by the Republic of Turkey Ministry of Health that is accessible via phone. Thus it is ensured that the patients could receive consulting service and could be directed accurately. It is stated that in Korea, due to the increased patient density and with the onset of bed problems, scoring was made via phone by asking the patients questions, and under the conclusion, patients were directed Kim SW et al. ⁽⁷⁾.

After the patient's hospitalization, the patients' relevant data were entered into the Patient Health Management System. The patients' contact was found and ensured that they stay in a home quarantine isolated for 14 days by the filiation team Demirbilek Y et al. ⁽⁸⁾. Family practitioners called the patients whose treatments were planned as outpatients or exchanged after their hospitalization via phone for a further follow-up. Due to the curfew of the people over the age of 65, home visits were made for those who access the healthcare services via phone, and thus the healthcare service was

sustained. Wosik J. et al. ⁽⁹⁾ stated in their review about the transition to the telemedicine system that polyclinic service, hospitalized or discharged patients' follow-ups and consultations can be done using telecommunication devices Wosik J et al. ⁽⁹⁾.

In our hospital's operating room, areas that will be used for patients with suspected Covid-19 were separated, and elective cases were postponed. In cases requiring urgent surgical operation, patients were examined in terms of Covid-19 infection, whether they contacted a patient with Covid-19 or not, and evaluated by an infectious diseases specialist when necessary. In case of operation of a suspected Covid-19 case, the operation performed by minimum personnel with full PPE. Video-laryngoscope was used during the intubation of patients with suspected Covid-19. The fever of the operating room employees were routinely followed every day. It is seen in the literature that other operating rooms in different countries took similar measures Wong J et al. ⁽¹⁰⁾.

In this study, the total mortality rate in PCR positive patients was found %11,3. In a meta-analysis evaluating 656 patients in China, the real mortality rate in PCR positive hospitalized patients was found as 13.9% Giacomelli A et al. ⁽¹¹⁾. In a study conducted in Italy, 233 patients were evaluated, and the mortality rate was 20% Rodriguez-Morales AJ et al. ⁽¹²⁾. These results are relatively higher compared to this study's results. The mortality rate in patients followed up in the intensive care unit in the USA's Seattle region was found to be 50%. In accordance with the literature, it was found that the mortality rate in intensive care units of our hospital was 61.1% Bhatraju PK et al. ⁽¹³⁾.

According to our experience an important implication taught by the pandemic is that patients with pulmonary involvement need to be admitted to the intermediate intensive care unit in the early period. Therefore, close monitoring of patients in intermediate intensive care units with non-invasive respiratory devices before the need for intubation develops will protect the patients from intubation

and related complications.

The limitations of our study are that it is a retrospective study and does not have long-term results.

In conclusion, the pandemic period is active, flexible, and dynamic. From a global point of view, the Covid-19 pandemic is big, is devastating for healthcare, and is the downfall for the countries' economies; it caught the whole world off guard, and still pursues its aggressivityC. In this pandemic period, all the nations worldwide and all the institutions, especially the health institutions, encountered new progress every day and gained new experiences every day. Therefore, institutions should always be prepared against such pandemics. In this matter, sharing hospitals' managerial experiences will help the management of the hospitals develop new strategies both during the ongoing pandemic and future situations. As such, these studies will have historical importance and will pave the way for scientific research in management.

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