






Original article

Action lines adopted by university hospitals based on contingency plans during the COVID-19 pandemic*

Linhas de ações dos hospitais universitários a partir dos planos de contingência na pandemia COVID-19

Líneas de acción adoptadas por hospitales universitarios a partir de los planes de contingencia durante la pandemia de COVID-19

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Abstract

Objective: to demonstrate the action strategies implemented by managers of federal university hospitals based on the COVID-19 pandemic contingency plan. **Method:** multicenter qualitative research based on sixteen interviews with managers from eight university hospitals involved in the development of contingency plans. Data collection took place from April to October 2021, with thematic content analysis. **Results:** six lines of action emerged: implementation and organization of specific COVID-19 patient units and increased bed capacity; acquisition of personal protective equipment and supplies; development of new protocols and continuous education; hiring of professionals; focus on and support for mental health of health workers. **Conclusion:** university hospitals served as the primary care way for severe COVID-19 cases. For safe and efficient care, they needed to reorganize patient flow, implement structural changes, provide training and offer mental health support for professionals.

Descriptors: Coronavirus; Pandemics; COVID-19; Health Management; Hospitals, University

Resumo

Objetivo: demonstrar as linhas de ações implementadas pelos gestores dos hospitais universitários federais a partir do plano de contingência da pandemia de COVID-19. **Método:** pesquisa multicêntrica com abordagem qualitativa, a partir de dezesseis entrevistas com gestores de oito hospitais universitários que participaram da construção dos planos de contingência. A coleta ocorreu de abril a outubro de 2021, com análise temática de conteúdo.

Resultados: surgiram seis linhas de ações: implementação e organização de unidades específicas de pacientes com COVID-19 e o aumento do número de leitos; aquisição de equipamentos de proteção individual e insumos; elaboração de novos protocolos e realização de educação permanente; contratação de profissionais; preocupação e apoio em saúde mental aos trabalhadores. **Conclusão:** os hospitais universitários foram a principal porta de entrada dos casos graves de COVID-19. Para assistência segura e eficiente, precisaram reorganizar fluxos de atendimento, mudanças estruturais, capacitações e acolhimento a saúde mental dos profissionais.

Descritores: Coronavírus; Pandemias; COVID-19; Gestão em Saúde; Hospitais Universitários

Resumen

Objetivo: demostrar las líneas de acción implementadas por gerentes de hospitales universitarios federales a partir planes de contingencia elaborados para hacer frente a la pandemia de COVID-19. **Método:** trabajo de investigación multicéntrico con enfoque cualitativo, basado en dieciséis entrevistas a gerentes de ocho hospitales universitarios que participaron en la elaboración de los planes de contingencia. Los datos se recolectaron entre abril y octubre de 2021, con análisis temático de contenido. **Resultados:** surgieron seis líneas de acción: Implementación y organización de unidades específicas para pacientes con COVID-19 y aumento en la cantidad de camas; Adquisición de equipos de protección personal e insumos; Elaboración de nuevos protocolos e implementación de programas de educación permanente; Contratación de profesionales; y Preocupación y apoyo en términos de la salud mental de los trabajadores. **Conclusión:** los hospitales universitarios fueron la principal vía de ingreso de los casos graves de COVID-19. Para brindar asistencia segura y eficiente, debieron reorganizar flujos de atención, implementar cambios estructurales, ofrecer programas de capacitación y proporcionar apoyo en términos de la salud mental de los profesionales.

Descriptor: Coronavirus; Pandemias; COVID-19; Gestión en Salud; Hospitales Universitarios

Introduction

The world was taken by surprise by an emerging disease caused by the novel SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2), which led to the COVID-19 pandemic,¹ first identified in 2019 in Wuhan, China.²⁻³

In this journey of confronting the pandemic, Brazil, through the Ministry of Health (*Ministério da Saúde*, MS), officially declared a public health emergency for the entire national territory on February 4, 2020, aiming to anticipate control and combat actions against COVID-19. The World Health Organization (WHO) declared the COVID-19 situation a pandemic on March 11th, 2020.⁴⁻⁵

As COVID-19 cases increased, there was a need for restructuring health units, including expanding bed capacity, human resources and personal protective equipment (PPE). Such measures were complemented by recommendations for social distancing,

isolation of infected individuals, closure of businesses, control measures for entry and exit from the country, and use of masks and hand washing.^{4,6} In the face of this global scenario, the pandemic brought visibility to the work of health professionals, especially in countries that rapidly reached high numbers of cases and alarming mortality rates. The dedication and efforts of all health professionals enabled us to face this unprecedented pandemic as effectively as possible, with each fulfilling an essential role. Physicians, through their management in health units, particularly in decision-making or direct patient care, played a crucial role. Similarly, nursing, representing the largest portion of the workforce, approximately 59% of the health professions, emerged as needing reinvention and greater appreciation.⁷⁻¹¹

During health care delivery, standard precautions are typically applied to ensure the safety of both professionals and patients. During the pandemic, it was necessary for services to adjust their protocols, whether through administrative, environmental, care-related or engineering measures.¹¹

The Pan American Health Organization (PAHO) emphasizes that ensuring the safety of health workers requires adequate training, the removal of professionals from high-risk groups, implementation of preventive measures, provision of information, acquisition and distribution of an adequate quantity of personal protective equipment (PPE), implementation of protocols for case management and monitoring and ensuring that employees know how to identify symptoms.¹²

As Federal University Hospitals (FUHs) in Brazil play a significant role in treating patients with COVID-19, serving as reference centers for medium and high complexity care within the Unified Health System (*Sistema Único de Saúde*, SUS). Furthermore, they play a significant role in training health professionals and supporting teaching, research and outreach activities in the higher education institutions to which they are affiliated.¹³⁻¹⁴

In hospital institutions, COVID-19 response actions vary according to the severity of patients, the care profile and the local epidemiology of the disease. Thus, it was observed that the main challenges faced by hospitals involve expanding intensive care unit (ICU) beds, training professionals and acquiring personal protective equipment in adequate quality and quantities.¹⁴⁻¹⁶

These interventions must be dynamic and adaptable to the epidemic evolution of the disease. Therefore, success in hospital management during this public health emergency requires providing health care coverage focused on assessment, prevention and treatment of diagnosed cases.^{15,17}

Therefore, tackling the COVID-19 pandemic was filled with challenges that demanded effective policy planning and managerial practices to provide structural conditions for health care in hospital settings.¹⁸ Among the issues that emerged with the COVID-19 pandemic and the immediate need to develop a contingency plan, there was an urgent demand to structure hospital services with the purpose of safely and effectively attending to COVID-19 patients, while also seeking to prevent infection among health professionals. Based on the above, the objective was to demonstrate the action strategies implemented by managers of federal university hospitals based on the contingency plan for the COVID-19 pandemic.

Method

This is an exploratory, descriptive research with a qualitative approach stemming from the multicenter macro-project entitled "Evaluation of Nursing Care for Patients with COVID-19 in Brazilian University Hospitals".

Regarding the research settings, there were eight large university hospitals (UHs) affiliated with the Brazilian Hospital Services Company (*Empresa Brasileira de Serviços Hospitalares*, EBSERH). Regarding geographical location, two hospitals were located in the northern region, two in the southern region, two in the Midwest region and two in the northeastern region. Thus, the selection of these locations for the study was aimed at exploring different contexts and strategies for addressing the COVID-19 pandemic.

After the university hospitals' adherence to the EBSERH public company, they underwent a process of restructuring their structural and managerial characteristics. The company established through Law 12,550 of 2011 demonstrates innovations for the health sector, particularly regarding performance and results requirements.¹⁹

During the COVID-19 pandemic, the headquarters of EBSERH, located in Brasília, forwarded a model contingency plan to the university hospitals (UHs). These hospitals were required to submit the updated contingency plan whenever there was a change in the physical structure of the UH or alterations in patient care workflows for COVID-19.

The study population consisted of managers who were working in the researched hospital institutions. For the selection of interviewees, an intentional sampling strategy and "snowball" method²⁰ were used, in which the initially selected interviewees from each hospital institution intentionally indicated other members with similar characteristics for the research. Nine nurses and seven physicians were interviewed, including nurse chiefs of quality management units and health care management, physicians in the superintendency, such as head of care division, head of quality management units and head of teaching and research management. These participants were included in the study because they were involved in the development of contingency plans for each hospital institution, as well as their action strategies. As inclusion criteria encompassed all managers who were involved in the construction, implementation and evaluation of contingency plans at their health institution. The twenty-four managers who were on leave, vacation, or who were not intentionally selected or referred through the snowball sampling strategy were excluded from the research.

Data collection was conducted from April to October 2021 by professors from the participating federal universities involved in the study. For conducting the interviews, a guiding manual was developed to standardize data collection and transcription procedures, aiming to ensure greater reliability of the research results. The manual is available in the institutional repository of *Universidade Federal de Santa Catarina* (UFSC), under the title "Guiding Manual for interviews with health managers and professionals involved in the development and implementation of contingency plans against COVID-19 in Brazilian university hospitals".

The data presented in the study correspond to two sections of the data collection instrument. The first part includes socio-professional characterization data: age, gender, sector, role, work shift and years of professional experience. The second part consisted of semi-structured interviews, using a script constructed based on the research object, question and objective. The second part comprised semi-structured interviews, employing a script constructed based on the research object, research and objective. The interview response time was approximately 60 minutes; some interviews took place in person, adhering to social distancing and mask usage, while others were conducted

remotely. All interviews were subsequently transcribed and sent back to the participants for transcription validation.

The participants' testimonies were identified with "N" followed by numbers 1 to 9 (nurses) and "P" from 1 to 7 (physicians).

For data organization and analysis, content analysis was used, which encompasses various techniques, including assessment analysis, enunciation analysis, propositional discourse analysis, expression analysis, relational analysis and categorical analysis, in which thematic analysis is found.²¹

It was decided to use thematic content analysis because it identifies one or several themes or cores of meaning that compose communication within a previously defined coding unit. For this type of analysis, it is recommended that the collected information be organized into pre-analysis, exploration of the material and treatment of the results obtained.²¹

During data analysis, a floating reading was conducted to select and analyze the sixteen interviews that provided insights into the changes made in the work environment based on the contingency plans during the COVID-19 pandemic. These interviews were organized into Excel spreadsheets during the pre-analysis phase. During the material exploration phase, in-depth readings were conducted and categories were created. Subsequently, data treatment was performed through the interpretation of results.

Ethically, this study is part of a multicenter macro-project approved by the Research Ethics Committee, with approval number: 4,347,463 on October 19th, 2020. The participants signed the Informed Consent Form to confirm their agreement regarding the terms of the study and participation in the interview. Therefore, resolutions No. 466/2012 and 510/2016 of the National Health Council were complied with.

Results

Regarding the socio-professional characterization, there was predominance of female participants (n=12, 75%), with a mean age of 54.8 years old and a mean of 28.71 years of professional experience. The majority worked as heads of the quality management department (n=6; 37.5%) and in the superintendency (n=4; 25%).

The contingency plans served as a guide for implementing action lines in hospital units for the care of COVID-19 patients. As a result of material exploration, six categories emerged: Organization of specific units for COVID-19 patients; Personal protective equipment and supplies; Ongoing health education regarding COVID-19; Increase in bed capacity; Increase and reallocation of personnel; Mental health support for health professionals.

Organization of specific units for COVID-19 patients

Category one refers to the creation and separation of specific units, changes in the physical structure of hospital units to exclusively care for suspected or diagnosed COVID-19 patients, as well as the establishment of patient movement flows within the hospital for COVID-19 cases.

Which would be the flow of a deceased individual within the units until reaching the morgue where the body would be kept, whether it would be open for the family to view, we mapped out the pathway in the hospital, from reception to the departure, either by discharge or by death. (N2)

In my opinion, our most accurate measure was to separate areas: one for COVID and one for non-COVID, starting from the entrance. By separating these areas, there was no longer any possibility of mixing either professionals or patients who might present any type of symptom. (N6)

We made adjustments in all hospital sectors [...] every unit of the hospital, the neurosurgical, the neurological, the entire hospital became COVID, we only kept the eighth floor, which was the administrative area, with our clinic and surgery patients who remained, who couldn't be discharged, all other sectors became COVID, without exception. (P2)

Due to the need to isolate suspected or confirmed COVID-19 patients, it was identified that new workflows needed to be developed. As a result, in a given UH, it was determined, for example, that one of the elevators would be designated solely for the transportation of suspected or confirmed COVID-19 patients along with the health team.

[...] we had two elevators, which was totally inconsistent with what was recommended [...] it ended up that we had two elevators for circulation, food, dirty laundry, clean laundry, patients, staff, the elevator remained stationary for a long time for cleaning [...]. For the second wave, we were able to free up the elevators more [...] since we designated a specific ward for changing clothes, there was more coherence, but regarding the elevator in the first wave, we encountered quite a bit of difficulty. (N1)

The situation of creating environments was very challenging; it was necessary to

adapt the outpatient structure to function as an emergency department, as well as adapt an ICU within a space that previously served as a ward.

We removed our normal emergency services to the outpatient clinic, and we had to make a complete physical adaptation of the outpatient area to accommodate the emergency department. We also allocated specific ICU beds and set up a dedicated ICU for COVID. With that, we relocated our ICU to a regular inpatient unit and designated our ICU, which had the potential for up to 20 ICU beds, for COVID ICU patients [...]. (N7)

[...] The first activity we did was, since all outpatient appointments and elective surgeries were suspended, we used the outpatient area to set up a non-respiratory emergency department for the care of non-respiratory patients, and the general emergency department, leaving our main emergency unit solely for the care of COVID patients. (N9)

With the creation of these new spaces within the UHs, the health teams had to undergo a reorganization, with some professionals being reassigned to COVID wards, COVID ICUs and COVID emergency departments.

It was a whole movement of changes, rearranging various hospital spaces to place COVID in the most isolated and secure places possible; we relocated many teams[...]. (P1)

The hospital reorganization in its physical structure and processes proved to be one of the main strategies implemented to address the COVID-19 pandemic. As knowledge about COVID-19 increased and the pandemic progressed with its complexities, new challenges emerged for professionals, such as measures to reduce or prevent the spread of the virus.

Personal protective equipment and supplies

Category two is related to the difficulties encountered in health institutions due to the shortage of personal protective equipment (PPE) and other supplies during the peaks of the pandemic.

Our biggest challenge was indeed the personal protective equipment, especially at the initial stage of the pandemic, which were masks and gowns. We managed to obtain masks at that time through a loan from the State Health Department. (N2)

Another challenge we faced initially was related to personal protective equipment [...] because it didn't exist, it disappeared from the market. We had a very significant partnership with the University, specifically the production engineering department, which began producing Face Shields in collaboration with the Federal Institute of Education [...]. (N7)

We received donations [...], the university produced hand sanitizer, which was a critical issue as there were supply problems with alcohol. We managed to unite the university with the hospital and indeed fulfill our role. (P5)

It is worth noting that at the beginning of the pandemic, the UHs did not have this immediate forecast of increased quota of PPEs. Strategies had to be sought to obtain these items, through donations, direct purchases and bidding processes. The consumption of these PPEs grew exponentially worldwide, as they were necessary for both individual and collective protection, complying with established standards.

In addition to the increase in actual demand for PPEs, there was also an excessive consumption of both surgical and N95 masks, fueled by conflicting information at that time.

The supplies arrived, but they are finite, and there was indiscriminate use, often related to misinformation [...] we remember well that our stock of N95 masks ran out before the first confirmed case in the hospital because everyone wanted to use N95 masks in the face of the unknown, out of fear. (N5)

Another issue experienced by professionals and managers was the high consumption of certain supplies, including some medications, which at one point became scarce in the market, leading to serious repercussions in the economy and public health.

And thus compromising even the issue of some supplies, especially sedatives, neuromuscular blockers [...] the cases arrived with a larger volume and were more acute cases, it was noticed that the volume of medication used in a patient was much higher than what was normally used with other patients. We also had some very distressing moments [...] especially regarding the issue of medication shortages, having to use some medications that wouldn't have as good an effect. (N7)

Many purchases that happened with numerous suppliers at the beginning of the pandemic were canceled because they wanted to sell outside at a higher price, so we started experiencing shortages due to the lack of integrity of the companies. (N8)

At the peak of the pandemic, the demand for supplies, especially oxygen, increased [...] the hospital went from having a demand for ten patients using oxygen to suddenly having over a hundred patients requiring oxygen, including high-flow oxygen. What happened is well known. (P2)

For pandemic control, the use of PPE and specific materials was a must. In public institutions, planning for acquisitions and assessing the situation due to increased demand was necessary. Alongside emergency purchases, civil society, through

donations, alleviated this demand. It was observed that as the population became educated about COVID-19, there was also an increase in the use of these items.

Ongoing health education regarding COVID-19

Category three corresponds to the training conducted for health professionals: caring for critical patients, correct use of PPE, use of mechanical ventilators, among others. Although a considerable portion of the professionals who were allocated to work directly on the COVID-19 frontline already had knowledge and skills regarding PPE, ventilators, among others, it was necessary to conduct educational approaches on these topics within the teams. There was a significant involvement of health professionals and management in promoting these moments of continuous education.

In the training, a nurse was designated to oversee it, and her role was to conduct training on PPE donning, and doffing procedures[...]. Mechanical ventilation, we had in the Headquarters [...] courses on mechanical ventilation, intensive care, for people to take. (N1)

Education of professionals, especially regarding the use of PPE items and [...] regarding the care of critically ill patients, because these patients are different from ICU patients. They have some specific care needs, including the positioning of these patients in bed and changing their position, which are quite complicated aspects, and all the staff was trained on them. (N7)

Because besides training the staff, we also had to train the residents, the interns. So, regarding the training issue, we had great support from the education and research management [...]. And with support from the human resources management division as well [...]. (P1)

In the medical field, there was the issue of intubation, how it should be done, what equipment to use, and training sessions conducted by the group, by the anesthesiology department, where anesthesiologists provided training every day. (P4)

Continuous education is important to foster processes of reflection and knowledge exchange, utilizing various strategies within the unit where the professional works. In the testimonials, it is evident that one of the tools used for learning was simulation, providing workers with the opportunity to practice in a simulated real-life scenario.

New actions were implemented in various modalities, and the most important of them involved up to 1,400 individuals, which was a program of realistic simulation training with several stations. This initiative had a fundamental participation from management, which made it mandatory for all employees to participate. (N5)

We created a series of things [...], such as the use of simulation

environments, and the university's skills laboratory for intubation practice. Intubation is part of the daily routine for COVID patients, especially those requiring critical care[...]. (P3)

Within the UHs, the construction of various materials (booklets, protocols) was identified with the support of units such as the CCIH, aiming to provide standardized knowledge within the institution. The contingency plan of each UH itself constituted these documents.

The ICU felt the need to create protocols and train the teams [...] the ICU professionals themselves, physiotherapists regarding mechanical ventilation, intensivists, and the nursing team underwent training for that specific area. In parallel, the emergency department also developed all the initial care protocols and provided training for the team, especially those on the frontline. And the infection control service created a comprehensive manual [...] covering all these COVID-related issues, such as PPE, when to use one type of PPE versus another, with photos. For PPE, we trained over a thousand workers [...]. (N8)

Therefore, the implementation of ongoing health education to increase professionals' knowledge regarding the care of COVID-19 patients helped foster a safer and more collaborative work environment among health professionals and management. This approach was relevant for the development of care routines amid the expansion of the pandemic over the years.

Increase in bed capacity

Category four refers to the increase in beds in Intensive Care Units (ICUs) and other specific units for COVID.

In the first wave, we were able to offer a maximum of eighteen ward beds and ten ICU beds, but for the second wave, I will have to provide a hundred beds [...] there were many issues regarding this. (N1)

As the interviews revealed, although not ideal, ICU-style beds had to be set up within certain emergency departments due to the severity of patients' conditions and the unavailability of ICU beds.

We were left with the support of critically ill patients, which consisted of the initial 5 ICU beds set up within the emergency department for those patients arriving at the front door, which was the Emergency Care Unit (UPA). They were immediately put on mechanical ventilation due to the rapidly progressing nature of the disease. We received these patients in a severely compromised state. (N6)

Due to the conversion of our 10 adult ICU beds into COVID units, we closed the emergency room and implemented 18 additional COVID ICU beds within the same physical space. This adjustment allowed us to have a total of 28 COVID ICU beds available. (P1)

Numerous locations around the world have been confronted with the urgent need to mobilize in order to expand health facilities. Saving lives and reducing COVID-19-related complications were directly linked to the expansion of both ward and ICU beds, as cases presented with a variety of complications. It is worth noting that for this increase in the number of beds, it was necessary, among other actions, to have the physical space equipped with gas networks, equipment and supplies, as well as to have a trained team available for patient care.

Increase and reallocation of personnel

Category five refers to temporary hires through emergency selection processes that were necessary during the pandemic, as well as the relocation of professionals from sectors that were closed to units facing more critical situations. It was identified that some of these new professionals, who were urgently hired to fill these positions, had little to no professional experience in the field.

Our greatest difficulty was in the pathology department concerning the need for additional autopsy technicians. In one of the ICUs, which already had a limited number of physicians initially, we had to request the hiring of three more intensivists from EBSEH. Additionally, we required a pathology department autopsy technician and some nursing technicians. This was particularly crucial as nurses are at the forefront, and many had to be absent due to pregnancy, maternity leave [...] being over 60 years old, or having underlying health conditions such as diabetes or hypertension [...] (N3)

We established a new ICU with the personnel we had available, who were not specialists and had not worked in intensive care for a long time. These professionals primarily came from the outpatient department [...]. In the third month, EBSEH managed to conduct a selection process to begin hiring professionals exclusively dedicated to COVID care. (N6)

Human resources were our major challenge [...] In fact, EBSEH conducted an emergency selection process exclusively for COVID, initially hiring only physicians and nursing staff. Later on, the scope was extended to include physiotherapists. Nowadays, I have a variety of professionals to assist, including even an architect, because with the pandemic, new services were being opened, requiring modifications. (P6)

With the uncontrolled progression of the pandemic, having a sufficient number of trained health professionals became a daily challenge. Several factors contributed to the decrease in health professionals working in COVID areas, prompting managers to implement recruitment strategies to support these areas.

Mental health support for health professionals

Category six relates to the provision of psychological and psychiatric support for health professionals who, amid the pandemic, experienced feelings of fear and distress regarding the risk of COVID-19 infection. It is well-known that, in general, ICUs and emergency departments are environments that induce physical and mental strain on health professionals, and the pandemic has exacerbated the suffering and illness among these individuals even further. At a certain point, some UHs offered both psychological support and hotel rooms for frontline professionals who wished to avoid contact with their families due to fears of virus transmission.

[...] Some professionals even experienced panic attacks and were very afraid, not only of getting sick themselves but primarily of infecting their families. At that point, the work carried out by our psychology and psychiatry staff was crucial. We formed a support group for the workers, offering individual and group sessions and setting up a room where they could take a break from their space and have someone to talk to whenever needed. (N7)

We also had this team of psychologists and psychiatrists [...] workshops were established to provide support for these groups to share their concerns with psychologists, as they often feared bringing the disease home with them. An external area adjacent to the hospital was created, resembling a lodging facility [...] equipped with a microwave and beds for professionals who didn't feel safe returning home, perhaps due to having someone in their household who was at higher risk [...] We also reached agreements with hotels that offered their facilities for professionals to stay in[...]. (N8)

The health professionals that primarily worked with suspected or confirmed COVID-19 patients experienced a mixture of emotions that impacted their mental well-being. Thus, some health institutions, recognizing the need to care for the caregivers themselves, provided specialized services and professionals to alleviate the psychological effects experienced during the pandemic.

Discussion

In relation to category one, which involves organizing specific units for COVID-19 patients, it is known that from the first cases attended to, management, along with some professionals, immediately needed to (re)organize themselves to plan effectively and in the shortest possible time their contingency plan, outlining the patient flow from the moment of admission to discharge due to recovery or death.

In a study conducted in Brazil, it was found that the separation of the COVID ICU from the General ICU and the decision to transfer the General ICU to another location caused anxiety among the multidisciplinary team and disrupted the unit's safety climate.²²

It was recognized that it was necessary to organize spaces within the institution to isolate these patients from others, as well as to provide specialized care to suspected and/or confirmed COVID-19 patients concerning the pathologies and conditions that university hospitals typically managed up to that point. This restructuring resulted in an impact on the provision of services. Thus, university hospitals were compelled to suspend appointments for several months, elective surgeries and some outpatient consultations.

As a result of a study conducted in England, it was concluded that the cancellation of elective surgeries was the most significant contributor to the increase in available capacity. A strategy widely implemented across various places in Europe. However, this may have come at a significant cost to patients whose treatments were canceled.²³

A study in Switzerland demonstrated that the mortality rate in COVID ICUs was lower compared to that of other countries with similar severity. The result is associated with effective organization for caring for the most severe COVID-19 patients, along with the rapid expansion of beds into new spaces, supported by human resources, supplies, training, protocols and programs. During this period, there was a rapid recruitment of physicians and nurses due to the suspension of all elective surgeries.²⁴

Regarding category two, which addresses personal protective equipment and supplies, the institutionalization of new routines within university hospitals exerted an impact by increasing the demand for some supplies. As interviews demonstrated, there

were instances where there was a shortage of an adequate quantity of PPE, exposing professionals directly involved in patient care.

According to a study, before the COVID-19 pandemic, Japan relied heavily on the importation of masks, alcohol and many raw materials used for producing medications. The quality of masks, PPE and other infection control supplies was negatively affected by the limited availability of imported raw materials, which prevented the production of infection control supplies in Japan. Additionally, some medications were available in lower quantities due to the reduced supply of imported materials.²⁵

Ensuring the health protection of health professionals is crucial to prevent the transmission of COVID-19 in health facilities and their homes. It is necessary to adopt infection control protocols (standard, contact, airborne) and provide PPE, including N95 masks, gowns, goggles, face shields and gloves.²⁶

In relation to category three, which is the process of ongoing health education regarding COVID-19, it is inferred that the teaching-learning process should be a constant in health services, especially when it involves the demand of a new pandemic. COVID-19 has brought about new knowledge and work routines, requiring all involved team members to understand the theoretical foundations of practice.

The National Policy of Permanent Education in Health promotes the training and development of workers in the SUS, based on everyday problems related to health and to the organization of health work. It contributes to identifying the needs for Permanent Health Education of SUS professionals and to developing strategies aimed at improving health and health management.²⁷

The movement towards permanent education requires professionals to adopt a proactive stance, with more secure attitudes and, for this, they need to understand how to correctly use PPE and be sensitized to do so.

An important strategy identified for risk containment, reducing fear and increasing the level of team and management updating would be to accelerate the communication of accumulated scientific information throughout the pandemic, including those related to self-care.²⁸

Regarding category four, which presents testimonies about the increase in beds, it was observed that many cities in the interior did not have ICU beds in their hospital

units. This demand fell on the beds of larger cities. The need for an increase in hospital beds was significant during the two peaks of the pandemic.

For this increase in ICU beds, university hospitals had to obtain authorization from the State Health Department, the agency responsible for managing authorized and contracted beds. The expansion of beds in private hospitals through the public system was observed in some countries.²⁹

Regarding the increase and reallocation of personnel described in category five, at the beginning of the pandemic, a significant shortage of workforce was observed within the FUHs, exacerbated by various situations that forced some professionals to withdraw from on-site activities due to prioritization, as they had risk factors or conditions that could worsen COVID-19, such as being pregnant or lactating, having heart disease, or obesity.

To meet this need, EBSEH issued notices for the temporary emergency hiring of professionals from various fields, especially nursing technicians, nurses and physicians.

During the pandemic, simplified selection processes were announced in some regions of the country to meet the temporary need of exceptional public interest for a specified period. Furthermore, there was a national emergency selection process aimed at serving the population in combating the COVID-19 pandemic. This additional influx of professionals to work on the front lines was crucial for ensuring continuous and quality care.¹³

Coinciding with another study¹⁸ that highlighted within the scope of management that university hospitals, during the pandemic, one of the fronts that enabled their reorganization was the emergency hiring of new professionals and the training of health teams. The search for new professionals was a necessity resulting from the increased demand for patient care, especially to cope with the peak of the pandemic.

Category six presents testimonies about mental health support for health professionals because it is known that being on the front lines was a significant challenge for health professionals and their families. Faced with this reality, many professionals felt the need to seek psychological and/or psychiatric support. The stress-inducing situations include a lack of ICU beds, fear of contracting the disease and dying, fear of transmitting the disease to loved ones, apprehension about having to take time off work and leaving the team even more overwhelmed, seeing colleagues falling ill,

increased workload due to absences and the demanding work schedules many professionals were subjected to.

A study conducted in Japan found that the workload of those providing care to COVID-19 patients significantly increased, and it was challenging to maintain motivation and reduce the fear of infection among the professional team. The causes of stress among frontline professionals were related to heavy and uneven workloads and responsibilities, unfamiliar methods of care delivery due to infection control measures, fear of contracting the virus through work, continuous pressure for professionals to remain uninfected and discrimination from the general population at the onset of the pandemic.²⁴

In a certain study³⁰, professionals reported at various times and in different ways their fear of contracting the disease, which was one of the main factors related to psychological distress. Working in a context where death comes so close and dealing with the loss of colleagues and other individuals enhances the desire to preserve the lives and health of family members and loved ones. The fear of contracting the disease leads professionals to act with greater discomfort and insecurity during procedures they perform, affecting mainly the contacts that require closer proximity with the patient.

A study¹⁸ found that the adoption of emotional support measures for professionals was evident in the UHs, as psychological counseling was provided for workers, along with complementary therapies and relaxation activities. This special attention to the mental health of professionals is crucial during a period of increasing workload and the treatment of a new disease.

Regarding the contributions to professionals holding management positions, the study highlighted the weaknesses that some institutions exhibit regarding the planning, monitoring and evaluation of assistance and management activities. In this sense, Nursing and Medicine, historically occupying leadership positions in these spaces, should incorporate these processes more organically into their daily routines.

The SUS works on promoting, preventing, protecting and rehabilitating the health of the population. Public hospitals played an essential role during the pandemic, as they reorganized to increase beds, staff and supplies to meet the daily demands in addition to COVID-19 patients.

As limitations of the research included the sample size, as some professionals did not participate due to workload overload, lack of time to participate, absences due to assessments, or as a result of the COVID-19 pandemic. A suggestion for further studies would be to investigate the document in its entirety, as well as to seek the perspectives of more health professionals and managers involved in the contingency plan.

Conclusion

The study identified that nurse and physician managers actively participated in the implementation of action plans, starting with the development of contingency plans to address the COVID-19 pandemic.

The interviewed managers stated that they faced several challenges regarding the implementation of action plans in the contingency plan, such as acquiring a sufficient quantity of PPE, supplies and equipment, hiring health professionals, developing new protocols, training, organizing spaces for the care of suspected and/or confirmed COVID-19 patients and concern for the mental health of health professionals.

Despite the difficulties, various strategies in the areas of care, management, extension and research of the contingency plan were essential for better results in care and pandemic control, such as interprofessional collaboration among professionals in the UHs and the support of federal universities.

The UHs affiliated with EBSEH provided care and recovery for thousands of severe COVID-19 patients through the SUS. We can understand from the testimonies of the managers that all the changes made in the hospital institutions were possible due to the support of the SUS, which provides comprehensive and universal care.

It is known that in many health institutions, such as UHs, a large portion of unit leadership positions are held by nurses and physicians. During the pandemic, it was evident how important these workers were in planning and decision-making processes. In light of this, it is inferred that these professionals should seek even further improvement to excel in these roles.

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