How are university hospitals coping with the COVID-19 pandemic in Brazil?

Como os hospitais universitários estão enfrentando a pandemia de COVID-19 no Brasil?

¿Cómo están enfrentando la pandemia de COVID-19 los hospitales universitarios en Brasil?

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Abstract

Objective: To identify the actions that federal university hospitals are developing to tackle the COVID-19 pandemic in Brazil.

Methods: Documentary study based on information available on official websites of 44 university hospitals in the federal teaching network in Brazil. The survey was conducted in April and May 2020. The excerpts were grouped by similarity, considering the Care, Management, Extension, Teaching and Research dimensions. Descriptive statistics was used for data analysis.

Results: The 495 actions identified to cope with the COVID-19 pandemic were distributed among Care (38.99%), Management (37.58%), Extension (16.16%) and Teaching and Research (7.27%). In Care, the highlights were the suspension of consultations not related to COVID-19 and elective surgeries, and changes in routines with focus on biosafety issues to prevent virus transmission. In Management, new professionals were hired and health teams were trained. In the Extension dimension, educational materials were developed, mainly on COVID-19 prevention measures. In relation to Teaching and Research, educational-training activities were suspended and the engagement of hospitals in the development of research on the subject stood out.

Conclusion: University hospitals are reorganizing care and looking for ways to provide the necessary conditions to fulfill their mission within the National Health System context, based on care, management, extension, teaching and research actions.

Resumo

Objetivo: Identificar as ações que os hospitais universitários federais estão desenvolvendo no enfrentamento da pandemia de COVID-19 no Brasil.

Métodos: Estudo documental, a partir de informações disponibilizadas nos sites oficiais de 44 hospitais universitários da rede federal de ensino do Brasil. O levantamento foi realizado nos meses de abril e maio de 2020. Os excertos foram agrupados por similaridade, considerando as dimensões Assistência, Gestão, Extensão, Ensino e Pesquisa. Para análise dos dados, utilizou-se estatística descritiva.

Resultados: Identificaram-se 495 ações para o enfrentamento da pandemia de COVID-19, distribuídas entre Assistência (38,99%), Gestão (37,58%), Extensão (16,16%) e Ensino e Pesquisa (7,27%). Na Assistência, destacou-se a suspensão de consultas não relacionadas à COVID-19 e cirurgias eletivas, bem como mudanças em rotinas com reforço às questões de biossegurança para evitar transmissão do vírus. No âmbito da Gestão, ocorreu contratação de novos profissionais e capacitação das equipes de saúde. Na dimensão Extensão, foram desenvolvidos principalmente materiais educativos sobre medidas de prevenção da COVID-19. Em relação ao Ensino e Pesquisa, houve suspensão de atividades educativo-formativas e sobressaiu-se o engajamento dos hospitais no desenvolvimento de pesquisas sobre o tema.

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Conclusão: Os hospitais universitários estão reorganizando o atendimento e buscando meios para prover as condições necessárias para o cumprimento da sua missão no contexto do Sistema Único de Saúde, a partir de ações de assistência, gestão, extensão, ensino e pesquisa.

Resumen

Objetivo: Identificar las acciones que los hospitales universitarios federales están llevando a cabo para enfrentar la pandemia de COVID-19 en Brasil.

Métodos: Estudio documental, a partir de información disponible en los sitios web oficiales de 44 hospitales universitarios de la red educativa federal de Brasil. La recolección fue realizada en los meses de abril y mayo de 2020. Los fragmentos se agruparon por similitud, considerando las dimensiones Atención, Gestión, Extensión, Enseñanza e Investigación. Se utilizó estadística descriptiva para analizar los datos.

Resultados: Se identificaron 495 acciones para el enfrentamiento de la pandemia de COVID-19, distribuidas entre Atención (38,99 %), Gestión (37,58 %), Extensión (16,16 %) y Enseñanza e Investigación (7,27 %). En Atención, se destacó la suspensión de consultas no relacionadas con la COVID-19 y cirugías electivas, así como cambios de rutinas con un refuerzo en las cuestiones de bioseguridad para evitar la transmisión del virus. En el ámbito de la Gestión, se contrataron nuevos profesionales y se capacitó a los equipos de salud. En la dimensión Extensión, se creó principalmente material educativo sobre medidas de prevención de la COVID-19. Con relación a la Enseñanza e Investigación, se suspendieron las actividades educativas y se destacó el compromiso de los hospitales en el desarrollo de investigaciones sobre el tema.

Conclusión: Los hospitales universitarios están reorganizando la atención y buscando los medios para ofrecer las condiciones necesarias para cumplir su misión en el contexto del Sistema Único de Salud, a partir de acciones de atención, gestión, extensión, enseñanza e investigación.

Introduction

In the end of 2019, a new coronavirus disease caused by the SARS-CoV-2 virus appeared in the city of Wuhan, central China, and was called COVID-19 (2019 Coronavirus Disease). In about two months, COVID-19 spread rapidly across Asia and reached all continents, becoming the most important global public health problem in the past 100 years. In view of the magnitude of the infection, the World Health Organization (WHO) classified the disease as a pandemic in March 2020.[1-3] In Latin America, the first case of COVID-19 was confirmed on February 25, 2020, in Brazil.[4]

COVID-19 is potentially fatal because it is a new disease with unpredictable behavior and rapid spread. SARS-CoV-2 is highly transmissible by droplets and contact, mainly in closed places. An individual infected with the new coronavirus transmits to two or three other people, depending on environmental conditions. In addition, no proven pharmacological treatments and/or specific vaccine have yet been identified.[3-5]

The treatment of the disease is symptomatic and hospital care plays a fundamental role in the provision of intensive care to patients with severe symptoms. It has been observed worldwide that COVID-19 increases the demand for care in hospital units, thereby requiring the reorganization of care processes and the development of management strategies to face the pandemic.[6,7]

In Brazil, federal university hospitals stand out in the care of patients with COVID-19 as referral centers of medium and high complexity for the National Health System (Brazilian SUS). In addition, they have a significant role in the health training of human resources and in the support to teaching, research and extension in the higher education institutions to which they are linked.[8,9]

No country was prepared to face the COVID-19 epidemic, which has had negative impacts on social and economic areas, on the physical and mental health of populations, and on the health care capacity of health systems. In the case of hospitals, actions to combat COVID-19 may vary according to the severity of patients, the care profile of the hospital and the local epidemiology of the disease. In general, the main challenges for hospitals involve the expansion of intensive care beds, the training of professionals and the acquisition of individual protection equipment in adequate quality and quantity.[3,6,10] These actions must be dynamic and adaptive to the current knowledge of the virus and the epidemic evolution of the disease. Thus, the success in the hospital management process of this public health emergency situation demands the provision of care coverage focused on the assessment, prevention and treatment of cases diagnosed.[5,11]

Therefore, coping with the COVID-19 pandemic leads to a context still permeated with challenges that demand planning effective management policies and practices for the provision of structural

conditions for health care in hospital settings. To this end, studies are needed to identify what has been done in response to the pandemic and, mainly, to support decision making to face this critical moment.

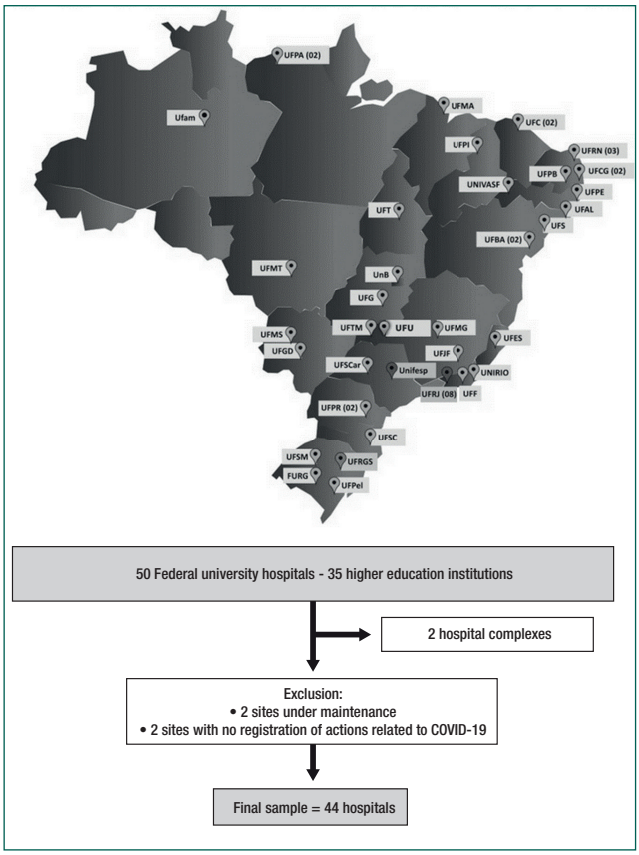
Based on the above scenario, the following research question was outlined: How are federal university hospitals facing the COVID-19 pandemic in Brazil? The aim of this study was to identify the actions that federal university hospitals are developing to face the COVID-19 pandemic in Brazil.

Methods

This is a documentary, quantitative study conducted by consulting the websites of Brazilian federal university hospitals. In Brazil, the network of federal university hospitals comprises 50 hospitals linked to 35 federal education institutions.[8]

Data collection was performed by four researchers individually, after adjusting the search parameters and extracting information from the sites. The electronic sites of all federal university hospitals were accessed between April 27 and May 1, 2020. Two federal education institutions had two federal university hospitals each, although gathered in the same hospital complex. Thus, 48 websites were consulted. In addition, two federal university hospitals that did not have COVID-19 related publications on their sites and two whose sites were under maintenance were excluded. All federal university hospitals had a website independent of the federal education institutions to which they were linked. Thus, the search was limited to their own source email addresses. The final sample of the study consisted of 44 hospitals, as shown in figure 1.[8]

For the characterization of hospitals, the National Registry of Health Establishments (Portuguese acronym: CNES) made available by DATASUS, was consulted in the public domain. Information on the number of professionals, the exclusivity of care by SUS, the number of general beds and the number of intensive care beds for adult patients was extracted.



Source: Figure adapted from the Brazilian Hospital Services Company. Brazil, 2020.[8]

Figure 1. Flow of selection of university hospitals

The collection of data on the actions to tackle the COVID-19 pandemic was focused on the dissemination of news and general information through texts on the websites. The excerpts identified were copied to a data sheet in Word®, according to each hospital.

For data analysis, four dimensions were defined a priori: Care, Management, Extension, Research and Teaching, which are the main axes of action of federal university hospitals.[8,9] The content taken from the websites was classified in each dimension. There were two meetings between the authors to discuss and reach consensus on the better adequacy and standardization of the classification of actions in the dimensions. Data were transferred to the Excel® software. Each action was counted as a unit of analysis for frequency counting. Descriptive statistical analysis was performed by using simple and relative frequency.

Table 1. Characterization of hospitals (n = 44) stratified by region

Regions	Exclusive service by SUS*		Classification of hospital*		Number of professionals*				Number of general beds*				Number of ICU beds**			
	Yes	No	Specialized	General	Up to 700	701 - 1,400	1,401 - 2,100	>2,101	Up to 100	101 - 200	201 - 300	>301	Up to 10	11 -20	21 -30	>31
Midwest and DF	1(20)	4(80)	-	5(100)	-	2(40)	2(40)	1(20)	-	2(40)	2(40)	1(20)	-	3(75)	-	1(25)
Northeast	-	17(100)	4(23.5)	13(76.5)	3(17.6)	5(29.4)	6(35.3)	3(17.6)	4(23.5)	4(23.5)	7(41.2)	2(11.8)	8(50)	2(15.2)	4(25)	2(12.5)
North	1(50)	1(50)	1(50)	1(50)	1(50)	1(50)	-	-	1(50)	-	1(50)	-	1(100)	-	-	-
Southeast	2(13.3)	13(86.7)	5(33.3)	10(67.7)	5(33.3)	1(6.7)	4(26.7%)	5(33.3)	5(33.3)	2(13.3)	4(26.7)	4(26.7)	2(20)	2(20)	2(20)	4(40)
South	1(20)	4(80)	-	5(100)	-	-	2(40)	3(60)	-	-	2(40)	3(60)	2(40)	-	1(20)	2(40)

*n=44; **n=36

As all information used in this study is in the public domain, the project approval by the Research Ethics Committee was not necessary.

Results

The 44 federal university hospitals account for a total of 11,034 general beds and 901 ICU beds. The Northeast region concentrates the largest number of hospitals (38.6%), but the Southeast region has the highest number of general beds (33.81%) and ICU beds (40.18%). The number of general beds ranged from 18 to 981, and of ICU beds in these in 36 hospitals, from one to 101. Most institutions are classified as general hospitals (77.3%) and provide exclusive care to SUS (88, 6%). Table 1 shows the details of the characterization of federal university hospitals stratified by region.

The 495 actions identified in federal university hospitals to cope with the COVID-19 pandemic were distributed among Care (38.99%), Management (37.58%), Extension (16.16%) and Teaching and Research (7.27%). In the Care dimension, actions related to the suspension and/or postponement of consultations or outpatient care, restriction and/or suspension of visits and suspension and/or postponement of elective surgeries were highlighted. In the Management dimension, the main strategies were the training of professionals to manage COVID-19, emergency hiring of health professionals and offering psychological care to workers (Table 2).

In relation to Extension, the main activity was the development of educational materials on COVID-19 prevention measures. Among the topics covered, nutrition guidelines for pregnant women and children, and on physical activity and mental health for patients and professionals stood out. In the field of Teaching and Research, teaching and research activities related to undergraduate and postgraduate courses were suspended. However, the engagement in the development of new research projects on epidemiological aspects, diagnosis, prevention and treatment of COVID-19 stood out (Table 3).

Table 2. Care and management strategies performed by hospitals (n=44)

Care (n=193)	n(%)
Suspension and/or postponement of consultations or outpatient care	37(19.17)
Restriction and/or suspension of visits	35(18.13)
Suspension and/or postponement of elective surgery	29(15.03)
Restriction of circulation of companions around the hospital	24(12.44)
Definition of flowchart and care protocols for patients suspected of being infected with COVID-19	22(11.40)
Implementation of video calls between patients, family members and health staff	20(10.36)
Suspension and/or postponement of exams	16(8.29)
Issuance of prescription and appraisal reports by e-mail	3(1.55)
Motivational messages in the lunchbox of inpatients with suspected COVID-19	2(1.04)
Screening of companions and visitors to detect respiratory problems	2(1.04)
Adoption of care referrals to urgent and emergency cases	2(1.04)
Development and distribution of therapeutic kits for patients in isolation	1(0.52)
Management (n=186)	**n(%)**
Training of professionals to manage COVID-19	36(19.35)
Emergency hiring of health professionals	34(18.28)
Offer of psychological care to workers	22(11.83)
Campaign for the collection of PPE and financial donations for the acquisition of ventilators	14(7.53)
Development of contingency plan for tackling COVID-19	13(6.99)
Campaign to thank and encourage health professionals	8(4.30)
Opening of a specific unit for patients with COVID-19	8(4.30)
Purchase of inputs and personal protective equipment (PPE)	8(4.30)
Provision of special accommodation for health professionals	7(3.76)
Opening of new ICU beds for patients with COVID-19	7(3.76)
Conducting COVID-19 tests for healthcare professionals	7(3.76)
Vaccination campaign against influenza for health professionals	5(2.69)
Redistributing and/or putting professionals from risk groups on leave	4(2.15)
Organization of exclusive teams to assist patients with COVID-19	3(1.61)
Distribution of 70% alcohol gel tubes for professionals	3(1.61)
Creation of a flu syndrome clinic for professionals and students	2(1.08)
Holding a general meeting on COVID-19 at the institution	2(1.08)
Search for volunteer professionals	1(0.54)
Blood donation campaign	1(0.54)
Sanitation in areas of high circulation	1(0.54)

Table 3. Extension, Teaching and Research strategies (n=44)

Extension (n=80)	n(%)
Development of educational materials on prevention of COVID-19	27(33.7)
Development of campaigns to receive donations from community resources	24(30.0)
Teleorientation for patients and teleconsultation for health professionals	12(15.0)
Dissemination of tips and online activities for the community in social isolation	10(12.5)
Suspension of events and interruption of extension projects	7(8.7)
Teaching and Research (n=36)	**n(%)**
Suspension of teaching activities (undergraduate, postgraduate) in general (theoretical, practical, internships), of new research projects (except those focused on COVID-19) and events, and adaptation of activities of residency programs	11(34.3)
Development of scientific research on epidemiological aspects, diagnosis, prevention and treatment of COVID-19	9(25.0)
Use of information and communication technologies (remotely) in teaching and exchange of information between professionals	6(16.6)
Development of technologies to support the coping with COVID-19	5(13.8)
Training actions for students and residents for coping with COVID-19	5(13.8)

Discussion

The results showed the heterogeneous distribution of university hospitals, general beds and ICU beds in Brazil. In view of the COVID-19 pandemic, this is a concerning situation because it can compromise the care, especially of patients with more severe symptoms. The scenario is worse for ICU beds and in the North and Northeast of the country. In addition, the presence of care gaps can lead the system to collapse, even with lower infection rates.[12]

The identification of the actions developed demonstrates the proactive and quick response of federal university hospitals to cope with the COVID-19 pandemic. Although the actions developed were classified in Care, Management, Extension and Teaching and Research dimensions, there is a complementarity between them in favor of the quality of health care, patient and team safety, as well as commitment to the production of scientific and technological knowledge.

The behavior of the new coronavirus is still not understood by the academic and scientific community, especially regarding forms of transmission. In this sense, data found in a study conducted in two hospitals in Wuhan, China, warned about the potential risk of airborne transmission, since particles of the virus were found suspended in the air in adjacent regions to the hospitals.[13] The circulation of people in these regions can carry a double risk of contamination, one through contact with potentially infected people and the other through direct exposure to possibly contaminated air. Therefore, the measures adopted by federal university hospitals in relation to reducing the circulation of people in the hospital environment stood out. Similar actions were also developed in Chinese hospitals during the pandemic.[14]

A worrying aspect of a pandemic is the growing flow of patients with a consequent burden on health systems, which causes a severe shortage of human and material resources in these units. In view of the care demands, such resources are so important that no effort should be spared to ensure an adequate quantity of these elements in the adverse pandemic scenario. To this end, reorienting the care models in hospital institutions requires greater rigidity in patient care, organization of primary demands and the support to other needs arising from inflection points that may emerge in the daily routine.[15]

In terms of Management, the highlights were the emergency hiring of new professionals and training of health teams. The search for new professionals is a necessity resulting from the higher demand of care by patients, mainly to cope with the peak of the pandemic. As observed in Italy and Spain, hospitals needed to increase their staff and their care capacity to prevent hospital collapse in the face of the pandemic context of Sars-CoV-2 infection.[16]

As COVID-19 was a previously unknown disease, training was required for health professionals who have or may have contact with people infected with the new coronavirus or suspected of infection. Training is necessary both on clinical management of the disease and to allow the practical implementation of the proper technique of putting on and taking off the Personal Protective Equipment (PPE) in order to reduce the risk of contamination and technical errors.[17]

The adoption of emotional support measures for professionals with the provision of psychological care to workers, complementary therapies and relaxation activities is another remarkable action. This special care to the mental health of professionals is essential at a time of increasing workload

and treatment for a new disease. Therefore, managers and institutional leaders should encourage team members to ask for help when they need it and make efforts to develop strategies to listen and support professionals in the face of a challenging moment.[7,18]

In addition to tangible actions to address their concerns, health professionals want visible leadership during this turbulent period. Leaders such as hospital administrators, nursing managers and department supervisors must develop innovative ways to be present and connect with their teams, given the constraints of social isolation. It is essential that leaders understand the sources of concern of health professionals and seek approaches that alleviate such concerns as much as possible.[18] For this reason, the development of campaigns at federal university hospitals to thank health professionals and the creation of videos and messages of encouragement and support are important to motivate professionals in this delicate period. Expressions of gratitude for the commitment of health professionals and their willingness to put themselves in danger for patients and colleagues can make a difference at this challenging time. Leaders of the organizations do not need and should not outsource gratitude entirely to the public.[18,19]

In relation to the Extension actions, the work of federal university hospitals in the production of informational materials aimed at the prevention of COVID-19 stood out, especially online. This information can contribute to the mental health of the population, since studies indicate the great impact on collective mental health caused by the enormous scale of the epidemic progress, which can generate and aggravate symptoms of anxiety, stress, depression, insomnia, anger and fear in a deep and durable way. Thus, online educational actions can represent a means of interaction, a source of information and contribute to emotional management.[19]

Another highlight among Extension actions were the campaigns to collect inputs and donations of PPE. This fact can be attributed to the scarcity of inputs worldwide, as a result of an abrupt increase in the demand for PPE to prevent the spread of the virus, not only by health institutions, but by the population in general, causing a shortage for the use by health professionals.[20]

As for Teaching and Research, in line with general measures aimed at reducing the circulation of people, activities related to undergraduate and postgraduate teaching and research were suspended. However, university hospitals have traditionally been characterized by being at the forefront in conducting research and developing health technologies. Thus, even at the beginning of the pandemic period, the findings of this study already indicated that federal university hospitals were committed to the production of new knowledge about COVID-19.

Studies on the new coronavirus already conducted in other countries have been fundamental for better responding to the epidemic.[21] However, there is an ongoing need for greater investment in scientific investigations both for the production of evidence for clinical practice and for understanding the effects of COVID-19 on the mental health of the population, mainly of vulnerable groups such as health professionals. To this end, we emphasize the importance of integrating disciplines in a perspective of international collaboration for the production of knowledge and new technologies.[22]

Limitations involve the fact of conducting the study at the beginning of the COVID-19 pandemic in Brazil, based exclusively on information disclosed on the websites of university hospitals. In addition, the survey was restricted to federal university hospitals, which do not represent the majority of hospital institutions in the country.

Despite these limitations, this study provides an overview of the actions taken by federal university hospitals to deal with the beginning of the COVID-19 pandemic in Brazil. It also gives visibility to the role of these institutions, which, through their managers, are developing strategies to provide the conditions and resources necessary to fulfill their care mission in the context of the National Health System. As suggestions for future studies, we indicate the importance of assessing the impact of the actions identified in this study within the organizational context, the work environment of profession-

als and the capacity of university hospitals meeting the health system demands.

Conclusion

Federal university hospitals are reorganizing the service and looking for ways to provide the necessary conditions to face the COVID-19 pandemic based on Care, Management, Extension, Teaching and Research actions. In Care, the highlight was suspension and/or postponement of consultations and outpatient care, restriction and/or suspension of visits and suspension and/or postponement of elective surgeries. In Management, the main strategies were the training of professionals to manage COVID-19, emergency hiring of health professionals and the offer of psychological care to workers. In Extension, the main action was the development of educational materials on preventive measures. In the field of Teaching and Research, activities related to undergraduate and postgraduate courses were suspended, but new research projects related to COVID-19 have started.

Collaborations

Santos JLG, Lanzoni GMM, Costa MFBNA, Debetio JO, Sousa LP, Santos LS, Marcelino TB, Mello ALSF contributed to the project design, data analysis and interpretation, article writing, relevant critical review of the intellectual content and final approval of the version to be published.

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