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ORIGINAL ARTICLE

VALIDATION OF AN EVALUATION MATRIX FOR ASSESSING CONTINGENCY PLANS IN BRAZILIAN UNIVERSITY HOSPITALS

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ABSTRACT

Objectives: to build, validate and test an evaluation matrix for coping plans established by hospital institutions. **Method:** This was a methodological study implemented using the content validation method that covered four stages: bibliographic survey and selection of structuring references, construction of the logical model and preliminary evaluation matrix, content validation by the committee of experts and testing matrix pilot. **Results:** the plans followed a model established by the EBSERH network. Weaknesses were identified in the subdimensions analyzed: provision of assistance and administrative teams, structure covering command, communication, support area, operations, logistics and administrative personnel for technical reserves. **Conclusion:** the establishment of contingency plans needs to cover planning, monitoring and evaluation processes, as well as the qualification of managers, managers and workers in addition to considering the Health System, its care networks and priority lines of care. There still persists a focused look at internal organizational processes as if the hospital institution were isolated from other health components and facilities.

Keywords: Health Strategies. Contingency Plans. COVID-19 Virus Disease. UniversityHospitals. Health Assessment.

INTRODUCTION

Contamination by COVID-19 began in December 2019 and quickly escalated to pandemic status. Since then, Brazil, along with other countries worldwide, has faced illness and death among workers, highlighting numerous weaknesses in the hospital setting[1]. In May 2022, it was decreed that COVID-19 was no longer a Public Health Emergency; however, by August of the same year, the country had recorded more than 680 thousand deaths from virus-related complications.The health crisis was exacerbated by infrastructure, material resource, and personnel shortages in healthcare services, with this highly transmissible and lethal virus rapidlyplacing the COVID-19 pandemic as a global health problem and, in a short period of time, leading to alarming morbidity and mortality indicators[2].

From a conceptual perspective, the Hospital Component is a dimension of Healthcare that should be qualified and organized, encompassing primary care services, the fixed and mobile pre-hospital component, hospital emergency points of access, clinical backup wards, extended care beds, priority Care Lines (CLs), and intensive care beds, with the primary points of accessaiming to provide comprehensive and qualified care to patients in emergency situations[3].

Accordingly, the centrality of the doctrinal principles of the Brazilian National Health System (*Sistema Único de Saúde* - SUS) can be seenas universality, equity, and comprehensiveness in emergency care; humanization of care, centered on the comprehensive care for the user; prioritized care, through Risk Classification, according to the degree of suffering, urgency, and severity of the case; regionalization of emergency care, with coordination of various points of care, regulated

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access to health services; and multidisciplinary care[3].In this context, based on studies conducted, in the case of Brazil, the hospital setting was chosen as strategic for tackling COVID-19, and for this, it needed teams engaged in planning, monitoring, and evaluating the COVID-19 pandemic. Therefore, the question arises: how did Brazilian hospitals plan, implement, and evaluate COVID-19 coping strategies[4]?

Based on this question, the following points need to be considered: evaluation as a management tool in the SUS is not yet an established reality in the daily life of Brazilian hospitals, the impact of the COVID-19 pandemic on health services and systems, and the model proposed by the Brazilian Hospital Services Company - EBSERH for the elaboration of contingency plans to be built during the COVID-19 pandemic in the hospitals under its management. Therefore, the objective of the present study was to construct, validate, and test an evaluation matrix for the coping plans instituted by hospital institutions.

METHOD

This study is part of a multicenter research project entitled "Evaluation of nursing care for patients with COVID-19 in Brazilian university hospitals," funded by the *Ministério da Ciência, Tecnologia e Inovação*, approved in Call MCTIC/CNPq/FNDCT/MS/SCTIE/Decit No. 07/2020 - Research to address COVID-19, its consequences, and other severe acute respiratory syndromes.It was a methodological study implemented using the content validation method, which encompasses four stages: literature review and selection of structuring references, construction of the logical model and the preliminary evaluation matrix, content validation by the committee of experts, and pilot testing of the matrix.

The setting for the pilot study was eight University Hospitals (UHs) affiliated with EBSERH and located in four Brazilian regions, specifically in the following states: Amazonas, Bahia, Mato Grosso do Sul, Mato Grosso, Pará, Rio Grande do Norte, Santa Catarina, and Rio Grande do Sul. The hospitals were selected by convenience, considering the ease of access of the research team members and their willingness to participate in the research.

Regarding the hospitals' affiliation with EBSERH, it is worth noting that this company, created by the federal government in 2011 through Law No. 12.550, is a public company with legal personality of private law and its own assets, linked to the Ministry of Education and responsible for managing the National Program for the Restructuring of Federal University Hospitals — Rehuf, created in 2010[5].

The methodology comprised the following steps:

1st stage: Literature review and selection of structuring references

In this stage of the research, an extensive survey was conducted to support the conceptual framework on contingency plans, the Donabedian triad, management models, content validation, and technical documents on COVID-19 response in Brazil, especially in the hospital setting. Specifically, the theoretical framework used in the development of the logical model and the evaluation matrix was the "Donabedian Triad," defined as a theoretical proposal for Health Evaluation. Developed in the 1980s, it consists of structure (operational conditions for the development of the evaluated process), process (the development of health practices), and outcome (the impacts generated by health practices)[6]. However, this study considered only the structure dimension, leaving the process and outcome dimensions for other stages of the macro-researchproject.

2nd stage: Construction of the logical model and the preliminary evaluation matrix

Considering that methodological studies with an evaluative approach aim to improve health and care practices as well as assist in decision-making[7], the second stage of the research was carried out from March to April 2022 when a committee of experts consisting of 12 researchers from various Brazilian Federal Universities, involved in the macro-research project, was formed. As a result of the work of this first committee, a preliminary evaluation matrix for contingency plans was elaborated,

which was evaluated through the Delphi technique[8].

3rd stage: Content validation by the committee of experts

In this stage, to validate the evaluation matrix, a second committee was formed, consisting of expert judges in methodological studies and/or health evaluation research, selected on the Lattes platform, and also healthcareproviders listed as the main members of the team that developed the contingency plans for coping with COVID-19 in the selected hospitals.

From April to August 2022, these judges were contacted by email, informed about the study and the type of participation required, and invited to participate. A deadline of ten days was established for a response, and the consent form was attached, providing details about the objectives, risks, and benefits of participating in the study. A total of 60 judges were contacted, but only 24 agreed to participate in the first round of the Delphi technique, and 16 sent their assessments and suggestions for improving the logical model and evaluation matrix. In the second round, only 12 judges effectively participated in the validation proposal.

The instrument evaluated in the first round described above was composed of one dimension of the Donabedian triad[6], 12 sub-dimensions, and 25 evaluative questions. After the suggestions from the judges and consensus of the research team, the new matrix was configured as follows: one dimension, nine sub-dimensions, and 22 evaluative questions, with this final model having its content statistically validated.

4th stage: Pilot testing of the matrix

As part of the content validation stage, a pilot test was conducted based on the analysis of contingency plans from the eight hospitals in the EBSERH network selected for the research. It is important to highlight that documentary analysis has been widely used in social sciences and historical research to describe/compare social facts, establishing their characteristics or trends[9].

The matrix was applied to the contingency plans by members of the larger research team, including undergraduate, master's, and doctoral students, who were calibrated due to their involvement with the research project since the project development stage. The contingency plans of the eight hospitals were individually evaluated by all members of the team. Specifically, the validated Evaluation Matrix, evaluative questions, and specific indicators that addressed the suggested requirements were applied. The responses were assigned the following values: one (01) when fully meeting the recommendation; two (02) when partially meeting it, and three (03) when not meeting it. Therefore, plans with higher scores would be those that deviated the most from the recommended guidelines, and those with lower scores would be those that were closest to the model suggested by the Hospital Services Network for the elaboration and implementation of health actions to cope with COVID-19 in these spaces.

After this individual evaluation of all plans by all members of the research team, a meeting was held for collective evaluation to discuss the items that presented discrepancies. The scores assigned by the members of this committee varied in some plans, with an average of two points higher or lower. This demonstrates the relevance and clarity of the validated instruments as well as the feasibility of their use in other evaluations. At this stage, it was decided, by consensus, to assign a value to each evaluated indicator. The results were processed using the R research software, which, according to onestudy[10], allows the researcher to propose new sub-routines and implement new analysis methods according to their needs.

The study was approved by the Research Ethics Committee of the Federal University of Santa Catarina (Authorization No. 4.347.463). At all stages of the study, the determinations of Resolution 466/2012 were respected, especially regarding the risks of interference in the behavior of experts (constraint in presenting suggestions or disagreements in the logical model or in the evaluation matrix, as well as in its application).Finally, considering the ethical issues of participant anonymity and to preserve the identities of the hospitals studied, they will

be identified by numbers.

RESULTS

In the first round, when the content of the evaluation matrix was validated, the following results were obtained: amean Concordance Rate (CR) of 66.26% and a general Content Validity Index (CVI) of 0.58. All indicators were considered valid, however, various changes were suggested in the evaluative questions, as well as the insertion of other sub-dimensions and changes in the value attribution and source.

In the second round, the CR reached 100% and the overall CVI was 0.98. Therefore, considering the parameters set as acceptable, namely, the concordance rate should be greater than or equal to 90%, and the CVI should be higher than 0.80[11], the indicators were validated with the relevance and clarity necessary to be applied in the documentary analysis, the second stage of the PC evaluation study, when the pre-test of the evaluation matrix was conducted, as presented in Table 1.

Table 1. Evaluation matrix of contingency plans validated after two rounds of the Delphi technique

SUB-DIMENSION	INDICATOR
A) PLAN ACTIVATION LEVELS	A1: Existence of activation levels of the contingency plan.
	A2: Existence of activation parameters of the contingency plan.
	A3: Existence of individuals responsible for activating the various levels.
B) HEALTHCARE NETWORK	B1: Existence of healthcare network for COVID-19 cases in the healthcare system, considering the level of complexity.
	B2: Existence of agreements between reference and counter-reference units.
C) ORGANIZATIONAL FLOWS	C1: Existence of flows for companions and visitors.
	C2: Existence of flows for physical access to the entry point.
	C3: Existence of flow for access to internal hospital units.
D) TRIAGE AND RISK CLASSIFICATION	D1: Existence of triage teams and risk classification.
	D2: Existence of triage/risk classification protocol for suspected cases of COVID-19.
E) INCIDENT MANAGEMENT SYSTEM	E1: Existence of a managerial/technical team with defined roles.
	E2: Existence of a structure covering command, communication, support area, operations, logistics, and administrative.
F) STRATEGIES TO INCREASE INSTALLED CAPACITY FOR COVID-19 CARE	F1: Existence of equipment estimation.
	F2: Existence of plans for opening new beds.
G) PERSONNEL MANAGEMENT	G1: Existence of strategies for Mental Health and well-being of hospital professionals.
	G2: Existence of workforce survey for COVID-19 response.
	G3: Existence of risk group survey for frontline COVID-19 care.
	G4: Existence of strategies for monitoring professionals absent due to COVID-19.
	G5: Existence of forecast for healthcare and administrative teams for technical reserve.
H) EPIDEMIOLOGICAL SURVEILLANCE	H1: Existence of notification strategies.
	H2: Existence of strategies for monitoring COVID-19 cases.
	H3: Existence of forecast for individuals responsible for surveillance actions.
I) COMMUNICATION	I1: Existence of communication plan.

Font: study data.

Regarding the application of the evaluation matrix, it should be emphasized that there were multiple editions of the contingency plans for the university hospitals. Therefore, it was decided to use the last final version, the seventh, and for that purpose, a new search for these documents was conducted, as shown in Table 2.

Table 2. Evaluation of the contingency plans of theUniversity Hospitals.

Subdimension	Total	Mean	Standard Deviation
A- Plan Activation Levels	31	3.875	1.96
B- Healthcare Network	22	2.75	1.39
C- Organizational Flows	27	3.38	0.99
D- Triage and Risk Classification	16	2.00	0
E- Incident Management System	21	2.63	1.32
F- Strategies to Increase Installed Capacity for COVID-19 Care	20	2.50	1.32
G- Personnel Management	58	7.25	2.33
H- Epidemiological Surveillance	29	3.63	1.65
I- Communication	10	1.25	0.66

Font: study data.

The subdimensions related to plan activation levels (A) and epidemiological surveillance (H) had higher means, therefore, they were the least considered. On the other hand, the one related to communication had a lower mean, being the most frequent in the plans (Table 2). The indicators with the highest scores, i.e., the least addressed in these plans, were the provision of healthcare and administrative teams and the structure covering command, communication, support area, operations, logistics, and administrative personnel for technical reserve (Table 3) (Table 1).

Table 3. Evaluation with detailed analysis of the indicators considered in the contingency plans of the University Hospitals, 2022.

Subdimension	Indicators	Total	Mean	Standard Deviation
A	**1**	9	1.29	0.76
	2	12	1.50	0.93
	3	10	1.25	0.71
B	**1**	10	1.25	0.71
	2	10	1.25	0.71
C	**1**	10	1.25	0.71
	2	10	1.25	0.71
	3	10	1.25	0.71
D	**1**	12	1.50	0.93
	2	12	1.50	0.76
F	**1**	12	1.50	0.93
	2	15	1.88	0.99
G	**1**	10	1.25	0.71
	2	10	1.25	0.71
H	**1**	10	1.25	0.71
	2	12	1.5	0.93
	3	12	1.5	0.93
	4	8	1	0.00
	5	19	2.375	0.92
I	**1**	11	1.375	0.74
	2	10	1.25	0.71
	3	10	1.25	0.71
J	**1**	10	1.25	0.71

Font: study data.

The indicator with the lowest score, meaning it was present in most plans, was the existence of strategies for monitoring professionals who are absent due to COVID-19. It is important to highlight that the dimension evaluated was the structure, considering that a contingency plan is a tool for tactical-operational moments and assessment. However, the plans should have described such strategies.

Overall, the plans followed an established model, and the variation in scores was not significant, ranging from 23 to 26 points in six hospitals (Table 4) (Table 1). The only exceptions were UH7, which scored 36 points, and UH6, with 65 points. This demonstrates that these hospitals failed to meet many planning/intervention recommendations outlined in the model.

Table 4. Global Evaluation of the Contingency Plans of the University Hospitals, 2022.

Institution	Total	Mean	Standard Deviation
UH1	23,00	1,00	0,00
UH2	28,00	1,22	0,60
UH3	25,00	1,09	0,29
UH4	26,00	1,13	0,46
UH5	25,00	1,09	0,42
UH6	65,00	2,83	0,58
UH7	36,00	1,64	0,95
UH8	26,00	1,13	0,46

Font: study data.

DISCUSSION

In the eight HUs surveyed, a high degree of similarity was found between the technical recommendations indicated and the content of the contingency plans with theoretical descriptions of the topics identified as strategic for addressing COVID-19 in hospital settings, rather than specifically detailing how a particular guideline would be implemented in the specific institution. On the contrary, it is important to consider management models that stimulate the creativity of healthcare teams and managers so that we can achieve more effective and efficient results for the strategic management of health services and systems[12].

The surveyed scenarios are diverse, as the Healthcare System presents specific nuances in each locality based on cultural, economic, social, and political issues unique to each Brazilian state. Furthermore, to have the desired impact,strategies for addressing COVID-19 need to be considered, taking into account aspects of the local reality.

Researchers highlight the heterogeneity of organizational capacities. This reveals the fragility of planning that does not consider the specificities of each healthcare service. It is a prescription of general actions thought of randomly without considering the economic, administrative, and political aspects of the territory. This highlights the importance of strategic management capacity to institutionalize the basic instruments of administration: planning, monitoring, and evaluation[13].

Regarding the healthcare networks, the organizational flows, and strategies to increase COVID-19 care capacity showed a lower standard deviation, being more frequently met in the contingency plans. This finding is consistent with studies in Primary Healthcare and hospital care, where a focus on flow issues and increasing service capacity was also observed[14,15].

Researchers argue that despite the federative crisis that delayed municipalities' response time, healthcare services demonstrated resilience in redefining flows, routines, restructuring units. However, it is a mistake to think of healthcare services as an end in themselves and not dependent on an organized network hierarchized by technological and social complexity[14].

Another aspect identified was the presence of various versions of the contingency plans in hospitals, which may indicate a weakness, as the fact that they are continuously changed can be interpreted as a constant presence of new factors, suggesting that planning and monitoring strategies were not well structured, and the decision-making process needs better qualification. On the other hand, it is necessary to consider that the pandemic also did not spread linearly across the national territory, which may have led to changes in the contingency plans of UHs.

Accordingly, it is necessary to consider the dynamism and specificities of healthcare services, as healthcare management has an interactive dimension, focused on the demands of the field of action to achieve goals/objectives, being attentive to the mission of organizations as well as the interests of workers[16,17].Furthermore, the development of a democratic and participatory management, attentive to local/regional needs, to think not only about the services themselves but also the care networks, their components, and lines of care in health committed to quality care and user, worker, and manager satisfaction. Although there are different models, participatory management allows the development of actions that are potentially capable of reconfiguring the work process democratically and innovatively[13].

The subdimensions that presented lower standard deviation may denote the high degree of normativity of the organizations associated with the productivity management model. The indicators with the highest scores are linked to management model issues and administrative efficiency for hiring professionals. On the other hand, the indicators with the lowest scores were related to communication issues and strategies to increase the installed capacity, which, upon analyzing the actions planned, showed that these were focused on low-cost actions for the organization.

Some studies have focused on addressing COVID-19 through simplified, superficial, and low-cost operational actions, such as the multiple training sessions conducted by municipal and state secretariats, with the consequent exacerbation of precariousness and work overload[18]. Studies that assessed working conditions in healthcare services during the COVID-19 pandemic showed that these were extremely affected due to inadequate infrastructure, exhausting work, biosafety at risk, exhaustion, fear of contamination and death, strong signs of physical and mental exhaustion among workers[19,20].

Considering another aspect, the hegemony of a management process is strongly based on the clinical model of healthcare, whose knowledge comes from anatomy, physiology, biology, pathology, and pharmacology. In this context, the hospital is an organization subordinate to management focused on control, standardization, and routinization of the work process[21].

It is evident that the plans were built with a low degree of articulation and networking, focusing on the internal environment of the organization. The results also show that, although hospitals have implemented a contingency plan to address COVID-19, which in itself represents an advance, they still presented results very similar to those of a state-owned public hospital. In this sense, it is debatable to affirm that they present better performance, even though they are linked to a model that proposes to be efficient, modern, and effective.

In this regard, research points out that between the discussion of efficiency of the public and private sectors, there is a political game that does not contemplate technical aspects, economic sustainability, the social role of organizations, and decision-making power, with a great reinforcement for privatization and the creation of models such as public-private partnerships being the World Bank, the International Finance Corporation[22].

Finally, a review study on management models in hospital institutions[23] explains that the administrative model adopted in Brazil since the 1990s meets market demands and yields to neoliberal aspirations, promising to make the State efficient and reduce its costs. Therefore, plans lacking creativity and meeting only local and routine service needs are identified. There is low investment in shared and democratic management practices, absence of representation of healthcare service users in planning actions, and very weak and infrequent monitoring and evaluation strategies[24].

CONCLUSION

The content of the logical model and the evaluation matrix for the COVID-19 response plans in the investigated hospital institutions were validated. The indicators were validated with the relevance and clarity necessary to be applied in the documentary analysis of the response plans.

It is important to mention that during the evaluation of the contingency plans, a high degree of similarity was observed among them, as well as a normative content. Only two hospital institutions deviated from the proposed parameter, and the evaluation of these last two was not linked to a high degree of inventiveness through the valorization of the local reality.In general, the plans followed an established model, and the variation in scores was not very significant. The exceptions were UH7 and UH6. These hospitals differed because they failed to comply with some planning/intervention recommendations proposed in the model plan.

The results indicate that six out of the eight evaluated contingency plans have bureaucratic characteristics, developed in a "reactive" manner to meet institutional demand, with little penetration into the healthcare service itself, based on traditional management practice models that show democratic, communicative,

and participative weaknesses.

It should be emphasized that this study can contribute theoretically, critically, and reflectively to the evaluation of contingency plans and healthcare service management, aiming to enhance the quality of organizations and the institutionalization of organizational processes of planning, monitoring, and evaluation in the healthcare network.

VALIDAÇÃO DE MATRIZ AVALIATIVA PARA AVALIAÇÃO DOS PLANOS DE CONTINGÊNCIA DE HOSPITAIS UNIVERSITÁRIOS BRASILEIROS

RESUMO

Objetivos: construir, validar e testar uma matriz avaliativa para os planos de enfrentamento instituídos pelas instituições hospitalares. **Método:** Trata-se de um estudo metodológico implementado a partir do método de validação de conteúdo que abrange quatro momentos: levantamento bibliográfico e seleção das referências estruturantes, construção do modelo lógico e da matriz avaliativa preliminar, validação de conteúdo pelo comitê de especialistas e teste piloto da matriz. **Resultados:** os planos seguiram um modelo estabelecido pela rede EBSERH. Identificou-se fragilidade nas subdimensões analisadas: previsão de equipes assistenciais e administrativas, estrutura abrangendo comando, comunicação, área de apoio, operações, logística e pessoal administrativo para reserva técnica. **Conclusão:** a instituição de planos de contingência precisa abranger processos de planejamento, monitoramento e avaliação, bem como, a qualificação dos gestores, gerentes e trabalhadores além de considerar o Sistema de Saúde, suas redes de atenção e linhas de cuidado prioritárias. Ainda persiste um olhar focalizado sobre os processos internos organizacionais como se a instituição hospitalar estivesse isolada dos outros componentes e equipamentos de saúde.

Palavras-chave: Estratégias de Saúde. Planos de Contingência. Doença por Vírus COVID-19. Hospitais Universitários. Avaliação em Saúde.

VALIDACIÓN DE MATRIZ EVALUATIVA PARA EVALUACIÓN DE LOS PLANES DE CONTINGENCIA DE HOSPITALES UNIVERSITARIOS BRASILEÑOS

RESUMEN

Objetivos: construir, validar y probar una matriz evaluativa para los planes de enfrentamiento instituidos por las instituciones hospitalarias. **Método**: se trata de un estudio metodológico implementado a partir del método de validación de contenido que abarca cuatro momentos: prospección bibliográfica y selección de las referencias estructurantes, construcción del modelo lógico y de la matriz evaluativa preliminar, validación de contenido por el comité de expertos y prueba piloto de la matriz. **Resultados**: los planes siguieron un modelo establecido por la red EBSERH. Se identificó fragilidad en las subdimensiones analizadas: previsión de equipos asistenciales y administrativos, estructura abarcando comando, comunicación, área de apoyo, operaciones, logística y personal administrativo para reserva técnica. **Conclusión**: el establecimiento de planes de contingencia debe abarcar procesos de planificación, monitoreo y evaluación, así como, la calificación de los gestores, gerentes y trabajadores, además de considerar el Sistema de Salud, sus redes de atención y líneas de atención prioritarias. Aún persiste un enfoque sobre los procesos internos organizacionales como si la institución hospitalaria estuviera aislada de los otros componentes y equipos de salud.

Palabras clave: Estrategias de Salud. Planes de Contingencia. Enfermedad por Virus COVID-19. Hospitales Universitarios. Evaluación en Salud.

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