Recommendations for the safety of hospitalised patients in the context of the COVID-19 pandemic: a scoping review

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ABSTRACT

Objective To map the recommendations for hospitalised patient safety in the context of the COVID-19 pandemic.

Design Scoping review using the method recommended by the Joanna Briggs Institute.

Data sources Databases: Medline, SCOPUS, EMBASE, ScienceDirect, Lilacs, CINAHL and IBecs; grey literature platform: Google Scholar; and 11 official websites of leading healthcare institutions were searched on 27 April 2021 and updated on 11 April 2022.

Eligibility criteria We included documents that present recommendations for the safety of hospitalised patients in the context of the COVID-19 pandemic, published in any language, from 2020 onwards.

Data extraction and synthesis Data extraction was performed in pairs with consensus rounds. A descriptive analysis was carried out to present the main characteristics of the articles. Qualitative data from the extraction of recommendations were analysed through content analysis.

Results One hundred and twenty-five documents were included. Most papers were identified as expert consensus (n=56, 44.8%). Forty-six recommendations were identified for the safety of hospitalised patients: 17 relating to the reorganisation of health services related to the flow of patients, the management of human and material resources and the reorganisation of the hospital environment; 11 on the approach to the airways and the prevention of the spread of aerosols; 11 related to sanitary and hygiene issues; 4 about proper use of personal protective equipment and 3 for effective communication.

Conclusions The recommendations mapped in this scoping review present the best practices produced so far and serve as a basis for planning and implementing good practices to ensure safe hospital care, during and after COVID-19. The engagement of everyone involved in the care of hospitalised patients is essential to consolidate the mapped recommendations and provide dignified, safe and quality care.

BACKGROUND

COVID-19 is an infectious disease caused by a highly transmissible virus, the new SARS-CoV-2, which may develop into a severe clinical state of respiratory failure.1–3 In March 2020, the disease was declared a global pandemic, imposing an extra burden on structures, equipment, inputs and human resources of health services, and this substantially challenged the health systems of several countries.4,5

The rapid and drastic changes in the care models imposed by the COVID-19 pandemic increased the workload, causing the relocation of staff and the cancellation of elective services, in addition to the treatment of a new disease. These challenging conditions impacted the performance of health teams to provide safe and quality healthcare. Studies

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The extensive search made by the review, involving scientific databases, grey literature and official documents from reference health institutions, together with the rigorously applied method, corroborate the reliability of the data presented.

⇒ The review process was performed independently by peer reviewers, and the research team was trained to conduct scoping reviews and developed a prior research protocol, which gave greater reliability.

⇒ The primary weakness of this review is that most studies are those of the expert consensus type.

⇒ Nevertheless, the context is that of a pandemic, both clinical practice guidelines and expert opinion are the best available evidence.

⇒ The grouping and analysis of results followed methodological rigour for qualitative data and the experience and diversity of the research team increased reliability.

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indicate that increased pressure at work, inadequate staff and worker fatigue are factors that contribute to poor safety. In the COVID-19 pandemic, there was evidence of change in the perception of patient safety, risks in different professional categories and a reduction in notifications of incidents.1-8

This context highlighted the need to develop strategies and recommendations to face the pandemic. Some institutions such as WHO, the International Society for Quality in Health Care (ISQua) and the Centers for Disease Control and Prevention (CDC) have provided daily updated information, protocols and recommendations to ensure the standardisation of safe and quality care.6 In addition to institutional publications, the scientific community has committed itself to disseminating experiences, practices and research related to hospitalised patient care in the context of the pandemic, resulting in a high number of publications on the subject. In this context, it has become important to organise the recommendations regarding patient safety. This scoping review seeks to map the recommendations for the safety of hospitalised patients in the context of the COVID-19 pandemic.

METHOD
Study design
This is a scoping review whose aims, inclusion criteria and methods were specified in advance and which had a registered protocol. It was prepared using the method recommended by the Joanna Briggs Institute,10 consisting of an exploratory review.11

Eligibility criteria
The research question of this study was elaborated according to the PCC mnemonic combination12 (P: population—hospitalised patient; C: concept—recommendations for patient safety; C: context—COVID-19 pandemic), with the following guiding question:

► What are the recommendations for the safety of hospitalised patients in the context of the COVID-19 pandemic?

The refinement of the articles found was based on pre-established eligibility criteria, which were: documents that present recommendations for the safety of hospitalised patients in the context of the COVID-19 pandemic, published in any language, from 2020 onwards, of all age groups and hospital units. The practices described in the documents as imperative to ensure patient safety were considered as recommendations.

Exclusion criteria: studies that did not meet the aim or answer the question, full text unavailable in electronic media, websites/electronic portals with restricted access and research projects.

Electronic search
The search strategy was developed by the researchers with the support of a librarian with extensive experience in carrying out reviews and followed the definition of each database/portal or directory, taking place from 1 to 27 April 2021 and updated on 11 April 2022. The descriptors and keywords used were ‘patient safety’, ‘COVID-19’, ‘hospitalisation’, ‘recommendation’ and their variations. The Boolean operator AND and OR was used. The search terms and strategy are detailed in the online supplemental appendix A.

The searches from the beginning took place in the following databases: Medline Complete (PubMed), SCOPUS (Elsevier), EMBASE (Elsevier), ScienceDirect (Elsevier), LILACS (Bireme), CINAHL Complete (EBSCO), IBECN (Bireme); grey literature: Google Scholar and official websites: WHO, CDC Institute for Healthcare Improvement, ISQua, Agency for Healthcare Research and Quality, National Health Services (NHS Improvement), National Institute for Health and Care Excellence, Ministry of Health, National Health Surveillance Agency, Brazilian Society for Quality of Care and Patient Safety and Collaborating Centre for the Quality of Care and Patient Safety.

Data charting process
The exploratory reading of titles and abstracts was performed independently by peer reviewers, classifying the studies that were related to the research question and met the inclusion criteria. Disagreements were resolved by consensus between peers or by the assessment of a third reviewer if the disagreement continued. The preselected studies were then read in full to evaluate the content as to their contribution to the understanding of the studied phenomenon and subsequent data synthesis. The reference lists of articles were then consulted to discover additional studies. All research, decisions and stages were documented and archived by the lead reviewer.

In the data extraction stage, a standardised data abstraction form (online supplemental appendix B) was used. This provided the identification of the essential elements of the studies such as database, author(s), title, DOI/access link, year of publication, country, collection period, study site/institution, aims, methods (type of research, age/age group, sample size, data analysis) and results (hospital sector, patient safety recommendations). Data extraction was performed in pairs with consensus rounds.

Data analysis and synthesis of results
A descriptive analysis was performed to present the main characteristics of the articles. Qualitative data from the extraction of recommendations were analysed through content analysis, according to the framework of Bardin,13 covering the pre-analysis, material exploration, data processing, inference and interpretation steps. The units of analysis were grouped by theme and then reviewed in pairs and consensus rounds. After the interpretations, the categories of recommendations, subcategories and the details of each recommendation were defined, through

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a reflective process, seeking rigour in terms of the references of the studies.

All analyses were conducted in pairs and discussed in consensus rounds with the review group. A synoptic table with the main characteristics of the studies was elaborated for the compilation and communication of the results, aiming to present an overview of all the material. The recommendations found in the literature were categorised and illustrated.

**Patient and public involvement**

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**RESULTS**

One hundred and twenty-five documents were included (figure 1). The online supplemental appendix C presents a summary, including the main author, year of publication, study origin, objective, method, setting, country and main recommendations presented. Most papers were identified as expert consensus (n=56, 44.8%), followed by literature review (n=35, 28.0%). Many articles described specific recommendations for performing intubation or for certain areas, such as psychiatric services, orthopaedics, haemodynamic, intrahospital transport, oncology, field hospitals, paediatrics, diagnostic centres, inpatient units, endoscopy and gastroenterology centres, gynaecology and obstetrics, emergency units, intensive care units, and the most common was the surgical centres. Other articles made recommendations for the hospital service as a whole. Most documents are from the USA (n=34, 27.2%), followed by Brazil (n=21, 16.8%) and multicentre studies (n=17, 13.6%). The documents were published in 2020 (n=76, 60.8%), 2021 (n=39, 31.2%) and 2022 (n=10, 8.0%). Table 1 summarises the main features of the items included.

Analysis of the documents revealed specific recommendations, which were later grouped into categories and subcategories. Each recommendation was built from the examined literature, and the online supplemental appendix D presents in detail the basis for the construction of each recommendation, as well as all related references. The data enabled the construction of 46 recommendations for the safety of hospitalised patients, 17 relating to the reorganisation of health services, 11 for airway management, 11 for sanitary and hygiene measures and 3 for communication management (figure 2).

The four recommendations related to personal protective equipment (PPE) have greater specificity and detail and for better visualisation are presented box 1.

**Reorganisation of the health services**

The reorganisation of the health services category addresses 17 recommendations related to the flow of patients, the management of human and material resources and the reorganisation of the hospital environment in order to prevent the transmission of COVID-19. It is recommended that all patients are considered suspects and undergo risk stratification with a history of clinical and epidemiological data and a test of RT-PCR, ELISA or nasal swab at admission screening.

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**References**

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referrals and before non-emergency procedures involving airway approaches.

Suspected and confirmed patients should be isolated, preferably in single rooms with negative pressure. If this is not possible, a minimum distance of 1 m should be maintained between beds in collective isolation. Preference should be given to the use of disposable materials in the care of health workers and a one-way, short and direct route for transport should be used, avoiding contact with patients without COVID-19. In case of death, the body must be wrapped in a sheet soaked in a disinfectant solution and placed in the coffin.

Aerosol-generating surgeries and procedures must be performed in rooms with negative pressure, and a one-way, short and direct route for transport should be used, avoiding contact with patients without COVID-19. In case of death, the body must be wrapped in a sheet soaked in a disinfectant solution and placed in the coffin.

Health professionals must undergo daily risk stratification and be tested periodically. Those who are suspected or confirmed must be removed immediately.

To reduce the movement of people, hospitalisations and elective procedures should be suspended, and the number of professionals in the areas of patients with COVID-19 should be kept to a minimum, and family visits to patients should also be restricted.

The teams must be trained regarding: measures to avoid self-contamination; hand hygiene; cleaning of environments, equipment, furniture and materials; and waste management.

Contaminated equipment and materials must be transported along a one-way route.

Airway management

Eleven recommendations were created regarding the approach to the airways and the prevention of the spread of aerosols. Airway management should be performed early in clinically deteriorating patients, avoiding emergency procedures. Intubation must be carried out soon after, and airway and upper trunk interventions (thoracotomy, endoscopy) must be performed by the most experienced professional.

To prevent the spread of aerosols, it is recommended to avoid manual ventilation with the airway maintenance breathing unit, nebulisation therapies, and non-invasive ventilation. As some of these

| Table 1 Main characteristics of included papers |
|-----------------------------------------------|
| **Paper characteristic** | **Categories** | **Results** |
| Year of publication | 2020 | 76 (60.8) |
| | 2021 | 39 (31.2) |
| | 2022 | 10 (8.0) |
| Paper source | Citation searching | 26 (20.8) |
| | Database | 29 (23.2) |
| | Website (Google Scholar) | 31 (24.8) |
| | Organisations | 39 (31.2) |
| Country of origin | USA | 34 (27.2) |
| | Brazil | 21 (16.8) |
| | Multicentre | 17 (13.6) |
| | Italy | 8 (6.4) |
| | Switzerland | 8 (6.4) |
| | UK | 8 (6.4) |
| | China | 5 (4.0) |
| | Canada | 4 (3.2) |
| | Singapore | 3 (2.4) |
| | Spain | 3 (2.4) |
| | India | 2 (1.6) |
| | The Netherlands | 2 (1.6) |
| | Poland | 2 (1.6) |
| | Others | 8 (6.4) |
| Method | Consensus of specialists | 56 (44.8) |
| | Literature review | 35 (28.0) |
| | Technical note | 18 (14.4) |
| | Opinion of professional | 7 (5.6) |
| | Commentary | 6 (4.8) |
| | Guidelines | 6 (4.8) |
| | Editorial | 2 (1.6) |
| | Letter to the editor | 2 (1.6) |
| | Case report | 1 (0.8) |
| Hospital setting | Hospital health services | 42 (33.6) |
| | Surgical centre | 33 (26.4) |
| | Intensive care unit | 11 (8.8) |
| | Gynaecology and obstetrics | 8 (6.4) |
| | Inpatient unit | 6 (4.8) |
| | Emergency unit | 5 (4.0) |
| | Endoscopy and gastroenterology centres | 5 (4.0) |
| | Paediatric | 5 (4.0) |
| | Tracheal intubation | 5 (4.0) |
| | Diagnostic centre | 3 (2.4) |
| | Psychiatry | 3 (2.4) |
| | Field hospitals | 2 (1.6) |
| | Oncology | 2 (1.6) |
| | Haemodynamic | 1 (0.8) |
| | Intrahospital transport | 1 (0.8) |
| | Orthopaedics | 1 (0.8) |

Continued
procedures are essential, closed systems, disposable, and with filter. The patient must be sedated for intubation, bronchoscopy and tracheostomy placement. Removal and aspiration should be conducted with strategies to minimise coughing.

Sanitary and hygiene measures

The 11 recommendations related to sanitary and hygiene issues propose that professionals keep their nails short, but each one of them has specific consequences. Health professionals should use PPE properly, following institutional and regulatory agency guidelines.

Communication management

For effective communication, three recommendations were made. Guidelines and information on care processes should be developed and disseminated through effective communication strategies.

DISCUSSION

Overall, studies have shown that to ensure hospitalised patient safety in the context of the COVID-19 pandemic, it is recommended that hospitals reorganise the hospital environment.
environment and patient flow and replan the management of human and material resources and of dead bodies. The approach and management of the airsos. Intubation must be performed in rapid sequence, preferably by the most experienced professional, and patients with invasive and non-invasive ventilation must be separated. Sanitary and hygiene measures must be taken by patients, accompanying persons, professionals and institutions, and the main measure is the correct and frequent washing of hands. Forecast, provision and management of PPE is necessary, and the team, patients and family members must be trained in its use. Finally, guidelines and protocols with information on fighting

Figure 2 Recommendations for the safety of hospitalised patients.
Box 1 Personal protective equipment (PPE) management recommendations

⇒ Manage forecast and provision of PPE.
⇒ Train the team, patients and family members to wear PPE.
⇒ Management of PPE by professionals:
  ⇒ Correct use of PPE, following institutional and regulatory agency guidelines:
    ⇒ Masks;
    ⇒ Respiratory protection mask (particulate respirator), tested for fit, with a minimum efficiency in the filtration of 95% of particles up to 0.3 µm must be worn during surgeries, transport and in the execution of aerosol-generating procedures in suspected or confirmed patients;
    ⇒ Surgical mask must be routinely worn in the hospital environment;
    ⇒ Disposable head protector must be worn for performing aerosol-generating procedures and transport and surgery of suspected or confirmed patients;
    ⇒ Long gowns and coveralls, with long waterproof sleeves routinely worn in the care of the suspected or confirmed patient are strongly recommended in the performance of surgeries, aerosol-generating procedures and cardiopulmonary resuscitation;
    ⇒ Disposable gloves must be routinely worn in the direct care of hospitalised patients;
    ⇒ Face shields routinely worn in the care of suspected or confirmed patients are strongly recommended in aerosol-generating procedures, transport and in the operating room;
    ⇒ Eye protection/protection goggles routinely worn in the care of suspected or confirmed patients are strongly recommended in aerosol-generating procedures, transport and in the operating room;
    ⇒ Shoes, boots or overshoe resistant to fluids and easy to routinely decontaminate in the care of suspected or confirmed patients are strongly recommended in procedures that generate aerosols, transport and in the operating room.
⇒ Follow the PPE wearing process, under the supervision of an experienced professional, in the following order: disposable hair cover, N95 respirator tested for adjustment, fluid-resistant gown, two layers of gloves, protection goggles and face shield, fluid-resistant shoe covers.
⇒ Remove PPE in the following order: sanitise hands and remove face shield, protection goggles, fluid-resistant apron, outer gloves, shoe covers and inner gloves; then sanitise hands again and remove the N95 mask and hair cover under the supervision of an experienced professional. Dispose of everything in the recommended place.
⇒ Perform the management of PPE by patients and companions:
  ⇒ Provide PPE to patients and visitors/companions and instruct them on its correct use.
  ⇒ All patients (not COVID-19, suspected and confirmed) must wear a surgical mask over the face, tracheostomy tube, ventilation face mask, nasal catheter and prongs.
  ⇒ Suspected and confirmed patients must wear N95 mask or similar.
  ⇒ Visitors of patients with COVID-19 should wear a surgical mask, disposable gowns and coveralls and gloves.
of documents of the expert consensus type, analysed in this scoping review, demonstrates the emerging nature of the issue as it is essential to act urgently in order to control the COVID-19 pandemic.\footnote{148} This scoping review is the initial step in mapping out recommendations for hospitalised patient safety, and there is a need for further research and an assessment of the effectiveness of these recommendations.

Given the possibility that we will be living together with SARS-CoV-2 and its variants, there is a need to carry out risk management, maintaining the recommendations of safe practices both for reducing transmission to patients and for the protection of health professionals. In this sense, the recommendations mapped in this scoping review serve as a basis for planning and implementing good practices to ensure safe hospital care, during and after COVID-19.

CONCLUSION

Forty-six recommendations for the provision of safe care to hospitalised patients, with regard to the scenario of the current pandemic have been described in this scoping review. Strategies for change in the organisation of health services to assist infected people have been highlighted, mainly focusing on the proper use of PPE and airway management, practices that have been consolidated throughout the pandemic and which will be reflected in other possible similar future situations. The engagement of everyone involved in the care of hospitalised patients is essential to consolidate the mapped recommendations and provide dignified, safe and quality care.

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Contributors MSM oversaw the development of all stages of the study and is responsible for the overall content as guarantor. MSM, DCdAL, RRSp, JMO, LTdDMN, RCM, MSdSS and MJdS contributed to all aspects of the study throughout the research cycle. MJdS critically reviewed the final version to be approved. MSM and DCdAL developed the first draft of the manuscript and all authors reviewed and approved the final manuscript.

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