



ORAL HYGIENE TO PREVENT THE OCCURRENCE OF ASPIRATION PNEUMONIA IN INTENSIVE CARE: A SCOPING REVIEW PROTOCOL

HIGIENE BUCAL PARA PREVENÇÃO DE PNEUMONIAS ASPIRATIVAS EM TERAPIA INTENSIVA: PROTOCOLO DE REVISÃO DE ESCOPO

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RESUMO

Objetivo: mapear as evidências científicas disponíveis sobre o uso de protocolos de higiene bucal para prevenção de pneumonias aspirativas em terapia intensiva. **Método:** protocolo de revisão de escopo desenvolvido conforme o *Manual for Evidence Synthesis* e registrado na *Open Science Framework*. A questão de pesquisa foi formulada conforme o mnemônico População: Pacientes internados na Unidade de Terapia Intensiva; Conceito: Protocolos de Higiene Bucal; Contexto: Prevenção de Pneumonias aspirativas na Unidade de Terapia Intensiva. As buscas serão realizadas nas seguintes plataformas: Literatura Latino-Americana e do Caribe em Ciências da Saúde, *Medical Literature Analysis and Retrieval System Online*, Google acadêmico, Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, *Cumulative Index to Nursing and Allied Health Literature* e *Scientific Electronic Library Online*. Após a exclusão das duplicatas no software Endnote, os estudos serão exportados para o software Rayyan para a etapa de seleção, obedecendo os critérios de elegibilidade. A pesquisa será reportada de acordo com o *Preferred Reporting Items for Systematic Reviews and Meta-analyses Extension for Scoping Reviews*. Espera-se identificar e mapear um conjunto de evidências científicas sobre os protocolos de higiene bucal na prevenção de pneumonias aspirativas nos pacientes em Terapia Intensiva.

Descritores: Pneumonia aspirativa; Unidades de Terapia Intensiva; Higiene Bucal; Protocolos Clínicos.

ABSTRACT

Objective: to map the scientific evidences available about the use of oral hygiene protocols for prevention of aspiration pneumonias in intensive therapy. **Method:** scoping review protocol developed according to the *Manual for Evidence Synthesis* and registered in the *Open Science Framework*. The research question was formulated according to the mnemonic Population: Patients admitted in the Intensive Therapy Unit; Concept: Oral Hygiene Protocols; Context: Prevention of aspiration pneumonias in the Intensive Therapy Unit. The searches will be carried out in the following platforms: Latin American and Caribbean Literature in Health Sciences, *Medical Literature Analysis and Retrieval System Online*, academic Google, Journal Portal of the Coordination for the Improvement of Higher Education Personnel, *Cumulative Index to Nursing and Allied Health Literature* and *Scientific Electronic Library Online*. After the exclusion of duplicates in the Endnote software, the studies will be exported to the Rayyan software for the selection stage, obeying the eligibility criteria. The research will be reported in accordance with the *Preferred Reporting Items for Systematic Reviews and Meta-analyses Extension for Scoping Reviews*. It is expected to identify and map a set of scientific evidences about the oral hygiene protocols in the prevention of aspiration pneumonias in the patients in Intensive Therapy.

Descriptors: Aspiration Pneumonia; Intensive Care Units; Oral Hygiene; Clinical Protocols.

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INTRODUCTION

The oral cavity, which consists of teeth, gums, the tongue, and other structures, is a conducive environment for the colonization of microorganisms. Given the vulnerability of this area, continuous assessment of the oral health status of patients in the intensive care units (ICUs) is paramount. A proper balance between oral hygiene (OH) and the comprehensive care in the ICUs is crucial for the patient's discharge from the hospital and for the prevention of serious complications such as aspiration pneumonia⁽¹⁻²⁾.

The ICU is a critical environment in which patients are subjected to medium- to long-term hospital stays, making them susceptible to other diseases, such as respiratory infections⁽¹⁻³⁾. In this environment, the admitted patients are frequently subjected to procedures such as endotracheal intubation, mechanical ventilation, aspiration, and other procedures that could result in an infection for these patients. Knowing this, it is essential to use protocols to support professional practice⁽⁴⁻⁵⁾.

The OH, a set of practices for keeping the oral cavity clean and free of bacteria, plays a key role in preventing the occurrence of infections and enhancing the general health of patients in the ICUs. However, dental care is still limited in the hospital environment, which reflects the lack of prioritization of these health care professionals in the management of health services. The presence of an odontologist is critical for ensuring careful and qualified monitoring of the patients' oral health⁽²⁻⁴⁾.

The patients' OH in the ICUs shall adhere to a strict protocol, which should include the use of personal protective equipment (PPE), hand hygiene, and a proper technique for brushing teeth, gums, and tongue. The OH should be carried out at least three times a day by using a soft brush or gauze moistened with antiseptic solution, to ensure effective removal of bacterial biofilms and prevent infections⁽³⁻⁶⁾.

The nursing team plays a central role in performing and monitoring the OH and is responsible for documenting any changes in the patient's oral health. A protocol for the OH in the ICUs ensures that all health care professionals adhere to uniform guidelines, thus minimizing variations in the quality of care. It also reduces the incidence of ventilator-associated pneumonia, which is a common complication in intubated patients. In addition, the implementation of a protocol simplifies the training of new health care professionals and promotes a systematic, evidence-based approach⁽³⁻⁶⁾.

Clinical studies suggest that a poor OH may lead to systemic infections, including respiratory infections, thus worsening the condition of critically ill patients. Therefore, the use of protocols on OH is an important strategy to reduce the incidence of aspiration pneumonia in the ICUs. This, in turn, may reduce the length of hospital stay, the costs of treating infections, and the workload of the nursing team⁽³⁻⁶⁾.

The implementation of a protocol improves the repeatability and effectiveness of OH and also simplifies the training and guidance of new health care professionals, thus promoting a systematic and evidence-based approach. Thus, a well-defined protocol on OH is vital for maintaining the oral and general health of patients in the ICUs, which contributes to better clinical outcomes and reduced length of hospital stays⁽⁵⁻⁷⁾.

Therefore, a preliminary search in databases was conducted to identify systematic reviews, scoping reviews, or

existing protocols on the use of protocols on OH to prevent the occurrence of aspiration pneumonia in the ICUs. The search revealed that, although there are primary studies on the subject, there is a shortage of comprehensive reviews that consolidate the available evidence. This gap in the literature justifies the need to conduct this scoping review to map the available scientific evidence on the use of protocols on OH to prevent the occurrence of aspiration pneumonia in patients in the ICUs.

Thus, this study is relevant regarding the continuous creation and implementation of protocols to standardize care procedures in terms of OH in patients in the ICUs.

It is therefore imperative to emphasize the need for using protocols for OH, thereby standardizing care, frequency, the materials to be used, and organizing the nursing team, which is responsible for carrying out this process. The objective of the study is to map the available scientific evidence on the use of protocols on OH to prevent the occurrence of aspiration pneumonia in the ICUs.

METHOD

This is a scoping review protocol based on the guidelines of the JBI Manual for Evidence Synthesis⁽⁸⁾ to map and explore existing evidence in the literature. Scoping review research has been highlighted worldwide for providing health evidence and syntheses that support professional practice⁽⁸⁻¹¹⁾. The purpose of a scoping review is to

map the available evidence, with emphasis on a thematic field, by unifying different types and designs of studies and recognizing what has currently been drawn up on the subject⁽⁸⁻¹¹⁾. The following steps are: 1) define and align the objective and the question; 2) develop and align the inclusion criteria with the objective and the question; 3) specify the planned strategy for searching, selecting, extracting data, and reporting evidence; 4) search for evidence; 5) select the evidence; 6) extract the evidence; 7) analyze the evidence; 8) report the results; and 9) summarize the evidence that is related to the study objective as well as highlight the conclusions and the impact of the findings⁽⁸⁾.

The study shall be reported in accordance with the provisions of the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)⁽⁹⁾. This protocol is registered on the Open Science Framework (OSF) platform at the following web-site: osf.io/2u76r.

Research question

The research question was developed according to the acronym PCC ("Population, Concept, and Context"). It means "population": patients that were admitted to the ICUs; "concept": protocols on OH; "context": prevention of aspiration pneumonia in the ICUs. Thus, the following research question was developed: What is the current bibliography regarding the use of protocols on OH to prevent the occurrence of aspiration pneumonia in intensive care?

Eligibility criteria

The inclusion and exclusion criteria presented in Figure 1 shall be used to effectively conduct the search.

POPULATION
Inclusion: Studies involving adult patients who have been admitted to the ICUs and who are at risk of developing aspiration pneumonia shall be included. Both intubated and tracheostomized patients undergoing mechanical ventilation or receiving enteral nutrition shall be considered. In addition, studies that include nursing professionals who are directly engaged in the implementation of protocols on OH in the ICUs shall also be considered.
Exclusion: Studies focusing on other health care professionals who are not directly responsible for the patients' OH, such as physicians or physiotherapists, shall be excluded. Studies dealing with patients outside the ICU environment, such as those cases in semi-intensive care units or in palliative care, shall also be excluded.
CONCEPT
Inclusion: Studies assessing specific protocols on OH that are implemented in the ICUs to prevent the occurrence of aspiration pneumonia shall be included. This comprises standardized and non-standardized protocols, OH measures relating to the use of antiseptic solutions such as chlorhexidine, and techniques for brushing and removing biofilms.
Exclusion: Studies discussing protocols on OH in other contexts than the ICUs, such as outpatient or home care environments, shall be excluded. Additionally, studies that address protocols for other purposes than the prevention of aspiration pneumonia, such as the prevention of tooth decay or periodontal disease, shall also be excluded.
CONTEXT
Inclusion: Studies that have been conducted in any type of ICU, including general, cardiological, neurological, pediatric, and neonatal ICUs, shall be included. Studies investigating the prevention of aspiration pneumonia in the ICUs in public and private hospitals in different geographical regions and socioeconomic contexts shall be considered.
Exclusion: Studies that are not specific to ICUs, such as those conducted in post-anesthesia care units or Intermediate Care Units, shall be excluded. Studies dealing with non-aspiration pneumonia, such as community-acquired pneumonia, shall also be excluded.

ICUs: Intensive Care Units; OH: Oral Hygiene.

Figure 1 - Criteria for data collection for a scoping review. Rio de Janeiro, RJ, Brazil, 2024

Types of sources of evidence

This review shall use scientific sources, including studies with qualitative, quantitative, and mixed approaches, as well as case-control research, observational, experimental, cohort, epidemiological, and cross-sectional studies, in accordance with the defined inclusion and exclusion criteria. The research shall include general scientific studies on the subject, which should be available in full in their different forms; theses and dissertations may be included. No time restriction will be applied, and the preferred languages will be Spanish, English, and Brazilian Portuguese. Theoretical essays and editorials shall be excluded.

Theoretical essays and editorials were excluded from this review because the objective is to map scientific evidence based on empirical data that can provide practical and well-founded support for the implementation of protocols on OH to prevent the occurrence of aspiration pneumonia in the ICUs. Theoretical essays, although important for developing concepts and theories, do not provide hard data or results of experimental or observational studies that can be directly used in clinical practice. Similarly, editorials usually express the opinions or personal interpretations of the authors and do not undergo a rigorous process of data collection and analysis, which limits their usefulness for synthesizing evidence in a scoping review. Therefore, the exclusion of these types of publications aims to ensure that the results of the review are based on tangible evidence and applicable in clinical practice.

When conducting the searches, the web app Rayyan⁽¹²⁾ (Qatar Computing Research Institute, Doha, Qatar) shall be used to identify duplicates and assist in their categorization.

Search strategy

Data collection shall be carried out in September 2024 on the following data platforms: Latin American and Caribbean Health Sciences Literature (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE), Google Scholar, Portal of Journals of the Coordination for the Improvement of Higher Education Person-

nel (CAPES), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Scientific Electronic Library Online (SciELO), by using the following Health Sciences Descriptors (MeSH/DeCS): Aspiration pneumonia; Intensive Care Unit; Oral Hygiene; Clinical Protocols, which should be cross-checked by the Boolean operator “AND” (Figure 2).

Selection of the sources of evidence

The search and selection of publications shall adhere to the following steps: reading the titles, reading the abstracts, and comprehensive analysis.

The first stage shall be carried out by two independent reviewers. They shall read the titles and abstracts of the identified publications to determine whether each study meets the inclusion criteria.

The studies that pass the first stage shall be fully analyzed by the same reviewers. Each reviewer shall read the articles in full to confirm eligibility based on the previously established criteria.

The publications that have been identified in the databases shall be transferred into the EndNote software, where duplicates shall be removed. Once duplicates have been removed, the studies shall be transferred into the web app Rayyan⁽¹²⁾, which will facilitate selection by allowing the reviewers to categorize and record the studies during the screening process.

In the event of disagreements between the reviewers during the screening stages, a discussion shall be held to resolve the differences in opinion. If consensus is not reached, a third reviewer shall be consulted to make the final decision on the inclusion or exclusion of the relevant study.

Data extraction

To extract the selected data, a database shall be created to store the results and the details of the identified publications. To report the results, the publications shall be organized into three tables. The first table shall include the main characteristics of the articles, whereas the second table shall include details on the frequency, management, and imple-

mentation of the protocols on OH in the descriptions of the scientific publications. The level of evidence will be analyzed and included in the last table as shown in Figure 3.

The methodology of the JBI⁽⁸⁾ shall be used, and the provisions of the PRISMA-ScR⁽⁹⁾ checklist shall be adopted for reporting the results⁽¹⁰⁾.

Database	MeSH/DeCS	Free terms	Boolean operators
LILACS	Aspiration Pneumonia [MeSH]; Intensive Care Unit [MeSH]; Oral Hygiene [MeSH]; Respiratory Tract Infections [Subject descriptor]; Dental Care [MeSH].	All searched terms in "All Fields."	AND / OR
MEDLINE	Aspiration Pneumonia [MeSH]; Respiratory Tract Infections [MeSH]; Intensive Care Units [MeSH]; Mouth Care [MeSH]; Dental Care [MeSH]; ICU [MeSH]; Oral Hygiene [MeSH].	All searched terms in "All Fields."	AND / OR
Google Scholar	Aspiration Pneumonia; Respiratory Tract Infections; Intensive Care Unit; Oral Hygiene; Dental Care; ICU; Clinical Protocols.	All searched terms in "All Fields."	AND / OR
Portal of Journals of the CAPES	Aspiration Pneumonia [Subject descriptor]; Intensive Care Unit [Subject descriptor]; Oral Hygiene [Subject descriptor]; Respiratory Tract Infections [Subject descriptor]; Dental Care [Subject descriptor].	All searched terms in "All Fields."	AND / OR
CINAHL	Aspiration Pneumonia [MeSH]; Respiratory Tract Infections [MeSH]; Intensive Care Units [MeSH]; Mouth Care [MeSH]; Dental Care [MeSH]; ICU [MeSH]; Oral Hygiene [MeSH].	All searched terms in "All Fields."	AND / OR
SciELO	Aspiration pneumonia; Respiratory Tract Infections; Intensive Care Unit; Oral Hygiene; Dental Care; ICU; Clinical Protocols	All searched terms in "All Fields."	AND / OR

Figure 2 - Search strategy for the scoping review. Rio de Janeiro, RJ, Brazil, 2024

IDENTIFICATION OF RELEVANT STUDIES
Authors; Title; Year of publication; Research design and study objectives.
PARTICIPANTS
The total number of participants in each study (N) and the main characteristics regarding the profile of the patients with aspiration pneumonia.
RESULTS
Main protocols in the care of patients with aspiration pneumonia, as well as prevention methods and the major conclusions of the study.

Figure 3 - Instrument for data collection for a scoping review. Rio de Janeiro, RJ, Brazil, 2024

Data analysis and reporting

Following the data extraction, the main findings on the subject shall be identified and mapped, with the support of charts, tables, and figures, which shall be related to the research objective.

It is expected to achieve the initially proposed objective, in which scientific mapping shall proceed on the use of protocols to prevent the occurrence of aspiration pneumonia in the ICUs.

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Potential impact and applicability of the results

The results of this scoping review are expected to significantly contribute to the strengthening of clinical practice in the ICUs, especially by standardizing protocols on OH. The systematization of these practices may denote a decisive strategy to reduce the incidence of aspiration pneumonia, one of the most recurrent complications in critically ill patients.

By mapping the available evidence, this review may provide a strong basis for the development of institutional guidelines and public policies focused on patient safety, thus promoting evidence-based care, greater uniformity in care, and effective training of multidisciplinary teams. In addition, the findings may support the creation of educational tools, flowcharts, and checklists that enable the implementation and monitoring of safe and efficient practices in the hospital environment.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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