

Bucal Health and Prevention of Pneumonia in the ICU: Literature Review

A Saúde Bucal e a Prevenção da Pneumonia na UTI: Revisão Literatura

Salud Bucodental y Neumonía en la UCI: Revisión Bibliográfica

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RESUMO

Objetivo: Analisar os fatores que interferem na saúde bucal na prevenção da pneumonia, cujos procedimentos metodológicos se fundamentaram a partir da literatura na modalidade integrativa. **Método:** Estudo do tipo Revisão de literatura nas bases de dados Latino-Americana e do Caribe em Ciências da Saúde (LILACS), Base de dados de Enfermagem (BDENF), Medical Literature Analysis and Retrieval System Online (MEDLINE), Scientific Electronic Library Online (SciELO). **Resultados:** Foram encontrados resultados mais relevantes que apesar dos profissionais de enfermagem afirmarem que possuem conhecimento suficiente sobre como realizar a higiene oral em pacientes, a aplicação do protocolo adequado diminui drasticamente nos casos de pneumonia associado a ventilação mecânica. **Conclusão:** Conclui-se que os protocolos de atividades voltadas para assistência à saúde dos pacientes com pneumonia precisam ser intensificados, sobretudo pelos profissionais de enfermagem.

Descritores: Higiene bucal; Unidade de Terapia Intensiva; Pneumonia..

ABSTRACT

Objective: To analyze the factors that interfere with oral health in the prevention of pneumonia, whose methodological procedures were based on the literature in the integrative modality. **Method:** Literature review study in the Latin American and Caribbean Health Sciences databases (LILACS), Nursing Database (BDENF), Medical Literature Analysis and Retrieval System Online (MEDLINE), Scientific Electronic Library Online (SciELO). **Results:** More relevant results were found that although nursing professionals claim to have sufficient knowledge about how to perform oral hygiene in patients, the application of the appropriate protocol drastically decreases in cases of pneumonia associated with mechanical ventilation. **Conclusion:** It is concluded that the protocols of activities aimed at health care for patients with pneumonia need to be intensified, especially by nursing professionals.

Descriptors: Oral hygiene; Intensive Care Unit; Pneumonia.

RESUMEN

Objetivo: Analizar los factores que interfieren en la salud bucal en la prevención de la neumonía, cuyos procedimientos metodológicos se basaron en la literatura en la modalidad integrativa. **Método:** Revisión de la literatura en las bases de datos de Ciencias de la Salud de América Latina y el Caribe (LILACS), Base de Datos de Enfermería (BDENF), Sistema de Análisis y Recuperación de Literatura Médica en Línea (MEDLINE), Scientific Electronic Library Online (SciELO). **Resultados:** Se encontraron resultados más relevantes que aunque los profesionales de enfermería afirman tener conocimientos suficientes sobre cómo realizar la higiene bucal en los pacientes, la aplicación del protocolo adecuado disminuye drásticamente en los casos de neumonía asociada al ventilador. **Conclusión:** Se concluye que los protocolos de actividades dirigidas al cuidado de la salud de pacientes con neumonía necesitan ser intensificados, especialmente por los profesionales de enfermería.

Descriptorios: Higiene bucal; Unidad de Cuidados Intensivos; Neumonía.

Introduction

The oral cavity is the gateway to healthy substances that will contribute to the nutrition of the human body, however, it is also a complex microbiota that can cause oral diseases, in addition to developing or aggravating systemic diseases, so oral health care should be performed by all individuals, especially those who are hospitalized in hospitals and hemodynamically critical.¹

Patients considered critical begin to present in the first 48 (forty-eight) hours of hospitalization, some alterations of the oral microbiota and thus, the lack of attention related to oral cleaning implies the appearance of dental plaques that become a habitat for pathogens that provide bacterial, oral, digestive and respiratory infections.² In view of this, it is essential that patients in the Intensive Care Unit (ICU) receive care focused on oral hygiene, even if these are difficult to access procedures, especially in the case of intubated patients; Nursing should perform the necessary care to keep the oral cavity moist, preventing infections and promoting patient comfort, but for this to occur, health professionals need to update their knowledge so that they can identify the consequences, implications and link between oral and systemic health.³

The clinical status of the patient and the length of hospitalization contribute significantly to the appearance of infections, especially oral infections and with the absence of asepsis, such infections contribute to the formation of the dental biofilm, becoming a reservoir for the microorganisms that cause diseases, such as nosocomial pneumonia which is the most frequent pathology in the ICU and with the use of mechanical ventilation this probability increases dramatically, thus impairing the patient's recovery and the risk of morbidity and mortality; ventilator-associated pneumonia (VAP) develops 48 hours after initiation of mechanical ventilation and is considered up to 48 hours after extubation.⁴⁻⁵

In this context, the evaluation of the mouth, the use of antiseptic to perform decontamination, cleaning of the teeth and lubrication of the mucosa and lips are essential practices in the care of the client who is hospitalized in the ICU.² And it is considered important that the nursing team has technical and scientific knowledge about oral hygiene, Because this contributes to the team being able to assess, care for and prevent damages that may affect the clinical state of the patient, corroborating for a faster recovery, their well-being and implying lower financial costs.

It is also noteworthy that the presence of the dentist in the composition of the multidisciplinary team is extremely necessary, since together with the nursing team, they will apply the basic care focused on oral health in the right and safe way, thus providing quality care.

That said, and considering the relevance of the nurse's role in basic health care for patients with pneumonia who are hospitalized in the ICU, the general objective of this research is to perform an analysis of the factors that interfere in oral health in the prevention of pneumonia in the ICU. And, in an ancillary way, we sought to know the oral hygiene protocols in the prevention of pneumonia, to understand the level of knowledge of nursing professionals

about oral hygiene and to identify the effects of oral hygiene in the reduction of pneumonia.

Thus, the present study sought to bring together the main factors of this context, thus enabling the general population, especially nursing professionals, to gain a view on the reality of the health care conditions that are provided to these patients under such conditions.

Method

In order to achieve the proposed objectives, an integrative review was developed, which consists of a methodology through a synopsis of the results that are achieved in previous research on a given theme or issue, in a systematic, organized and broad way, being called integrative because it enables more comprehensive information about a given subject or problem, thus forming a vast knowledge.⁵ The development of this research occurred in 4 (four) stages, namely:

- a) a) identification of the theme and definition of the guiding question of the research; b) literature search and establishment of inclusion and exclusion criteria; c) identification of pre-selected and selected studies; d) categorization of the selected studies, analysis and interpretation of the results, presentation of the synthesis of knowledge.
- b) The guiding question consisted of knowing what is the relationship of oral hygiene in view of the prevention of pneumonia in the ICU? From this, a search was conducted in the bibliography, whose selection took place from July to August of the year 2021, through the Virtual Health Library (BVS-BIREME) and the databases: Latin American and Caribbean Database on Health Sciences (LILACS), Nursing Database (BDENF), Medical Literature Analysis and Retrieval System Online (MEDLINE) and Scientific Electronic Library Online (Scielo).

The descriptors used to search for articles related to the theme of this research were: oral hygiene, intensive care unit and pneumonia, in addition, the Boolean operator AND was used. We considered the articles that addressed the guiding question, whose publications occurred in the period from 2015 to 2020 and written in the languages Portuguese and English. Repeated articles that had no relation to the proposed theme were excluded. In the initial survey, 120 (one hundred and twenty) articles were found, which after the insertion of the aforementioned filters, were reduced to 47 (forty-seven); After a thorough reading of them, 10 (ten) articles were chosen for the purpose of results and discussion. The steps mentioned above are shown in Figure 1.

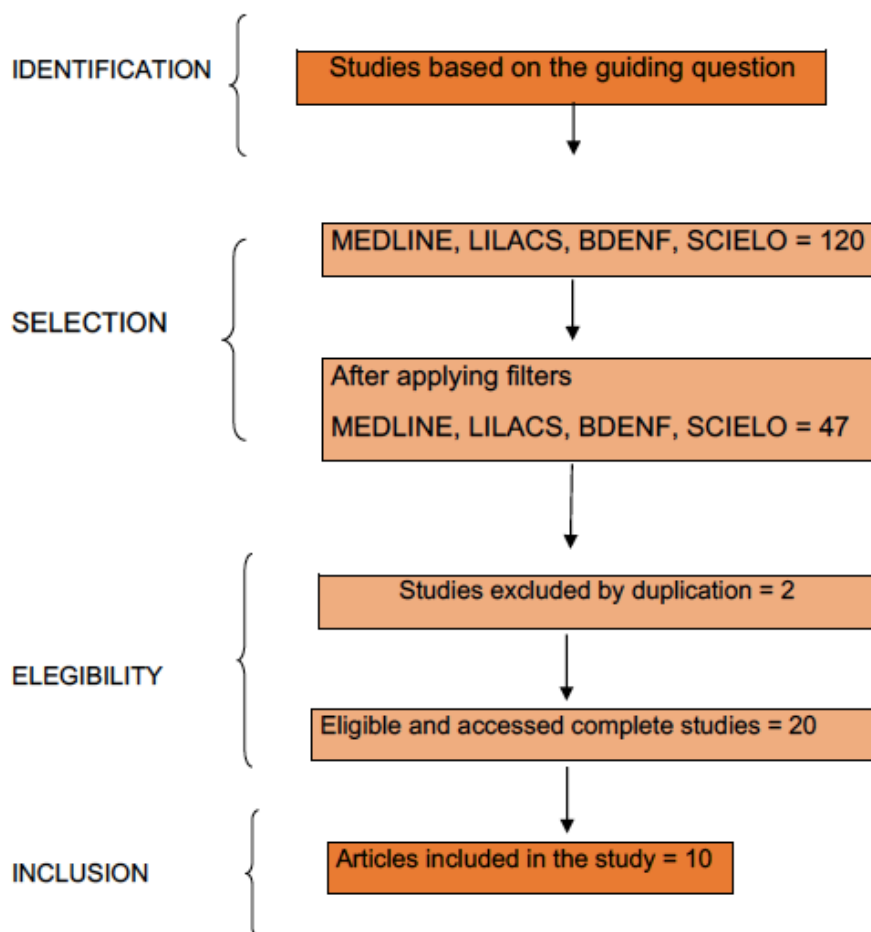


Figure 1 - Route for search and selection of studies in the databases.

Results and Discussion

This chapter summarizes the results of the studies that were selected for the purpose of analyzing and discussing the results. Chart 1 presents the 10 (ten) selected articles that comprised the sample of this research and that have a close connection with the theme and with the proposed objectives, respecting the inclusion and exclusion criteria for the year of their publication, that is, considering the articles published between the years 2015 to 2020.

The structuring of this framework was based on 5 (five) specific points, namely: study, type of research, title of the article, objective and results.

Chart 1 - Synthesis of the studies selected to compose the research sample.2023.

Study/Type of Research	Title	Objective	Results
Almeida et al. ⁶ Descriptive, quantitative and observational study.	Adherence to prevention measures for ventilator-associated pneumonia.	To evaluate the adherence of health professionals in intensive care units to preventive measures for	Frailty in the care and exposure of patients to risk situations; Only 35.38% of the patients completely adhered to the

		ventilator-associated pneumonia implanted in the hospital.	protocol for the prevention of ventilator-associated pneumonia.
Legal et al. ⁷ Cross-sectional descriptive study.	Legal knowledge of nursing about the prevention of ventilator-associated pneumonia in a public hospital.	To evaluate the knowledge of the nursing team about the protocol for the prevention of ventilator-associated pneumonia in a public hospital in the northeast of the state of Santa Catarina in 2017.	77% reported having knowledge about the protocol for the prevention of ventilator-associated pneumonia; Most remembered activities: headboard raised to 30 degrees, aspiration of the endotracheal tube, oral hygiene, measurement of the cuff and use of sterile materials to prevent pathologies.
Cruz e Martins ⁸ Longitudinal and descriptive study; questionnaire application; Direct observation grid to record the procedures performed.	Pneumonia associated with invasive mechanical ventilation: nursing care.	To identify nursing procedures in patients undergoing invasive mechanical ventilation and the development of pneumonia in an intensive care unit	The verification of cuff pressure and aspiration of secretions were the procedures that registered the lowest adherence. There was a ventilator-associated pneumonia rate of 0.3%
Silva Júnior et al. ⁹ This is an exploratory, descriptive, cross-sectional study with a quantitative approach; questionnaire application.	Oral hygiene: performance of the nursing team in a hospital environment	To identify the performance of the nursing team in oral hygiene in a hospital environment	75.4% of the nursing professionals reported that they did not perform oral hygiene in the last shift; 44.7% of the team suggested that the patient do so; work overload and high patient turnover were cited as impediments
Silva et al. ¹⁰ Cross-sectional, descriptive,	Prevention practices of ventilator-associated	To identify adherence to practices to prevent	Most common practices for the prevention of VAP: maintenance of the

quantitative study	pneumonia in intensive care	Ventilator-Associated Pneumonia (VAP) in an Intensive Care Unit (ICU)	elevated headboard (100%), control of cuff pressure (91.1%); 40.5% of medical records without records of oral hygiene performed; non-adherent practices: non-interruption of sedation (81%); Prophylaxis care for venous thromboembolism and peptic ulcer disease was not performed
Tanguay et al. ¹¹ Cross-sectional descriptive pilot study; Application of a questionnaire to 375 nurses	Factors that influence oral care in patients intubated in intensive care	To study the factors that influence how nurses perform oral care in intubated patients in the intensive care unit, mentioning the constructs of the theory of planned behavior	Perceived behavioral control and attitude were the most important determinants in the level of intention to engage in oral hygiene; knowledge, human resources, available materials and the time of experience in intensive care nursing also influence
Scalco et al. ¹² Observational study; prognostic study; Risk factors	Analysis of the Preventive Influence of an Oral Hygiene Protocol on Ventilator-Associated Pneumonia	To evaluate the influence of an oral hygiene protocol on the incidence of VAP among patients on mechanical ventilation (MV)	Reduction of 43.94% in the VAP rate after implementation of the protocol; implementation of the protocol associated with the significant reduction of Enterobacter spp infections
Coelho et al. ¹³ Observational study; Risk factors	The impact of interprofessional learning on ventilation-associated pneumonia: implementatio	To verify the impact of bundles and interprofessional learning in the prevention of ventilator-	Increased adherence to endotracheal pressure of the cuff (8.10%), daily interruption of sedation (16.67%), and subglottic

	n of bundles in an intensive care unit	associated pneumonia in an intensive care unit (ICU)	aspiration (18.75%), after hospitalization
Lourençone et al. ¹⁴ Observational and longitudinal study	Adherence to preventive measures versus incidence of ventilator-associated pneumonia	To evaluate the rate of adherence of the nursing team for VAP, after the restructuring and application of the prevention protocol and to verify the incidence density rates of patients with VAP	The average rate of adherence to preventive measures in 1,296 evaluations showed adequacy in 94% of the filter position; 88.7% raised headboard; 77.3% oral hygiene with chlorhexidine 0.12%; and 91.7% cuff pressure control
Branco et al. ¹⁵ Quasi-experimental, retrospective study	Education for the prevention of ventilator-associated pneumonia in an intensive care unit	To evaluate nursing adherence to the Ventilator-Associated Pneumonia Prevention Package and the incidence rate before and after Continuing Education	The mean age of the patients was 62.39 ± 17.06 years. Appropriate measures before and after training: position of the fan filter; raised headboard; oral hygiene with chlorhexidine; tooth brushing and cuff pressure; incidence density went from 7.99 to 4.28 infections/1000 ventilators per day

Regarding the characterization of the type of research of the articles highlighted in Chart 1, it is noteworthy that 70% of these are descriptive and cross-sectional; In 25% of the total, a questionnaire was applied and 12% corresponded to a study defined as quasi-experimental.

Level of knowledge of the nursing team related to the prevention of pneumonia in the face of oral hygiene

Legal et al.⁷ conducted a study that was conducted in an Intensive Care Center in a public hospital in the northeast of the state of Santa Catarina in 2017, together with 61 (sixty-one) nursing professionals in order to evaluate the knowledge of the nursing team about the protocol for the prevention of ventilator-associated pneumonia in the aforementioned public hospital and in

the aforementioned year, whose data collection revealed that 77% of the nurses declared that they knew the protocol for the prevention of ventilator-associated pneumonia and that the most remembered activities related to this protocol were headboard elevated to 30 degrees, endotracheal tube aspiration, oral hygiene, cuff measurement and use of sterile materials to prevent pathologies.

A similar study was conducted by Almeida et al.⁶ in a university hospital in the city of Recife, between February and April of 2014, with 130 (one hundred and thirty) patients, aiming to evaluate the adherence of health professionals in intensive care units to preventive measures against ventilator-associated pneumonia implanted in the hospital; This study revealed that there is a fragility regarding the care and exposure of patients who were hospitalized to risk situations, it was also verified that the total adherence of these patients to the protocol for the prevention of pneumonia associated with mechanical ventilation was low, being only 35.38%; The most frequent interruptions were: sedation and oral hygiene the interventions, being respectively equivalent to 70.06% and 48.86%.

In this context, we highlight the longitudinal and descriptive study by Cruz and Martins⁸, carried out in a hospital in Portugal, between the periods of November 2017 to February 2018, through a sample of 20 (twenty) nurses and a total of 102 (one hundred and two) observations, aimed to identify nursing procedures in patients undergoing invasive mechanical ventilation and the development of pneumonia in an intensive care medicine service, whose result indicated that the procedures with the lowest record of adherence were: the verification of cuff pressure and aspiration of secretions, implying a rate of ventilation-associated pneumonia of 0.3%.

Oral hygiene protocols in the prevention of pneumonia / factors that interfere with oral health in the prevention of pneumonia in the ICU

In order to identify the performance of the nursing team in oral hygiene in a hospital environment, Silva Júnior et al.⁹ conducted an exploratory, descriptive, cross-sectional research with a quantitative approach with 114 (one hundred and fourteen) nursing professionals who worked in the hospital area, through the application of a questionnaire covering sociodemographic data, work and the performance of the participants in oral hygiene, where it was collected that 75.4% of these professionals stated that they had not performed oral hygiene in the last shift and 44.7% of them suggested that the patient himself perform such a procedure, due to the overload of work and the high turnover of patients admitted to the hospital.

In the pilot study by Tanguay et al.¹¹ it was found that perceived behavioral control and attitude are the most relevant factors with regard to the level of intention of nursing professionals, regarding their participation in the oral hygiene process of patients, as well as their knowledge, human resources, availability of available materials, in addition to their time of experience in the area of intensive care.

The study by Silva et al.¹⁰ sought to identify adherence to the prevention practices of Ventilator-Associated Pneumonia (VAP) in an Intensive Care Unit (ICU), whose results showed that the most used practices for the prevention of VAP consisted of maintaining the elevated headboard and

controlling the cuff pressure, and the practice not adopted by the professionals was the non-interruption of sedation, It was also observed that 40.5% of the medical records performed did not have oral hygiene records, in addition to the non-performance of venous thromboembolism and peptic ulcer prophylaxis procedures.

In this logic, Scalco et al.¹² found in their study, where they addressed the preventive influence of an oral hygiene protocol in the face of VAP, in order to evaluate the influence of this protocol on the incidence of VAP in patients who were under mechanical ventilation, whose result indicated a reduction of 43.94% in the rate of VAP after the implementation of this protocol, with a significant reduction in *Enterobacter* spp. infections, and the absence of VAP cases that were related to *S. aureus* and *C. albicans*, which are the main etiologic agents of the disease.

Still discussing the preventive actions for VAP, the results obtained in the study by Lourençone et al.¹⁴ showed that of the 1296 (One thousand two hundred and ninety-six) evaluations that were carried out to evaluate the rate of adherence of the preventive actions of the nursing team for VAP, after the restructuring and application of the prevention protocol, as well as verifying the incidence density rates of patients with VAP, showed adequacy of filter position (94%), elevated headboard (88.7%), oral hygiene with chlorhexidine (77.3%) and control of cuff pressure (91.7%).

In a research conducted by Branco et al.¹⁵, together with 302 (three hundred and two) patients who were hospitalized in an ICU and who were submitted to mechanical ventilation, it was sought to evaluate the nursing adherence to the bundle of prevention of Ventilator-Associated Pneumonia and the incidence rate, before and after Permanent Education, where it was obtained that the most appropriate measures and that should be adopted by nursing professionals in view of the aforementioned patients, included the following procedures: ventilator filter position, elevated headboard, oral hygiene with chlorhexidine, tooth brushing and cuff pressure.

In order to verify the impact of the bundle and interprofessional learning in the prevention of VAP in patients admitted to an ICU, Coelho et al.¹³ conducted their research in a public hospital in the city of Diamantina in the state of Minas Gerais, with the participation of 56 (fifty-six) professionals who provided direct care to patients undergoing mechanical ventilation, whose records reported that after the intervention, there was an increase in adherence to the endotracheal pressure of the cuff in the percentage of 8.10, daily interruption of sedation of 16.67% and subglottic aspiration of 18.75%. It is also highlighted in the results of this study that the intervention was significant ($p < 0.0083$) for the absence of aspiration, positioning of the head of the bed, frequency of oral hygiene and type of hand hygiene.

Conclusion

From the results obtained in this research, whose purpose was to achieve the proposed objectives (general and specific), it was possible to identify that the level of knowledge of the nursing team about the protocol for the prevention of pneumonia in patients hospitalized in the ICU, especially

related to the oral hygiene factor is extremely important in combating the pathologies that these patients may acquire during hospitalization.

Preventive activities against pneumonia, such as headboard elevated to 30 degrees, aspiration of the endotracheal tube, oral hygiene, cuff measurement and prophylaxis are essential to combat pathologies resulting from the hospitalization of patients with pneumonia. However, although the protocols are known to nursing professionals, but they need to be intensified about their relevance in the treatment of the health of patients with pneumonia, from the awareness of these professionals about the risks that the lack of application of adequate procedures may cause to the health of the hospitalized.

It is necessary that the protocol associated with mechanical ventilation be fully complied with, at the risk of maximizing the incidence rate of opportunistic diseases, therefore, it is necessary that the nursing team be aware of its importance in care and prevention, through training and constant updating of nursing knowledge focused on oral hygiene.

In view of the results achieved in this research, it is suggested that it be continued in order to raise other factors that contribute to the well-being of patients in the ICU, which favor their recovery and reduce the risks to their health.

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