

Nursing Actions in the Prevention of Pressure Ulcers in Prone Patients Diagnosed with Covid-19: Systematic Review

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Abstract:- The intensive care unit considered a critical ward where patients show neurological vulnerability, immobility, lack of hygiene, since the pressure exerted by the body on an object is a causal factor in skin lesions, hence the importance of focusing nursing care on the prevention of pressure ulcers, maintaining a continuous and team work. **Objective:** To plan nursing actions in the prevention of pressure ulcers in prone ulcer patients with a diagnosis of COVID-19 admitted to the intensive care unit. **Methodology:** an information search strategy was established in scientific databases in Spanish and English using PubMed, SciELO, LILACS, Redalyc, Web of Science. The search strategy used free terms and MeSH terms (Medical Subject Headings), DeCs, "care", "nursing", "prone decubitus", "pressure ulcers", "covid", "respiratory distress syndrome". The description between these descriptors, using Boolean AND and OR intersections. Incorporating studies published as original articles on the effectiveness and safety of prone ventilation in patients with acute respiratory distress syndrome (ARDS), of any etiology, and in COVID-19 patients. **Results:** 22 studies were potentially appropriate for inclusion in this review, the name, date considered for the review were recorded in the search log and 4 duplicate citations were excluded from the platforms, giving a total of 18 included studies. **Conclusion** The nursing staff involved in the process of patient care with a diagnosis of Covid 19 should play an active role in the performance of actions for the prevention of PUs. According to the need to maintain body hygiene and skin integrity in order to achieve an adequate degree of health and well-being, actions should be directed to act against skin alterations or lesions: presence of pressure ulcers (PUs), indicating their location, size and characteristics.

Keywords:- Nursing Care, Prone Decubitus, Pressure Ulcers, Covid 19, Respiratory Distress Syndrome.

I. INTRODUCTION

The work presented deals with the management of patients in intensive care units, and the problem of developing pressure ulcers offers a new dimension due to the specific characteristics of each patient and the severity of their pathology, which leads to an adaptation and structuring of new designs of preventive action in hospitalized users with a diagnosis of COVID-19 (1).

From the point of view of Guardia and Vega, the initial assessment of the level of risk on admission of the patient to the unit is considered the fundamental pillar in the prevention of deterioration of skin integrity, a risk that increases as the patient's stay increases (2).

The interest of this work is due to the fact that bedsores are a health problem that prolongs hospital stay, increases the expenditure of health resources and nursing care. Ulcers are lesions of ischemic origin, located in the skin and underlying tissues, with loss of cutaneous substance, produced by prolonged pressure or friction between two hard surfaces, which considerably reduces the quality of life of those who suffer from them (3).

In Ecuador, in spite of the efforts made at all levels of care to prevent and control the incidence of ulcers, it continues to be a major problem, and its incidence increases in critical units, since the skin of therapy patients is very vulnerable and is in continuous danger of suffering damage among the various causes that facilitate the appearance of pressure ulcers, are: poor general condition, dehydration, presence of secretions, exudates, radiotherapy, pharmacological therapy (4).

This research delves into the subject of skin lacerations in patients, which are considered an aggravation, deterioration and decrease in life expectancy. Pressure ulcers extend the time of hospitalization of the patient, generating high costs of care, avoidable complications that would allow

reducing the percentage of cases. The most important thing is that 95% of these ulcers are avoidable with meticulous and continuous care; therefore, adequate prevention is an absolute priority (5).

Considering the incidence of these episodes in 1.7% in patients between 55 and 69 years of age, and in 3.3% in patients between 70 and 75 years of age. Sixty percent of the cases develop in the in-hospital setting. Most of these injuries occur in public hospitals, especially in critical care units and geriatric centers. The most frequent are type I lesions and the most common regions in adults are the sacral area (65%) and the trochanters and heels (30%). Children can also develop them and the most common area is the occipital region. In Latin American countries, the available statistics are very poor and several of them lack epidemiological studies. From this we can see the importance of prevention and management of this pathology (6).

As it is already known, COVID-19 is considered a relevant problem since it is a complication of respiratory distress syndrome, a pathology that mainly affects the hemodynamic status of the patient, which generates a long stay in the critical care unit, the nursing work is focused on the prevention of pressure ulcers during the hospitalization period, The aim of this article is to create a scientific basis to collaborate in reducing the number of cases progressively, allowing the identification of the risk of developing pressure ulcers, basing the inter-work and human relationship of the nurse-patient, focused on providing continuity in nursing care (7).

The following research question arises from this problem.

Why nursing actions in the prevention of pressure ulcers in prone ulcer patients with a diagnosis of COVID-19, are of relevance in reducing complications in patient recovery?

Coronavirus is a disease composed of a large family of viruses that can cause human illnesses ranging from a common cold that can progress to severe acute respiratory syndrome (SARS). Detected in December 2019 in Wuhan - China, and declared by the World Health Organization as a pandemic on March 11, 2020. It has affected on large scales countries such as: United States amounting to more than 3 million Brazil report more than 1.7 million, Peru 312,000, Chile 303,000, Mexico 268,000, Spain 252,000, Italy 242,000, Colombia 124,000, Argentina 83,000 cases of Covid 19 so far this year. Patients recovered exceed 5 million (7).

Evolution of COVID-19 disease and its relationship with hospital stay in Ecuador.

SARS VOC 2 enters cells using the ACE-2 enzyme or angiotensin converting enzyme, abundant in the lungs, kidneys and heart, as a receptor. Once the virus enters, the symptomatology and severity of the disease could be due to individual determinants originated in the genetic variation of the human population, viral load and pulmonary damage mainly. This imbalance in the renin angiotensin aldosterone

system could be related to the blockage or inhibition of the angiotensin-2 converting enzyme by the virus (8).

Severity criteria related to COVID-19 disease are analyzed demographically and by laboratory findings. Advanced age is a severity criterion (> 60 years), as well as comorbidities, arterial hypertension being the most common, followed by diabetes mellitus and coronary artery disease. As for laboratory findings, the criteria are: elevated levels of leukocytes, ALT, DHL, ultrasensitive troponin I, CPK, D-dimer, serum ferritin, IL-6, prolonged prothrombin time, increased creatinine and procalcitonin, as well as lymphopenia. The clinical manifestation of COVID-19 can be varied, from asymptomatic or mild cases to situations as severe as acute respiratory failure, mediated with consistent data of pneumonia (9).

The median duration between symptom onset and ICU admission has been reported to be 9 to 10 days, suggesting a gradual deterioration in most cases. The condition requiring intensive care has been respiratory support. Risk factors remain uncertain, although advanced age and comorbidity have emerged as possible important factors. The relevance of knowing the criteria for severe pneumonia lies in the immediate initiation of treatment in order to improve survival. Several risk factors for death have been identified in hospitalized adults, such as D-dimer levels above 1,000 ng/mL and an elevated SOFA score since admission (9).

The prone position has been used since the 1970s to treat severe hypoxemia in patients with respiratory distress syndrome because of its effectiveness in improving gas exchange. Positioning patients in the prone position produces a more even distribution of tidal volume, in part by reversing the vertical pleural pressure gradient, which becomes more negative in the dorsal regions, improves resting lung volume in the dorsocaudal regions by reducing the overlying pressure of both the heart and abdomen. In contrast, lung perfusion remains preferentially distributed in the dorsal lung regions, thus improving overall alveolar ventilation-perfusion relationships. In addition, the greater mass of tissue suspended from a broader dorsal chest wall produces a homogeneous distribution of pleural pressures throughout the lung that reduces abnormal tension and stress development. This is thought to ameliorate the severity or development of ventilator-induced lung injury and may explain in part why pronation reduces the mortality rate (10).

Severe respiratory failure requires mechanical ventilation in infected patients, as protection for the lung, the most favorable is to start prone decubitus within the first 48-72 hours after being diagnosed with acute respiratory distress syndrome. This procedure allows a redistribution of ventilation towards the dorsal areas of the collapsed lung, thus improving the ventilation-perfusion ratio. It is necessary to check ventilation, devices, as well as the correct position of extremities and head and the use of pillows (donuts) in the thorax, preventing pressure zones (11).

The prone position also affects chest-abdominal interactions, worsens intra-abdominal hypertension and may lead to subsequent renal and hepatic dysfunction. Therefore, it is reasonable to monitor intra-abdominal pressure while the patient is in this position and consider using an air mattress or a suspended abdomen if abdominal pressures become excessive and there is the presence of vomiting, decreased tolerance to high volume enteral feeding it is recommended to place the bed in a reverse Trendelenburg position while the patient is prone (12).

- Phenomena that could improve patient survival.
- - Reduced extent and duration of severe hypoxemia.
- - Reduced susceptibility to ventilator-induced lung injury.
- - Reduced incidence of nosocomial or ventilator-associated pneumonia.
- Adverse effects associated with prone position to ventilation are the most notable (12):
- - Unplanned extubation and risk of a potentially catastrophic hypoxemia episode;
- - Unintended bronchial intubation, which will also worsen hypoxemia and increase the risk of barotrauma (e.g., pneumothorax).
- - Development of pressure ulcers.
- Ocular complications.
- Intracranial hypertension, which may compromise cerebral circulation.

Improved oxygenation with prone positioning may allow additional time for lung repair processes and, by reducing secondary lung infection or injury, has the potential to speed recovery and decrease mortality among adults with acute respiratory failure. Adverse effects and complications related to prone positioning may reduce the overall impact of these potential benefits (12).

Theoretical references of pressure ulcers. Classification

Nursing is a human science, practice that is based on science to help, preserve and maintain life, performing activities in a logical and rational systematized way. It has theories which include Dorothea E. Orem who refers to the promotion, maintenance of health, treatment and prevention of complications. Virginia Henderson provides a theoretical structure that allows the organization of nursing work by care needs, thus facilitating the definition of the field of action through the Nursing Care Process, a mechanism through which the professional uses his opinions, knowledge and skills to assess, diagnose, plan, act and evaluate, focusing attention on the patient's recovery (13).

Pressure ulcers or bedsores are skin or tissue lesions that develop as a result of a combination of physiological events and external conditions on the skin, which may occur more frequently in areas such as heels, ankles, hips and coccyx. Complications in patient recovery are related to care, 76% are predictable. The etiology of bedsores is a multifactorial phenomenon related to nursing care and the patient's environment, including neurological impairment, level of consciousness, biochemical variations, immobility,

age, chronic diseases, vasoactive infusion, temperature elevation, blood pressure, shearing, skin rubbing and lack of hygiene (14).

Pressure ulcers are classified as follows: grade I presents erythematous skin that does not improve with postural change, affecting the epidermis, grade II shows phlyctenas and laceration of the epidermis and superficial dermis layers of the skin, grade III reaches the loss of tissue up to the dermis and hypodermis, grade IV total loss of the skin affects the muscle and produces destruction of the tissue and support structures (15).

Nursing actions in the prevention of pressure ulcers in COVID-19 patients.

The pressure ulcer index is one of the most representative quality indicators of nursing care, given that the appearance of bedsores is a frequent and important complication that causes a negative impact on the health of the individual, in addition to producing a prolonged hospital stay and increased treatment costs, its development leads to deterioration in patient recovery, most are preventable are based on the care of nursing staff performing actions to prevent injuries, through the process of risk assessment, rest activity, elimination, safety and protection (16).

The aim of this study was to plan nursing actions for the prevention of pressure ulcers in prone ulcer patients with a diagnosis of COVID-19 admitted to the intensive care unit. As specific objectives, the aim was to know the nursing strategies to improve the actions aimed at preventing pressure ulcers in hospitalized patients with a diagnosis of coronavirus in the intensive care unit. The effects that promote the application of nursing care in the prevention of pressure ulcers and the reduction of complications were identified and the importance of nursing care in the prevention of pressure ulcers in patients admitted to the intensive care unit was described.

For this purpose, the selected articles in the literature review will be used to investigate nursing strategies to improve actions aimed at preventing pressure ulcers in hospitalized patients diagnosed with coronavirus in the intensive care unit, identifying the effects that promote the application of nursing care in the prevention of pressure ulcers and the reduction of complications. The importance of nursing care in the prevention of pressure ulcers in patients admitted to the intensive care unit is also described.

II. METHODOLOGY

Type of research

A systematic review of the literature was carried out. The recommendations of the PRISMA statement were followed to carry out this process.

Search strategy.

The search strategy used free terms and MeSH (Medical Subject Headings) and DeCs terms: "cuidados", "enfermería", "decúbito prone", "úlceras por presión", "covid", "síndrome de distrés respiratorio" (in Spanish) and

"care", "nursing", "prone position", "pressure ulcers", "covid", "respiratory distress syndrome" (in English). The description between these descriptors, using Boolean AND and OR intersections. Incorporating studies published as original articles on the effectiveness and safety of prone ventilation in patients with acute respiratory distress syndrome (ARDS), of any etiology, and in COVID-19 patients.

The following databases were searched: Scopus, Redalyc, Scielo, Pubmed, Google Scholar, Scopus, Springer, Taylor and Francis, Web of Science, Proquest, Ebook Central, Fielweb.

Inclusion criteria

The selection of articles was made as follows:

- Languages: Spanish and English.
- Year of publication: from 2015 to 2020.
- Original research article.
- Studies of a quantitative or mixed nature.
- Quality of the articles.

Exclusion criteria

We excluded from the study articles that are not from the year of publication of the search, thesis type studies (undergraduate, graduate and PhD), monographs and argumentative essays, the impossibility to retrieve the full text of the article and articles repeated from a previous search.

Procedure

In the first stage, the topic and the formulation of the research question in the acronym PICO (Population, Intervention, Control and Outcome) format were identified: "Why nursing actions in the prevention of pressure ulcers in prone ulcer patients with a diagnosis of COVID-19 are relevant in reducing complications in patient recovery".

In the second stage, original articles related to risk factors associated with postpartum hemorrhage, published in Portuguese, English and Spanish, with full text and online, were established as inclusion criteria.

The exclusion criteria included thesis-type studies (undergraduate, graduate and doctoral), monographs and argumentative essays. Then, in the third stage, the primary selection of publications was made by reading the title and abstract.

In the fourth and fifth stages, the evaluation of the studies was carried out with more criteria (according to the proposed objectives), and the interpretation of the results obtained, in order to reach the sixth stage where the discussion and synthesis of knowledge was formed. The aim is to provide a systematic review with rigorous and exhaustive scientific information with studies with more and better pertinent information, without introducing information or publication bias, in such a way as to contribute to the scientific community.

III. RESULTS

The search in the different databases generated a total of 259 results and complementary research records were found in other sources, but they did not meet the inclusion criteria. The titles of 259 papers were read to verify compliance with all the inclusion criteria, from which 95 studies were selected for reading the abstract of each one and, subsequently, the articles were read in their entirety where 72 were excluded because the reviews did not meet the inclusion criteria and had no concordance with the objectives.

Twenty-two studies were considered in this review, in the search log the name, date considered for the review and 4 duplicate citations were excluded from the platforms, giving a total of 18 included studies.

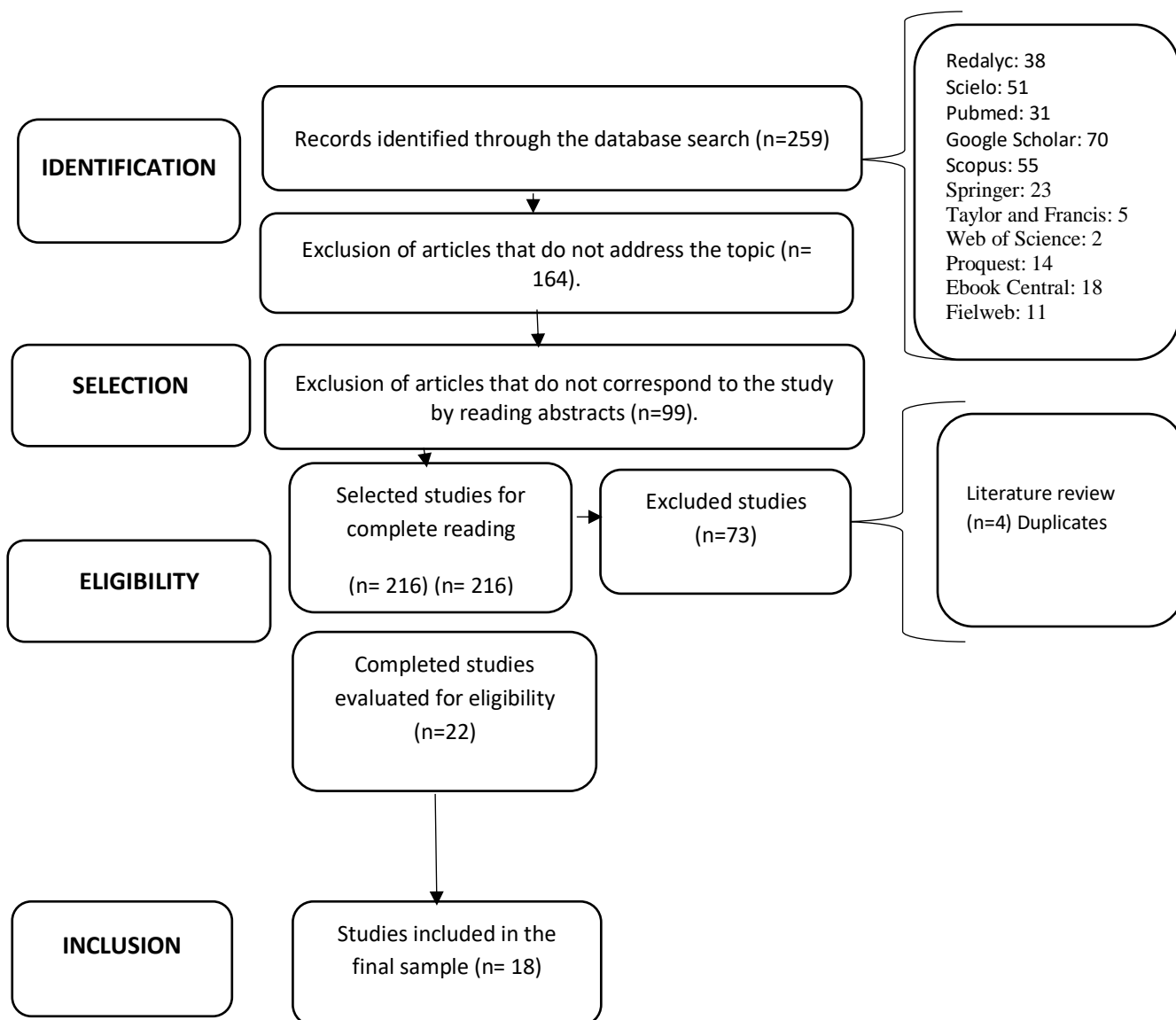


Figure 1. Flow chart of study selection.

Table 1 presents the methodological characteristics of the articles consulted on pressure ulcers. Of the 18 studies selected, the design was cross-sectional descriptive, literature review, narrative and systematic, although one study is prospective.

Table 1. Matrix of selected articles.

Database	Name of magazine	Article title	Author(s)	Target	Methodology
1.Scielo	University nursing	Prevalent nursing diagnoses in elderly patients with pressure ulcers: a cross-sectional study.	Alvarez, Cegueda, Cuevas, Gonzalez, Gomez, Garcia. 2020 (17)	To determine the prevalence of nursing diagnoses in hospitalized older adult patients with pressure ulcers and to identify actual, potential, health and syndrome nursing diagnoses by functional health pattern.	Cross-sectional, descriptive study comprising a sample of elderly patients hospitalized in different services of a hospital in Acapulco, Guerrero, Mexico. For its evaluation, an instrument was designed according to Marjory Gordon's functional patterns. The E-cuidados® nursing best practices platform was used for the analysis.
	Nursing: Humanized Care	Nursing Models and Theories: Underpinning Palliative Care	Figueredo, Ramirez, Nurczyk, Diaz. 2019 (12)	Determine the use of nursing theories and models in palliative care.	An integrative review was carried out, which is understood as a method whose objective is to summarize published research in order to obtain new conclusions on a topic of interest.
	Gerokomos	A contribution to the knowledge of the historical context of pressure ulcers.	Torra, Verdú, Sarabia, Paras, Soldevilla, López, et al. 2017 (18)	Review key elements related to the history of pressure ulcers and their context, from the Ancient Ages, the Renaissance, the 19th century to the modern age.	Through a narrative review, the authors review key elements related to the history of pressure ulcers and their context, from the Ancient Ages, the Renaissance, the 19th century to the modern age.
2.Elsiever	Intensive Care Medicine	Predictive validity and reliability of the Braden scale for pressure ulcer risk assessment in an intensive care unit.	Lima, González, Castañob, Araujob, Lima. 2018 (19)	To contribute to the validation of the Braden scale in patients admitted to the ICU by analyzing its reliability and predictive validity.	Analytical, observational, longitudinal and prospective.
	Healthcare Quality Magazine	Impact of a risk management program on pressure ulcer rate.	Farías, Febré 2018 (20)	To determine the impact of a risk management program on PU prevention in an adult intensive care unit (ICU) in a high complexity teaching hospital in Chile.	A quantitative, prospective study was designed with pre- and post-intervention evaluation, implemented in 3 stages.
	Respiratory Care	A comprehensive review of the prone position in ARDS.	Kallet 2015 (21)	Demonstrate that PP provides a survival advantage in subjects with relatively severe ARDS (PaO ₂ / FIO ₂ <150 mm Hg).	Descriptive Study

3.PubMed	Annals of the American Thoracic Society	Prone position for acute respiratory distress syndrome. A systematic review and meta-analysis	Munshi, Sorbo, Adhikari, Hodgson, Wunsch, Meade, Uleryk, Mancebo, Pesenti, Ranieri and Fan. 2017 (22)	This review evaluates the effect of prone positioning on 28-day mortality (primary outcome) compared to conventional supine mechanical ventilation for adults with ARDS.	We updated the literature search of a systematic review published in 2010, searching MEDLINE, EMBASE, and CENTRAL (as of August 2016).
	Cochrane Systematic Reviews	Position prone to acute respiratory failure in adults.	Bloomfiel, Noble, Sudlow 2015 (23)	To determine whether prone ventilation offers a mortality advantage over traditional supine or semi-recumbent ventilation in patients with severe acute respiratory failure requiring conventional invasive artificial ventilation, and to complement previous systematic reviews on prone ventilation for hypoxemic respiratory failure in an adult population.	We searched the Cochrane Central Register of Controlled Trials (CENTRAL; 2014, Issue 1), Ovid MEDLINE (1950 to January 31, 2014), EMBASE (1980 to January 31, 2014), the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1982 to January 31, 2014), and Latin American Caribbean Health Sciences Literature (LILACS) (1992 to January 31, 2014) in Ovid MEDLINE for eligible randomized controlled trials.
	Rev Bras Ter Intensive Care.	Prone position in patients with acute respiratory distress syndrome	Setten, Plotnikow and Accoce 2016 (24)	To discover the available evidence related to the implementation of the prone position, the changes produced in the respiratory system due to the application of this maneuver, and its impact on mortality.	A literature search was performed in PubMed, SciELO, Cochrane and Lilacs databases using the following combinations of MeSH terms and keywords: "randomized controlled trial" OR "controlled clinical trial" OR "randomized" OR "trial" OR "groups" AND "prone position "(MeSH) OR" supine position "(MeSH) OR" patient positioning "(MeSH) OR" prone "OR" pronation "OR" prone position "OR" supine "AND" respiratory distress syndrome, adult "(MeSH) OR "acute lung injury" OR "ARDS" OR "respiratory distress syndrome" OR "respiratory failure".
BMJ Journals	Effectiveness of pressure ulcer prevention interventions in adult intensive care units: a protocol for a systematic review and network meta-analysis.	Du, Wu, Lu, et al 2019 (25)	To identify the most effective interventions and combinations of interventions that prevent PU in adults in the ICU using systematic review and network meta-analysis (NMA).	Search for all published and unpublished RCTs evaluating interventions to prevent PU compared with other PU prevention measures or with usual care in the adult ICU.	
Medicina Intensiva (Edición en inglés)	Acute respiratory distress: from syndrome to disease	Fernandez, Correger, Villanueva, Rios 2016 (26)	Analyze the need to evolve from the concept of ARDS as a syndrome to ARDS as a disease.	Narrative review	

3.PubMed	Rev Bras Ter Intensiva	Guidelines of the Portuguese Society of Intensive Care for stress ulcer prophylaxis in the intensive care unit.	Mendes, Silva, Gonçalves, Oliveira, Gouveia. 2019 (27)	To summarize the current evidence and provide clinical recommendations for the use of stress ulcer prophylaxis in the intensive care unit (ICU) to provide a standardized prescribing policy and avoid harmful use.	A multidisciplinary working group was formed. The working group was composed of physicians (specialists in gastroenterology and critical care medicine), nurses, pharmacists and economists with special interest and expertise in stress ulcer prophylaxis and/or evidence-based medicine.
	Indio J Crit Care Med	Pressure ulcer and nutrition	Saghaleini, Dehghan, Shadvar, Sanaie, Mahmoodpoor Ostadi. 2018 (28)	To review the current evidence related to hydration and nutrition for the prevention and management of adult pressure ulcer announced by the latest National Pressure Ulcer Advisory Panel (NPUAP) nutritional endorsements and the European Pressure Ulcer Advisory Panel guidelines for pressure.	Descriptive study
	PLOS ONE	Support surfaces for pressure ulcer prevention: a network meta-analysis.	Chunhu, Dumville, Cullum. 2018 (29)	To determine, using network meta-analysis, the relative effects of different support surfaces on reducing pressure ulcer incidence and comfort and to rank these support surfaces in order of their effectiveness.	Systematic review, using a literature search through November 2016, to identify randomized trials comparing support surfaces for pressure ulcer prevention.
PubMed	Cochrane Database Syst Rev.	Education of health professionals to prevent pressure ulcers.	Armstrong, Moore, Bradbury, McDonough, and Cochrane Wounds Group 2018 (30)	To evaluate the effects of educational interventions for health professionals on pressure ulcer prevention.	In June 2017, we searched the Cochrane Wounds Specialized Register; the Cochrane Central Register of Controlled Trials (CENTRAL); Ovid MEDLINE (including in-process and other non-indexed citations); Ovid Embase; and EBSCO CINAHL Plus. We also searched clinical trial registries for ongoing and unpublished studies, and scanned reference lists of relevant included studies, as well as reviews, meta-analyses, and health technology reports to identify additional studies.
	BMC Geriatr	An overview of comorbidities and pressure ulcer development among older adults.	Barron, Rosenzweig, and Mencil 2018 (31)	Describe chronic and acute conditions that are risk factors in elderly patients for developing PU.	Overview of comorbidities observed with PU in three different patient locations.

Clin Cosmet Investig Dermatol	Nurses' knowledge of pressure injury prevention: a systematic review and meta-analysis based on the Pressure Ulcer Knowledge Assessment Tool.	Sahar Dalvand, Abbas Ebadi, and Reza Ghanei Gheshlagh 2018 (32)	To assess nurses' general knowledge of PI prevention based on their scores on the Pressure Ulcer Knowledge Assessment Tool (PUKAT) and its subscales in different settings.	Systematic review and meta-analysis, databases including Web of Science, Science Direct, Google Scholar, PubMed and Scopus were searched using the following keywords: pressure ulcer, pressure injury, pressure ulcers, decubitus ulcers, decubitus ulcer, pressure ulcer, knowledge and their possible combinations According to the heterogeneity among studies, data were analyzed using a random effects model.
Advanced Wound Care (New Rochelle)	Review of the current management of pressure ulcers	Boyko, Longaker and Yang 2018 (33)	To develop more effective products for the prevention and treatment of pressure ulcers.	Systematic review.

Through the review and creation of the search log, 18 articles with scientific evidence were selected to fulfill the main objective of planning nursing actions in the prevention of pressure ulcers in prone ulcer patients with a diagnosis of COVID-19 admitted to the intensive care unit.

IV. DISCUSIÓN

In the articles selected in the systematic review, the authors show the results and nursing strategies to improve the actions aimed at preventing pressure ulcers in hospitalized patients with a diagnosis of coronavirus in the intensive care unit. Nursing actions in the prevention of pressure ulcers in prone ulna patients with a diagnosis of COVID-19 admitted to the intensive care unit. Nursing strategies to improve actions aimed at preventing pressure ulcers in landmark studies were reviewed. Nursing staff efforts to prevent PUs begin at the time the decision is made as to what strategy is needed. Early identification of risk factors can aid in the development of specific interventions to prevent the development of PUs.

In the present study, the aim was to learn about nursing strategies to improve actions aimed at preventing pressure ulcers in hospitalized patients diagnosed with coronavirus in the intensive care unit. As indicated by Álvarez, Bolaños, et al, (17) it is necessary to emphasize the importance of adopting preventive strategies and comprehensive care, as well as improving care planning to avoid deterioration of patient conditions. PUs affect patients' lives significantly. More research is needed to fully understand this phenomenon and to efficiently develop additional strategies for prevention. Understanding patient risk factors and associated processes can help nurses determine which patients are at higher than normal risk. Early identification of what actions are needed and recognition of patient risk factors allows nurses to implement prevention strategies in the shortest possible time to prevent the development of PUs.

In the case of Figueredo, Borda, et al, (12) consider as a strategy the orientation of a Nursing model supported with greater precision the identification of the main problems presented by the patient. In this way, the nursing model would evidence the necessary resources for a timely care, being fundamental for the organization, planning and for the arrangement of priorities on the part of Nursing, it maintains that the basic principles of the Humanistic Nursing Theory are appropriate for all professionals.

The review investigated the effects that promote the application of nursing care in the prevention of pressure ulcers and the reduction of complications. Torra, Bou, et al, (18) through a narrative review, reviewed the key elements related to the history of pressure ulcers and their context, the authors point out that pressure ulcers (PU) have accompanied human beings since ancient times. The study allows to have a reference of the aspects related to the past of PUs and to be able to plan nursing actions in the prevention of pressure ulcers can be very useful to help to understand their present and future. It is also necessary to know the incidence of patients who developed pressure ulcers. Lima, Serrano et al, (19) point out in their study that 40.6% were stage I and 59.4% were stage II, with the sacrum standing out as the most frequent location. Based on this information, it is possible to identify the risks and carry out more specific preventive actions. The effects that promote the application of nursing care in the prevention of pressure ulcers and the reduction of complications according to the research of Araya Fariasa, Febré (20) in their study according to data on the prevalence of adverse effects in Latin American hospitals (IBEAS), the rate of PPU in Latin American hospitals was equal to 7.2%. The authors point out that it is important to reduce the time and amount of pressure on the exposed body areas by making postural changes. They recommend changing position every 2h, stimulating this change with the clock technique suggested by the Institute for Healthcare Improvement, achieving the highest adherence of the 3 measures applied in the ICU PU Bundle, increasing the percentage of adherence by 48.5 percentage points.

To describe the importance of nursing care in the prevention of pressure ulcers in patients admitted to the intensive care unit in prone decubitus position with a diagnosis of covid-19, it is necessary to know the technique of positioning in the different therapeutic postures as well as the most effective practice in the prevention of this type of lesions, therefore it is important to point out the indications of Kallet (21) where he states that the application of therapeutic maneuvers should be part of the protocol and should be performed by trained personnel, adapted to the particularities of each institution and to the requirements of the patient.

Among the strategies for both prevention and treatment of PUs include comprehensive patient assessment, skin assessment and care, nutritional assessment and care, moisture control, pressure management, and health education as noted by Munshi et al, (22) the effectiveness of pressure ulcer prevention interventions in adult intensive care unit (ICU) patients helps guide healthcare providers in selecting appropriate prevention methods that may ultimately lead to reduced healthcare costs and improved outcomes for adult ICU patients.

The responsibility for preventing the risks associated with pressure ulcers in prone patients, as well as for all interventions performed on patients with a diagnosis of covid-19 in intensive care, falls on the nursing team, therefore, in order to minimize the effects, it is considered what Bloomfiel, Noble and Sudlow (23) pointed out that prone ventilation can improve pulmonary mechanics and gas exchange and could improve treatment outcomes.

Therefore, Setten (24) points out that patients should be evaluated daily during multidisciplinary care rounds to determine the continued need for prophylaxis, this strategy will reduce the risk of PPU. Likewise, Du, Wu, Lu, et al. (25) point out that pressure ulcers can decrease the overall quality of life, therefore, their prevention and management are very important; they mention that hydration plays a vital role in the preservation and repair of skin integrity, and is considered an important measure in the prevention and management of pressure ulcers in adults.

Cardinal, Fernandez, Correger, Villanueva and Rios (26) point out that acute respiratory distress syndrome (ARDS) is one of the most important entities in critical care medicine because of its high incidence, mortality, long-term sequelae and lack of specific pharmacological treatment. Mendes, (27) states that it is uncertain whether pressure ulcer prevention makes any difference in the incidence or knowledge of nurses. This is because the included studies provided evidence of very low certainty. Therefore, more information is needed to clarify the impact of health professional education on pressure ulcer prevention. Saghaleini, et al, (28) mention that the cost burden, cure and, most importantly, prevention of pressure ulcers in critically ill patients is very important. Among the strategies he points out that assessment and provision of adequate nutrition based on evidence-based nutritional guidelines should be considered as an important point. Therefore, proper

screening of nutritional status, collaboration with a trained dietitian, and administration of a specialized formula composed of macro- and micronutrients are important aspects of pressure ulcer management in critically ill patients.

Chunhu, Jo, Dumville and Cullum (29) highlighted the incidence of pressure ulcers and electric hybrid pneumatic surfaces are likely to reduce the incidence of pressure ulcers compared to standard hospital surfaces. Porter, et al (30) point out that prevention and management are very important in their study concludes that nutritional deprivation and insufficient dietary intake should be checked because they are the key risk factors for the development of pressure ulcers and impaired wound healing. In older adult patients, good pressure management as noted by Jaul, et al, (31) requires a comprehensive approach for older patients with functional impairment and comorbidities to prevent the development of PUs.

Ongoing training should be a fundamental strategy in prevention, in the review of the work of Sahar Dalvand, et al (32) evaluate knowledge according to the results in the three groups (nurses, auxiliary nurses and nursing students), the lowest knowledge scores were the prevention measures to reduce the amount of pressure / shear. Nurses' knowledge (55.4%, 95% CI 42.4-68.4) was higher than that of nursing students (52.7%, 95% CI 3-49.56) and auxiliary nurses (42.2%, 95% CI 16.4-68).

In conclusion, the contribution of Boyko, et al, (33) point out that the prevention of pressure ulcer formation is aimed at alleviating the risk factors for the individual patient, depends mainly on the experience of the treating team with pronation and the existence of guidelines and protocols with the indications, contraindications and safety measures during the procedure.

V. CONCLUSIONS

In spite of the great burden produced by pressure ulcers in prone patients diagnosed with covid-19, there are not enough studies to try to establish nursing actions in the prevention of PUs, which translates into the inexistence of a specific therapy against this new virus.

There is a possibility that there are other studies that were not captured in the search under the words used for Covid 19, the publications on this new disease are recent because research continues to determine its effects on the body, however according to the evidence found, there have not yet been complications due to PUs, but it is necessary to determine the risk within the first six hours, because once established, morbidity and mortality increases and delays the patient's recovery.

The nursing staff involved in the care process of patients with a diagnosis of Covid 19 should play an active role in the performance of actions for the prevention of PUs. According to the need to maintain body hygiene and skin integrity to achieve an adequate degree of health and

wellbeing, actions should be directed to act against skin alterations or lesions: presence of pressure ulcers (PPU), indicating their location, size and characteristics. Nursing actions to prevent pressure ulcers in prone patients guide the work of the staff is a guarantee of quality of work and safety for the patient.

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