Chapter 94

Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

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ABSTRACT
to identify in the literature the nurses' knowledge regarding the management of invasive mechanical ventilation. Metodologia: Trata-se de uma revisão integrativa que contemplou estudos publicados entre janeiro de 2017 a maio de 2022, disponíveis na integra eletronicamente, com enfoque em adultos, não restringindo o idioma, a localidade de origem das produções e o método utilizado. Thematic analysis was adopted and the data were operationalized by the Iramuteq® software. Results: nine studies were found that approached the theme. From the analysis three classes emerged, being: 1st Class: (Un)Knowledge about the care of patients under mechanical ventilation in Intensive Care Unit; 2nd Class: Educational strategies for the qualification of professionals who act in the care of patients under mechanical ventilation; and 3rd Class: Professional autonomy of nurses for the decision making in the care of patients under MV. Final considerations: a gap was identified in the formation and qualification of nurses to develop nursing care with quality, safety and autonomy. The nurse plays a relevant role in the management of patients on mechanical ventilation, acting in three pillars considered essential: care, management and education/research.

Collection of international topics in health science:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1167

1 INTRODUCTION

Intensive Care Units (ICU) and Emergency Rooms (ER) are considered complex units, whose organizations are given by the physical structure and the team involved, requiring professionals with agility, skill, dexterity, and the ability to think clinically efficiently in a timely manner. Often, patients who are admitted to these sectors require orotracheal intubation (OTI) and invasive mechanical ventilation (MV) (ANTONELLI; JUNIOR, 2014).

A study developed in Sweden found that of the 39,510 ICU admissions evaluated in 2017, 4% (1,643) required MV, and 0.8% (307) underwent prolonged MV (those with more than 21 days of device use). Longer ICU stays were associated with the use of MV, and the mortality of individuals using this device was 21% (CEDERWALL et al., 2021).

Indicated in acute respiratory failure (ARF) or acute chronic respiratory failure, MV can partially or totally replace spontaneous ventilation. When used invasively, it occurs through an endotracheal tube or a tracheostomy tube (SANTOS et al., 2020).

In addition to these indications, the world has experienced an exponential increase in the demand for ICU beds and the use of invasive MV due to COVID-19. The care of critically ill patients with COVID-19 has been evolving rapidly. Although there are reports in the literature of promising therapies, such as the use of *remdesivir* and *dexamethasone*, MV remains the mainstay of management of severe COVID-19. However, a systematic review of the literature detected a high mortality rate in adult patients with COVID-19 receiving invasive MV, ranging from 43% to 64%, worsening exponentially among the elderly (>70% in those aged 60 years and older) (LIM et al., 2021).

In this context, it is important to highlight the importance of the assistance of a specialized multiprofessional team, capable of assisting individuals using invasive MV, being the nurse responsible for maintaining the intubated patients' patent airways, as well as mastering the ventilatory parameters, necessary to evaluate the patient's adaptation and thus implement nursing care (SANTOS et al., 2020).

According to COFEN Resolution nº 639, from May 6th 2020, it is the nurse's responsibility to assemble, test and install MV equipment in adult, pediatric and neonatal patients. It is also the professional's responsibility to monitor, check alarms, initial adjustment and management of invasive and non-invasive MV parameters, the latter two to be done by agreement with the medical team (COFEN, 2020).

Although endotracheal intubation consists of a commonplace procedure in SEs and ICUs, it is considered an advanced skill for nurses due to its difficult interpretation, graphic ventilator monitoring, and the potential implication of its implementation to the patient (BULLERI et al., 2018). A study   conducted

Collection of international topics in health science:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

116

in Japan noted that nurses lack adequate knowledge for the management of the patient on MV, resulting in aggravations such as ventilator-associated pneumonia (VAP) (RAFIEI et al., 2020). Thus, it is essential that nurses have the training and understanding necessary to properly manage the therapy and management of the patient on invasive MV.

Considering the frequency of patients with respiratory instability using invasive MV in the ICU and/or SE, the possibility of mismatches between the ventilator and the patient, the risk of VAP, there is a need for a trained professional to safely deal with all these variations (CABRINO et al., 2018). Highlighting the responsibility of nurses regarding the assembly, testing and installation of mechanical ventilation devices (COFEN, 2020). Clinical scenario aggravated by the current pandemic of COVID-19 (LIM et al., 2021), whose professionals had even more in front of such procedure, it is important to develop a literature review in order to identify the nurses' knowledge about the management of mechanical ventilation, in order to propose strategies for improving the assistance provided to the population.

Given the above, this study has the following question: What is the available evidence in the literature on nurses' knowledge regarding the management of mechanical ventilation in Intensive Care Units? It aims to identify in the literature the nurses' knowledge regarding the management of invasive mechanical ventilation.

2 METHODOLOGY

2.1 STUDY TYPE

This is an integrative literature review, which followed the guidelines of the PRISMA Protocol (MOHER, et al., 2009). The research question was formulated based on the PICo strategy (HULLEY; NEWMAN; CUMMINGS, 2015): (P - nurses, I - knowledge about the management of mechanical ventilation, Co - Intensive Care Unit): What is the available evidence in the literature on nurses' knowledge about the management of invasive MV in Intensive Care Unit?

2.2 STUDY SELECTION

The following inclusion criteria were adopted: original articles, published in the last five years (between January 2017 and May 2022), available in full electronically, with a focus on adults, the language, the place of origin of the productions, and the method used were not restricted. Exclusion criteria included: articles that were distant from the reflections proposed by this study, literature/reflection reviews, editorials, short communications, clinical trial projects, abstracts of proceedings, theses, dissertations, course completion work, epidemiological bulletins, management reports, books, and official documents from national and international programs.

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1169

2.3 DATA COLLECTION

Data collection occurred between July and August 2022. The following terms were used in the *Medical Subject Headings* (MeSH): *Emergency Room Nurse, Mechanical Ventilation, Nurses* AND *Intensive Care Unit* in the search strategies PUBMED, EMBASE, *Web of Sciense* and SCOPUS. In the Virtual Health Library (VHL) using the Health Science Descriptors (DeCS): Emergency Nursing, Mechanical Ventilation, Nurses AND Intensive Care Units. It is noteworthy that for this collection, only the key words were used, discarding the synonyms presented. In order to increase the number of articles obtained, a cross search between the key words was performed using the Boolean connector "AND", adopting the same combination in all search sites.

2.4 DATA ANALYSIS AND TREATMENT PROCEDURES

The articles were selected and identified in three steps: 1) Reading of the titles and abstracts of the studies and exclusion of those that did not fit any of the criteria; 2) Reading in full all articles selected in the first step; 3) Selection of the works that fit the eligibility criteria. The steps were carried out independently by the researcher himself, and disagreements were discussed with the supervisor until a final consensus was reached. It is noteworthy that the articles duplicated in the databases were excluded after being read in full in order to avoid exclusion errors.

To facilitate the extraction of information contained in the studies we used the RAYYAN®, free *online software,* which assists in conducting systematic and integrative reviews by exporting data from databases, creating a selection of information of the articles that facilitate their choice, namely: identification, title, year of publication, indexing base, journal, level of evidence, objective, study *design,* main results and conclusion.

For the level of evidence, the following classification was considered: level I systematic reviews or meta-analyses of Randomized Controlled Clinical Trials (RCT); level II evidence obtained from at least one well-designed RCT; level III well-designed clinical trials without randomization; level IV from well-designed case-control and crossover studies; level V obtained from systematic reviews of descriptive or qualitative studies; level VI from a single descriptive or qualitative study; and level VII evidence originating from opinion of authorities and/or expert committee (GALVÃO, 2006).

Thematic modality content analysis was used, following the three proposed phases: pre-analysis; material exploration; and treatment of results (BARDIN, 2016). Accordingly, the key information was extracted through the thematic modality were operationalized by the IRAMUTEQ® *software* (SOUZA, et al., 2018). Initially, a *text corpus* was constituted with the main results and conclusions of the selected works, which through the frequency of words gave rise to text segments (each text segment is equivalent to approximately 3.25 lines).

For this study, we adopted the Factor Analysis of Correspondence (FCA), which corresponds to the crossing between the vocabularies (considering the frequency of incidence of words) and the classes,

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1170

generating a graphic representation in a Cartesian plane, from which the positions can be visualized between classes or forms. The Descending Hierarchical Classification (DHC) was also used, where text segments were classified according to the association between similar vocabulary words, and then flexed according to frequency, forming initial classes. To verify association between text segments to the given class, the *software* performed the chi-square test ($x2$), whose words were chosen according to statistical significance ($p≤0.001$) (SOUZA, et al., 2018). The convergence between the vocabulary words highlighted by the *software* and the inference of the data, gave rise to the definitive classes. The results were discussed according to the literature.
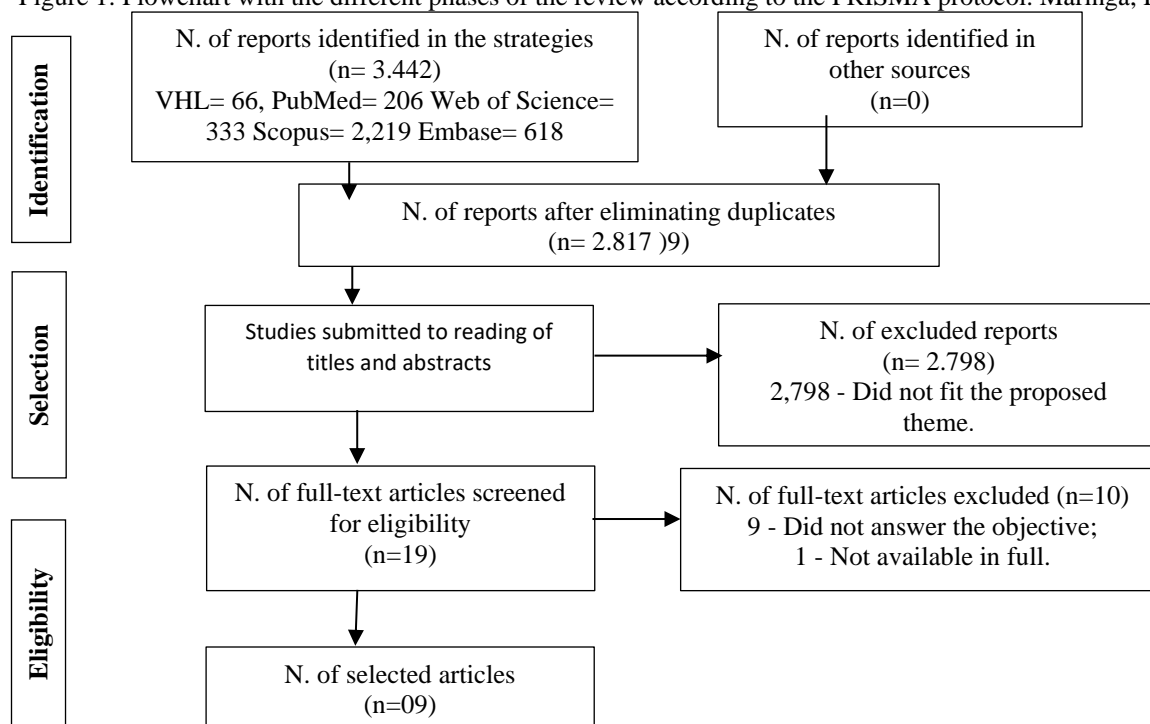
2.5 ETHICAL ASPECTS

Ethical aspects were preserved, and all authors of the articles included in this review were properly referenced. To facilitate the identification of the works that comprise the evaluated text corpus, the letter M (Mechanical ventilation) and the respective study entry number were adopted (Example: M1).

3 RESULTS

During the search phase, a total of 3,442 articles were found, of which, after reading the full text and applying the eligibility criteria, nine articles remained, as shown in figure 1, according to the PRISMA protocol.

Figure 1. Flowchart with the different phases of the review according to the PRISMA protocol. Maringá, PR, Brazil. 2023.

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1171

Among the selected studies, all were published in the English language and were conducted in eight different countries: Philippines, Australia, Finland, Jordan, Palestine, Saudi Arabia, South Korea, and Norway, and one survey covered the entire European continent.

Of the studies that comprised this review, six (66.7%) presented the mixed type methodological design (quantitative - qualitative), three (33.3%) were transversal, two were qualitative and one was quantitative. The study population ranged from 29 to 3,329 participants (mean 492 participants), and the age of the professionals involved ranged from 20 to 59 years. It is worth noting that three studies did not define the age of the participants.

The time of experience of professionals was three to more than 10 years in nursing, and most studies brought time of experience evaluated between three and seven years in ICU. Regarding gender, there was a predominance of females in five studies (M1, M3, M4, M6, M7), and three did not indicate the gender of the participants (M2, M8, M9).

In all works that contemplated this review, the *locus of* research was the ICU, only two were also conducted in other sectors, such as the Infirmary and the Neurological Unit. As for the level of evidence, all were classified as VI. Table 1 shows the characterization of the articles selected for this review.

Table 1. Characterization of the selected articles. Maringá, PR, Brazil. 2023.

ID	Title	Journal Title	Year	Country	Language	Level of Evidence
M1	Assessment of knowledge and implementation practices of the ventilator acquired pneumonia (VAP) bundle in the intensive care unit of a private hospital (ABAD *et al.,* 2021)	Antimicrobial Resistance and Infection Control	2021	Philippines	English	VI
M2	Nurses' knowledge, experience and self-reported adherence to evidence-based guidelines for prevention of ventilator-associated events: A national online survey (MADHUVU *et al.,* 2020)	Intensive & Critical Care Nursing	2020	Australia	English	VI
M3	Implementation of strategies to liberate patients from mechanical ventilation in a tertiary-level medical center (JANSSON *et al.,* 2019)	American Journal of Infection Control	2019	Finland	English	VI
M4	Evidence-based guidelines for prevention of ventilator-associated pneumonia: Evaluation of intensive care unit nurses' adherence (DARAWAD *et*	American Journal of Infection Control	2017	Jordan	English	VI

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1172

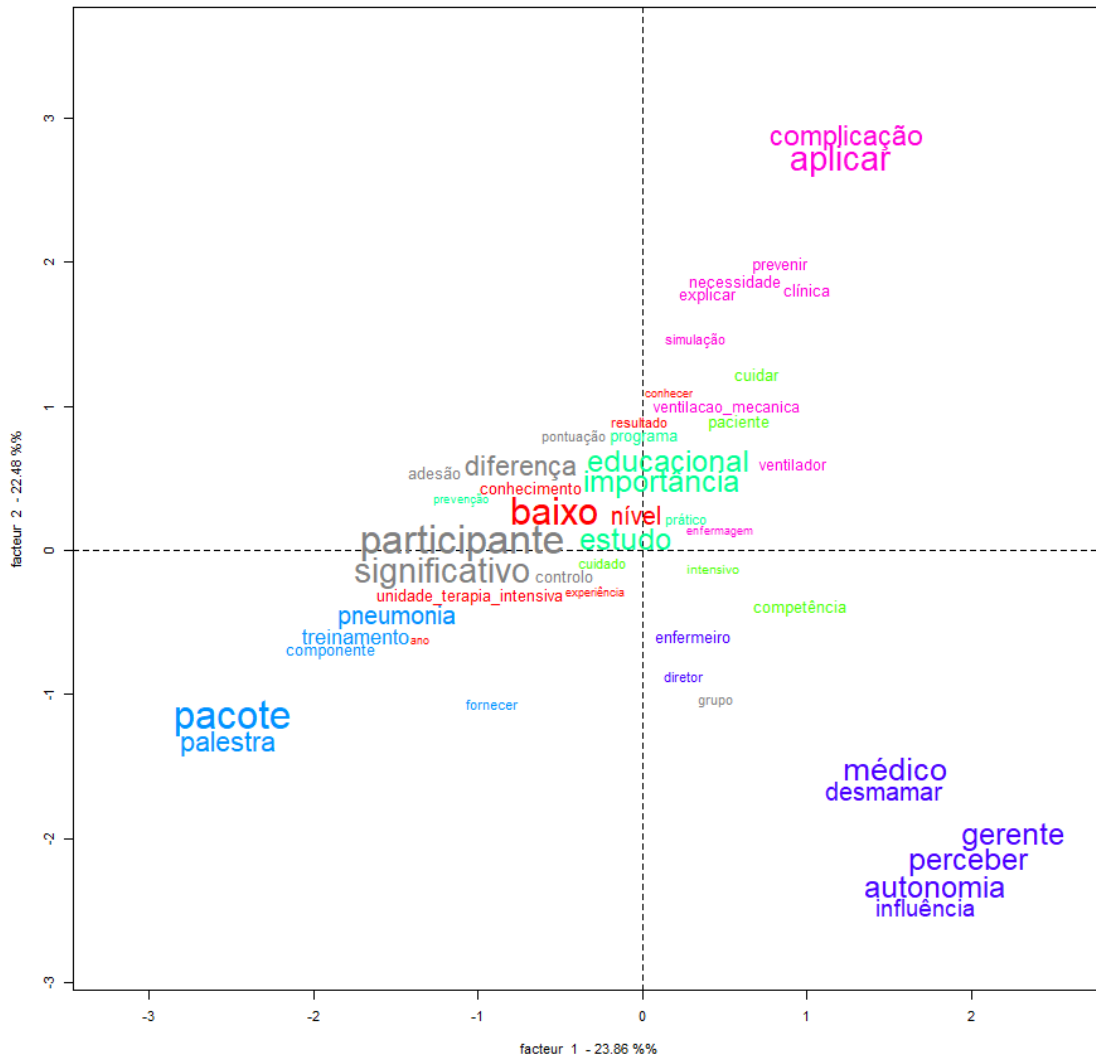|						
M5	Nurses' Attitude, Behavior, and Knowledge Regarding Protective Lung Strategies of Mechanically Ventilated Patients (ASMAR *et al.,* 2020)	Critical Care Nursing Quarterly	2020	Palestine	English	VI
M6	Critical care nurses' perception of care coordination competency for management of mechanically ventilated patients (ALSHARARI *et al.,* 2020)	Journal of Clinical Nursing	2020	Saudi Arabia	English	VI
M7	The Effect of a Non-Invasive Positive Pressure Ventilation Simulation Program on GeneralWard Nurses' Knowledge and Self-Efficacy (KIM *et al.,* 2021)	International Journal of Environmental Research and Public Health	2021	South Korea	English	VI
M8	Perceived decisional responsibility for mechanical ventilation and weaning: a Norwegian survey (HAUGDAHL *et al.,*2019)	British Association of Critical Care Nurses	2019	Norway	English	VI
M9	Evidence-based guidelines for the prevention of ventilator-associated pneumonia: results of a knowledge test among European intensive care nurses (LABEAU *et al.,* 2018)	Journal of Hospital Infection	2018	Europe	English	VI

Source: Prepared by the authors (2023).

From the analysis performed by the Iramuteq® *software*, 53 text segments were obtained, of which 43 were analyzed, corresponding to 81.13% of assertiveness. Among the words that emerged from the *text corpus*, the following stood out Low Level (n=1,430), Practical Study (N=1,203), Weaning (n=917), Complication (n=888), Importance (n=715), Manager (n=715), Autonomy (n=715), Educational (n=715), Knowledge (n=699), Pneumonia (n=699), Competence (n=523), Intensive Care Unit (n=356) and Training (n=356), according to Figure 2.

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1173

Figure 2. Factorial Correspondence Analysis of the classes. Maringá, PR, Brazil, 2023.
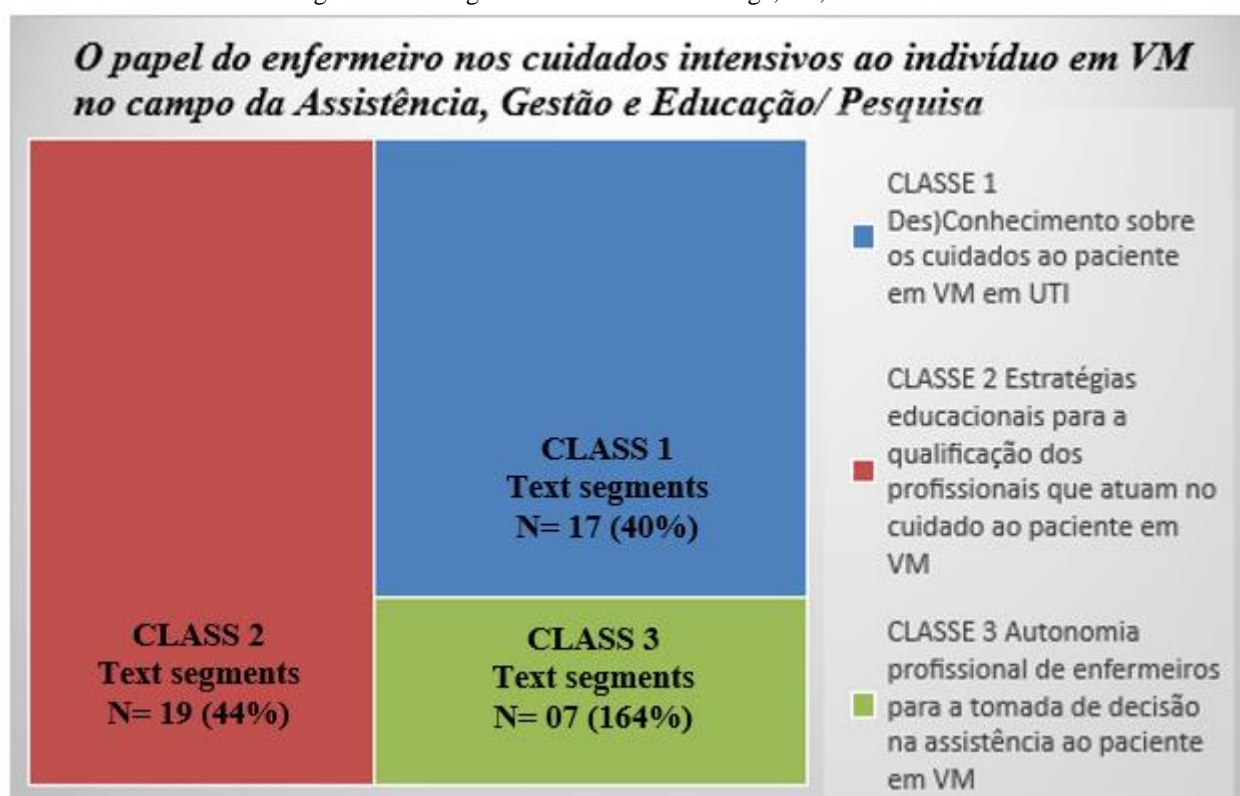

Source: Iramuteq® *software*.

The *software* suggested the organization of the data into seven initial classes. However, from the convergence between the initial results suggested by Iramuteq® and the thematic analysis, three final classes were originated that are interconnected and consecutive, which dealt with *The role of the nurse in intensive care of the MV individual in the field of Assistance, Management and Education/Research*.

The final classes were named: 1st Class: (Un)Knowledge about ICU MV patient care; 2nd Class: Educational strategies for the qualification of professionals who work with MV patient care; and 3rd Class: Professional autonomy of nurses for decision making in MV patient care. The interaction among the classes will be presented in Figure 3

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1174

Figure 3. Dendogram of the classes. Maringá, PR, Brazil. 2023.

Source: Prepared by the authors (2023).

3.1 1ST CLASS: (UN)KNOWLEDGE ABOUT ICU MV PATIENT CARE (ASSISTIVE)

In this class, the following vocabularies stood out: Low Level (n=1,430), Complication (n=888), Knowledge (n=699), Pneumonia (n=699) and Intensive Care Unit (n=356). These reflected the (lack of) knowledge of professionals to assist MV patients in the ICU.

Studies M1, M2, M3 and M4, showed that most of the nurses who work in ICU were not trained to perform the clinical management of individuals under MV, nor did they have the necessary knowledge to perform their role with the multiprofessional team. The same articles pointed out that the time of experience was not related to a more efficient MV management. The knowledge of ICU specialist nurses also did not show a statistically significant difference ($p=0$.308) in relation to those who did not have a post-graduate degree (M2). The M6 study reiterated that there is still a gap in the professional training base related to the development of competencies that enable nurses to coordinate intensive care.

Developing countries showed the lowest performance in relation to knowledge/training about MV and the possible complications arising from this procedure (M1, M5). On the other hand, it was identified that in developed countries, nursing teams demonstrated the minimum knowledge necessary about the management of the mechanical ventilator, exposed through the phrases: *I know what to explain to the patient before starting the ventilator*; I *know how to connect the ventilator circuit*; I know how to *handle and change the ventilator*; and *I know what to record related to nursing care associated with the ventilator* (M7).

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1175

The (lack of) knowledge about MV management favored the emergence of complications such as VAP. In this sense, it was identified that the participants of the studies were not oriented about the VAP prevention *bundles* (oral hygiene with 0.12% *chlorhexidine*; headboard elevated 30-45°; *cuff* pressure between 20-30 cm $H_2 O$; and care with tracheal secretion aspiration), negatively affecting adherence to care needed to prevent the development of pneumonias (M4). One study pointed out that the largest proportion of nurses working in ICU disagreed about the harmful use of low tidal volume in the patient on MV (M5), suggesting that these professionals did not know the ventilatory parameters that should be adopted for each individual. Most nurses reported fear when dealing with MV patients, and that they would only feel safe if they received adequate and continuous training (M7).

However, it is noteworthy that the studies (M1, M5) pointed out that few nurses adhered to the training available by the institutions. While the articles (M2, M4, M7 and M8) showed that those who attended training on MV and VAP were more assertive in their actions when dealing with the patient on MV.

3.2 2ND CLASS: EDUCATIONAL STRATEGIES FOR THE QUALIFICATION OF PROFESSIONALS WORKING IN MV PATIENT CARE (EDUCATION/RESEARCH)

In this class the words that stood out were: Practical Study (n=1,203), Educational (n=715), Importance (n=715), Competence (n=523) and Training (n=356). These words were understood as a complement to the previous class, demonstrating the importance of health institutions employing educational strategies sensitive to the needs of nurses working in ICU, in order to generate the problematization of the work process and provide safe, humanized and qualified care to people under MV.

Among the educational strategies pointed out as efficient to improve knowledge on MV, the lectures on VAP prevention *bundles* associated with the practical component were highlighted (M1), which favors the development of decision-making competence. However, it was noted modest adherence to the bundles of *bundles* for prevention of VAP by nurses (M2).

Simulations were also presented as indispensable for the development of critical thinking, by helping nurses to experience problem-solving situations and experiences in a clinical environment, reducing the fear of handling the MV and increasing the professional's confidence (M7).

The authors recommended implementing multifaceted educational programs that include information, case studies, videos, and practical scenarios that address recent guidelines on MV management and VAP prevention in the ICU, promoting nurse participation in order to improve awareness of infection control and other possible adverse events (M5, M9).

In general, the studies pointed out the unquestionable need for quality in the nurses' training, as well as the importance of improving these professionals, through post-graduate courses in intensive care nursing and short courses on MV management and VAP prevention guidelines.

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1176

3.3 3RD CLASS: PROFESSIONAL AUTONOMY OF NURSES FOR DECISION MAKING IN MV PATIENT CARE (MANAGEMENT)

In this last class, the words that assumed a prominent position were: Weaning (n=917), Autonomy (n=715) and Manager (n=715). These words talked about the importance of the professional to make decisions in a quick and assertive way when assisting the patient on MV, aiming at patient safety and reducing complications.

Nurses are essential for weaning from MV, especially when physical therapists are not available or when the number of these professionals is small in the institutions, as is the case in Palestine (M5). However, nurses often did not participate in the initial set-up of the ventilator and were not involved in discussions about weaning protocols, reducing autonomy over decision-making in the clinical management of the patient on MV (M8).

Thus, team leader nurses perceive greater autonomy, influence and collaboration in decisions about MV than the medical team recognizes about the nurse's performance (M8). Such understanding negatively implies in the interdependence among ICU professionals, instead of the individual autonomy of each category (M8).

For the exercise of nurses' professional autonomy about weaning from the mechanical ventilator, the authors pointed out the importance of knowledge about the parameters, alarms and ability to respond promptly to emergency situations, which can influence the patient's recovery process (M6, M7). The knowledge allows nurses to contribute with the multiprofessional team, in order to identify potential problems, optimize the use of resources, besides raising the understanding about the importance of comfort and emotional support of both patients and their families (M5, M6).

4 DISCUSSION

Considered complex units due to their physical structure organization and the team involved, that mostly deal with MV patients, ICU and ES, require above all, skilled nurses, with agility, efficient clinical reasoning capacity and in a timely manner. This study identified the evidence on nurses' knowledge regarding the management of mechanical ventilation available in the literature. The copilated information demonstrated the role of the nurse in intensive care of the individual under MV in the field of Assistance, Management and Education/Research. However, a gap was observed in the training and qualification of these professionals to develop nursing care with quality, safety and autonomy.

Nursing care is essential for the management of critically ill patients, especially those on MV. The nurse is responsible for clinical and diagnostic assessment and the implementation of individualized care plans that will result in the treatment of each patient (MAURYA et al., 2016). However, without the proper preparation, associated with inexperience and lack of knowledge about the management of MV, the risk of developing complications and adverse events increases, which increases the length of hospital stay, occupation of ICU beds, costs and a significant increase in the mortality rate (ALOUSH, 2017).

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1177

Another point highlighted by the analyzed studies is the fact that the time of experience and specialty did not positively influence the knowledge and skills of nurses for MV patient care. These data corroborate part of the literature, which points out that less than a third of the expert professionals were able to evaluate the MV parameters efficiently (RAMIREZ et al., 2017). Not adapting the parameters to the clinical case of each patient favors asynchrony with the ventilator in addition to other complications such as increased respiratory work, delayed and/or prolonged weaning, changes in gas exchange and increased length of stay in the ICU (RAMIREZ et al., 2017).

Among the main complications that can be avoided by the knowledge and proper management of the patient on MV, PAV stands out. In developed countries, the incidence of VAP ranges from three to five cases per thousand patients on MV, whereas in developing countries, this rate can reach up to 41 cases per thousand patients, also reflecting a higher mortality rate (ALOUSH, 2017). Furthermore, the average costs of care for individuals who developed VAP are high, corresponding to approximately US$40,000 per person (KHAN et al., 2017).

The results showed that nurses did not receive training for the implementation of VAP prevention *bundles* in the institutions, and when they did, there was little adherence to their guidelines. A similar result was observed by a study developed in Jordan, whose authors pointed out that only conducting educational activities focused on VAP prevention bundles does not improve the adherence of nurses to its protocols. Therefore, it is necessary to associate training with the transformation of other factors that affect the work process in an ICU environment, such as excessive workload and the number of patients that these professionals are responsible for (ALOUSH, 2017).

The literature suggests that the smaller the number of beds per nurse aligned with reduced workload, the greater the adherence to prevention protocols (ALOUSH, 2017). Other strategies for the successful implementation of ICU prevention *bundles* should be adopted, such as the need for care to be patient-centered and for there to be articulation between the service and universities, so that faculty can collaborate in addressing the challenges experienced in the work process through evidence-based practices (BALAS et al., 2019).

In this context, the results pointed out the need for the use of varied educational methods that aim at professional improvement, such as simulations, training with a practical component, use of videos and reading of protocols. These strategies, when based on the problematization of the nurses' work process, are configured as Permanent Health Education (PHE) actions. HPS as a public policy has the potential to transform paradigms in health care in the fields of care, management and education/research, promoting professional empowerment, greater adherence to evidence-based practices and team collaboration (ARNEMANN et al., 2018).

Through HPS, ICU nurse leaders can modify the nursing care provided to MV patients by focusing on meaningful learning, paying attention to the demands and individual needs of each team member and the reality of the sector in which they work. Also by implementing protocols based on scientific evidence,

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1178

investing in permanent educational actions, raising professional autonomy (ARNEMANN et al., 2018; MAURYA et al., 2016).

Autonomy in nursing is translated into the organization and structuring of services, management and people management, ethical issues of the profession, construction and implementation of protocols, work process and care grounded in the Systematization of Nursing Care (SAE), which represent the responsibility in the standardization of the services offered (BONFADA et al., 2018).

In this review, it was noted that nurses had a different notion from physicians about their autonomy in the management of the patient under MV, which negatively influenced the care given to the population. For professional autonomy it is necessary to have decision power, as well as the ability to apply these orders and to be responsible for them. Therefore, interprofessional collaboration must be aligned with professional autonomy, which influences the quality of care and the physical and mental health of nurses. A study developed in the city of Ardabil (Iran), identified a mean score of collaboration between physicians and nurses in the ICU of 47.83±3.9, which indicates good collaboration between these professionals. The authors also observed that 73% of nurses reported moderate autonomy and 27% of them considered their autonomy high (AGHAMOHAMMADI et al., 2019).

The findings of the works that make up the review reinforced that for the performance of autonomy, nurses need to have knowledge about a range of information that covers the management of MV, such as parameters, alarms and ability to respond promptly to emergency situations. Research concluded that the higher the nurses' level of autonomy, the greater their professionalism was, which was associated with higher qualification, knowledge, ability, behavior, professional posture and involvement in scientific research. Nurses with greater professional autonomy are committed to society in providing services with high quality standards and can strengthen nursing education and practice (PURSIO et al., 2021).

This review has limitations that restrict the interpretation of its findings, such as the small number of studies that have addressed the topic, the low level of scientific evidence of the works that contemplated the analysis (level VI) and the scarcity of studies developed in Brazil, whose continental dimensions and economic, educational and cultural disparities may reflect on the results. However, despite these limitations, the findings have the potential to collaborate with the strengthening of public policies regarding the actions of professional training and continuing education, by detecting gaps in nurses' knowledge regarding the management of MV patients and interventions developed by educational and health institutions. We also reiterate the relevance of developing attributes for effective leadership, as it is a complex and highly valued component, essential to raise the standard of professional education, consolidate research and clinical practice, aiming at patient safety, quality of care and cost reduction.

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1179

5 CONCLUDING REMARKS

This study identified the evidence available in the literature on the knowledge of nurses regarding the management of invasive mechanical ventilation, which should be based on three pillars considered essential for: assistance, management, education and research.

However, there is a gap in the training and qualification of nurses on the management of MV, whose lack of knowledge contributed to the emergence of complications such as Ventilator-Associated Pneumonia. To strengthen the knowledge about MV, the studies suggested educational strategies for professional qualification, which should articulate numerous tools to meet the specifics of each service and nurse, such as discussion of case studies, videos, simulations and practical scenarios that address the recent guidelines on MV management and prevention of VAP in the ICU.

The study also showed that the time of experience was not able to improve the knowledge of nurses regarding the management of MV, and that the professionals who received some type of training showed greater autonomy and safety when dealing with MV patients, but only a modest part of those involved adhered to the training.

The results also highlighted the importance of professional autonomy to make decisions quickly and assertively, for which it is essential to understand the parameters, alarms and ability to respond promptly to emergency situations. Therefore, it is suggested the development of interventions aimed at the professional development of nurses to exercise leadership in the care of MV patients, strengthen public policies for continuing education in health and evidence-based practice, in order to contribute to the multiprofessional team, so that potential problems can be identified, thus optimizing the use of resources.

Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1180

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Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1181

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Methodology focused on the area of interdisciplinarity:
Nurses' Knowledge Regarding The Management Of Invasive Mechanical Ventilation: Integrative Review

1182