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CRITICALLY ILL PATIENT WITH DELIRIUM IN THE INTENSIVE CARE UNIT: A SYSTEMATIC LITERATURE REVIEW

DOENTE CRÍTICO COM DELIRIUM NA UNIDADE DE CUIDADOS INTENSIVOS: REVISÃO SISTEMÁTICA DA LITERATURA

PACIENTE CRÍTICO COM DELIRIO EN LA UNIDAD DE CUIDADOS INTENSIVOS: UNA REVISIÓN SISTEMÁTICA DE LA LITERATURA

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ABSTRACT

Introduction: The aim of this review was to identify the scientific evidence on nursing interventions for the prevention and management of *delirium* in critically ill patients in the Intensive Care Unit.

Methods: This systematic literature review was developed according to the Joanna Briggs Institute protocol and the studies were selected according to the PRISMA model. Inclusion criteria were defined (studies with nursing interventions for *delirium* in critically ill patients and carried out in adult patients; studies carried out in the context of intensive care; and studies written in English, Portuguese and Spanish). The search for articles was carried out on the B-on and EBSCO platforms, between 2019 and 2021.

Results: 1572 articles were identified, of which only 9 met the defined criteria. The nursing interventions for the prevention and management of *delirium* extracted from the analyzed articles were grouped into 9 categories: cognitive stimulation, sensory stimulation, *delirium* monitoring, pain control, sedation management, physical environment management, promotion of sleep quality, early mobilization and family involvement.

Conclusions: Although there are studies that prove the effectiveness of interventions for the prevention and management of *delirium*, the results are not very significant. Interventions are applied in isolation instead of a multimodal protocol composed by the various categories of interventions, as recommended by international guidelines.

Keywords: Critical Care; Delirium; Medical-Surgical Nursing; Nursing Care.

RESUMO

Introdução: O objetivo desta revisão foi identificar a evidência científica sobre as intervenções de enfermagem para a prevenção e gestão do *delirium* no doente crítico na Unidade de Cuidados Intensivos.

Métodos: Esta revisão sistemática da literatura foi desenvolvida segundo o protocolo de Joanna Briggs Institute e os estudos foram selecionados de acordo com o modelo PRISMA. Foram definidos os critérios de inclusão (estudos com intervenções de enfermagem para o *delirium* no doente crítico e realizados em doentes adultos; estudos realizados em contexto de cuidados intensivos; e estudos escritos na língua inglesa, portuguesa e espanhola). A pesquisa dos artigos foi realizada nas plataformas B-on e EBSCO, entre 2019 e 2021.

Resultados: Foram identificados 1572 artigos, dos quais apenas 9 cumpriam os critérios definidos. As intervenções de enfermagem para a prevenção e gestão do *delirium* extraídas dos

artigos analisados foram agrupadas em 9 categorias: estimulação cognitiva, estimulação sensorial, monitorização do *delirium*, controlo da dor, gestão da sedação, gestão do ambiente físico, promoção da qualidade do sono, mobilização precoce e o envolvimento familiar.

Conclusões: Apesar de existirem estudos que comprovem a eficácia das intervenções para a prevenção e gestão do *delirium*, os resultados são pouco significativos. As intervenções são aplicadas de forma isolada ao invés de um protocolo multimodal composto pelas várias categorias de intervenções, como recomendado pelas orientações internacionais.

Palavras-chave: Cuidados Críticos; Cuidados de enfermagem; *Delirium*; Enfermagem Médico-Cirúrgica.

RESUMEN

Introducción: El objetivo de esta revisión fue identificar la evidencia científica sobre las intervenciones de enfermería para la prevención y manejo del delirio en pacientes críticos en Unidad de Cuidados Intensivos.

Métodos: Esta revisión sistemática de la literatura se desarrolló de acuerdo con el protocolo del Instituto Joanna Briggs y los estudios se seleccionaron de acuerdo con el modelo PRISMA. Se definieron criterios de inclusión (estudios con intervenciones de enfermería para el delirio en pacientes críticos y realizados en pacientes adultos; estudios realizados en el contexto de cuidados intensivos; y estudios escritos en inglés, portugués y español). La búsqueda de artículos se realizó en las plataformas B-on y EBSCO, entre 2019 y 2021.

Resultados: Se identificaron 1572 artículos, de los cuales solo 9 cumplieron con los criterios definidos. Las intervenciones de enfermería para la prevención y manejo del delirio extraídas de los artículos analizados fueron agrupadas en 9 categorías: estimulación cognitiva, estimulación sensorial, monitoreo del delirio, control del dolor, manejo de la sedación, manejo del ambiente físico, promoción de la calidad del sueño, movilización temprana y participación familiar.

Conclusiones: Aunque existen estudios que prueban la efectividad de las intervenciones para la prevención y manejo del delirio, los resultados no son muy significativos. Las intervenciones se aplican de forma aislada en lugar de un protocolo multimodal compuesto por las diversas categorías de intervenciones, como recomiendan las directrices internacionales.

Descriptores: Cuidados Críticos; Cuidados de Enfermería; Delirio; Enfermería Médico-Quirúrgica.

INTRODUCTION

Delirium is a common condition in the Intensive Care Unit (ICU) with high prevalence and incidence rates worldwide. According to international data, more than 87% of patients admitted to the ICU may develop *delirium*[1,2,3].

The prevalence of *delirium* leads to a worse prognosis for the patient, with an increase in functional and cognitive decline, an increase in the need for invasive mechanical ventilation (IMV) and an increase in the length of hospital stay[4].

Delirium can be defined as a syndrome of acute or subacute onset, of rapid onset (hours to days) and associated with alterations and fluctuations in the patient's state of consciousness, cognitive functions and behavior. These alterations are caused by acute cerebral dysfunctions and by risk factors[1,5].

This condition can be classified into three subtypes, depending on the presentation of the patient's psychomotor pattern: *hyperactive* (characterized by a pattern of restlessness and psychomotor agitation); *hypoactive* (characterized by lethargy, psychomotor slowing and hyporeactivity to external stimuli); and *mixed* (fluctuation between the two main motor subtypes)[5,6].

The etiology is complex and multifactorial, with no scientific evidence yet to explain the pathophysiology of *delirium* with certainty[5,6,7].

The development of *delirium* is dependent on several risk factors related to the patient's characteristics and the patient's environment[7]. The literature points to multiple causes for this condition but emphasizes that the identification of the precipitating factor of this acute pathology may be the step towards prevention and management[7].

Delirium monitoring in the ICU should be performed using valid and highly sensitive scales, such as The Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) or the Intensive Care Delirium Screening Checklist (ICDSC)[5,8,9].

According to Stolling *et al*[10], for the prevention and management of *delirium*, a multimodal approach is required using pharmacological and non-pharmacological strategies. The prevention and management of *delirium* in the ICU is based on guidelines that derive from studies, trials, expert opinion and published recommendations[8]. With regard to pharmacological strategies, there is no consensus and scientific evidence on which is the best pharmacological agent for the prevention and treatment of *delirium*[8].

There are non-pharmacological strategies with significant benefits in reducing prevalence, incidence, mortality and length of stay and ventilation rates[1,3,8,11,12,13].

The main non-pharmacological strategies for the prevention and management of *delirium* in the ICU are centered on: orientation of patients towards reality and the use of personal objects (such as dental, auditory and ocular prostheses); cognitive stimulation; management of the environment surrounding the patient; ventilatory weaning and sedation protocols; pain prevention and control; early mobilization; *delirium* monitoring; family support; and the education of health professionals[1,3,8,11,12,13].

Non-pharmacological strategies focus on low-cost interventions that increase nurses' workload[1,8,14].

Delirium in critically ill patients is a worrying condition, not recent and with repercussions for the patient. In addition to being a multifactorial condition, it is often undervalued, so it is necessary to rethink clinical practice, integrate the early identification of risk factors for the development of *delirium* and apply timely strategies to act and reduce the risks for the critically ill patient.

Thus, the aim of this study is to know and identify in the scientific evidence the nursing interventions for the prevention and management of *delirium* in critically ill patients in the ICU.

METHODS

Review aims

To identify in the scientific evidence the nursing interventions for the prevention and management of *delirium* in critically ill patients in the ICU.

Research strategies

This systematic review of the literature was carried out in order to respond to the previously mentioned objective and the entire process of selection of studies was carried out following the model Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA)[15].

This review began with the construction of the research question, using the PICOD methodology (participants, intervention, context, results and design)[15]: *What are the relevant nursing interventions for the prevention and management of delirium in critically ill patients in intensive care unit?*

Given the research question developed, the eligibility criteria were identified (Chart 1↗).

For the research of studies, descriptors validated by Medical Subject Headings (MeSH) in English were used: *Critical care*, *Delirium*, *Nursing care*. Also, non-validated descriptors were used, such as *Intensive Care Units* and *Nursing Interventions*, in order to narrow the research and the selection of articles.

The search for articles was carried out between November and December 2021 on the B-on and EBSCO platforms, namely in the Complementary Index, Academic Search Complete, MEDLINE, CIHNAL and SCOPUS databases.

By intersecting the different descriptors on the electronic data platforms, it was possible to construct the following Boolean equation:

- B-on and EBSCO Platform: *Critical care* AND *Delirium* AND *Nursing care Intensive* AND *Care Units* AND *Nursing Interventions*.

As research delineators, only articles in full text and studies carried out between 2019 and 2021 were selected (studies prior to 2019 were not included because there is a systematic review on the subject in that year).

The following were defined as inclusion criteria for this review: studies with nursing interventions for *delirium* in critically ill patients, encompassing only adult patients (over 18 years old); studies carried out in the context of intensive care; and written studies in English, Portuguese and Spanish.

Other studies were excluded for the following reasons: studies with pediatric patients; studies without relevance to nursing care; studies not available in full; studies related only to pharmacological interventions; studies unrelated to *delirium*; and studies not performed in the ICU context.

The evaluation of the methodological quality and the risk of bias of the included articles was carried out by two researchers, using the quality grid criteria of the Joanna Briggs Institute (JBI).

The entire study selection process was outlined according to the PRISMA[15] model (schematically represented in Figure 1↗).

RESULTS

Based on the application of the eligibility criteria, a total of 1,572 articles were grouped. For the analysis and extraction of relevant results, only 9 studies were selected, as evidenced in the PRISMA flowchart in Figure 1↗.

The selected articles were classified according to the level and quality of evidence according to the criteria proposed by the JBI (Chart 2↗).

The studies were examined in their entirety, applying the critical evaluation grid proposed by the JBI (The Joanna Briggs Institute Critical Appraisal Checklist for Analytical Cross-Sectional Studies) and outlined in Table 1↗.

Of the eligible studies, 2 were quasi-experimental studies[16,18], 4 were randomized controlled studies[17,19,21,22] and 3 were described observational[20] and analytical studies[23,24]. It was observed that most studies (55.6%) were published in 2020.

After analyzing the articles, relevant data for the systematic literature review were extracted. A summary table was built for data extraction with the authors, study objectives, participants, main results and study period (Chart 4↗).

DISCUSSION

It was found that there are many studies on critically ill patients with *delirium* in the context of intensive care, which is a difficult factor for summarizing the most relevant scientific evidence on the subject. Despite this, it was possible to find studies that allowed reflection on nursing interventions for the prevention and management of *delirium* in critically ill patients in the ICU.

Thus, this discussion of the results extracted from the analyzed articles was grouped into 9 categories: cognitive stimulation, sensory stimulation, *delirium* monitoring, pain control, sedation management, physical environment management, promotion of sleep quality, early mobilization and family involvement.

Cognitive stimulation

Contreras *et al*[16] determined the effectiveness of a multimodal intervention centered on two components: cognitive stimulation and family support. With regard to the cognitive stimulation intervention, the nurses had to carry out a set of interventions aimed at guiding the patient, managing communication with the patient and about their health status, encouraging the use of prostheses (eye and hearing) and the use of their personal objects (photographs, drawings, glasses, hearing aids, dental prostheses, religious objects). They demonstrated that the use of the various techniques explained above allowed a decrease in the incidence of *delirium* (only 0.6% of patients in the intervention group developed *delirium* instead of 20.1% of patients in the control group)[16].

In another study[21], in addition to the established mobility exercises, cognitive stimulation techniques were also applied, such as promoting communication and patient reorientation, pointing to promising results (lower incidence of *delirium* in the study patients).

The patient's reorientation and cognitive stimulation through communication management and the use of personal objects (prostheses, belongings and photographs) are autonomous interventions, easy to apply and with positive results, as observed in the studies described[16,21]. Thus, these findings are in line with the guidelines and interventions described in terms of promoting guidance for patients at risk of developing *delirium* and with *delirium* effectively[1,3,8,11,12,13].

Sensory stimulation

Sensory stimulation in critically ill patients is an overlooked aspect, but essential for their well-being, as this type of stimulation is often associated with cognitive stimulation. There are several authors[1,3,11,12,13] who reinforce the need to implement sensory interventions in critically ill patients for the prevention and management of *delirium*.

Momeni *et al*[17] carried out a study that consisted of foot massage performed either by nurses or by relatives of patients admitted to the ICU. They proved that the integration of massage in the care of the critically ill, even if only for 15 minutes, allowed to reduce the prevalence of *delirium* between 8 and 12% after a week of the implementation of the intervention.

In the study by Nydahl *et al*[21] also used therapeutic massage (on the feet and back) during the early mobilization of patients admitted to the ICU and reported that, in about 72% of the participants, a decrease in the incidence of *delirium* was observed.

Another study[16] revealed that the application of sensory stimulation techniques, such as the use of personal objects (such as ocular and hearing aids) have results, even if not very significant, on the incidence of *delirium*.

This confirms the importance of sensory stimulation in critically ill patients with *delirium* and the need to integrate massage and other stimulation techniques into nursing care in the context of intensive care.

Delirium monitoring

The monitoring of *delirium* in the ICU can be performed using several scales, however the most frequent is the CAM-ICU scale[5,8,9]. This scale is quick and easy to use (2 to 5 minutes), with good psychometric properties, good reliability and high sensitivity and specificity. Timely identification and frequent monitoring of *delirium* through the CAM-ICU scale allows the prevention and management of *delirium*[8,9].

In the study by Spiegelberg *et al*[23] concluded that the use of the CAM-ICU scale made it possible to properly identify patients with *delirium* and at an effective risk of developing *delirium*, making referral to the medical team and the implementation of non-pharmacological strategies easier. The final results of the study reveal the importance of the CAM-ICU scale for monitoring *delirium* and its applicability in clinical practice.

It appears, therefore, that it is important to assess the risk of *delirium* early, using validated and reliable scales. In addition, frequent monitoring by ICU nurses allows for timely recognition and proper management of *delirium*.

Pain control

Pain is considered a modifiable and precipitating risk factor for the development of *delirium*, and two aspects are essential, according to recent guidelines: pain monitoring and treatment/control[11,12,13].

There are multiple validated scales for assessing pain in the context of intensive care and a range of non-pharmacological interventions for pain relief, which are the basis for reducing *delirium* prevalence rates[11,12].

Larsen *et al*[24] validated the effectiveness of a set of interventions for reducing the duration of *delirium* in patients with traumatic brain injury (TBI). One of the interventions was related to pain monitoring using The Critical-Care Pain Observational Tool (CPOT) scale for patients with inability to communicate and Numerical Pain Scale (END) for patients able to classify the intensity of their pain.

Although there was no significant reduction in the duration of *delirium* in the study patients, it was possible to observe an increase in the prevalence of pain assessment through scales up to 90%, demonstrating a concern with pain in critically ill patients with *delirium*[24].

Rosa *et al*[20] adds in their study that flexible visits by family members can have a positive effect on pain control, as it allows timely recognition and treatment of pain.

The importance of pain assessment, treatment and control in critically ill patients with *delirium* is recognized, in light of the aforementioned studies and guidelines[8,11,12,13]. However, studies are little focused on the pain/*delirium* relationship, which suggests the need for further studies on the impact of interventions to control pain in *delirium*.

Sedation management

Sedation is also a modifiable risk factor for the development of *delirium*. Clinical guidelines point to the need to avoid deep sedation and the use of benzodiazepines, preferring other therapies with less risk of *delirium* (such as propofol and dexmedetomidine)[8,11,12].

The ABCDEF bundles are a set of interventions capable of reducing the prevalence and incidence rates of *delirium*, being associated with a decrease in 7-day mortality. With regard to the letter B (Both spontaneous awakening and spontaneous breathing trials), it reflects the need for daily interruption of sedation to improve pain assessment and weaning from the ventilator. Other guidelines reinforce the need to monitor the level of sedation using the RASS scale or the Bispectral Index (BIS) and maintain a light level of sedation (RASS between 0 and -2)[11,12].

In the study by Larsen *et al*[24], another of the implemented interventions focused on sedation management, where they used the RASS scale to titrate sedative therapy in patients hospitalized with TBI. Although the introduction of the RASS scale in the study did not lead to a reduction in *delirium* time, it was possible to integrate its use into clinical practice and reduce patient sedation.

Spiegelberg *et al*[23] carried out an improvement project with the aim of clarifying nurses about the risk factors for *delirium* and the respective consequences. They determined that the use of risk medication (opioid analgesics and benzodiazepines) increased the risk of developing *delirium* and the number of days of hospitalization (up to 8.15 days). After this analysis, they implemented an intervention project with educational sessions for nurses. The authors observed that after the implementation of the improvement project, it was possible to verify a decrease in the use of risk medication (patients with high risk of developing *delirium* from 4.73% to 2.99%; and patients with low risk of developing *delirium* from 7.37% to 3.92%).

Thus, it is reflected that sedation management should be an important strategy to integrate for the prevention and management of *delirium*, as evidenced in studies[23,24] and in international guidelines[8,11,12].

Management of the physical environment

The studies included[16,17,18,19,20,21,22,23,24] in this review did not include the management of the physical environment in isolation, on the contrary, it appears that care was always taken to integrate aspects related to this strategy in the different interventions of the studies.

Larsen *et al*[24] refer that one of the strategies to reduce the development of *delirium* focused on the management and optimization of the physical environment around critically ill patients. It was found in the study by Contreras *et al*[16] that the placement of personal objects, magazines, letters and photographs had an impact on the reduction of the incidence rate of *delirium*.

In another study[19], several strategies were explained to minimize the occurrence of *delirium*, such as reducing luminosity at night, increasing visibility and sunlight during the day, exposing photos and personal objects during nursing care, facilitating the integration of these practices in the daily care of critically ill patients, also benefiting them.

There is no evidence of the isolated effectiveness of these interventions on *delirium*, however there are several authors who support the need to include the management of the environment around the patient (remove unnecessary objects and medical devices) and place belongings close to the patient[11,12,13].

All interventions described above are in line with the strategies proposed in recent literature[11,12,13].

Sleep quality promotion

Arttawejkul *et al*[22] studied the effect of the use of ear plugs and face masks on sleep quality, also with the aim of assessing the prevalence of *delirium*. Through polysomnography, they assessed the quality of sleep and using the CAM-ICU scale, they assessed the prevalence of *delirium*[22].

They demonstrated that the reduction of light intensity with face masks and the reduction of sound intensity through earplugs brought benefits in sleep quality. Furthermore, the prevalence of *delirium* had a significant reduction between the control group (11.1%) and the intervention group (12.5%)[22].

In the study by Larsen *et al*[24] strategies were also used to improve sleep quality, such as performing noisy procedures during the day. The same study revealed that there was greater adherence to this practice, however there was no impact on the incidence of *delirium*[24].

In addition, Oliveira *et al*[19] demonstrated that reducing light at night, reducing noise, and adjusting the time of procedures and therapy are alternative strategies to minimize the occurrence of *delirium*.

The literature points out that there are multiple factors that contribute to sleep interruption, such as: noise, procedures performed at night, uncomfortable beds, light intensity, surrounding environment, medication and IMV. The promotion of the sleep-wake cycle is essential for the prevention of *delirium*, which is why measures are recommended for this purpose[12,13].

In view of the above, it is important to emphasize the need to integrate this knowledge into the care of critically ill patients with a view to preventing and managing *delirium* in critically ill patients in the ICU. In addition, it is essential to carry out studies on sleep promotion strategies and their relationship with the prevalence and incidence of *delirium*.

Early mobilization

Nydahl *et al*[21] carried out a study with the aim of determining the viability of an early mobilization program during the night period (between 9:00 pm and 11:00 pm). In addition to mobilization, complementary strategies were also reconciled, such as communication with the patient, combing, performing oral hygiene, massages and the use of new technologies with a view to sensory stimulation of the patient[21].

The aforementioned authors[21] concluded that there were differences in the duration of *delirium* during the study. The incidence of *delirium* was reduced in the intervention group (26.9%) compared to the control group (50%).

In the study by Larsen *et al*[24] they also included an early mobility protocol, where stable patients were encouraged to reach the highest level of mobility possible, so the implementation of this intervention did not reveal a significant change in the incidence of *delirium*[24].

We can conclude that the findings of the studies are in line with the literature[8,12,13]. Other authors[11] reinforce that it is necessary to promote the mobility of critically ill patients, from getting up to walking, even if they are still ventilated or connected to other medical devices. There are several studies that demonstrate the effectiveness of early mobility in reducing the incidence of *delirium*[12,13].

Family involvement

Krewulak *et al*[18] evaluated the effectiveness of The ICU Family Education on *Delirium* (iFARM-ED) intervention. The intervention consisted of training family members in the recognition and control of *delirium*, using non-pharmacological strategies (watching illustrative videos and then solving clinical cases). The study allowed the development of family members' knowledge about *delirium*, with retention of information by family members in the two weeks after the intervention. About 78% of the family members in the study were able to recognize and classify the different subtypes of *delirium*, and 92% of the family members were able to identify the symptoms of *delirium*[18].

Referring again to the study by Contreras *et al*[16], the other part of the study intervention focused on family support. During visiting hours and for a minimum period of 5 minutes, relatives of hospitalized patients could stay as long as they wanted, being encouraged to encourage patient orientation, integrating education sessions on *delirium* and its complications. The study revealed that this intervention reduced the incidence of *delirium*[16].

The study by Rosa *et al*[20] aimed to determine whether flexible visiting hours reduced the incidence of *delirium*. A comparison was made between flexible visiting hours (allowing up to 2 family members to visit for 12 hours a day) and restricted visiting hours (allowing visits between 1.5 hours and 4.5 hours a day).

There was not a very significant difference in the incidence of *delirium* between flexible hours (18.9%) and restricted hours (20.1%) visits. Despite this, the authors demonstrated that the flexible visiting hours allowed for a greater presence and involvement of family members in non-pharmacological strategies for the prevention and management of *delirium*, such as reorientation, early mobilization and pain control (but this intervention was not sufficient to prevent fully the development of *delirium*). They refute that the data may have been mitigated by the fact that the duration of the flexible visits were short, which could prevent greater involvement in the interventions[20].

It should be specified that another study[19] reinforces the importance of the family for reorienting the patient and the need for flexible visiting hours to reduce the incidence of *delirium* in critically ill patients.

Several authors call for the need for family support during ICU stay[8,11,12,13]. Although the results found are not very significant, it should be noted that the presence of family members allows for cognitive stimulation (through reorientation, memory stimulation and communication) and sensory stimulation (massage), thus making it essential to create flexible and extended hours in the ICU[11,13].

Thus, and after reviewing the analyzed articles, we assume that there are studies with some significant results for the decrease in the prevalence and incidence of *delirium* in the context of intensive care. In view of the extraction of their results, we concluded that it is crucial to integrate several categories of interventions in the care of these patients, instead of just implementing a simple and single intervention, as pointed out in the most recent guidelines[8], that is, using a multimodal approach.

CONCLUSION

After the analysis, discussion and interconnection of the selected studies with other relevant authors on the topic of critically ill patients with *delirium* in the ICU, we can draw some conclusions for this review.

Despite the existence of many studies that prove the effectiveness of certain strategies for reducing the prevalence and incidence of *delirium*, the results presented are not very significant and most of the studies integrated an isolated intervention instead of a multimodal strategy, as described in recent international guidelines.

Pain control, sedation management and sleep promotion are a major pillar for the prevention and management of *delirium*, as demonstrated in the most recent guidelines. However, in the analyzed studies, these interventions were not very evident, not very conclusive and not well integrated in the studies, which is why it is proposed to carry out studies that more effectively integrate these autonomous and easy-to-implement interventions.

The management of the physical environment, communication and reorientation of the critically ill patient were often used in an integrated, vague and unclear way as to how it was actually applied, not making it easier to distinguish them in the results.

The promotion of early mobility and family involvement were the interventions with the most evident and promising results in terms of reducing the prevalence and incidence of *delirium*.

Despite this, the results derived from the analyzed studies can be an asset to clinical practice, improving the provision of nursing care to critically ill patients and the development of individualized care plans centered on the needs of critically ill patients with *delirium*.

We infer that more primary studies on the subject are needed, given the scarcity of effective results, which was an important barrier to carrying out this systematic review of the literature. Another limitation for this review stands out in the fact that studies prior to the

year 2019 were excluded, as it restricted the sample, omitting possible studies that could have contributed to the enrichment of this review.

It is crucial to promote the education of nurses in the ICU and family members about *delirium* (risk factors, subtypes, consequences) and the main interventions for the prevention and management of *delirium* in critically ill patients in this context, with a view to facilitating care planning and preparation for discharge.

We conclude that the development of this review allowed identifying the main areas of nursing intervention for the prevention and management of *delirium* in critically ill patients in the ICU, making it possible to respond to the objective of this review. It is believed that the dissemination of the main interventions described in this review could be fundamental to encourage the adoption of a new approach to the critically ill patient with *delirium*.

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MM: Desenho e coordenação do estudo, recolha de dados, revisão e discussão dos resultados.
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Chart 1 – PICOD Chart.↖

Acronym	Meaning		Components of the review question under study
P	Population (Participants/ Structures)	*Who was studied?*	Critical patient
I	Intervention (Relation of care/ Process)	*What was done?*	Nursing interventions for the prevention and management of *delirium*
C	Context	*Context*	Intensive Care Unit
O	Results (intermediates and finals)	*What were the results or effects?*	Identification of the nursing interventions for the prevention and management of *delirium*
D	Study design	*How is it?*	Qualitative and quantitative primary studies

Chart 2 – Summary of the level and quality of evidence in the articles (according to JBI criteria).↖

Researches	References	Evidence level according to JBI
Study 1 (E1)	Contreras *et al*[16]	Quasi-experimental study (II-C)
Study 2 (E2)	Momeni *et al*[17]	Randomized controlled trial (I-C)
Study 3 (E3)	Krewulak *et al*[18]	Quasi-experimental study (II-C)
Study 4 (E4)	Oliveira *et al*[19]	Randomized controlled trial (I-C)
Study 5 (E5)	Rosa *et al*[20]	Descriptive observational study (III-E)
Study 6 (E6)	Nydahl *et al*[21]	Randomized controlled trial (I-C)
Study 7 (E7)	Arttawejkul *et al*[22]	Randomized controlled trial (I-C)
Study 8 (E8)	Spiegelberg *et al*[23]	Analytical observational study (III-C)
Study 9 (E9)	Larsen *et al*[24]	Analytical observational study (III-C)

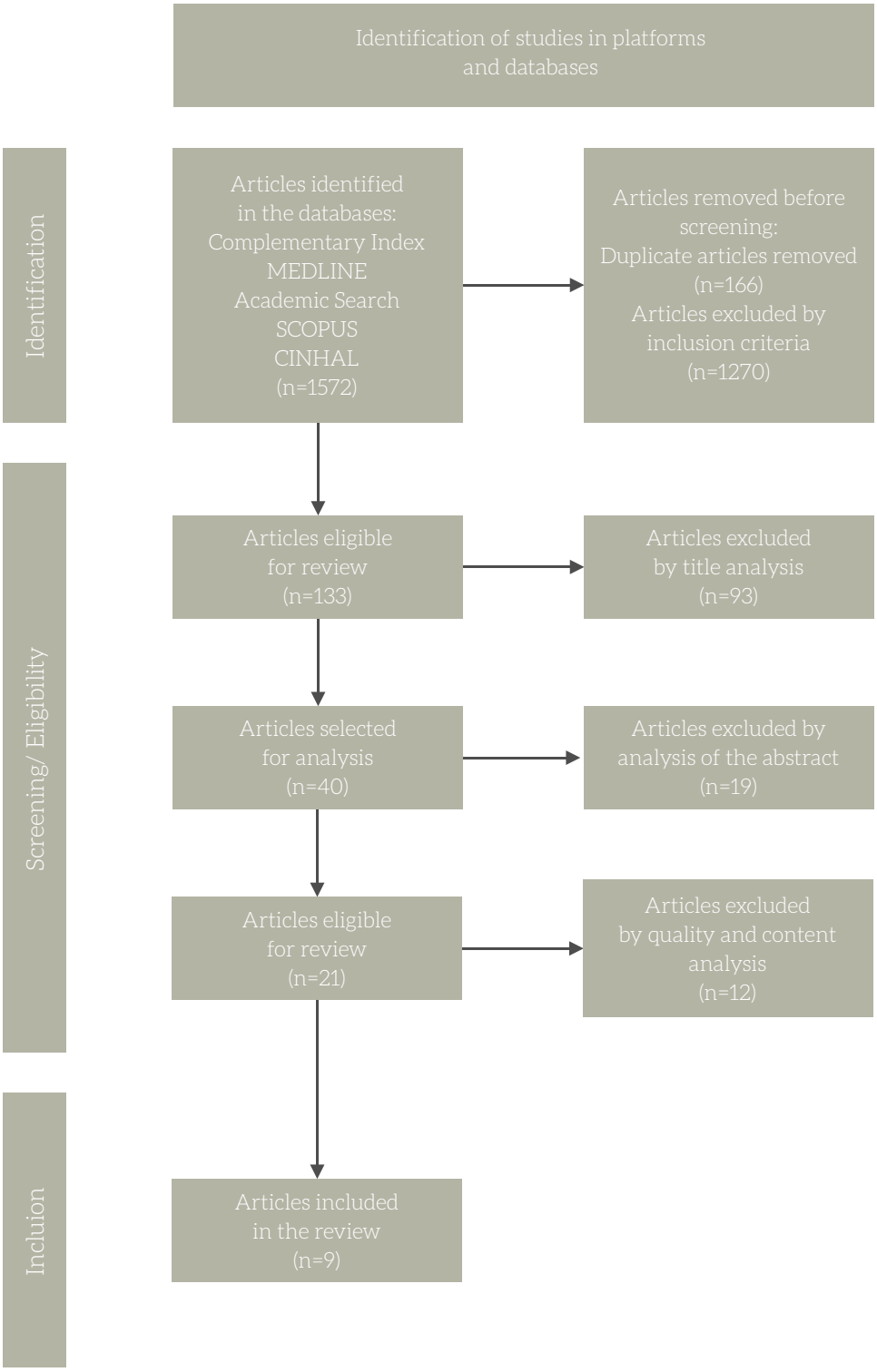


Figure 1 – Scheme of the study selection process according to the PRISMA diagram[15].

Table 1 – Results of the critical evaluation according to the JBI checklist.

Studies	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Results
E1[16]	Y	Y	Y	Y	Y	Y	Y	Y	Y	–	–	–	–	100%
E2[17]	Y	Y	Y	Y	U	U	Y	Y	Y	Y	Y	Y	Y	84,6%
E3[18]	Y	Y	Y	N	Y	Y	Y	Y	Y	–	–	–	–	90%
E4[19]	Y	Y	Y	Y	N	N	N	Y	Y	Y	–	–	–	70%
E5[20]	Y	Y	Y	Y	U	U	Y	Y	Y	Y	Y	Y	Y	84,6%
E6[21]	Y	Y	Y	Y	N	U	Y	Y	Y	Y	Y	Y	Y	84,6%
E7[22]	Y	Y	Y	Y	U	U	Y	Y	Y	Y	Y	Y	Y	84,6%
E8[23]	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	Y	–	–	90,9%
E9[24]	Y	Y	Y	Y	U	Y	Y	Y	Y	U	Y	–	–	81,8%

Subtitle: Y – Yes; N – No; U – Unclear; NA – Not Applied.

Chart 3 – Summary table of the extraction of data from the quantitative and qualitative evidence of the selected studies.

Study	Duration	Study aim(s)	Participants	Results
E1[16]	October 2015 – October 2016.	To determine the effectiveness of a nursing intervention for the prevention of *delirium* in critically ill patients.	291 patients admitted to the ICU.	• Application of nursing interventions that focused on cognitive stimulation and family support, in periods of 15 minutes a day; • Implementation of interventions decreased the likelihood of developing delirium. There was an impact on the incidence of *delirium* in participants (20.1% to 0.6%).
E2[17]	2017.	To determine the effect of foot massage, performed by nurses or family members, on the level of consciousness and *delirium* in patients admitted to the ICU.	75 patients admitted to the ICU.	• It revealed an insignificant decrease in the prevalence of *delirium* (decrease of 8% to 12% in one week after the intervention); • There was no significant difference between the three massage intervention groups (performed by nurses, by the family and the control group).
E3[18]	January 2019 – October 2019.	To evaluate the effectiveness of the intervention – The ICU Family Education on *Delirium* (iFAM-ED).	63 relatives of patients admitted to the ICU.	• Implementation of the intervention The ICU Family Education on Delirium (iFAM-ED) which prepares family members to detect, prevent and control *delirium* in the ICU; • The level of knowledge of family members about *delirium* (risk factors and interventions) improved significantly after the implementation of the iFAM-ED intervention.
E4[19]	September 2018 – October 2018.	To describe the strategies used by nurses to minimize the occurrence of *delirium* in patients admitted to the ICU.	16 nurses.	• Valuing non-pharmacological strategies to minimize the occurrence of *delirium* (monitoring of *delirium* in the ICU, family support, safe environment, reorientation, early mobilization and sleep hygiene); use of physical restraint in extreme cases of *delirium*. • There was a lack of knowledge about instruments for diagnosing *delirium*.
E5[20]	April 2017 – July 2018.	To determine whether a flexible ICU visiting policy reduces the incidence of *delirium*.	36 ICUs (1,685 patients, 1,060 family members, 737 health professionals).	• There was no significant difference in the incidence rate of *delirium* in patients with flexible visits and restricted visits (*delirium* occurred in 18.9% and 20.1% respectively); • Patients with flexible visits showed greater family involvement in *delirium* prevention strategies (reorientation, mobilization and pain control).

Chart 3 – Summary table of the extraction of data from the quantitative and qualitative evidence of the selected studies.

Study	Duration	Study aim(s)	Participants	Results
E6[21]	June 2019 – July 2019 (2 semanas).	To investigate the feasibility of mobilization at night to prevent and treat *delirium* in ICU patients.	46 patients admitted to the ICU (4 different ICUs).	• They reported significant differences in the duration of delirium in the patients included in the study; • The incidence of *delirium* was lower in the intervention group (26.9%).
E7[22]	June 2017 – May 2018.	To study the effect of using ear plugs and face masks on sleep quality and *delirium* in the ICU.	17 patients admitted to the ICU.	• Reducing the intensity of light and sound through the use of ear plugs and face masks has a benefit in the quality of sleep (decreased index/level of arousal); • The measures had implications for the prevalence of *delirium* (reduced from 12.5% to 11.1%).
E8[23]	Fase 1: January 2017 – September 2017. Fase 2: October 2017 – March 2018.	To educate nursing staff about risk factors for delirium and the consequences of *delirium*.	Phase 1: 288 patients admitted to the ICU. Phase 2: 199 patients admitted to the ICU.	• The implementation of a continuous improvement project made it possible to increase the application of the RASS scale and the CAM-ICU scale in clinical practice and in computer records (adherence rate of 83%); • Continuous training allowed a significant decrease in the use of high-risk medication (benzodiazepines and opioid medication) in patients with *delirium*.
E9[24]	August 2015 – June 2016.	To validate the application of interventions (sedation, sleep, pain and mobilization) to reduce the duration of *delirium* in patients with acute brain injury (traumatic brain injury).	89 patients admitted to the ICU for neurocritical.	• Invasive procedures began to be performed during the day and the prevalence of pain assessment increased (90%); • Regarding mobilization, before the study there was already the practice of carrying out early mobilization, so the implementation of the guidelines did not reveal a very significant change (87% to 98%); • Prevalence and duration of delirium did not change during the study. There was no difference in the length of stay in the ICU, the number of days without *delirium* or coma, and the number of days requiring sedation.