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EFFECTIVE COMMUNICATION METHODS APPLIED TO THE VENTILATED PERSON IN AN INTENSIVE CARE UNIT: A SYSTEMATIC REVIEW OF THE LITERATURE

MÉTODOS DE COMUNICAÇÃO EFICAZES APLICADOS À PESSOA VENTILADA EM UNIDADE DE CUIDADOS INTENSIVOS: REVISÃO SISTEMÁTICA DA LITERATURA

MÉTODOS DE COMUNICACIÓN EFICACES APLICADOS A LA PERSONA VENTILADA EN LA UNIDAD DE CUIDADOS INTENSIVOS: UNA REVISIÓN SISTEMÁTICA DE LA LITERATURA

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ABSTRACT

Introduction: The objective was to identify the effective communication methods in the relationship between nurse and patients in invasive mechanical ventilation, in an intensive care unit.

Methodology: The methodology used was based on a systematic literature review, which included the development of the research question, the search in scientific databases, the analysis and interpretation of the selected articles, and the synthesis and presentation of the results obtained. The PI[C]OD methodology was used to select articles and formulate the research question.

Results: After applying the methodology, a final set of 7 studies was obtained, which emphasized effective communication through the use of available technological resources in nursing intervention, so as to reduce the levels of anxiety and stress experienced by patients during the health-illness transition phase. Alternative and augmentative communication is composed of several methods that present high rates of success and effectiveness, although they depend on the control of the existing variables during their application.

Conclusion: Based on scientific evidence, non-tech, low-tech and high-tech methods are the most used in the communication between nurses and patients undergoing invasive mechanical ventilation. Their effectiveness depends on the prior and individualized assessment of the patient, on the continuous training of nurses and support from supervisors, promoting quality and safety of care.

Keywords: Communication; Communication Barriers; Critical Care Nursing; Intensive Care Units; Mechanical Ventilation; Nursing Care.

RESUMO

Introdução: O objetivo foi identificar os métodos de comunicação eficazes na relação entre o enfermeiro e a pessoa submetida a ventilação mecânica invasiva, internada em unidade de cuidados intensivos.

Metodologia: A metodologia utilizada alicerçou-se numa revisão sistemática da literatura, que incluiu o desenvolvimento da pergunta de investigação, a pesquisa em bases de dados científicos, a análise e a interpretação dos artigos selecionados bem como a síntese e apresentação dos resultados obtidos. Para a seleção de artigos e formulação da pergunta de investigação utilizou-se a metodologia PI[C]OD.

Resultados: Aplicada a metodologia, obteve-se um conjunto final de 7 estudos, os quais dão enfâse à comunicação eficaz através da utilização dos recursos tecnológicos disponíveis na intervenção de enfermagem, de modo a diminuir os níveis de ansiedade e *stress* vivenciados pelo doente na fase de transição saúde-doença. A comunicação alternativa e a aumentativa são compostas por vários métodos que apresentam taxas elevadas de sucesso e de eficácia, embora dependam do controlo das variáveis existentes, aquando da sua aplicação.

Conclusão: Com base na evidência científica os métodos sem auxílio tecnológico, de baixo nível tecnológico e de elevado nível tecnológico, são os mais utilizados na comunicação entre o enfermeiro e a pessoa submetida a ventilação mecânica invasiva. A sua eficácia depende da avaliação prévia e individualizada do doente, da formação contínua dos enfermeiros e apoio das chefias, promovendo qualidade e segurança dos cuidados.

Palavras-chave: Barreiras de Comunicação; Comunicação; Cuidados de Enfermagem; Enfermagem de Cuidados Críticos; Unidades de Terapia Intensiva; Ventiladores Mecânicos.

RESUMEN

Introducción: El objetivo fue identificar métodos de comunicación eficaces en la relación entre la enfermera y la persona sometida a ventilación mecánica invasiva, ingresada en una unidad de cuidados intensivos.

Metodología: La metodología utilizada ha sido basada en una revisión sistemática de la literatura, que incluyó la elaboración de la pregunta de investigación, la búsqueda en bases de datos científicas, el análisis e interpretación de los artículos seleccionados, y la síntesis y presentación de los resultados obtenidos. Para la selección de artículos y la formulación de la pregunta de investigación, se utilizó la metodología PI[C]OD.

Resultados: Tras la aplicación de la metodología, se obtuvo un conjunto final de 7 estudios, en los que se hizo hincapié en la comunicación efectiva a través del uso de los recursos tecnológicos disponibles en la intervención de enfermería, con el fin de reducir los niveles de ansiedad y estrés experimentados por el paciente en la fase de transición salud--enfermedad. La comunicación alternativa y aumentativa se compone de varios métodos con altos índices de éxito y eficacia, aunque dependen del control de variables durante su aplicación.

Conclusión: Basándonos en la evidencia científica, los métodos no tecnológicos, los de baja tecnología y alta tecnología son los más utilizados en la comunicación entre el personal de enfermería y los pacientes sometidos a ventilación mecánica invasiva. Su eficacia depende de la evaluación previa e individualizada del paciente, la formación continua de

las enfermeras y el apoyo de los jerárquicos, promoviendo la calidad y la seguridad de los cuidados.

Descriptores: Barreras de Comunicación; Comunicación; Cuidados de Enfermería; Enfermería de Cuidados Críticos; Unidades de Cuidados Intensivos; Ventiladores Mecánicos.

INTRODUCTION

In Europe, about 990,000 to 1,500,000 patients per year are ventilated in intensive care units for critical illness[1]. Intensive care medicine focuses on the prevention, diagnosis and treatment of potentially reversible acute disease, with a focus on impending or established failure of one or more vital functions[1]. In this sense, critically ill patients are subjected to numerous invasive techniques, often invasive ventilation associated with sedation, in a depersonalized and highly technological environment[2].

The benefit of invasive mechanical ventilation (IMV) is to protect the patient's lungs by providing ventilation and oxygenation until the underlying causes are eliminated. However, this technique causes inability to communicate verbally due to endotracheal intubation or tracheostomy, which causes loss of voice for a certain period of time[3,4].

In clinical nursing practice, communication is an essential element, to the extent that it is through the nurse-patient relationship that one can deeply understand the physical and emotional needs inherent to the person's health status[5]. To this end, a contact of respect and empathy is established with the purpose of promoting an intense and effective relational work that does not involve the dehumanization and depersonalization of care[5].

It is expected that the practice of IMV will be increasingly frequent in conscious patients, with lighter sedation having benefits in reducing ventilation time, as well as in reducing complications[4]. The prevalence of mechanically ventilated patients who are submitted to light sedation protocols allows patients to become more awake and interactive, which promotes new challenges for nurses regarding the development of appropriate communication skills for a humanized approach to care[2,6].

Several studies show that conscious ventilated patients report as one of their worst experiences the negative feelings of despair, irritation, anger and stress for not being understood and unable to pronounce a word and/or express a basic need, which may lead to anxiety and depression after discharge[7-9]. Nurses, due to their greater proximity during care provision, are experts in obtaining patient-centered solutions regarding the optimization of communication during mechanical ventilation[3].

Phaneuf (2005), praises the time nurses spend with the patient, mentioning that, in comparison with other health professionals, nurses are present 24 hours a day and 7 days a week at the patient's bedside, being the vehicle for all the intervention and involvement in alleviating their suffering[5].

Intensive care nursing benefits from nurses specialized in critical care, since the descriptive statements mention that a therapeutic relationship with the person/family is essential to manage interpersonal communication in a highly complex health situation. The specialist nurse in this area is endowed with advanced technical-scientific communication skills capable of contributing to breaking down communication barriers and adapting them[10].

The identification and application of effective methods of communication with the ventilated patient can develop positive feelings for the patient and family/caregiver, in the sense that it benefits the ability to express and control pain and increases the level of safety, motivation and satisfaction[9]. These advantages also apply to the nursing team, resulting in an increase in the quality of care provided to critically ill patients ventilated at Intensive Care Units (ICUs)[9].

Objective

To identify the contribution of the most effective communication methods in the relationship between nurses and patients undergoing IMV admitted to an ICU.

METHODS

Ethical aspects

We did not request the opinion of the Ethics Committee because this was a secondary study. In formulating the problem, we were concerned with the principles of clarity, objectivity and accuracy, so that the results could represent an added value for nursing care regarding the effective communication methods applied to the patient ventilated in an intensive care unit. The analysis of data from the selected studies was developed in line with the principle of respect for the results obtained in these studies and by these researchers. The authors were referenced according to the standards of good academic and scientific practices.

Type of Study

Nurses' clinical practice is always performed based on the most current scientific evidence and it is this aspect that translates Nursing care into quality care. This evidence-based practice encompasses a whole process of collection, interpretation, evaluation and implementation of clinical data that are important for the professionals' decision-making[11].

This study is a systematic literature review based on the need to implement quality nursing care according to the most current scientific evidence. It includes the following steps: i) identification of the research question; ii) definition of criteria for inclusion and exclusion of studies; iii) selection of studies according to the defined criteria; iv) analysis of the selected articles; v) presentation and discussion of results; and vi) synthesis of the acquired knowledge.

Methodological procedures

Based on the previously outlined objective, which served as a common thread for the systematic literature review, a research question was formulated using the PI[C]OD methodology, with (P) the target population, (I) the type of intervention, the comparisons, (O) the result – outcomes, and (D) the type of study – design. Based on this structure, the following guiding question was formulated: What are the gains of intervention (Outcomes) of nursing care resulting from effective communication methods (Intervention) in adult patients undergoing IMV in an ICU (Population)?

Table 1↗ was developed which depicts how the research question was defined according to the PICO mnemonic.

After formulating the research question, we conducted electronic searches in Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH), selecting the relevant descriptors to be used in this review: "Intensive care units", "Mechanical ventilation", "Critical care nursing", "Nursing care", "Communication, Communication barriers".

Once the descriptors were defined, the Boolean operators "OR" and "AND" were used, combined with the following search formula: ("Intensive care units" OR "Mechanical ventilation") AND ("Critical care nursing" OR "Nursing care") AND ("Communication OR Communication barriers"). These terms were combined in two scientific databases, namely the Biblioteca do Conhecimento On-line (B-On) and Elton Bryson Stephens Company (EBSCOhost) in August 2021, with the purpose of giving credibility to the research conducted.

In order to limit the search, the following inclusion criteria presented in Table 2↗ were used to select the studies and publications to be used in this review. According to JBI (2020)[12] two categories are considered: inclusion criteria based on the study characteristics and inclusion criteria based on the publication characteristics.

After using the Booleans mentioned above, 1855 articles were obtained in the scientific databases B-On and 2681 in EBSCOhost. Subsequently, the inclusion criteria defined according to JBI[12] were applied, selected by the characteristics of the publication and study, and it was possible to obtain 537 articles in the B-On platform and 170 articles in EBSCOhost.

A total of 520 articles were removed from the B-On database and 167 from EBSCOhost after the presence of duplicates and the reading of titles and abstracts. Then, the articles included were read in full, and 9 articles were selected from the B-On platform and 2 articles from EBSCOhost. After checking the relevance to the research question, we concluded that 5 articles from B-On and 1 article from EBSCOhost did not meet the objectives.

RESULTS

At the end of the article selection process in each scientific database, a total of 7 articles were included in this review, as shown in the flow diagrams (adapted from PRISMA 2020 Statement)[13] (Figs. 1↗ and 2↗).

In order to ensure the quality of the review, the articles were assessed by two independent reviewers, verifying the level of evidence according to JBI[14] and the methodological quality was assessed according to Bugalho and Carneiro[15]. These articles were found to have moderate to high methodological quality, so the 7 selected articles were kept. The analysis of the selected articles is shown in Table 3↗.

Therefore, we extracted from the articles the relevant information on the participants of the studies, place and time where they were conducted, study design, objective(s), interventions applied, results and conclusions. The individualized summaries of the extracted data are shown in Table 4↗.

DISCUSSION

Difficulties in the communication and relationship between nurses and patients undergoing IMV are identified and cause negative feelings, both in health professionals and patients.

Nurses, most of the time, feel frustration for not being able to establish verbal communication with the patient, being unaware of methods to facilitate it, which may induce them to ignore and neglect the patients, leading to their isolation[18,20].

Therefore, people undergoing IMV wish to know more about their health status and recovery, as well as express physical needs (eating, drinking, bowel and bladder elimination, oral hygiene, positioning, and verbalizing pain). When they are not understood, they experience feelings of fear, anxiety, and frustration, and it should be noted that most nurse-patient interactions are brief and focused on information about procedures[20,22].

In this sense, all authors of the selected studies emphasize the importance of facilitating communication and, thus, reducing anxiety levels. Dithole *et al* (2016) emphasizes the implementation of assisted communication strategies in the ICU as a solution to prevent emotional stress between nurse-patient undergoing IMV[16].

The AAC is the type of communication strategy, common among the authors of the studies, described as facilitating the relationship between the nurse and the patient under IMV. There are several methods that nurses can use during the intervention regarding the communication with patients under IMV: AAC systems without technological aid in which body language is used, such as, for example, handshakes, lip mimicry, facial expressions, nodding or pointing objects; low-tech AAC systems (do not require electronic programming), such as, for example, letter plates, symbols, alphabet, picture books, and paper/pencil; and, finally, high-tech AAC systems (allow easy storage and retrieval of the electronic message) referenced as voice-generating devices and electronic equipment such as tablet or computer using facilitative communication applications[16,17,19,20].

There are several perspectives on the effectiveness of each method, and some studies only refer to physical communication, highlighting its importance due to the nurse's attention to facial expressions and body language in the person's pain perception, and the high success rates when using gestures and "yes or no" questions[16]. The authors Momennasab *et al* (2019) reported that nurses only applied body language communication methods, since 57% used hand gestures and glances, 10.86% nods, and a small percentage used pen and paper-assisted communication (0.57%). Communication between nurses and intubated patients revealed low levels of satisfaction for both participants[22].

In contrast, studies using low- and high-tech AAC show surprise at the possibility of providing motivating and high-quality care, mentioning that tablet applications, auditory assistive board, letter board, images, and illustrated pain scale are the most effective means of communication[18]. They describe real situations such as, for example, the ICU nurses having used the alphabet board to communicate with the patients, which allowed them to express their concerns about their health status and the health professionals to effectively respond to what was intended[18].

It is noteworthy that advantages were demonstrated in the use of the tablet with communication applications: feasibility (94%), as patients learned to use it in less than 10 minutes; increased ability of patients to communicate with the team (80%); and clinical importance of communication with the patient (95%)[21]. The person's satisfaction in using the tablet as a communication tool was cross- cutting in another study which mentions the example: in an emergent care situation, the tablet was left with the intubated patient and, after the health professional returned to him/her, he/she had written "This is very smart"[18,21].

Other scientific evidence states that the application of low-tech AAC provides improvements in the communication process, greater ease of use, lower associated costs and greater accessibility[19]. It also mentions that high-tech AAC show a significant decrease in communication difficulties and increase patient satisfaction through its continuous use[19]. However, it requires more education and training, presents more technical problems and has a greater associated monetary investment[19].

In the application of communication methods, variables that limit the success of the relationship between the health professional and the person undergoing IMV were identified. It is described that health professionals, including nurses, show "resistance" to change, relying only on their professional experience to understand the messages that patients want to convey[18,22]. According to health professionals, this is due to time saving, prioritizing the communicational procedures that they usually use, such as body language[18,22].

Negative attitudes of health professionals towards the application of AAC methods are demonstrated due to the high workload, complex environmental conditions and complicated clinical situation of patients[19,20]. In this line, it should be noted that the devices are often out of reach of the patient, the equipment does not work properly and health professionals take time to meet the patient's needs, being required training and education for effective use[19,20]. In addition, support from superiors and resource management is necessary to ensure the availability and permanence of AAC devices in the unit, so that their application becomes a common practice[17].

For communication tools to be effective, we demonstrated the importance of knowing and adjusting the existing resources to the patient's capacity so that messages are effective and the need for nurses to change their attitudes regarding the adoption of skills to improve patient communication. To this end, it is essential to provide continuous training in the dissemination of knowledge, as well as develop institutional protocols to improve the communication between nurses and patients undergoing IMV[17,22].

Limitations of the study

The limitations of this systematic literature review are related to the heterogeneity of the selected studies and the fact that only articles in Portuguese, English and Spanish were considered, which may have resulted in the loss of important international studies in other languages.

CONCLUSION

This systematic literature review provided scientific evidence on the communication facilitators used in the effective relationship between nurses and patients unable to communicate verbally, which may contribute to improve the quality of nursing care and patient safety in ICUs.

It was found that AAC is the communication strategy validated by most of the authors of the studies, and that AAC systems without technological aid, low- tech systems, and high--tech systems are considered effective communication methods. It was understood that the application of both can promote important breaks in the communication barriers between nurses and patients undergoing IMV, thus increasing the level of satisfaction of those involved.

It is important to note that increased effectiveness in communication proportionally reduces the negative feelings experienced by both nurses and patients.

Based on the scientific evidence of the studies analyzed, it is also possible to conclude that, in addition to identifying the methods that facilitate communication, it is important to adapt the available methods through a prior and individualized assessment of the patient, to increase the effectiveness of these communication tools.

The challenges presented are essentially related to the empowerment of nurses in the development of communication skills, through continuous training and practice of the existing methods of facilitated communication, and the development of strategies that

integrate senior managers in the provision of materials and implementation of institutional protocols that ensure the success of effective communication between nurses and patients undergoing IMV.

Further comparative studies on this topic could be developed to assess the applicability of the most effective facilitated communication tools and, thus, contribute to improving the safety and quality of nursing care.

Considering all these aspects, the systematic literature review was able to answer both the objective and the PICO question initially proposed.

Future studies should be conducted through an empirical approach that allows verifying the effect of the applicability of facilitated communication instruments. This approach of experimental character, involving the triad of control, randomization, and manipulation of the independent variable is a guarantee of the methodological quality of a study.

Authors' contributions

CC: Design and coordination of the study, collection, storage and analysis of data, review and discussion of results.

AF: Study design, review and discussion of results.

IB: Study design, review and discussion of results.

All authors read and agreed with the published version of the manuscript.

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Table 1 – Formulation of the research question according to the PICO mnemonic.

P	Population	Conscious adult person submitted to IMV in ICU
I	Intervention	Effective communication methods
C	Comparisons	–
O	Result/Outcomes	Intervention gains

Table 2 – Inclusion criteria[12].

Based on the characteristics of the study	
Type of participants and environments	– Conscious persons, aged ≥ 18 years;
	– Submitted to IMV;
	– Admitted to the ICU.
Type of interventions	– Nursing intervention in the face of impaired communication.
Type of results	– Identifies and verifies the effectiveness of the communication tools applied by nurses to the person undergoing IMV;
	– Promotes optimization strategies in the provision of quality care and safety to the person with impaired communication in the ICU.
Type of studies	– Quantitative studies, qualitative studies and articles;
	– Full texts and peer review;
	– Available in the scientific databases B-On and EBSCOhost.
Based on the characteristics of the publication	
Date of publication	– January 1, 2016 to December 31, 2020.
Language of publication	– Portuguese, Spanish and English.
Type of publication	– Published or not published in commercial scientific databases.

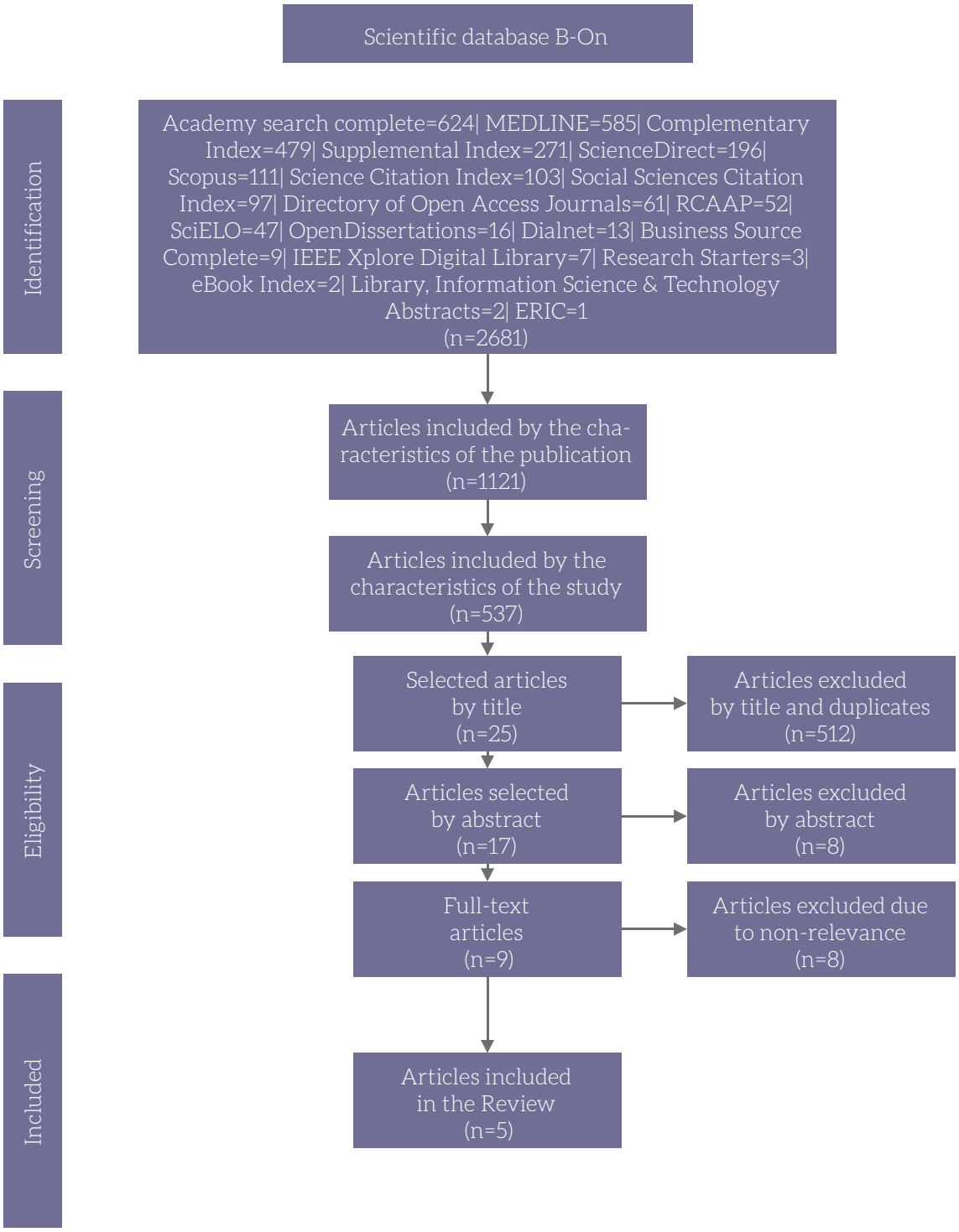

Figure 1 – Flow diagram (adapted from PRISMA 2020 Statement) regarding the article selection process in the scientific database B-On.

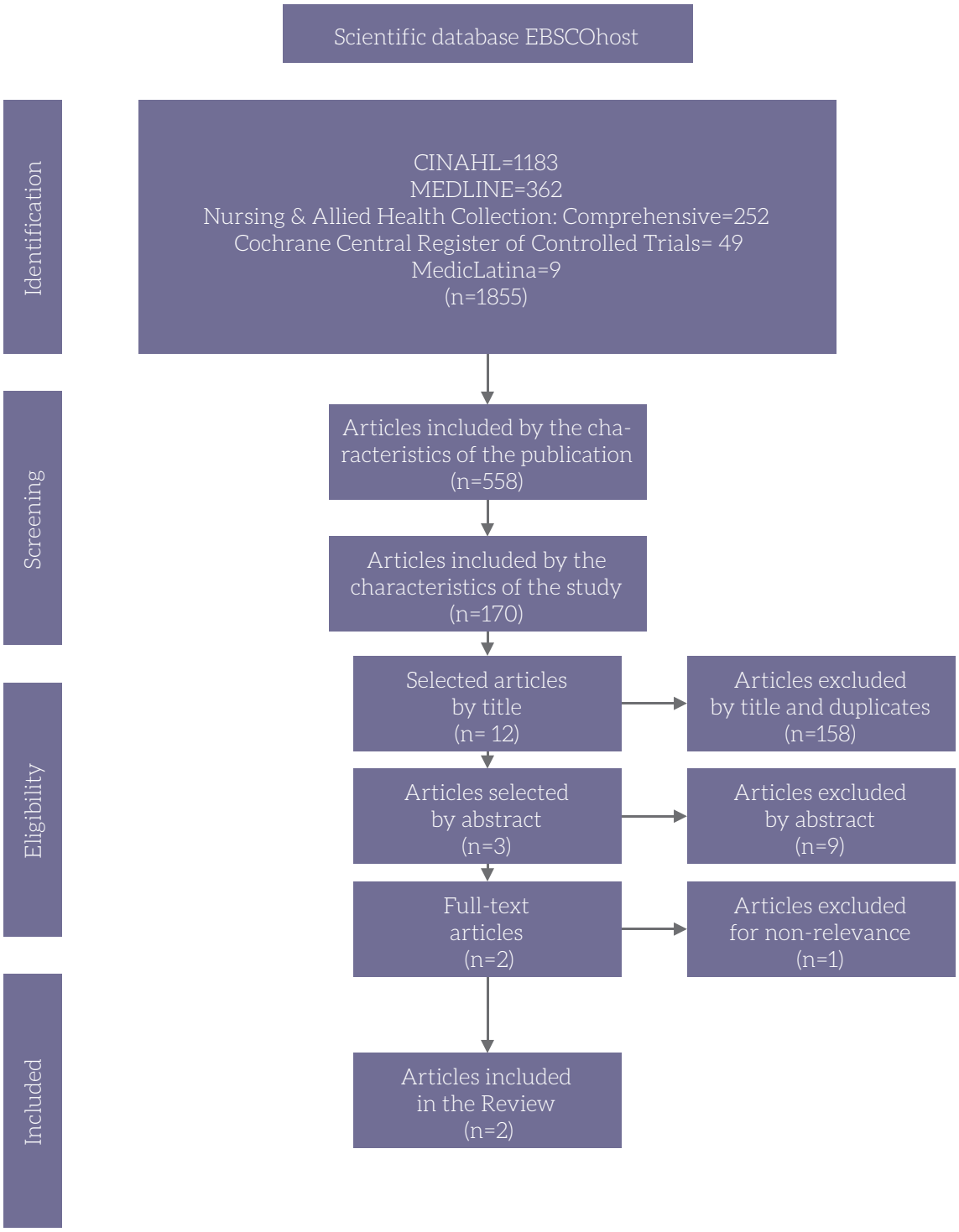

Figure 2 – Flow diagram (adapted from PRISMA 2020 Statement) regarding the article selection process in the scientific database EBSCOhost.

Table 3 – Analysis of the selected articles.

Study Identification	Levels of evidence[14]	Methodological quality[15]
Study 1 (S1) Dithole *et al* (2016)[16]	*Level 4.a*	Moderate
Study 2 (S2) Dithole *et al* (2017)[17]	*Level 4.c*	High
Study 3 (S3) Charlotte Handberg, Anna Katarina Voss (2018)[18]	*Level 4.c*	High
Study 4 (S4) Helen Carruthers, Felicity Astin & Wendy Munro (2017)[19]	*Level 1.b*	Moderate
Study 5 (S5) Aziza Salem, Muayyad M Ahmad (2018)[20]	*Level 1.b*	Moderate
Study 6 (S6) Santiago *et al* (2019)[21]	*Level 3.d*	High
Study 7 (S7) Momennasab *et al* (2019)[22]	*Level 3.c*	High

Table 4 – Study; Participants, Place and Time; Study Design; Objectives; Interventions and Outcomes/Conclusions.

Study	Participants, place and time	Study design	Objective(s)	Interventions	Results/Conclusions
S1	Nurses and people under mechanical ventilation. In an ICU context, in the United States, Israel, Finland and Sweden. Research took place in February 2015.	Scoping Review.	To identify the communication challenges between nurses and people under mechanical ventilation in an ICU setting.	Search for relevant studies in MEDLINE, CINAHL and PsycINFO databases published between January 2005 and December 2014; Found based on the following individual and combined keywords: *communication challenges, mechanically ventilated patients, ICU or critical care*; Identified 6 studies investigating the relevance of the theme.	– Adoption of assisted communication strategies among nurses--patients under IMV prevents emotional stress; – Physical communication methods were considered: handshake, lip mimicry, facial expression or nodding; – Low-tech methods were successful, being described: boards with alphabet and use of pen with paper; – 73.7% success rate in using "yes or no" questions and gestures in the communication exchange; – Nurse should be aware of the patient's pain and communication attempts reflected in facial expressions and body language; – The successful use of communication methods involves adjusting the existing resources to the patient's capacity so that the messages are effective; availability to be with the patient and training nurses' skills in improving communication.
S2	20 nurses (12 women and 8 men). In two ICUs located in Botswana: Gaborone and Francistown Hospitals; Between April and July 2013.	Qualitative study.	To describe the nurses' experiences in communication skills training.	Communication skills training workshops for nurses; Practical scenarios were used involving the application of augmentative and alternative communication (AAC) devices; Semi-structured interviews were conducted and analyzed to the nurses during the training sessions.	Nurses reported: – Increased knowledge regarding the variety of effective communication strategies available in the relationship with the ventilated patient: pen and paper; alphabet board and image board; – Need for support from management/leaders to ensure the availability and permanence of AAC devices in the unit, so that their application becomes a common practice; – Changing attitudes involves spreading knowledge, through continuous training to all nurses, including newcomers to the unit, through workshops on this topic; – Guidelines for communication between nurses and ventilated patients should be established in institutions.

Table 4 – Study; Participants, Place and Time; Study Design; Objectives; Interventions and Outcomes/Conclusions.↔↖

Study	Participants, place and time	Study design	Objective(s)	Interventions	Results/Conclusions
S3	48 health professionals (Nurses, operational therapists and physiotherapists). In four ICUs in different hospitals in Denmark. November 2015 to August 2016.	Qualitative study.	To describe the health professionals' perspectives when applying the AAC in the relationship with intubated patients.	ICUs received box containing a variety of AAC resources: iPad app- *GoTalkNow* and *Predictable*; Windows app- *On Screen Communicator*; letter board; picture board/ book; illustrated pain scale; hearing assistance chart and alphabet board; Participants underwent theoretical training including semi- -structured and recorded interviews by groups of 4-6 participants for each interview. Practical training workshops were held for the 48 participants and observations, conversations and final reflections were recorded in fieldwork.	– Health professionals showed resistance to change, referring to prioritize the communication methods they use out of habit and time saving, which consist of: "yes or no" questions; nodding; shaking hands; lip mimicry; – They acknowledged that they often felt difficulty and frustration for not understanding or being able to communicate with the intubated patient, being surprised by how much the assistance of AACs enables motivating high-quality care; – Examples of this, it is stated: The team used the alphabet board, and the intubated patient was able to express his concern regarding his health status, as he had not been extubated in the morning as scheduled. The team reported that the patient was fine and would be extubated the next day; The team left iPad with intubated patient due to an emergent care situation. When they returned to the patient, he had written "This is very clever"; – They mentioned that the iPad app, hearing assistance chart, letter chart; picture board/book and illustrated pain scale are the most effective means of communication.

Table 4 – Study; Participants, Place and Time; Study Design; Objectives; Interventions and Outcomes/Conclusions.

Study	Participants, place and time	Study design	Objective(s)	Interventions	Results/Conclusions
S4	1958 patients and 454 health professionals. Research took place between January 2004 and January 2017.	Systematic literature review.	To evaluate the effectiveness of AAC strategies to enable the communication of people temporarily unable to speak by medical device.	Search of relevant literature, conducted in ten scientific databases with selection of 12 review studies; Grey literature search was applied using the *Evidence Search database*.	– The use of low-tech AAC strategies (Examples: letter boards, images, alphabet, symbol boards, and paper/pencil) showed improvement in communication and increased patient satisfaction; – The application of high-tech AAC strategies (Examples: voice--generating device, use of technological communication applications by computer and/or tablet) revealed high levels of communication and the continuous use increased patient satisfaction; – Limitations identified in the use of AAC methods were: device out of the patient's reach; condition of the participant; equipment not working properly; delay in meeting the needs, lack of training and education.
S5	Nurses of ICU and people under IMV. Research took place between January 2010 and December 2016.	Integrative literature review.	To examine the available evidence on the knowledge, skills, perceptions and limitations of communicating with patients receiving IMV.	Literature search, relevant conducted in MEDLINE, Ovid, CINAHL, Sage and PsycINFO databases; Selected 11 keywords, which were combined with each other; Seventeen review studies were considered.	– Patients under IMV wanted to know more about their health status and recovery, reporting that most nurse- patient interactions were brief and aimed at informing them about procedures; – Nurses reported that patients under IMV could be at risk of being ignored, neglected and isolated due to ineffective communication; – The option went using AAC in the UCI, and the following methods were identified: Low-tech that does not need electronic programming (books and communication boards); high-tech that allows easy storage and retrieval of the electronic message (voice generating device and communication applications for tablet or computer) and unaided AAC systems such as body language (gestures and pointing); – They mentioned limitations of AAC devices, such as the negative attitude of health professionals due to the high workload, the patient's complex clinical conditions, and the need for training for their effective use.

Table 4 – Study; Participants, Place and Time; Study Design; Objectives; Interventions and Outcomes/Conclusions.

Study	Participants, place and time	Study design	Objective(s)	Interventions	Results/Conclusions
S6	20 patients (11 with endotracheal tube and 9 with tracheostomy). In ICU at the hospital center in Toronto, Canada. Between September 2013 and August 2014.	Pilot observational study.	To explore the feasibility and usefulness of a tablet communication application in the relationship with patients unable to communicate verbally in an ICU.	Individual training was provided to staff and patients on the use of the tablet device application to facilitate communication; The app's personalized interface was explained to patients about various options for basic needs, wants, and phrases to facilitate more complex interactions between nurses and patients, avoiding minimizing the study to nods and gestures only; The training took 10 minutes each and was completed at the patient's bedside. The tablet was used for a maximum of 60 minutes per patient to minimize the risk of fatigue; A scale was applied to evaluate the usefulness of the tablet communication application.	– 94% of the team reported viability of the communication app as patients found it easy to learn in less than 10 minutes; – 80% reported that the tablet app increased patients' ability to communicate with staff; – 95% reported that the use of the tablet to communicate with the patient was important to their practice; – 63% of patients were very satisfied with the use of the tablet as a communication tool; – On a scale of 0-10, 75% of the team rated the usefulness of the tablet communication app at 7 or higher, to be used with the patient for 10 minutes or less.

Table 4 – Study; Participants, Place and Time; Study Design; Objectives; Interventions and Outcomes/Conclusions.

Study	Participants, place and time	Study design	Objective(s)	Interventions	Results/Conclusions
S7	10 nurses and 35 patients under IMV. In cardiothoracic ICU located in Shiraz in southern Iran. Between January and April 2014.	Observational study.	To describe the quality of communication between nurses and patients on mechanical ventilation.	Patient selection criteria through the application of the Glasgow Coma Scale (GCS) and Richmond Agitation-sedation Scale (RASS); Inclusion criteria were considered: ECG equal or greater than 11 and RASS between -3 and +3; Data were collected through observation and recorded in a checklist before the nurse-patient communication.	– 50.3% of the communication contents were related to physical needs: eating, drinking, elimination, oral hygiene and positioning; 23.5% to pain; 1.1% to the patient's feelings: frustration, anxiety and fear; – Regarding communication methods: 57% used hand gestures and glances, 10.86% nods and 0.57% paper and pen; Assisted communication strategies such as word and picture board were not used; – The degree of satisfaction in nurse-patient communication was assessed: 20% of the nurses were not satisfied and only 5.7% of the patients were completely satisfied; – Nurses relied solely on their professional experience to understand patients' messages. – Access to facilitated communication resources and staff training should be future strategies to increase communication success.