

Theories and educational interventions in pain for the nursing team: integrative review

Teorias e intervenções educativas em dor para a equipe de enfermagem: revisão integrativa

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ABSTRACT

BACKGROUND AND OBJECTIVES: Despite the available evidence, there is still a lack of knowledge and a high prevalence of pain in different clinical contexts, with a negative impact on patients' well-being, functionality and recovery. The present study's objective was to map the literature on educational strategies and theoretical references used in the application of educational interventions on pain for nursing staff and the content taught.

CONTENTS: Integrative literature review conducted in seven databases, using the descriptors "Pain" OR "Pain Management" AND "Education" OR "Education, nursing" OR "Educational Status" OR "Teaching" AND "Nursing" OR "Nursing Team". Studies describing educational interventions in pain for nursing staff, published in the last 10 years, were analyzed. Thirty-three articles were analyzed. The theoretical references used in the interventions were: COM-B Framework, Self-efficacy Theory; Human Care Theory

and Critical Thinking. Among the educational strategies were trail simulation, problem-based learning, flipped classroom and spaced learning. The interventions were offered as e-learning, lectures, case discussions, simulation and combined formats. The main contents covered were neurobiology of pain, biopsychosocial experience, principles of assessment, recording and pharmacological and non-pharmacological management of pain.

CONCLUSION: Few educational interventions explained the theoretical framework used. The educational strategies were varied, with a predominance of active teaching strategies and combined formats. Educational interventions on pain seem to contribute to increasing the self-confidence of nursing professionals in the assessment and management of pain.

Keywords: Education, Nursing, Pain, Pain Management, Pain Measurement.

RESUMO

JUSTIFICATIVA E OBJETIVOS: Apesar das evidências disponíveis ainda se observa falta de conhecimento e elevada prevalência de dor em diferentes contextos clínicos, com impacto negativo no bem-estar, funcionalidade e na recuperação dos pacientes. O objetivo deste estudo foi mapear na literatura as estratégias educativas e os referenciais teóricos utilizados na aplicação de intervenções educativas em dor para a equipe de enfermagem e o conteúdo ministrado.

CONTEÚDO: Revisão integrativa da literatura conduzida em sete bases de dados, a partir dos descritores "Pain" OR "Pain Management" AND "Education" OR "Education, nursing" OR "Educational Status" OR "Teaching" AND "Nursing" OR "Nursing Team". Foram analisados estudos que descreveram intervenções educativas em dor voltados para a equipe de enfermagem, publicados nos últimos 10 anos. Trinta e três artigos foram analisados. Os referenciais teóricos utilizados nas intervenções foram: COM-B *Framework*, Teoria da autoeficácia; Teoria do Cuidado Humano e Pensamento crítico. Entre as estratégias educativas observou-se simulação por trilhas, aprendizagem baseada em problemas, aula invertida e aprendizagem espaçada. As intervenções foram oferecidas no formato *e-learning*, aula expositiva, discussões de caso, simulação, além de formatos combinados. Os principais conteúdos abordados foram: neurobiologia da dor, experiência biopsicossocial, princípios de avaliação, registro e manejo farmacológico e não farmacológico da dor.

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HIGHLIGHTS

- Several educational strategies have been combined in educational interventions in order to improve nursing staff's knowledge of pain management.
- Theory-based educational interventions with active teaching strategies have the potential to increase knowledge, modify beliefs, improve attitudes and reduce barriers to pain management.
- Pain education interventions contribute to increase the self-confidence of nursing staff in the assessment and management of pain.

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CONCLUSÃO: Poucas intervenções educativas explicitaram o referencial teórico utilizado. As estratégias de ensino foram variadas, com predomínio de estratégias ativas de ensino e em formatos combinados. As intervenções educativas em dor parecem contribuir para aumentar a autoconfiança dos profissionais da enfermagem na avaliação e manejo da dor.

Descritores: Dor, Educação em Enfermagem, Manejo da dor, Medição da dor.

INTRODUCTION

Pain is present in a variety of clinical contexts, can be acute or chronic, resulting from the disease itself, diagnostic processes or therapeutic interventions¹. The nursing staff can play an important role in the evaluation and management of pain, due to their continuous contact with patients^{2,3}. However, there is still a lack of knowledge about pain management and a high prevalence of pain in different clinical contexts, with a negative impact on the patients' functionality and well-being⁴⁻⁶.

The Montreal Declaration stressed that among the main reasons for inadequate pain management is the lack of knowledge among health professionals and emphasized that access to adequate pain management is a human right⁷. The International Association for the Study of Pain (IASP) Curriculum Outline on Pain for Nursing emphasized the role and responsibility of nurses in the assessment and management of pain⁸.

The teaching of pain in undergraduate and technical nursing courses is deficient, approached in a superficially, within varied disciplines, without due appreciation, and with little space in the workload⁹. A Brazilian study concluded that most nursing students do not feel able to assess pain¹⁰.

Training and educational programs aimed at nursing staff are essential for improving pain control in the hospital environment, improving not only the professionals' comprehension of the physiological aspects of pain, but also the adoption of more effective and compassionate pain relief measures. In this way, they help to reduce the barriers faced by nursing staff in assessing, recording and managing pain, improving professional competence and the quality of care¹¹⁻¹⁵.

In order to develop new proposals for pain education interventions for the nursing staff, it is necessary to know which interventions have been used, their theoretical basis and characteristics. The present study's objective was to map out in the literature the educational strategies and theoretical references used in the application of educational interventions on pain for the nursing team, as well as the content taught.

CONTENTS

Integrative literature review, following the steps: identification of the topic and selection of the hypothesis or research question, sampling or literature search, data extraction or categorization of the studies, critical analysis of the studies included, interpretation of data, presentation of the integrative review^{16,17}, conducted according to the recommendation of the Preferred Reporting Items for Systematic reviews and Preferred Reporting

Items for Systematic reviews and Meta-Analyses (PRISMA)¹⁹ for reporting the review, seeking to answer the following research question: "Which theoretical references, teaching strategies and content have been applied in educational interventions on pain for nursing staff?".

The organization of the search strategy followed the PCC acronym, with P for population, C for concept and C for context. The Population was made up of studies that had nursing staff as the focus of the educational intervention. The key Concept of this review was made up of studies that detailed the characteristics of pain education interventions for nursing staff (theoretical references, educational strategies and content) and the Context included hospitals, clinics or outpatient clinics.

The search strategy aimed to locate published studies and took place in two stages. In the first, a search was carried out on Medline and Cumulative Index to Nursing and Allied Health Literature (CINAHL), followed by an analysis of the words in the titles and abstracts and the descriptors of the publications using the terms: "Nurses, Education and Pain". In the second stage, a search was carried out using all the keywords and descriptors identified. The descriptors used were: "Pain" OR "Pain Management" AND "Education" OR "Education, nursing" OR "Educational Status" OR "Teaching" AND "Nursing" OR "Nursing Team". The search strategy was developed with the help of an experienced librarian and a modified controlled vocabulary was used for each database.

Considering the progress made in the teaching and learning processes in recent years, the authors decided to include only articles published in the last 10 years (2013-2023). Data collection took place between May 2 and June 2, 2023, in the Pubmed/Medline, Scientific Electronic Library Online (Scielo), PsycINFO databases, in the Latin American and Caribbean Literature in Health Sciences (LILACS) database through the portal of the Coordination for the Improvement of Higher Education Personnel (CAPES) and in the CINAHL, Web of Science, Scopus and ERIC databases. There was no search for gray literature.

This review included qualitative and quantitative studies focusing on pain education interventions for nursing staff and/or nursing students on the assessment, recording and management of pain in adults and seniors. Qualitative studies of any theoretical and methodological approach were considered, as well as studies published in English, Spanish or Portuguese in the last 10 years. Literature review studies (systematic or integrative reviews), professional reports, dissertations, theses, studies that did not describe the characteristics of the interventions and studies focusing on pediatrics were excluded. Studies that addressed educational interventions aimed at pain management in pediatrics were excluded due to the population presenting many specificities in relation to the assessment, recording and management of pain, which require different skills from professionals¹⁸.

All the titles and abstracts retrieved in the searches were grouped in the EndNote® reference manager database to identify and exclude duplicates. The Microsoft Excel spreadsheet software was used to select and evaluate the studies in the sample. Studies were pre-selected by having the title and abstract read by two reviewers independently, based on the established inclusion criteria.

During the selection of studies, disagreements were resolved by discussion between the two reviewers and, when necessary, by a third reviewer.

Data extraction from the studies included in the review was carried out using a standardized data extraction tool. The general data extracted included data on the authors, year of publication, objectives, methods, study design, outcomes, characteristics of the target population, characteristics of the intervention (educational strategies, mode of delivery, dose, interventor), theoretical model and main results of the intervention.

RESULTS

The search resulted in 2881 articles. After excluding duplicates, the title and abstract of 2662 studies were read and 63 works were selected, but 7 were not located, leaving 56 studies to be read in full. At this stage, 23 articles were excluded for having an ineligible population, context, concept or study design, as described below: 9 studies focused on pediatric professionals, patients or family members; 6 studies did not describe the educational intervention, 4 studies presented educational interventions outside the context of pain and 4 studies were literature reviews or case reports, leaving 33 articles for analysis. The results of the search and selection are described in figure 1, presented by the PRISMA-ScR flowchart¹⁹

Among the 33 studies analyzed, the most commonly used study design was quasi-experimental (66.6%), followed by experimental studies (21.2%), study protocols (9.1%) and a methodological study to develop and validate an educational intervention (3.1%).

The analysis of the 33 selected studies showed a predominance of studies carried out in the United States (18%) and Iran (18%), followed by Brazil (9.1%) and Australia (9.1%). China and Jordan had 2 studies each and the other countries had 1 study (Saudi Arabia, United Arab Emirates, Ethiopia, South Korea, Turkey, Finland, Canada, Spain, Taiwan and Germany).

As for the target population, there was a predominance of interventions aimed at nurses (54.5%), followed by nursing students, medical students and/or residents in both areas (21.1%), nursing assistants, technicians or staff (15.2%) and nurses and doctors (9.1%). Table 1 shows a summary of the studies analyzed.

The context in which the intervention was applied was quite varied, with studies aimed at nursing staff in operating rooms, anesthesia recovery or surgical clinics (24.2%), studies carried out in university hospitals or general hospitals (21.1%), long-stay institutions for seniors (15.2%), Intensive Care Units (18.2%), oncology and/or palliative care (12.1%), psychiatric hospitals (3.0%) and school environments (3.0%).

Of the 33 studies analyzed, only seven described the theoretical framework used, including Critical Thinking²¹; Self-Efficacy Theory^{12,13}, Jean Watson's Theory of Human Care²⁹ and COM-B Framework^{12,41,42}.

The teaching strategies used were Branching Patch Simulations (BPS)²¹, problem-based learning¹⁴, flipped classes¹³, spaced learning^{41,42}, educational videos^{30,38}, simulation³⁷, software^{35,48}, mind map²⁸, case discussions^{22,39}, distribution of printed and electronic

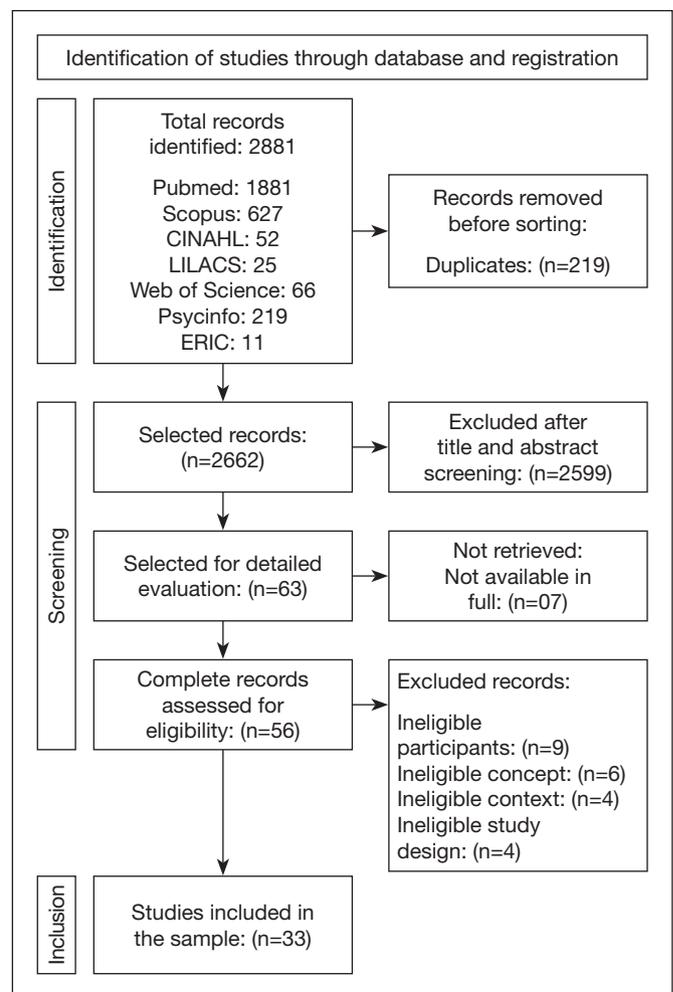


Figure 1. PRISMA flowchart.

material²⁶ and simulation associated with discussion⁴⁶. The interventions analyzed applied educational strategies in different formats: online training or e-learning^{14,31,32,40-42,49}, lectures^{13,23-25,47}, workshops^{20,27,33,34,43} and talks^{12, 21,29,36,44,45}, as well as combined formats.

The content of the educational activities used in the interventions varied, including the neurobiology of pain, the biopsychosocial experience, principles of assessment, recording and pharmacological and non-pharmacological pain management. There was a predominance of interventions focusing on pain management (45.5%), followed by pain assessment (27.7%), knowledge, beliefs and attitudes towards pain management (24.2%), and interventions focused on pain assessment and management (12.1%).

In most of the studies, educational activities were carried out in groups, except for those in which the educational strategy was offered in an online format (individual). Most of the educational interventions used active teaching methodologies and case studies in combination to train the nursing team, with emphasis on the topics of pain assessment, recording and management. The main outcomes assessed in the studies analyzed were knowledge, attitudes and beliefs of the professionals.

Table 1. Summary of the main characteristics of analyzed studies

Studies	Study design	Context/ Population and sample	Educational strategy	Theoretical reference	Contents	Results
A11 ⁸	Quasi-experimental study	PAR/ Post-anesthetic recovery nurses (n=34)	Educational guide with workshop, case studies with recorded videos (PBL - problem based learning) and discussion of cases.	-	Pharmacological therapy, benefits of multimodal analgesia.	Reduction in the use of opioids and in the average recovery time and stay in anesthetic recovery.
A21 ⁹	Experimental study	University/Nursing students (n=102)	Traditional lectures and clinician scenarios x Branching Patch Simulations and clinical cases.	Critical Thinking	Pain management in patients with dementia.	Higher scores on the Critical Thinking Scale and subscales in the intervention group compared to the control group.
A3 ²⁰	Quasi-experimental pilot study	School nurses (n=39)	9 hours training, divided into 3 sessions of 3 hours of theoretical content and discussion.	-	Neurobiology of pain, biopsychosocial experience, best practices for pain assessment in students with cognitive impairment.	Participants had less difficulty assessing pain after the educational program.
A4 ²¹	Quasi-experimental study	Surgical Center/PRA Nursing technicians (n=50) and nursing assistants (n=7)	Theoretical-practical program with lectures and dialogues and audiovisual resources. Applied in groups lasting 2 hours.	-	Visual Numeric Scale of pain as the fifth vital sign.	Increased knowledge after training. The nursing professionals were able to correlate the intensity of pain with the standardized drug suggested by the WHO.
A5 ²²	Experimental study	ICU Nurses (n=75), nursing technicians (n=105) and patients (n=182)	Training with a lecture and 5 case studies, as well as a systematized pain assessment form.	-	Impact, assessment and management of pain.	Significant reduction in pain intensity at rest and when coughing. Increase in the number of doses of morphine administered and in the number of patients receiving it.
A6 ²³	Mixed methods study protocol	Long-stay institution/Nursing staff	8 hours training with interactive classes for and 3 hours of discussion with experts + Training for caregivers: 2 hours of instruction with interactive discussion of cases.	-	Pain assessment and management.	Information can be used to develop future implementation strategies in this field.
A7 ²⁴	Quasi-experimental study	Surgical Clinic/Nurses (n=15) and patients (n=102).	Distribution of printed and electronic material (protocol) with compulsory reading and two hours training.	-	Comprehensive pain assessment, intervention principles and documentation.	The implementation of a nursing protocol combined with education was associated with an increase in nurses' knowledge and attitudes towards pain.
A8 ²⁵	Experimental study	University/Medical students - 1st year (n=307) and Nursing students - 4th year (n=169)	3-hour interprofessional workshop with clinical cases on pain management.	-	Pain management according to IASP guidelines.	The results showed that interprofessional mentoring and participation in interprofessional groups improved pain management skills of medical students, but did not have the same effect on the performance of nursing students.
A9 ²⁶	Quasi-experimental study	University/nursing students - 2nd year (n=79)	Three sessions with brainstorming, group work, discussion, case simulation and creation of a concept map. A total of 12 hours of education (3 sessions of 4 hours).	-	Definitions, types of pain, theories, pathophysiology and risks of postoperative pain, pain assessment, tools, pharmacological and non-pharmacological interventions.	The nursing students showed a significant increase in knowledge and improved attitudes immediately after the training and after 3 months.

Continue...

Table 1. Summary of the main characteristics of analyzed studies – continuation

Studies	Study design	Context/ Population and sample	Educational strategy	Theoretical reference	Contents	Results
A10 ²⁷	Quasi-experimental study	ICU/Nurses (n=138)	Lectures and case discussions.	Jean Watson's Theory of Human Care.	Pharmacological advances in pain management, basic skills in pain treatment.	After the training, there was a 50% decrease in the average difference between the patients' pain assessment and the nurses' pain assessment. No significant differences were found in the knowledge scores.
A11 ²⁸	Quasi-experimental study with mixed methods	ICU/Nurses (n=48)	Video on pain assessment in non-communicative patients (15 min), made available online + pain assessment of two patients, immediately afterwards.	-	Pain assessment using the Critical-Care Pain Observation Tool (CPOT).	The results of the knowledge tests indicated that the nurses had learned the principles of using the assessment tool. The nurses rated the video positively, but requested additional interaction.
A12 ²⁹	Quasi-experimental study	Long-stay institutions in rural areas/ Care directors (n=7), nurses (n=21) and nursing assistants (n=14)	Online training through an interactive and dynamic platform, with 6 modules of 10 to 15 minutes + optional module with videos.	-	Pain assessment focusing on the use of the Pain Assessment Checklist for Seniors with Limited Ability to Communicate Scales (PACSLAC-II) for individuals with dementia.	Knowledge about pain assessment increased significantly after completing the online training program. Implementation of the standardized protocol resulted in more frequent pain assessments. The online training program and the standardized protocol were well received, despite some barriers to effective implementation.
A13 ³⁰	Methodological study protocol for the development of an educational intervention	Intervention aimed at primary care doctors and nurses.	Intervention group: Online training using dynamic 3D explanatory videos. Contact with a chronic pain specialist by e-mail or videoconference. Control group: video and material in PDF format.	-	The basis for the educational intervention will be taken from a qualitative study.	The results on the qualitative phase provided a better understanding of the misconceptions about the origin and meaning of chronic low back pain. The hope is that in the quantitative phase the educational intervention will be effective in changing the beliefs and attitudes of health professionals in primary care.
A14 ¹⁴	Quasi-experimental study	University/ Undergraduate nursing students (n=75)	Educational intervention through a digital platform using simulated clinical scenarios with questions, feedback and help links.	-	Assessment of acute pain in adults and newborns according to the IASP Pain Core Curriculum	There was a significant difference in the students' learning in the post-test. The students understood the importance of the topic and were satisfied and motivated by the technology and method applied. The use of persuasive technology, with mobile and online devices, expands learning spaces in an innovative, flexible and motivational way.
A15 ³¹	Quasi-experimental study	Surgical Clinic/ Nurses at the University Hospital (n=60)	Two-day workshop training.	-	Did not mention the content of the intervention	After the intervention, there was a significant improvement in knowledge and attitude scores. The authors suggest that maintaining well-structured training programs leads to improved knowledge and attitudes among participants.

Continue...

Table 1. Summary of the main characteristics of analyzed studies – continuation

Studies	Study design	Context/ Population and sample	Educational strategy	Theoretical reference	Contents	Results
A16 ¹³	Quasi-experimental study with control group	Surgical Clinic/Nurses (n=40)	Intervention group: 2.5-hour flipped classroom course (video two weeks before). Control group: lecture.	Self-efficacy theory.	The origin of aromatherapy, evidence of the role of aromatherapy in pain relief, types of essential oils to be used, mechanism of action, mode of use, dose preparation and precautions in the use of essential oils.	In the post-test, there was a significant increase in knowledge and self-efficacy in the experimental group compared to the control group, indicating that flipped teaching improved the participants' knowledge and self-efficacy.
A17 ¹²	Quasi-experimental study	ICU/Nurses Group A (n=34) Group B (n=33)	<u>Group A:</u> Use of an online messaging group (Telegram) to send texts, photos, videos and audios for two weeks. <u>Group B:</u> Two 90-minute lectures.	Self-efficacy theory and COM-B Framework.	Pain assessment in patients capable of self-reporting and Critical-Care Pain Observation Tool (CPOT).	After the intervention, both groups presented improved scores, but nurses in the online group (group A) had significantly higher scores for pain assessment and management compared to the face-to-face group (group B).
A18 ³²	Quasi-experimental study	Long-stay institutions/Experimental group: Nurses (n=100) and doctors (n=22) Control group: Nurses (n=69) Doctors (n=8) Seniors (n=126)	Nurses: 360-minute workshop and printed material (leaflets and tasks). Doctors: Online training. Control group: 45-minute information event.	-	Basic, pharmacological treatment, non-pharmacological treatment, pain assessment, reflection on attitude towards pain and developing better pain awareness.	The main outcome (reducing the average pain intensity by 2 points) was not achieved, but there was an improvement in the longitudinal follow-up (6 months). The intervention group improved significantly in pain intensity and in the walking domain.
A19 ³³	Randomized experimental study	Surgical Center/Nurses E-learning (n=38) and Traditional classes (n=39)	Class: 4 lessons of 1 hour with slides in combination with questions and answers. Electronic: FLASH software, delivery of educational CD and instructions (4 weeks to study the material).	-	Definition of pain, physiology and types of pain, principles of correct pain assessment, principles of the use of analgesics and principles of the use of non-pharmacological methods for pain.	After the intervention, both groups presented a significant increase in knowledge, practice and attitude. The average score was significantly higher for the e-learning group compared to the traditional class group.
A20 ³⁴	Quasi-experimental study	University Hospital/Nurses (n=111)	Two face-to-face sessions (consecutive days) with interactive lectures, group case discussions and readings (at home) for a total of 16 hours + an 8-hour refresher session, 4 weeks later.	-	The multidimensional nature of pain, pain assessment, pain management and clinical conditions.	The average score of nurses' knowledge and attitudes towards pain improved significantly after participating in the educational program.
A21 ³⁵	Quasi-experimental study	Medical-Surgical Clinic/Nurses (n=124)	Training using theory and clinical practice with simulations, totaling 12 hours.	-	Definition, physiology and types of pain, pain assessment and reassessment tools, pain management, respiratory and cardiac complications, patient monitoring and documentation, patient rights and patient/family education.	After the intervention, there was a significant increase in nurses' levels of knowledge and an improvement in their attitude towards pain.

Continue...

Table 1. Summary of the main characteristics of analyzed studies – continuation

Studies	Study design	Context/ Population and sample	Educational strategy	Theoretical reference	Contents	Results
A22 ³⁶	Quasi-experimental study	Long-stay institution/Nursing assistants (n=56)	Intervention using a 17-minute educational video, discussion with questions and answers and distribution of revision material.	-	Definition of pain, difference between acute and chronic pain, changes in behavior that indicate pain and communication with the patient.	There was an improvement in the nursing assistants' knowledge. There was no change in the verbal reporting of pain. There was an improvement in the nursing assistants' pain reports.
A23 ³⁷	Quasi-experimental study	Surgical Center/Nurses (n=107)	Lecture and case studies for discussion (8h). Teacher and expert help available (video and WeChat).	-	Multidimensional nature of pain, pain assessment, pharmacological and non-pharmacological management and application of knowledge based on the IASP Interprofessional Pain Curriculum.	Nurses' post-operative pain management practices improved in terms of pain documentation and the use of pain intensity assessment tools. Intramuscular injection of opioids decreased. Average postoperative pain decreased significantly.
A24 ³⁸	Quasi-experimental pilot study	Palliative care/Nurses specialized in palliative care (n=34)	Intervention using online method with 11 case scenarios.	-	Pain assessment (evidence-based practice), patient preferences, inter-professional practice and the nurse as patient advocate.	Participants increased their knowledge and confidence in carrying out pain assessments. Participants were more likely to document pain intensity and there was a significant reduction in the average pain reported by patients.
A25 ³⁹	Quasi-experimental pilot study	Oncology/Nurses specialized in oncology (n=44)	Online intervention using spaced learning methodology, audit and feedback.	COM-B Framework.	Multidimensional nature of pain, pain assessment, pain management and clinical conditions.	Participants increased their knowledge and confidence about pain assessment. There was a significant impact on the proportion of documented pain assessments.
A26 ⁴⁰	Randomized Clinical Trial phase III	Palliative Care/Intervention aimed at doctors and nurses specialized in cancer or palliative care	Spaced learning method, online, real-time auditing, feedback and evidence-based decision support.	COM-B Framework.	Cancer pain assessment and screening.	The results will be verified at the patient level and concern the likelihood that a personalized mHealth performance feedback intervention will translate into a clinically significant reduction in average pain score scores from admission to the time of verification.
A27 ⁴¹	Quasi-experimental study	ICU / Nurses (n=32)	Training in a two-day workshop, with lectures and case simulations.	-	Intensive pain management, methodology for using the pain management algorithm and the process of implementing the pain management program.	The average score for nurses' awareness of pain was significantly different in the pre- and post-intervention periods. However, no significant change in nurses' attitudes was observed.
A28 ⁴²	Randomized Clinical Trial	Oncology/Nurses Experimental group (n=63) and Control group (n=68)	Training with lectures, discussions and case studies. Two consecutive days (16 hrs).	-	Pain management, epidemiology, definition and types of pain, pain theory, basic pain management, pain assessment, cancer pain and cancer pain management, chronic pain and pharmacological and non-pharmacological pain management.	Knowledge and attitude towards pain improved after the implementation of the educational program, with a significant difference between the intervention group and the control group.

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Table 1. Summary of the main characteristics of analyzed studies – continuation

Studies	Study design	Context/ Population and sample	Educational strategy	Theoretical reference	Contents	Results
A29 ⁴³	Quasi-experimental study with control group	ICU /Nurses Experimental group (n=25) and Control group (n=25)	Intervention with a 2-hour lecture and distribution of an educational leaflet by electronic means.	-	Using the Nonverbal Pain Scale (NVPS) to monitor pain.	There was a significant difference between the control and intervention groups in the diagnosis of pain related to decubitus changes and pain during airway aspiration.
A30 ⁴⁴	Quasi-experimental pilot study	Teaching hospital/ Nursing and medical students and residents (n=68)	Interprofessional program based on simulation and joint discussion of clinical cases.	-	Experiential learning exercise on pain assessment and management. Communication with the patient about pain and pain management planning encouraged.	There was a significant improvement in the confidence of assessing and managing acute pain after the simulation. Regarding relationships, after the simulation there was a significant change in collaborative practice and support between doctors and nurses.
A31 ⁴⁵	Experimental study	Psychiatric Hospital / Nurses (n=100)	Pain education program with two lectures. Total of 5 hours.	-	Introduction to pain management, covering pain definitions, pathophysiology, current trends in pain management, pain assessment and pharmacological and non-pharmacological pain interventions.	The experimental group had significantly higher scores in pain knowledge compared to the control group.
A32 ⁴⁶	Methodological study to develop and validate an e-learning intervention	University/ Training aimed at nursing students was evaluated by 8 anesthesiologists and nursing professors, 55 undergraduate students and 28 master's students	Training through software made available to participants.	-	Concept of pain, assessment (history, physical examination, vital signs, recording and measuring instruments) and pain management (drugs and actions).	The software was evaluated by experts and students with a high score and rated at a good level.
A33 ⁴⁷	Experimental study	PRA/Nurses Experimental group (n=23) and Control group (n=23)	Online education program using multimedia, videos, audio, photos and slide shows.	-	Pain theory, pain assessment, pharmacotherapy for pain management, complementary methods for pain management, pain treatment interventions, patient-controlled analgesia (PCA), recent advances in pain management and pain management in special groups.	There was a significant difference in knowledge about pain management between the two groups. The experimental group was significantly superior in: knowledge of analgesics, pain assessment and interventions. There was no difference between the groups in terms of attitude towards pain management and pain management. The self-efficacy of the experimental group increased significantly compared to the control group.

PAR = post-anesthetic recovery.

DISCUSSION

This study set out to map the theoretical references, teaching strategies and content of educational interventions on pain related to the nursing staff. The analysis of the theoretical references showed that few studies explained the reference used,

as observed in a study that analyzed educational strategies for nurses in the recognition of clinical deterioration⁵⁰.

Two studies used the Self-Efficacy Theory^{12,13}, proposed by Albert Bandura in 1977, as a basis for educational intervention. The Self-Efficacy Theory explains motivation to change behavior and confidence in one's personal ability

to perform tasks in order to achieve an expected result⁵¹. Strengthening the self-efficacy of the nursing staff for pain management can be a promising strategy for improving the pain management skills of the staff⁵¹.

The studies which used self-efficacy theory^{13,25} showed that it positively influenced the behaviors of the nursing team and consequently the patients' experience of pain relief^{13,25}. Three studies used the COM-B Framework^{12,41,42}, a theoretical model used to promote health behavior change that uses three essential elements: capacity, opportunity and motivation. According to this approach, opportunity can influence motivation and capacity; a new behavior can alter capacity and influence motivation and opportunity⁵².

Several studies have used combined educational strategies to improve the professionals' knowledge on pain management. A study comparing a video and flipped classes intervention with a lecture intervention found that professionals who underwent video and flipped classes training showed a significant increase in knowledge compared to professionals who only received a lecture¹³.

Another study compared the use of an online social text messaging application with educational content for two weeks, as well as two 90-minute lectures. The results showed that the nurses who took part in the online training outperformed the nurses in the face-to-face group¹².

The effectiveness of the online educational strategy was also confirmed by a study that tested an educational intervention on pain assessment for nurses specializing in palliative care, in which participants increased their knowledge and confidence in carrying out pain assessment⁴⁰.

A study comparing the use of an online educational strategy (e-learning) with traditional classes showed that both groups showed an increase in knowledge and better practices and attitudes towards pain, but the average score of the e-learning group was higher than the group that received traditional classes³⁵.

In the sample of this review, only four studies compared different educational strategies^{12,13,21,35} and one proposal was carried out by methodological study protocol³².

The outcomes analyzed to assess the results of educational interventions varied, but the main outcome assessed was knowledge^{13,14,23,26,28-31,33,35-38,40,41,44,47,49}, followed by attitudes towards pain^{35-37,43,44}. Other outcomes, such as reduction in opioid use and average anesthetic recovery time²⁰; critical thinking scale²¹; pain assessment^{22,45,46}; pain intensity^{24,34}; morphine use²⁴; pain documentation^{38,39} and pain awareness⁴³ were also evaluated.

Evaluating opioid consumption can be a way of checking whether the nursing team is implementing all the available resources in terms of prescribed pharmacological treatment, because the drugs prescribed in the "if necessary" mode are often not used. Investigating the performance of professionals in assessing and recording pain and also the average pain intensity of a given population before and after the application of an educational intervention can also be an indicator of the intervention's effects.

Several studies have shown that the educational objectives were achieved, and the training led to changes in the behavior of professionals, a reduction in pain and an improvement in patient experience^{20,24,26,39}.

Theory-based educational interventions with active teaching strategies have the potential to increase knowledge, modify beliefs, improve attitudes and reduce barriers to pain management. These interventions appear to have a positive impact on the nurses' ability to carry out pain assessment and management and should be tested in future studies.

Limitations of the present study include the fact that the search time was within the last 10 years, which may have limited access to previously published studies, the absence of checking the references of the studies analyzed to locate additional studies and the inclusion of studies with populations from different contexts, in addition to hospital nursing staff (universities, schools and primary care).

CONCLUSION

The present study's findings show that different educational strategies have been used to reduce barriers and improve the self-confidence of nursing professionals to carry out pain assessment and management. The theoretical framework used to increase the methodological rigor of the intervention was explained in few studies, with emphasis on critical thinking, self-efficacy theory, human care theory and the COM-B Framework. The educational strategies observed were trail simulation, problem-based learning, flipped classroom and spaced learning. The trainings were offered in the format of e-learning, lectures, case discussions and simulation.

Neurobiology of pain, biopsychosocial experience, principles of assessment, recording and pharmacological and non-pharmacological management of pain were the main contents covered in the educational interventions. The studies that used a theoretical framework to develop the intervention and combined active teaching strategies seemed to have better results and should be tested in future studies, as those have the potential to improve nursing care in pain management.

AUTHORS' CONTRIBUTIONS

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Data Collection, Conceptualization, Project Management, Research, Methodology, Writing - Preparation of the original, Validation, Visualization

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