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INTEGRATIVE LITERATURE REVIEW ARTICLE

PERMANENT EDUCATION IN NURSING AT THE INTENSIVE CARE UNIT*

EDUCAÇÃO PERMANENTE EM ENFERMAGEM NO CENTRO DE TRATAMENTO INTENSIVO

EDUCACIÓN PERMANENTE EN ENFERMERÍA EN EL CENTRO DE TRATAMIENTO INTENSIVO

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ABSTRACT

Objective: to analyze in the scientific literature how the continuing education of the nursing team at the Intensive Care Unit has been developed. ***Method:*** this is a bibliographic, descriptive, integrative review type study that searched for articles between 2007 and 2017 in Portuguese, in the databases, LILACS, MEDLINE, BDENF and in the Virtual Health Library. A descriptive analysis of the results was carried out based on the existing data in the synthesis figure of the articles, supported by the scientific literature. ***Results:*** 583 articles were found and five made up the final sample. It is considered, in general, that the results resulting from the training carried out were satisfactory, which shows the importance of a permanent training program for the nursing team in Intensive Care. ***Conclusion:*** it can be said that, although there are permanent education actions in the Intensive Care Unit, this is a policy that still needs to be strengthened and consolidated in Brazilian hospitals, since, in this study, a small number of articles related to the theme, which responds, in part, to the assumptions of the authors regarding this integrative review. ***Descriptors***: Teaching; Continuing Education, Nursing; Intensive Care; Methodology; Hospitals.

RESUMO

Objetivo: analisar na literatura científica como tem sido desenvolvida a educação permanente da equipe de enfermagem no Centro de Tratamento Intensivo. ***Método:*** trata-se de um estudo bibliográfico, descritivo, tipo revisão integrativa em que se buscou por artigos entre 2007 a 2017 no idioma português, nas bases de dados, LILACS, MEDLINE, BDENF e na Biblioteca Virtual de Saúde. Realizou-se a análise descritiva dos resultados a partir dos dados existentes na figura síntese dos artigos, com respaldo na literatura científica. ***Resultados:*** encontraram-se 583 artigos e cinco compuseram a amostra final. Considera-se, de modo geral, que os resultados decorrentes das capacitações realizadas foram satisfatórios, o que mostra a importância de um programa permanente de capacitação da equipe de enfermagem na Terapia Intensiva. ***Conclusão:*** pode-se dizer que, apesar de existirem ações de educação permanente no Centro de Terapia Intensiva, essa é uma política que ainda precisa se fortalecer e se consolidar nos hospitais brasileiros, visto que, neste estudo, encontrou-se um número reduzido de artigos relacionados ao tema, o que responde, em parte, aos pressupostos das autoras relativos a esta revisão integrativa. ***Descritores*:** Ensino; Educação Continuada; Enfermagem; Terapia Intensiva; Metodologia; Hospitais.

RESUMEN

Objetivo: analizar la literatura científica tal como se ha desarrollado la educación permanente del equipo de enfermería en el Centro de Cuidados Intensivos. ***Método:*** se trata de un estudio de tipo de revisión bibliográfica, descriptiva e integradora que buscó artículos entre 2007 y 2017 en portugués, en las bases de datos, LILACS, MEDLINE, BDENF y en la Biblioteca Virtual en Salud. Se realizó un análisis descriptivo de los resultados con base en los datos existentes en la figura de síntesis de los artículos, respaldados por la literatura científica. ***Resultados:*** se encontraron 583 artículos y cinco constituyeron la muestra final. Se considera, en general, que los resultados resultantes de la capacitación realizada fueron satisfactorios, lo que demuestra la importancia de un programa de capacitación permanente para el equipo de enfermería en Cuidados Intensivos. ***Conclusión:*** se puede decir que, aunque existen acciones de educación permanente en el Centro de Cuidados Intensivos, esta es una política que aún debe fortalecerse y consolidarse en los hospitales brasileños, ya que, en este estudio, se encontró un pequeño número de artículos relacionados con el tema, que responde, en parte, a los supuestos de los autores con respecto a esta revisión integradora. ***Descriptores***: Enseñanza; Educación continuada; Enfermería; Terapia intensiva; Metodología; Hospitales.

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INTRODUCTION

It is known that the transformations that are taking place in contemporary society, especially with the advancement of information, communication and digital technologies, have demanded constant updates from their workers and their professional practices from health services. It is understood that these new technologies have an impact on health organizations, in various professions and in work processes, mainly in the hospital area.

In this context, the Intensive Care Unit (ICU) stands out, for serving critical and highly complex patients, as a place that requires specific knowledge and high technology equipment, which characterizes it as a scenario of constant innovations. Thus, the need to update professionals in this area and the search for a worker profile that increasingly appropriates the current technologies in health services is enhanced, requiring new professional competencies and skills from the Nursing team.[1]

It is understood, in Nursing, in addition to universities and high schools, that the health service has a fundamental role in the development of professional capacity, contributing to the training of workers. In this perspective, two types of education in health work are described: continuing education and permanent education.[2]

Continuing education is defined as a process of acquiring technical and scientific information by the worker that includes planned learning experiences that lead to an improvement in attitude, skills and knowledge, through formal schooling and work experiences at the institutional level or outside, offering a chance for constant professional development and training.[3] Thus, it is pointed out that this modality involves teaching activities after graduation/technical training and has a defined duration, such as, for example, postgraduate courses, refresher courses, among others.

It is noted that continuing education provides workers with the acquisition of new knowledge, achieving their goals in relation to a given reality and improving professional performance, since the worker develops competences and skills, adding what has lagged in the course of his academic training. Therefore, it appears that this type of education is an important component in the intellectual development of professionals in health services.[4-5]

Another type of education at work is understood, permanent education, as a set of educational actions based on the problematization of the health work process, which aim to transform the organization of work and professional practices, having as reference the health needs of individuals and populations, the reorganization of the work process and social control.[6]

It is known that permanent education promotes the holistic development of the professional, taking advantage of the events in the work environment in which he is inserted to improve and perfect his knowledge.[7] It should also be noted that, in Nursing, this type of education at work can enable the team to update the techniques, procedures and skills to work with new technologies.[5]

It is noteworthy that permanent health education, as a pedagogical guideline, became public policy in the health field through Ordinance GM/MS nº 198/2004, that instituted the National Permanent Health Education Policy (NPHEP) as a training and development strategy for health workers, in view of interdisciplinarity, the integrality of health actions, the commitment to the work process and the community, as well as the improvement of interpersonal relationships in the work environment.[6,8]

Despite the institutionalization of the NPHEP, it is evident in the daily work, the difficulty of Nursing professionals, mainly in the Intensive Care Units, in participating in training in the service, due to several factors, such as the high demand for work, shortage of personnel, the nature and the work process itself, which ends up making it difficult to assimilate new technologies and keep up with rapid changes and the growing advance of scientific knowledge.

In addition, it is noted that, in general, investment in worker development is still deficient in health organizations. It appears that the moments of permanent education that the services offer are still addressed through traditional teaching strategies, based on the mere transmission of knowledge in which, in most cases, the teams do not actively participate in their teaching-learning process.

It is emphasized that the growing scientific and technological advances in the ICU and the guidelines of the NPHEP do UHS require constant training at work, with the use of methodologies that accompany these transformations and enable the critical and reflective training of Nursing professionals.

It is suggested, therefore, that active methodologies can be an interesting alternative in the teaching-learning process, as they enable changes in traditional methods, in which the educator ceases to be the holder of knowledge, and provide the student with the initiative with a more open teaching, with collective participation, facilitating the exchange of knowledge and their learning.[9]

> *It is evaluated that the active methodologies are possible strategies for the formation of critical-reflective professionals, that is, co-responsible for the construction of their own learning*

> *process, from the observation of the social reality, understanding of the problem through theoretical-scientific basis and survey of hypotheses for solving the identified problems*.[9:2]

It is perceived, in this scenario and in the daily care, the need for nurses to be more engaged in the teaching-learning processes in permanent education, in order to promote their development and that of their team, to monitor changes and intervene in the work process, finding effective solutions to everyday problems. It is observed, therefore, that the professional becomes prepared and competent to provide quality care and risk-free, especially to critical patients.

In view of these considerations, the guiding questions of this study were established: "How does the process of permanent education of the nursing team at the ICU occur?" and "Which themes are most worked on and which teaching strategies are used?"

OBJECTIVE

- To analyze in the scientific literature how the continuing education of the nursing team at the Intensive Care Unit has been developed.

METHOD

This is a bibliographic, descriptive, integrative review type on permanent education in Intensive Care. It is pointed out that the integrative review consists of a method that enables the knowledge process, being the most abundant methodological approach on reviews.[10]

Integrative review is also known as a broad study of the literature that obtains a deep understanding of a given subject based on previous studies.[11] It is noted that this type of review contributes to the construction of knowledge in the field of Nursing, which supports the performance of work with quality, since it makes scientific work accessible quickly in the dissemination of knowledge, in addition to promoting “methodological rigor and clarity in the presentation of results”.[11:760]

It is understood that the methodological rigor enables the “reader to identify the characteristics of the analyzed studies and offer subsidies for the advancement of Nursing”,[12:435] being analyzed systematically in relation to the proposed objectives. The six-step integrative review was described.[11]

First step: elaboration of the guiding question

The identification of the theme and the guiding question of the research was defined as the first stage, being a very important phase of the review process, which must be done in a clear, specific way and related to the knowledge already acquired by the researcher on the studied topic.[10]

The authors developed the following guiding questions for this integrative review: "How does the permanent education process of the Nursing team at the ICU occur?" and "Which themes are most worked on and which teaching strategies are used?"

Second step: sampling or literature search

This stage of the research refers to the search in the literature for scientific production related to the object of study to establish the sampling of the investigation. It should be noted that this literature search must be documented, including the databases, exclusion and inclusion criteria, as well as the keywords and search strategies used.[12]

In order to carry out this integrative review, firstly, the specific terminology of the descriptors and keywords, through the Health Sciences Descriptors (DeCS), from which the following descriptors related to the researched subject were extracted: “Continuing Education”, “Nursing” and “Intensive Care”.

For the elaboration of the search strategy, the descriptors were grouped in two sets: in the first, there was the union of terms related to continuing education / professional training through the Boolean operator OR; in the second, the same occurred with the terms intensive care unit, intensive care units and critical care. In order to relate the descriptors of the two sets, the AND operator.

The inclusion criteria were: articles available in full; in Portuguese; published from 2007 to 2017, in Brazil. Theses, dissertations, incomplete papers, articles in a foreign language, studies outside the national territory, articles that do not directly involve the study under analysis, books, book chapters and duplicate articles were excluded.

It is pointed out that the Virtual Health Library (VHL) enabled the search for the material to be searched, in the following databases: Latin American Health Sciences Literature of Latin America and the Caribbean (LILACS); Medical Literature Analysis and Retrieval System Online (MEDLINE) and Nursing Database (BDENF).

In order to begin the work of selecting the articles, firstly, read their titles, selecting those that met the theme. Then, a critical reading of the abstracts was performed, selecting the articles that, in principle, met all the inclusion criteria.

From the complete and careful reading of each article, those who are included in the topic under study were chosen, using an instrument to synthesize the information necessary for the research.

Third step: categorization of studies and data collection

The third stage of the research was composed by defining the information to be extracted from the selected studies. At this stage, information should be organized in a clear way, creating a database that is easily accessible and managed by the researcher.[11]

It is recommended that the elaborated instrument allows the data to be extracted in a relevant and complete way, reducing errors in the transcription and ensuring the accuracy of the information collected.[10] In this way, the selected articles were organized, forming a database of easy access and management.

Fourth step: critical analysis of the included studies

This stage refers to the analysis of the studies included in the research, in which the researcher critically analyzes whether the criteria are authentic, the importance of the information extracted and the methodological quality.[12]

It is pointed out, at this stage, that the reviewer should evaluate the results obtained impartially, with a critical analysis, looking for explanations in different studies for the variations in the results found in the research.[11] The data was analyzed in a descriptive way, based on the existing data in the synthesis figure of the articles, supported by the scientific literature.

Fifth step: discussion of results

It is noted that the fifth stage consists of the interpretation of the data found. This is the phase of discussion of the main results found in the research: "The reviewer is based on the results of the critical evaluation of the studies, including making the comparison with theoretical knowledge and identifying conclusions".[11:762]

The results were interpreted and compiled, comparing them with the scientific literature, identifying possible gaps and determining priorities for future studies.

Sixth step: presentation of the integrative review

It should be noted that this step consists of interpreting the results found. It is stated that the review must be clear and complete to allow the reader to critically evaluate the results and must contain relevant and detailed information, based on contextualized methodologies, without omitting any related evidence.[10]

At this stage, the main results shown in the analysis of the included articles were presented. Optou-se, como modo de apresentação dos resultados, pela descrição para a possível comparação entre todos os estudos selecionados. The flowchart of the methodological path is shown below (Figure 1).

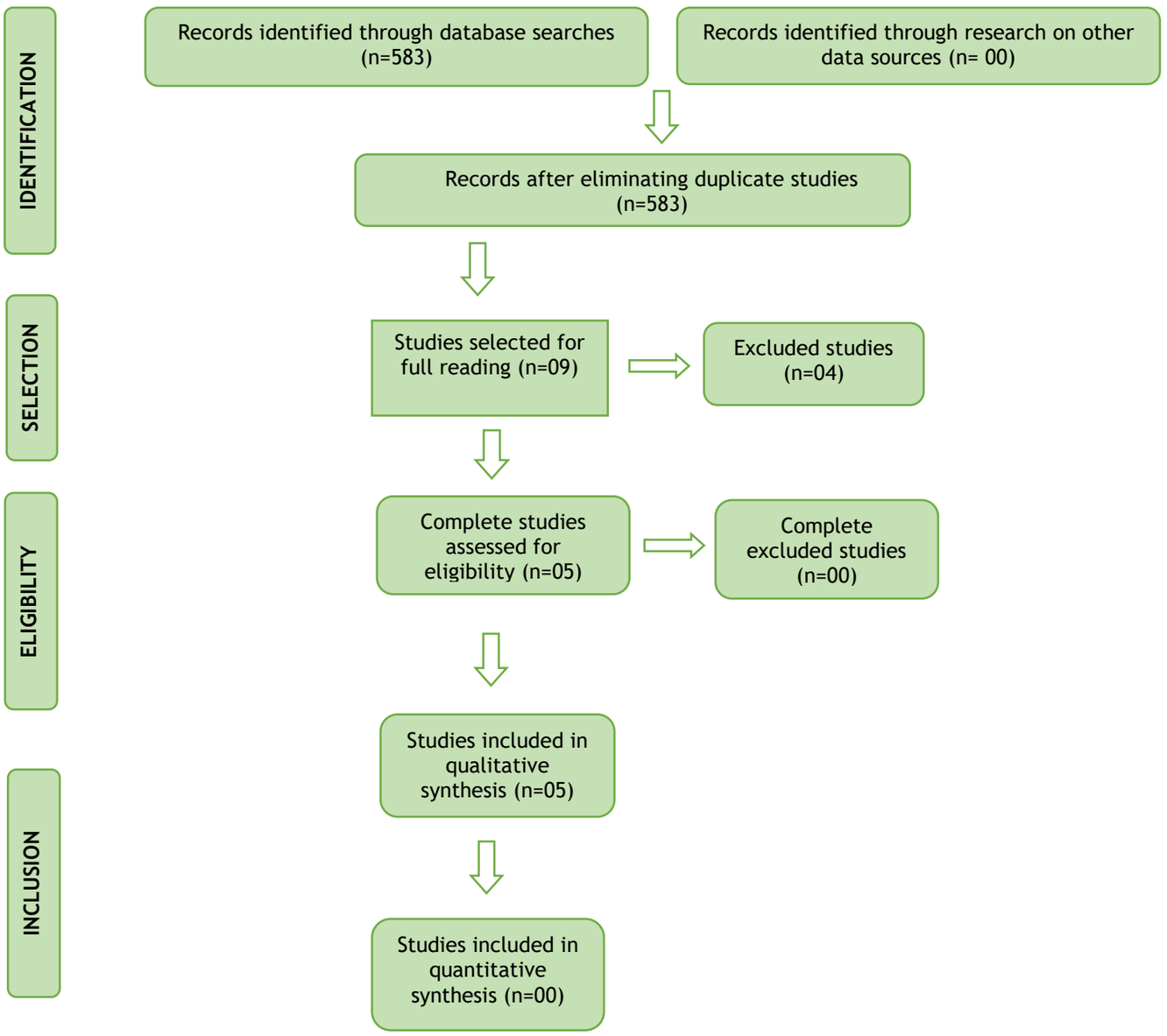

Figure 1. Flowchart of study selection adapted from Preferred Reporting Items for Systematic Reviews and Meta-Analyzes (PRISMA 2009). Belo Horizonte (MG), Brazil, 2020.

RESULTS

Figure 2 shows the selected articles, with their respective titles, the journals in which they were published, year of publication, place and type of study.

A total of 583 articles were found, 326 in the LILACS database, 151 in the BDENF and 106 articles in the MEDLINE. The titles were read and the inclusion and exclusion criteria were applied, resulting in 22 articles (ten, from BDENF; 12, from LILACS and zero from MEDLINE). After reading the abstracts, the number of articles was reduced to nine, (four, from LILACS and five, from BDENF), which were thoroughly read in full, highlighting, for the final sample, three articles from the LILACS database and two from BDENF, totaling five studies.

It appears that three studies were carried out in the State of Paraná, one in Rio de Janeiro and one in Rio Grande do Sul. It is observed that the year of publication varied from 2007 to 2017, with article two being the most recent, published in 2017.

The following types of studies were identified: non-randomized intervention study; exploratory descriptive research with a quantitative approach; experimental study and quantitative method. The experimental study was used by two researchers, in articles five and three. The variety of journals in which the studies were published is highlighted: Mineira Nursing Journals (REME), Brazilian Journal of Nursing (REBEN), Brazilian Journal of Intensive Care, Ana Nery School of Nursing (EEAN) and Brazilian Archives of Health Sciences (ABCS).

Author	Year	Country	Type of study
Castellões, Silva	2007	Brazil	Quantitative
Duarte, Matos, Tozo, Toso, Tomiasi, Duarte	2012	Brazil	Non-randomized intervention
Lima, Fleck, Borges, Condessa, Vieira	2013	Brazil	Quasi-experimental
Olkoski, Assis	2016	Brazil	Quantitative, descriptive, exploratory
Mansano, Belei, Vinci, Melo, Cardoso, Garcia, Carrilho et al.	2017	Brazil	Experimental, of before and after type

Figure 2. Results found in studies according to the author, year of publication, country and type of study. Belo Horizonte (MG), Brazil, 2018

Figure 3 shows a summary of the selected articles, highlighting the theme of the training carried out, teaching strategies used, didactic material, target audience, workload, training of facilitators, the form of evaluation and the results achieved.

Article code	Theme	Teaching strategy/didactic material	Target Audience	Workload	Who presented it	Training evaluation form	Results
1	Accidental Extubation	Posters inviting the team to participate in the training. A debate was held using, as an instrument, a guide that addressed the moments of accidental extubation.	ICU Nursing Team.	Two hours on each team.	Researcher.	Questionaire.	A positive result was observed in all questions, with greater relevance in those that refer to knowledge about pneumonia related to mechanical ventilation and what to do before going down the head of the bed.
2	Noises in the Intensive Care Unit (ICU)	Expository classes and simulations of the stressful and noisy environment of the ICU. Distribution of educational material such as folders and posters.	Doctors, nurses, Nursing technicians, janitors, secretary and nutritionist.	It was not described in the article.	Academics and speech therapy professor and ICU assistant physician.	A sound evaluation and reassessment were carried out within the ICU.	In general, there was a reduction in sound levels after the educational interventio n, despite staying at 40 bB, which still exceeds the level established by the WHO, which is below 35 dB.
3	Tracheobro nchial aspiration techniques	Expository classes with audiovisual resources and step-by-step demonstration of the tracheobronchial aspiration technique. Distribution of teaching material with the tracheobronchial aspiration technique.	Nurses, nursing technicians, nursing assistants and physiotherapi sts.	Two hours.	Physiotherap ists and physiotherap y students.	Data collection instrument before and after educational intervention.	After the educational interventio n, the tracheobro nchial aspiration technique improved in several items: post-aspiration hand hygiene;

							assessment of pre-aspiration vital signs; use of PPE; explanation of the technique to the patient and pre-oxygenation.
4	Pressure ulcer	Campaign publicizing the issue in the hospital's internal bulletin, face-to-face invitation to staff, posters, folders and illustrative banner with preventive measures in the elevator hall. Discussion of the theme with the teams.	Nurses, Nursing technicians and Nursing assistants.	Two-hour meeting.	Researcher.	The pre- and post-educational campaign evaluation using a data collection instrument.	There was an improvement in adherence to preventive measures after training. Only the items pressure-free ears and adequate fixation of catheters and drains registered low adherence.
5	Prevention of pneumonia associated with mechanical ventilation	Discussion on the theme based on the training script and illustrative posters.	Doctors, Nursing, Physiotherapy, undergraduate and graduate students.	Within the team's working hours. No workload was reported.	Researcher.	Post-intervention visits to assess participants' behavior after training.	Educational action had positive effects in adhering to the recommendations for maintaining high decubitus to prevent pneumonia related to mechanical ventilation.

Figure 3. Presentation of the synthesis of the articles included in the integrative review. Belo Horizonte (MG), Brazil, 2020.

It is pointed out that study one aimed to present the results of the training of the Nursing team to prevent accidental extubation related to nursing care associated with four moments: bathing in bed; transportation of the critical patient; change of position and change of fixation of the ventilator device. It appears that the study took place in the ICU of the Procardia Hospital, in the city of Rio de Janeiro, with a capacity for 15 beds. The quantitative method was used and the study had the participation of the entire nursing team. It is noted that the didactic material used for the training was a guide that addressed the moments of nursing care in which accidental extubations occurred. Before the training of the team, a test was applied with questions related to the guide on the same subject, however, with different degrees of difficulty for nurses and nursing technicians.

Disclosure took place one month before training began through posters inviting the ICU Nursing team to the educational proposal. It is observed that the training took place during the shift of each team, lasting two hours. In the first meeting, the pre-test was applied and then a debate was held according to the illustrative guide, prepared previously. After the debate, the post-test was carried out with the same questions as the pre-test, respecting the level of each professional category.

From the results found by the researchers in correcting the pre and post-test, a global average of 63.86% of the technicians who obtained a score of 7.4 in the pre-test was registered, increasing to

9.6 in the post-test. It is pointed out, in the nurses' assessment, that 93.33% obtained a score of 9.4 in the pre-test, which, in the post-test, increased to 9.9. It is noteworthy that, for nurses, the question that presented more than 10% of errors in the pre-test was related to the change of fixation of the ventilator device, reducing it to 3.3% of errors after training.

It should be noted that the technicians had 40% errors in the question about checking the fixation of the device before the patient's bath, and, after training, this value was reduced to 2.9% and, in the question of what to do before placing the headboard at 30 °, the second highest percentage of errors was presented in the pre-test (63%) and in the post-test (14%).

It is registered, in the question about the items that must be checked to avoid pneumonia associated with mechanical ventilation, that 23% of errors were obtained in the pre-test and, in the post-test, no professional was wrong. It appears that the question regarding the definition of pneumonia associated with mechanical ventilation had a percentage of errors of 71% in the pre-test and, in the post-test, the value was 14% in both professional categories. In the question of what to do before descending the headboard, 63% of errors were calculated in the pretest, and, in the post-test, 23%, also in both professional categories.

It is emphasized, although there is a reduction in the percentage of errors in the post-test in the questions about the definition of pneumonia and the actions related to the position of the head of the bed, that the facilitators understood that these are crucial themes to perform the assistance of Nursing. Thus, it was decided to carry out a new training focused only on these two issues, justified by the fact that pneumonia associated with mechanical ventilation is used as a marker to assess the quality of care provided and the occurrence of accidental extubation. When applying the new test after this training, levels below 10% of errors were detected.

It is identified that study two aimed to verify the level of sound pressure within a general ICU that serves adult and pediatric patients. Educational intervention was carried out at different times to assess its impact on the team. This study is classified as an intervention study, not randomized, being carried out in a private university hospital in the city of Cascavel, in the State of Paraná, which has, on average, 12 fixed professionals in the sector in each shift, including doctors, nurses, Nursing technicians and physiotherapist.

The work was carried out in stages, and in the first stage, noise levels were collected inside the ICU by a previously trained Speech Therapy student. It is detailed, in order to preserve the professionals' routine, without interfering in the collection result, that only the chief physician and nursing chief were aware of the study. The other professionals were informed that it was a procedure for collecting clinical data. Data was collected at stipulated times in three time intervals: from 11 am to 11:29 am; from 12:45 pm to 1:14 pm and from 11:00 pm to 11:29 pm, daily, for seven days. It appears that the researcher used a decibel meter, which was activated at the patient's bedside to note the highest values of the noise presented. A random rotation of the beds was performed each day, and the bed could be repeated.

The second stage started one week after the initial collection. An educational intervention was carried out jointly by the academics, teacher and the ICU assistant physician, with the professionals who worked in the sector. Expository classes were given, in addition to the distribution of educational materials, such as folders and posters, being addressed issues about what noise is, the intensity of noise recommended for hospitals, possible changes that can cause in the patient and the team and the ways to soften noise. A simulation of the stressful and noisy environment of the ICU was also carried out, in which the students themselves acted as patients. Posters were posted in the ICU environment on the importance of noise and its consequences. This stage was developed for two weeks.

In the third stage, the sound pressure levels were measured again by the same researcher and with the same rotation between the beds. It is observed that the researcher endeavored to maintain confidentiality; however, due to the educational action carried out, her presence was identified by the team and attributed to a “data collection related to noise”. The participation of 35 professionals in the lecture classes was registered, with a participation of 30.5% of the Nursing team and 38.9% of doctors. Brief meetings were organized to involve all ICU professionals to explain the content and distribution of folders.

According to study two, it was revealed that it was at night that a lower level of noise was obtained, both in the pre and post educational intervention. It appears that the loudest times were the visits of family members and the team’s shift change. It should be noted that lunch time was the moment when the most important noise reduction was identified after training, followed by the night period. The highest level of noise was generated by the team and not by the ICU equipment.

The objective of study three is to evaluate the effectiveness of an educational intervention in the adherence of health professionals who perform the tracheobronchial aspiration technique in ICU patients. The study was carried out in the surgical clinic ICU of Hospital São Vicente de Paula, in

patients over 18 years old, in the city of Passo Fundo, in Rio Grande do Sul. The quasi-experimental study research method was used. The instrument developed to collect data from the global guidelines of the Disease Control Center on the tracheobronchial aspiration technique was developed. The following items were evaluated: vital signs before and after aspiration; handwashing; use of Personal Protective Equipment (PPE); asepsis care with the material used in the procedure; be careful with opening the packages; explanation of the procedure to the patient; performing circular movements during the catheter removal procedure; act of protecting the catheter after the procedure; use of distilled water to wash the connection latex and pre-oxygenation.

Theoretical and practical training was carried out for professionals working in the ICU, and, in the theoretical part, expository classes were given using audiovisual resources. In addition, a practical intervention was carried out by demonstrating the steps of the tracheobronchial aspiration technique. It is observed, at the end of the educational action, that each professional received didactic material about the procedure in focus. It is pointed out that the duration of the educational action was two hours, covering all items of the data collection instrument.

The evaluation was carried out after four weeks of the educational action, using the same data collection instrument as the pre-evaluation, by the same professionals. It is evaluated that the result of the intervention, in general, was positive, since a significant increase in the use of PPE was detected, the better adherence to the care related to the technique of opening the packages, the correct use of the sterile glove in the dominant hand, care not to contaminate the material, the act of protecting the catheter after the procedure and the use of distilled water to wash the connection latex. Despite the positive results in the aforementioned items, it is warned that, subsequently, the educational intervention did not make progress with regard to the assessment of vital signs after aspiration and hand hygiene before aspirating the patient.

Note that study four aimed to assess the effectiveness of applying pressure ulcer prevention measures with regard to the team's adherence to the guidelines worked on, being carried out in the Intensive and Semi-Intensive Care Units of a teaching hospital in the city of Curitiba, in the State of Paraná. The exploratory method was used in the research, with a quantitative approach.

It is known that the training carried out in this study was an educational campaign disseminated through the hospital's newsletter, which contained an article on the problem of pressure ulcers and the main preventive measures. This newsletter was widely distributed, in addition to an invitation for all teams to participate in the official opening of the educational campaign, in which a two-hour scientific meeting was held. An illustrative banner with preventive measures in the hospital elevator halls was also exposed. In the different work shifts, on-site training was carried out with discussion based on the content of an illustrative folder that was distributed with the preventive measures of pressure ulcers, in addition to fixing posters in the sectors with all the measures discussed.

For the evaluation of the applied measures, a checklist-type instrument was developed based on the main measures recommended by the European Pressure Ulcer Advisory Panel (EPUAP), with some adjustments to the reality of the institution. The measures evaluated in the instrument are listed: repositioning the patient within three hours; elevation of the headboard with an angle less than 45°; lateralization of the patient with an angle less than 90°; elevation of heels with support on the calves; use of foam pillow over the head; use of special mattresses (static or dynamic air); pressure-free ears on the pillow or orotracheal tube fixation laces; oxygen mask and correct fixation of catheters and drains. The evaluation was done once in each work shift in the sectors, in the pre and post educational campaign periods. It appears that the researcher marked the questions on the checklist according to the observations made in occupied beds.

It appears that the results found in the study showed that the item on repositioning in a three-hour interval obtained, in the pre-campaign, 31.5% adherence and, in the post-campaign, this value increased to 50.4%. It was calculated, in relation to the assessment of lateralization with an angle less than 90°, percentages, in the pre-campaign, of 56.5% and, in the post-campaign, of 93.5%. In the item on headland elevation below 45°, adhesions of 79.4% were registered in the pre-campaign and 100% in the post-campaign. In the item referring to the elevation of the heel with support on the calf, 7.9% adherence in the pre-campaign and 22.4% in the post-campaign. It should be noted that the use of special pillows and mattresses did not show a significant increase in the percentage. It is noted that the item pressure-free ears, in the pre-campaign, had a result of 66.9% and, in the post-campaign, of 57.6% and the fixation of drain and catheters obtained a percentage of 27.6 %, in the pre-campaign and, in the post-campaign, 27.2% adherence. In study four, it was demonstrated that a pressure injury prevention campaign, associated with other actions, such as discussion with teams in the work sectors, can constitute effective strategies to

encourage the team to adhere to the recommended measures.

Study five was carried out in the Adult ICU at the State University Hospital of Londrina, in the State of Paraná, being of a public and large nature. The objective was to carry out an educational action to maintain the elevated decubitus for 24 hours, as a preventive measure of pulmonary infection in the ICU, and to evaluate the impact of the educational action on the frequency of pneumonia associated with mechanical ventilation. The type of quasi-experimental study was chosen by the researchers. The sample included all professionals with a minimum experience of 12 months who were on site at the time of training.

In the pre-intervention study (during ten days), daily visits were made in the three shifts (morning, afternoon and evening), these being drawn to ensure a uniform assessment. Data on the decubitus angle were collected using a 0º to 180º protractor with ruler. The use of a nasogastric tube, the administration of diets and the use of pillows or other equivalent items in the head region were recorded.

It is pointed out that the training carried out with professionals who work in the ICU followed a pre-elaborated script with relevant points about maintaining high decubitus and care before, during and after the administration of enteral diet. A discussion was promoted with the professionals, individually and during working hours, based on a pre-established script, in addition to the use of posters with figures demonstrating the differences in the rates of gastric content aspiration for patients in decubitus lying down and between sitting and between each position, highlighting the correct 30° angle. These posters were subsequently affixed to the patients' bedside, in order to alert the professional to the correct techniques, being removed only in the third month.

It appears that the results found in this research show an increase in the mean angle of the headland between the pre-intervention period (27.85%) and post-intervention period (30.71%). It was concluded, by the authors of the article, that the educational action had positive effects in adhering to the recommendations for maintaining high decubitus for the prevention of pneumonia related to mechanical ventilation, but that they were transitory, since, after removing the posters with images of the relationship between the patient's position and pulmonary aspiration, there was a decrease in adherence to the correct angle of decubitus.

DISCUSSION

It is pointed out that this study has five articles that met the inclusion and exclusion criteria proposed in this integrative review, which shows a small number of studies published with the theme that deals with permanent education for the Nursing team in Intensive Care.

It is noteworthy that all training developed in the articles identified in this research had as target audience the Nursing team, in addition to other professionals, since Nursing is the largest health working class and that at the ICU provides care to patients 24 hours a day. It is known that Nurses accompany the patient and transmit a variety of information to other professionals, playing an important role in the process and continuity of care, which justifies the importance of constant training for this working class.

It is assessed that the themes addressed in the training sessions carried out were varied and of great relevance. Articles one, four and five were highlighted, which addressed issues related to adverse events, such as the prevention of pneumonia related to mechanical ventilation, pressure ulcers and accidental extubation, situations to which the patient is subject when admitted to the ICU.

It is considered that the studies found in the literature show that taking care of patient safety is one of the main responsibilities of Nursing, being a subject addressed by WHO and that requires, from institutions, this marker of quality of health services. Thus, it is observed that the themes developed were of fundamental importance for the Nursing team to provide quality and risk-free care.[13]

In Intensive Care, it is understood that patients are considered at risk for adverse events, which requires professionals to perform complex care, attention, agility and know how to deal with technologies,[14] which demonstrates the importance and the need to always carry out training in this sector. It should be noted that the ICU is a highly complex hospital sector that requires continuity of service and the dedication of professionals to transform the environment in which they work.[15]

It is pointed out that the themes about the technique of tracheobronchial aspiration and aspiration of patients in the ICU are relevant to the training of the Nursing team, as they are routine techniques in patients on mechanical ventilation. These are procedures that offer serious risks to the patient if they are not performed correctly, for example, nosocomial pneumonia.[16]

It is known that noise in Intensive Care was the theme addressed in article two, which, even though it is not directly linked to nursing procedures, proved to be an important issue to be studied and used as a team training theme, since, in the study itself, it was evidenced that the noise levels between 55 and 65 decibels can produce

nervous excitations and stress, leaving the patient more sensitive to pain, and noise above 65 decibels can lead the person to the infarction.

It is highlighted in the literature that:

> *Elevated noise levels can cause behavioral disturbances, resulting in physiological responses to stress in hospitalized patients, and that the sound pressure intensity in 65 decibels can affect the hypothalamus and pituitary, increasing the levels of adrenaline, norepinephrine and corticosteroids, as well how to cause increased blood pressure, changes in heart rate and peripheral vasoconstriction.*[17:554]

It is emphasized, therefore, the importance of professionals being aware of the level of noise they produce in the work environment, especially when it comes to the ICU, in which patients are in an extremely fragile situation. It is necessary to train the team not only to perform procedures with quality and safety, but also to take care of the therapeutic environment, in order to further promote the quality of care and contribute to the recovery of patients, providing a peaceful and safe.

It is evaluated, in general, that the themes addressed in the analyzed studies had a fundamental role for the permanent education of the Nursing team in Intensive Care, increasingly qualifying the nursing care provided by professionals who are constantly beside the patient.

It appears that the teaching strategies chosen to carry out the training of intensive care professionals were diverse, covering debates, expository classes, lectures, distribution and exhibition of educational material (posters, banners and illustrative folders), practical demonstrations and simulations, with researchers / facilitators using more than one strategy to engage the target audience.

Thus, it is observed that the facilitators were not restricted, for example, to the expository class, but used creativity when mixing teaching strategies and techniques, using didactic materials and simulations, in order to provide experiences and experiences in the teaching-learning process of professionals, which can contribute to a more active participation of workers in the training and updating processes in permanent education.

It is considered important to know and combine the most diverse ways to improve interest on the topic presented and facilitate learning, thus reaching the expected objective.[18] It is also emphasized the importance of the educator choosing the teaching strategies that he will use in the learning process properly so that the student can interact and produce knowledge according to their individual experiences to interpret the information obtained.

It was identified that the debate and discussion of the theme occurred in three of the studies (one, four and five), offering the student the opportunity to express their opinions, clarify doubts and participate in a critical and reflective way when analyzing the issues addressed. It can be said that, in this context, the facilitators sought theoretical support in the pedagogy of problematization.

It is pointed out, in studies, that the educator Paulo Freire is one of the theorists who propose a problematizing education, in which the educator is not only the one who educates, but is the one who, while educating, seeks the transformation of reality, based on dialectics and the concept of praxis as fundamental elements for the relationship between theory and practice. It is suggested that people seek knowledge that can change themselves, others and the reality in which they are inserted through critical awareness of events.[19]

It is indicated that another teaching strategy used was the expository classes present in the training analyzed in articles two and three. Other teaching techniques were associated with this teaching strategy, such as simulation (article two) and the practical demonstration of a procedure (article three), in addition to the distribution of educational materials that were used in both training courses. In these researches, the need to articulate theory and practice was demonstrated, which makes it possible for the worker to reflect on the action, analyzing their professional practice based on the simulation or demonstration of their conduct based on theoretical knowledge and in professional experiences.

Furthermore, the health area is characterized as an uncertain environment where interpersonal relationships, care and the advancement of knowledge and technologies are present. It is understood, in this perspective, that a teaching alternative that stands out in these environments are simulators, which, according to PAHO, are considered powerful tools in the training of health professionals, exactly because they analyze the behaviors and experiences of the professionals, since, despite the existing protocols, in most cases, there are no “ready-made recipes” for the situations that arise in the daily work.[20]

Thus, a new context is determined by the permanent education policy, in which the teacher is no longer the holder of knowledge, but rather the facilitator of the process, leading the student to have a critical and reflective view in the construction of the their knowledge inserted in the health services.[21] In this context, the use of active methodologies in the teaching-learning process becomes an important factor, since it allows the participation of all those involved,

generating reflections articulated to the work process.[22]

The poster, the banner and the illustrative folder stand out as the most used teaching materials in the training analyzed for the dissemination, explanation or demonstration of the contents, and in study one, the poster was affixed to the patient's bed, after training, to draw the team's attention to the main points to be observed during the procedure under study.

In this work, the importance of knowledge being learned, also visually and not only in textual form was emphasized. The constant need for continuing education and the use of different teaching techniques was reaffirmed, as posters with figures related to tracheal extubation prevention measures were effective only while they were accessible and close to the care provided. It was observed, however, that after the posters were removed from the patient's bedside, there was a reduction in adherence to these measures, showing that these materials are practical and easily accessible, which allows the worker to review training topics constantly and quickly consult the content whenever doubts arise.

It should be noted that the researched articles did not make it clear how the teaching materials used in the training courses were made. It is considered ideal that this type of didactic material is easy to understand and capable of causing changes in attitudes and skills development, enabling the student to acquire knowledge, in order to contribute to the construction of their autonomy and the exercise of decision-making, considering that their actions influence the qualification and organization of the work process.

It is recommended; therefore, by the Ministry of Health (MH), that the educational materials, used in the teaching-learning process, should be elaborated from the apprentices' experiences and that, from this context, they can build their own knowledge.[23]

In all articles analyzed, educational interventions were assessed through questionnaires, data collection instruments (forms and checklist), observation of professional practice and pre and post-tests, carrying out evaluations along the same lines before and after training. Thus, it is verified whether evaluations are a means of verifying whether changes have occurred and whether the teaching strategy used for the training was effective.

It is argued that the evaluation used by the facilitator / researcher must be impartial so as not to interfere with the results. It is added that the literature points to the evaluation:

> *As a primary function, the continuous search for improvement of the educational process, in order to build and support new proposals, reorient programs and, above all, consider the changes evidenced in the work process. In this perspective, information from educational programs is important for people management, especially for the continuous development and improvement of health care*.[24:777]

In general, it is evaluated that, in all articles, the results resulting from the training carried out were satisfactory, which shows the importance of a permanent training program for the Nursing team at the ICU, enabling professionals to follow the advancement of knowledge and innovation technologies, with a view to qualifying the care provided in a safe and risk-free manner for users and workers.

CONCLUSION

It is concluded that the articles analyzed showed that permanent education at the ICU aims to transform professional practice, based on problem solving and critical reflection of the process and work relationships, aiming to improve the quality of care and provide the multi-professional participation.

The topics addressed are considered relevant, as they deal with problems that occur in Intensive Care and that lead to adverse events, which can cause irreparable damage to patients, requiring constant updates of these and other topics that interfere in the organization and work process.

It is understood, to carry out the training at the ICU, that the facilitators adopted teaching strategies that seek, in most cases, to provide, to the student, their participation in the teaching-learning process, in a critical and reflective way. Some teaching techniques that aroused interest, curiosity and trust in professionals were used, such as, for example, simulation / practical demonstration, in addition to the use of illustrative teaching materials that attract the attention of students when viewing related figures and images to the content covered. It is pointed out, in general, that the results of the training were positive in all the studies analyzed.

It is pointed out that, despite the existence of permanent education actions at the ICU, this is a policy that still needs to be strengthened and consolidated in Brazilian hospitals, since, in this study, a small number of articles related to the theme were found, which responds in part to the assumptions of the authors to elaborate this integrative review.

It is noted that this research shows the need for permanent education programs not to be limited to the development of specific actions, but to seek to implement, in fact, the Permanent Health Education Policy established by the MH, that is, that problematize professional practice through the use of active methodologies that provide the worker to participate in the construction of their

teaching-learning process, developing critical and reflective thinking.

It is suggested, in view of the small number of publications on permanent education in the ICUs, the publication of research and experience reports on this theme, in order to really identify the effectiveness of the work of the permanent education centers and programs and the impact of educational actions carried out in the organization and in the work process, mainly in the hospital environment and at the ICU, where transformations occur at an accelerated rate, with constant advances in scientific knowledge and changes in technologies.

It is concluded that studying about permanent education made possible the acquisition of a different perspective on health institutions, opening new possibilities for the creation of projects to be worked with the Nursing team and other professionals of the ICU, in addition to showing the importance of having constant training for the nursing team in Intensive Care, using different teaching and learning strategies.

CONTRIBUTIONS

It is informed that all authors contributed equally in the design of the research project, collection, analysis and discussion of the data, as well as in the writing and critical review of the content with intellectual contribution and in the approval of the final version of the study.

CONFLICT OF INTERESTS

Nothing to declare.

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