



## REVISIONES

### Educational strategies for the prevention of incidents in intensive care units

Estratégias educativas para prevenção de incidentes em unidades intensivas  
Estrategias educativas para la prevención de incidentes en unidades intensivas

Daniella Cristina Julio Lima<sup>1</sup>  
Thayana Nascimento dos Santos<sup>1</sup>  
Fernanda Silva de Oliveira<sup>1</sup>  
Lidiana Fortunato Correa<sup>1</sup>  
Luana Ferreira de Almeida<sup>1</sup>  
Vanessa Galdino de Paula<sup>1</sup>

<sup>1</sup> State University of Rio de Janeiro. Brazil.

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#### ABSTRACT:

**Objective:** To map the educational strategies directed to health professionals for the prevention of incidents in intensive care units.

**Method:** Integrative review carried out between April and May 2021 in the databases: LILACS, MEDLINE, BDNF and CINAHL. Included studies published between 2016 and 2021 in English, Spanish and Portuguese full texts. Excluded abstracts, editorials, theses and dissertations. Used as descriptors: "health personnel", "continuing education", "medical error", "patient safety" and "intensive care units" with Boolean operator "AND" and "OR". The data were organized in a table from the journal, qualis, authors, year of publication, title and educational actions. The contents were compared and grouped by similarity.

**Results:** Educational actions such as training, protocols, classes with interactive discussions, targeted professional support, use of short text messages, videos and playful activity were identified.

**Conclusion:** There was a predominance of educational activities in the traditional way such as training, classes and videos with little interaction of the professional.

**Key words:** Patient Safety; Health Personnel; Continuing Education; Medical Error; Intensive Care Units.

#### RESUMO:

**Objetivo:** Mapear as estratégias educativas direcionadas aos profissionais de saúde para a prevenção de incidentes em unidades de terapia intensiva.

**Método:** Revisão integrativa realizada entre abril e maio de 2021 nas bases de dados: LILACS, MEDLINE, BDNF e CINAHL. Incluídos estudos publicados entre 2016 a 2021 nos idiomas inglês, espanhol e português com textos completos. Excluídos resumos, editoriais, teses e dissertações.

Utilizados como descritores: “pessoal de saúde”, “educação continuada”, “erro médico”, segurança do paciente” e “unidades de terapia intensiva” com operador booleano “AND” e “OR”. Os dados foram organizados em uma tabela a partir do periódico, qualis, autores, ano de publicação, título e ações educativas. Os conteúdos foram comparados e agrupados por similaridade.

**Resultados:** Foram identificadas ações educativas como treinamentos, protocolos, aulas com discussões interativas, apoio profissional direcionado, uso de mensagens de texto curtas, vídeos e atividade lúdica.

**Conclusão:** Observou-se predominância de atividades educativas da forma tradicional como treinamento, aulas e vídeos com pouca interação do profissional.

**Descritores:** Segurança do Paciente; Pessoal de Saúde; Educação Continuada; Erro Médico; Unidades de Terapia Intensiva.

## RESUMEN:

**Objetivo:** Mapear las estrategias educativas dirigidas a los profesionales de la salud para la prevención de incidentes en unidades de cuidados intensivos.

**Método:** Revisión integradora realizada entre abril y mayo de 2021 en las bases de datos: LILACS, MEDLINE, BDNF y CINAHL. Se incluyeron estudios publicados entre 2016 y 2021 en textos completos en inglés, español y portugués. Se excluyen resúmenes, editoriales, tesis y disertaciones. Utilizados como descriptores: "personal de salud", "educación continua", "error médico", "seguridad del paciente" y "unidades de cuidados intensivos" con operador booleano "AND" y "OR". Los datos se organizaron en una tabla de la revista, qualis, autores, año de publicación, título y acciones educativas. Los contenidos fueron comparados y agrupados por similitud.

**Resultados:** Se identificaron acciones educativas como capacitación, protocolos, clases con discusiones interactivas, apoyo profesional dirigido, uso de mensajes de texto cortos, videos y actividad lúdica.

**Conclusión:** Hubo un predominio de actividades educativas de la manera tradicional como capacitaciones, clases y videos con poca interacción del profesional.

**Palabras clave:** Seguridad del Paciente; Personal de Salud; Educación Continua; Error médico; Unidades de Cuidados Intensivos.

## INTRODUCTION

When considering quality in health and patient safety as fundamental aspects to guarantee more effective, efficient, egalitarian and harm-free care, it is necessary that health services promote actions in a transversal and multiprofessional way through evaluation strategies, control, monitoring and notification of incidents, with the objective of identifying failures and seeking actions that minimize such problems<sup>(1)</sup>.

In addition to that, errors associated with the techniques and procedures related to health care can psychosocially affect patients and their families, prolong hospitalization times and considerably increase hospital costs<sup>(2)</sup>.

With regard to the hospital institutions that provide health care, intensive Care Units (ICUs) stand out for being one of the environments most prone to the occurrence of adverse events (AEs). This fact is due to the peculiarity of the care and services provided in this sector, which has a complex technological arsenal, seeking to assist critically-ill patients<sup>(3)</sup>.

In Brazil, a cohort study conducted in an ICU showed that patients with AEs presented an increase in the mean hospitalization time and in mortality, when compared to those who did not had them. By associating the incident with the occurrence of death, it was estimated that the age and AE variables together increased the chance for death. In

addition to that, 32.4% of the patients presented some AE with an incidence of 9.4 events per 100 patients-day<sup>(4)</sup>.

In the same study, the adverse events identified were pressure injury (48.2%), failure in the use of medications/intravenous fluids (24.4%), healthcare-associated infections (15.7%), failures related to vascular catheters (5.3%) and in ventilatory management (4.6%), damage from handling urinary and gastric catheters (0.6%), hypoglycemia, and failure in medical equipment and in the installation and maintenance of medical equipment infrastructure (0.3%)<sup>(4)</sup>.

Another Brazilian study pointed out that the most common AEs related to Nursing practices were drug administration errors, surveillance errors (falls, loss of catheters, probes and drains, and unscheduled extubations), harms related to the patient's skin integrity and, lastly, events related to material resources<sup>(5)</sup>.

It is known that educational programs promote meaningful learning, knowledge innovation, patient safety, care quality, agility in daily procedures and sharing of acquired experiences.

In this way, the importance of involving the Nursing team in the actions developed by the institution's permanent education sector becomes increasingly evident, and especially encouraging nurses, who in a way play a leadership role, to be multipliers of this practice of sharing knowledge, experiences, reflections and questions in the daily exercise of their activities, thus creating an environment that promotes changes through the issues raised and the participation of all the actors involved<sup>(6)</sup>.

On the other hand, there is still certain weakness with regard to the educational strategies to promote actions aimed at patient safety and, consequently, to the reduction in of health incidents, which points to a reduced number of published papers with this theme focused on the Nursing team in intensive care units<sup>(7-9)</sup>.

Based on the problem presented, it is understood that through permanent and continuing education it is possible to achieve improvements in patient safety and, consequently, a reduction of incidents in the ICU<sup>(8)</sup>.

Thus, the justification of this study aims at increasing the health professionals' knowledge, with a focus on intensive care nurses, through updated searches in the national and international literature, regarding the educational strategies aimed at preventing incidents related to the care provided to critically-ill patients. The relevance of this research lies in the fact that it incorporates more knowledge to intensive care nurses, providing subsidies for a safe Nursing practice through care aimed at preventing adverse events and maintaining patient safety.

In this sense, the objective of this study was to map the educational strategies aimed at health professionals for the prevention of incidents in intensive care units.

## METHOD

This was an integrative review consisting of six stages, namely: identification of the topic and selection of the research hypothesis or question; definition of criteria for inclusion and exclusion of studies; definition of the diverse information to be extracted from the studies selected; evaluation of the studies included in the integrative review; interpretation of the results; and a stage for presenting the review and performing the knowledge synthesis<sup>(10)</sup>.

In the first stage, the PICo strategy was used, considering P (Problem/Population) – health professionals, I (Interest) – educational strategies for incident prevention, and Co (Context) – intensive care unit. From this, the research question defined was the following: “Which are the educational strategies aimed at health professionals to prevent incidents in intensive care units?”

Studies published from 2016 to 2021 in English, Spanish and Portuguese were included; and abstracts, editorials, theses and dissertations were excluded. Data collection was carried out between April and May 2021 by consulting the following databases: *Literatura Latino-Americana e do Caribe em Ciências da Saúde* (LILACS), Medical Literature Analysis and Retrieval System on-line (Medline), *Base de Dados Específica da Enfermagem* (BDENF) and Cumulative Index to Nursing and Allied Health Literature (CINAHL).

For the search, the Descriptors in Health Sciences (*Descritores em Ciências da Saúde*, DeCS) and those from the Medical Subject Headings (MeSH) were used, namely: “*peçoal de saúde*” (Health Personnel), “*educação continuada*” (Education, Continuing), “*erro médico*” (Medical Error), “*segurança do paciente*” (Patient Safety) and “*unidades de terapia intensiva*” (Intensive Care Units), associated through the Boolean operators “AND” and “OR”, as it is shown in Chart 1

**Chart 1 – Synthesis of the search strategy according to the descriptors. Rio de Janeiro, RJ, 2021.**

<b>PICo Strategy</b>	<b>P (Problem/ Population)</b>	<b>I (Intervention)</b>	<b>Co (Context)</b>
<b>PICo</b>	Health professionals	Educational strategies to prevent incidents	Intensive Care Unit
<b>DeCS</b>	<i>Pessoal de saúde</i>	<i>Educação continuada; erro médico; Segurança do paciente</i>	Intensive Care Units
<b>MeSH</b>	Health Personnel	Education, Continuing; Medical Error; Patient safety	Intensive Care Units

Source: Research data.

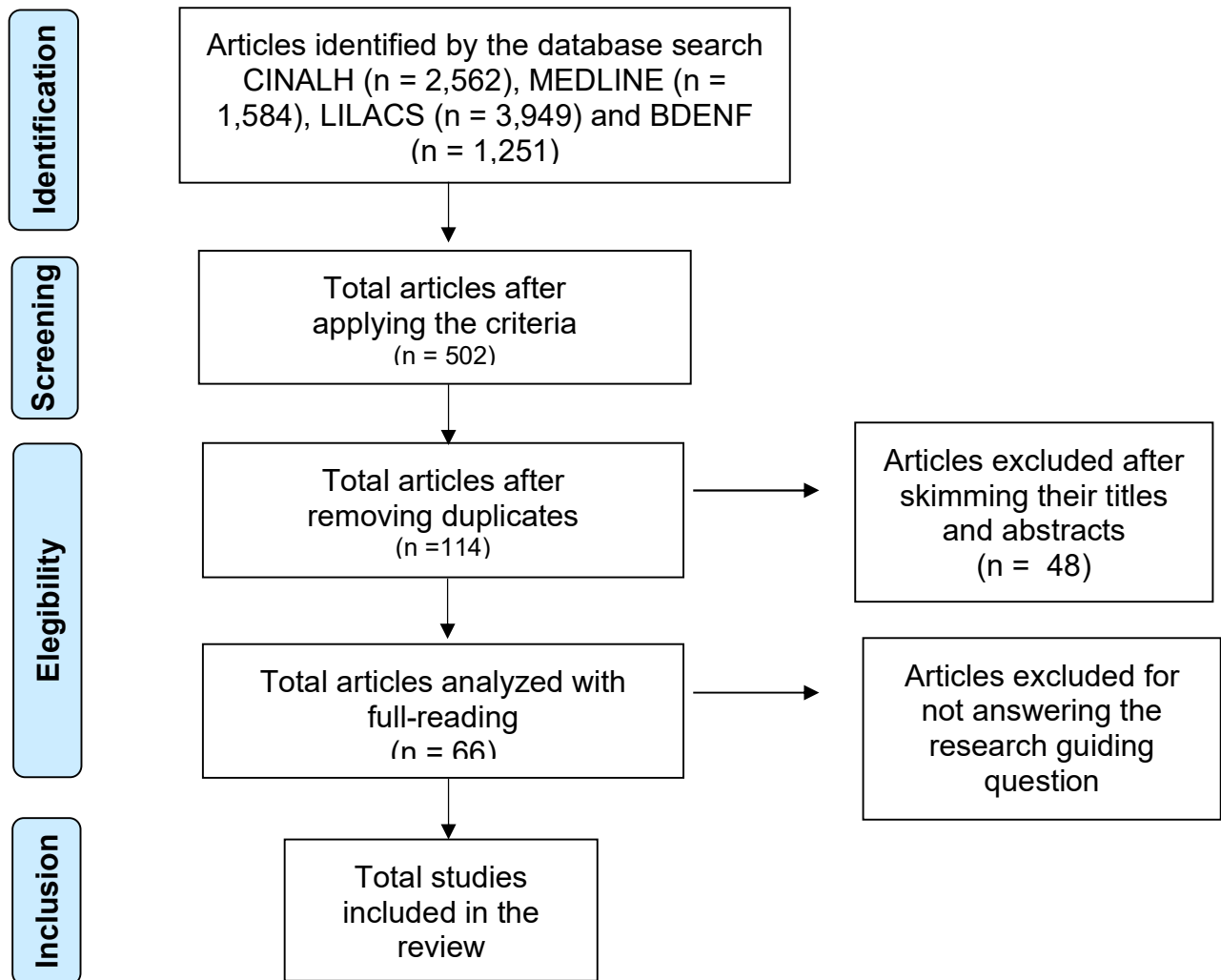
The data were organized, analyzed and interpreted in a summarized way, being arranged in a table with the following variables: journal, qualis, authors, year of publication, title and educational actions found in the studies.

Subsequently, the selected studies were characterized, extracting the educational actions carried out to prevent the adverse events found in each article. The contents were compared and grouped by similarity.

## RESULTS

A total of 9,346 articles were found in the searches in the databases, which, after applying the inclusion and exclusion criteria, yielded 11 articles, according to the PRISMA flowchart (Figure 1).

**Figure 1 – Flowchart of the selection process in the search for articles. Rio de Janeiro, RJ, 2021.**



The studies analyzed were published in 2019 (4 – 36%), 2017 (4 – 36%), 2018 (2 – 18%) and 2020 (1 – 9%). Publication in English predominated with nine (82%) articles, while two (18%) were published in Portuguese.

Most of the studies were quantitative (4 – 36%), followed by cohort (3 – 27%), quantitative-qualitative (2 – 18%), experimental (1 – 9%) and case-control (1 – 9%).

Educational actions aimed at preventing adverse events were identified, such as the following: an electronic medication management system with diverse information about medications to be administered and on how to manage adverse reactions, with the possibility of reducing medication errors and harms from adverse reactions; various protocols and bundles; face-to-face classes and Tele-education; videoconferences to teach classes on the subject matter directed to intensive care and to discuss clinical cases of patients; training on protocols; actions with posters and notices in the ICU and email messages to health professionals aiming to inform and remind about the adoption of protocols, bundles and instruments of the sector; educational interventions through brief text messages on their cell phones and playful activities to promote hand hygiene (Chart 2).

**Chart 2 – Distribution of the articles according to journal, qualis, authors, year of publication, title and educational activities found in the studies. Rio de Janeiro, RJ, 2021, n=11.**

<b>Journal/Qualis Authors/Year</b>	<b>Title</b>	<b>Educational actions</b>
<i>The Canadian Journal of Critical Care Nursing</i> A3 Santiago et al, 2020	<i>Intensive care unit nurse satisfaction with medication management before and after introduction of an electronic medication management system</i>	- Implementation of an electronic system; - Training sessions.
<i>Worldviews on Evidence Based Nursing</i> A1 Spooner; Aitken; Chaboyer, 2018	<i>Implementation of an evidence-based practice nursing handover tool in intensive care using the knowledge-to-action framework</i>	- Videos; - Training sessions; - Posters and email reminders.
<i>American Journal of Critical Care</i> A1 Smith and Grami, 2017	<i>Feasibility and effectiveness of a delirium prevention bundle in critically ill patients</i>	- Trainings; - Implementation of a bundle.
<i>Critical Care</i> A1 Kovacevic et al, 2019	<i>Impact of weekly case-based tele-education on quality of care in a limited resource medical intensive care unit</i>	- Tele-education; - Discussion of cases.

<i>The National Medical Journal of India</i> No qualis Mohan et al, 2019	<i>Decreasing medication errors in four intensive care units of a tertiary care teaching hospital in India using a sensitization programme</i>	- Training sessions; - Implementation of an error notification form.
<i>Critical-Care Nurses</i> No qualis Wanik et al, 2019	<i>Implementation of a Bowel Protocol to Improve Enteral Nutrition and Reduce Clostridium difficile Testing</i>	- Implementation of protocols, flowcharts and algorithm.
<i>The Journal of Continuing Education in Nursing</i> A1 Saffari et al, 2019	<i>An education-based text messaging program to improve nurses' knowledge, attitude, and practice related to nosocomial infections in intensive care settings</i>	- Brief text messages on their cell phones.
<i>Journal of Hospital Infection</i> A2 Musu et al, 2017	<i>Controlling catheter-related blood stream infections through a multi-centre educational programme for intensive</i>	- Training sessions; - Implementation of a bundle.
<i>Revista de Enfermagem Universidade Federal de Pernambuco online</i> B2 Ribeiro et al, 2017	<i>Estratégia lúdica para a melhoria de práticas de higienização das mãos entre os profissionais de saúde</i>	- Playful activities.
<i>ABCS Health Sciences</i> B3 Mansano et al, 2017	<i>Impacto de ação educativa na manutenção do decúbito elevado como medida preventiva de pneumonia associada à ventilação mecânica em unidade de terapia intensiva</i>	- Cards and posters; - Training sessions.
<i>International Journal of Health Care Quality</i> B1 Backman et al, 2018	<i>Implementation of a multimodal patient safety improvement program 'Safety LEAP' in intensive care units: A Cross-Case Study Analysis</i>	- Targeted professional support; - Implementation of an electronic system; - Training sessions.

Source: Research data.

Six categories were identified after a critical reading of the articles included in Chart 2, namely: 1) Training, implementation of protocols, flowcharts and algorithms; 2) Interactive case discussions; 3) Targeted professional support; 4) Brief information using technological instruments; 5) Video; and 6) Playful activity.

## DISCUSSION

### Training, implementation of protocols, flowcharts and algorithms

Most of the educational actions identified in this category were related to training and to the implementation of protocols, flowcharts and algorithms.

The study conducted in an ICU in Texas showed a 78% reduction in the chances of *delirium* after staff training and implementation of a *delirium* prevention bundle. The researchers organized the bundle for the Nursing care flow in an ICU and trained the nurses to use the bundle and the CAM-ICU ( *Confusion Assessment Method for the Intensive Care Unit*) and RASS ( *Richmond Agitation-Sedation Scale*) tools required to apply the bundle, observing the decrease in the incidence of *delirium*<sup>(11)</sup>.

Another study sought to investigate the impact of a sensitization program and of a medication error reporting tool. The authors showed the efficacy in improving drug safety, with training for physicians and nurses as educational action<sup>(12)</sup>.

A study carried out in five Italian ICUs aimed at investigating changes in the bloodstream infections related to venous catheters after implementing an educational program aimed at health professionals. The results showed that compliance with the hand hygiene procedures and standard precautions was improved during the intervention for all groups of employees<sup>(13)</sup>.

Significant reductions (21%-55%) in the blood infections associated with insertion and maintenance of central venous catheters were observed after the intervention. Small improvements in the monthly infection trend were also observed. Such data indicate that conducting an educational program focused on good general infection control practices, rather than central venous catheter care packages, led to a reduction in the bloodstream infection rate, even if the improvement was sustained over time<sup>(13)</sup>.

The actions adopted during training of the team for the intervention proposed were teaching materials, such as posters displayed in places inside or outside each ICU. In addition to that, ongoing training and performance feedback were conducted via monthly meetings. The training sessions consisted of a brief literature review, followed by practical demonstrations and videos, as well as discussions on the use of a central venous catheter (CVC) in patients present at the ward, procedures that require attention when using the CVC and feasibility of the new practices<sup>(13)</sup>.

Another study based on an educational action in the form of training showed short-term efficacy in adhering to decubitus elevation above 30 degrees for prevention of pneumonia associated with mechanical ventilation. The educational action was carried out with the ICU team professionals, including physicians, Nursing team,



physiotherapy and undergraduate and graduate students, in addition to fixing posters at the bed headboards to alert the professionals about the ideal decubitus angle<sup>(14)</sup>.

The authors observed an increase in the mean decubitus angle with 44.8% adherence and, the first month after the educational activity, an adherence rate of 62.1%, with a progressive reduction of this mean in the subsequent periods<sup>(14)</sup>. It was concluded that lack of persistence in adherence to maintaining high decubitus probably reflects the absence of audit programs and feedback associated with the training implemented<sup>(14)</sup>.

In addition, using protocols and flowcharts proved to be effective educational strategies in the prevention of adverse events, such as the study conducted in an ICU of a hospital in the United States of America, whose objective was to evaluate the effectiveness of implementing protocols to reduce constipation, diarrhea and inadequate tests for the *Clostridium difficile* infection. The study showed that, after implementing intestinal protocols, there was an increase in the volumes of total enteral diets of up to 78% of the target volume (80%); a 54% reduction in inadequate tests for hospital infections by *Clostridium difficile* and a 43% reduction in infections<sup>(15)</sup>.

Protocol algorithms were also created to help guide the professionals in the proper identification of constipation or diarrhea, or potential *Clostridium difficile* infection<sup>(15)</sup>.

It is noticed that some educational activities showed efficiency in a short period of time after the educational interventions, demonstrating and reinforcing the need for continuing education, auditing and continuous feedback as a strategy to maintain good health practices.

### **Interactive case discussions**

Health services and professionals constantly need improvement and updates through discussions of the practices and a constant need for personal and collective development actions of the professionals who work in health units<sup>(16)</sup>.

Interactive discussion and classes with specialists in intensive care are a promising strategy when the objective is to implement a new system or program aimed at improving care quality and reducing adverse events in the ICU<sup>(17,18)</sup>.

The implementation of an electronic medication management system resorted to intensive care specialists at two moments in a study carried out at a university hospital. At the first moment, eight-hour face-to-face classes were held, covering fundamentals of the electronic system, work flow and contents related to intensive care, in addition to practicing with real case scenarios. Following the educational line, during the transition of the system implemented, seven specialists were available to support the ICU on a full-time basis<sup>(17)</sup>.

Ratifying this strategy, other authors used videoconferencing, known as Tele-education, asserting that remote video simulations and training sessions based on a platform structured via Tele-education are efficient learning methods to disseminate clinical skills to health professionals<sup>(18)</sup>.

Based on the remote classes, the authors evaluated the impact of learning and reinforcement in the clinical practice of an ICU in Bosnia and Herzegovina. In the remote classes, in addition to the content taught, the case of a patient was chosen based on its severity and complexity to be evaluated and discussed in the session. 2 years later, Tele-education was associated with reduced mortality in the ICU (from 43% to 27%) and in the hospital (from 51% to 44%), as well as in the hospitalization time (from 8.3 to 3.6 days), in addition to cost savings and a high level of employee satisfaction and engagement with the Tele-education program<sup>(18)</sup>.

Using the Tele-health strategy guarantees and expands access to health actions and care through remote classes between service providers and users through information and communication technologies<sup>(19)</sup>.

### **Targeted professional support**

Targeted professional support emerged as an educational action in the ICU as an eligible and efficient practice for the prevention of incidents<sup>(17,20,21)</sup>.

In the search for patient safety, it was noticed that medication errors reach 61% in the ICU, most of the in the prescription phase. Nearly one third of the transcription errors are identified and corrected prior to administration, but only 2% of the errors that occur in the administration phase are intercepted. Thus, the electronic medication management system was proposed, instead of a paper-based system<sup>(17)</sup>.

For the implementation of such system, the authors opted for some educational strategies, and the selection of key members from the ICU team to develop the system, called “champions”, was one of them. The team's experiences and opinions were analyzed and internalized, and the demands were included in the system. The strategy was important to promote an effective and useful system, in addition to creating a sense of ownership and developing an adherence spirit<sup>(17)</sup>.

From this perspective, another study also used recruitment of “champions” within the team to be the driving force of change through the development of positive relationships with nurses, and, thus, challenging barriers, educating and supporting Nursing leaders to use the instrument<sup>(20)</sup>.

The authors aimed at implementing and evaluating an instrument with a minimal electronic dataset (eMDS) to assist in handover of the ICU Nursing team leader. Thus, a clinical transfer eMDS was created using the *MetaVision* software, which retrieves diverse information from the hospital's clinical information system, in order to gather information about each patient.

Three months after implementing eMDS, 49 handovers showed that 82% of the transfers were performed using the instrument. An implementation research study was also carried out with the nurses, in which they reported that, despite being extensive, eMDS saved time and provided up-to-date and timely information, with sufficient and easy-to-follow content<sup>(20)</sup>.

Collaborating in this analysis, another survey used the strategy of choosing team professionals to implement the *SafetyLEAP* program, with “Leadership and Engagement”, “Audit and Feedback” and “Planned Quality Improvement Intervention” stages. After implementing this intervention, a modest reduction in the overall proportion of AEs during deep catheter insertion was observed, from 27.2% to 15.7%<sup>(21)</sup>.

### **Brief information using technological instruments**

A study carried out at a hospital in Iran sought to assess the influence of a text messaging program to improve the health professionals' knowledge about in-hospital infections. A total of 46 text messages were developed, each one consisting of 15 to 25 words and sent at a predefined time on working days, from Monday to Friday, with the exception of the weekends, during a 2-month period<sup>(22)</sup>.

This in-service training e-learning method was rated as an appropriate educational strategy by 94% of the participants. The results showed that the participants' knowledge, attitude, and practice were increased by 17%, 3% and 9%, respectively, from baseline to follow-up. Knowledge in aspects such as hand hygiene, work safety and protective equipment was increased to a lesser degree from the pre- to the post-test, when compared to other aspects<sup>(22)</sup>.

Another study, carried out in an ICU of a tertiary-level hospital in Australia, showed technology use via electronic means through the implementation and evaluation of an instrument with a minimal electronic data set (eMDS) to assist in the care handover of the ICU Nursing team leader<sup>(20)</sup>.

The minimal electronic data set was built in the *Meta Vision* software and structured using the ISBAR mnemonic (Identify, Situation, Background, Assessment and Recommendation). Content items considered pertinent to the handover were added, such as alerts about allergies, infectious status and incidents with patients, as well as patient management strategies, such as end-of-life planning and investigations. In addition, diverse managerial information on the ICU admissions and discharges of materials was added<sup>(20)</sup>.

Encouraging the use of technological devices and instruments as a potential tool for education due to the various use possibilities, it is known that elaboration of these tools is still a challenge for Nursing, with the need for multiprofessionals for their preparation and a permanent evaluation and users' feedback for improvements in the products<sup>(23)</sup>.

### **Video**

The pedagogical practice associated with the technology advances has changed the way in which information is conveyed; with a current society extremely tied to the use of technologies, the expository video class is a differential in the teaching-learning process to play an academic role that facilitates content internalization, aligned with the students' interests and abilities<sup>(24)</sup>.

The differential strategy of using interactive video was identified in a study where the authors conducted 30-minute educational sessions to address knowledge deficits, focusing on national safety standards in transfers, ICU handover guidelines, resources and transfer scenarios from real life in the ICU<sup>(20)</sup>.

Information and communication technology through educational video facilitates learning, as it promotes teaching dynamism with quick access to the contents, with availability of home learning methods and promotion of students' autonomy<sup>(24)</sup>.

The video class strategy is beneficial, both for its accessibility and its language in the most varied degrees of understanding, although it must be used correctly. Some modes of inappropriate use are quite frequent, such as routine use without the support of other teaching tools, which wears out the method and tires the students. Thus, it is identified that there is a pedagogical challenge in using video and exercising the brain to keep attention fully focused on the current moment, so that the students remain focused on their studies<sup>(25)</sup>.

The length of educational videos is essential to keep the students' attention. Video lessons should be brief, around 5-15 minutes long, based on the mean 10-minute retention time perceived in *Youtube Analytics*. The authors assert that there is better adherence to classes that do not exceed the 30-minute limit and that, for denser and more complex contents, it is recommended to divide the subject matter into topics, making a series of short videos<sup>(26)</sup>.

### **Playful activity**

A study showed that the playful activity favored team motivation, freedom of expression and spontaneity, as well as it strengthened the professionals' commitment to the care provided. The results showed that this strategy encourages the professionals' active participation, encouraging involvement in the activity, pleasure and curiosity in a given topic, filling knowledge deficits, and minimizing the formal nature of knowledge transmission in the traditional way<sup>(27)</sup>.

The educational action was carried out through a dice game with the objective of improving adherence to hand hygiene (HH) among the health professionals during their working hours and lasting from 30 to 40 minutes<sup>(27)</sup>.

An elaborate dice presented six activities on each of its sides: "playing with gouache paint", "ultraviolet light test", "hand hygiene types", "five hygiene moments", "reasons that influence adherence to hand hygiene" and "feedback on the hand hygiene adherence rates in the sector"<sup>(27)</sup>.

The activity with gouache paint aimed at preparing the professional with a fabric blindfold over his eyes in order to guarantee that he would not see what was being developed. A strategy adopted, without prior knowledge of the professional, was replacing the soap by the multipurpose gouache paint bottle (Acrilex® brand, non-toxic and washable), as well as timing the time spent to perform the hand hygiene procedure. When the professional finished the HH technique, the blindfold was

removed and he was encouraged to check his procedure and the need for improvement was reinforced<sup>(27)</sup>.

The second activity, which consisted in resorting to ultraviolet light, used, without the professional's knowledge, a cream simulating microorganisms with a fluorescent characteristic; subsequently, the professional was asked to perform HH and the his hands were evaluated with the help of ultraviolet light, emphasizing the importance of using the correct technique for antiseptic friction<sup>(27)</sup>.

The third activity aimed at identifying the hand hygiene type, indication and time spent with the procedure as recommended by the World Health Organization (WHO), and the fourth addressed the five moments for hand hygiene stipulated by the WHO. The fifth activity consisted of a space for the professionals to describe the reasons they considered as having influenced adherence to HH, positive and negative factors, in order to understand the particularities of the institution and of each worker<sup>(27)</sup>.

The sixth and final activity consisted in providing feedback to the team about the hand hygiene adherence rates in the sector. It was verified whether the professionals were aware about the HH adherence rates in the sector in which they worked, and thus, providing them with feedback on the values of these rates<sup>(27)</sup>.

At the end of the activities, acknowledgment of weaknesses on the topic was noticed, without causing a sensation of fatigue resulting from the repetition of training sessions focused on knowledge transmission, which can enhance adherence to hand hygiene in patient care<sup>(27)</sup>.

Playful activities enhance the teaching-learning process. In this way, games have been created in the educational environment in the health area as a differentiated tool for learning. Creation of the so-called *Serious Games* permeates fun and entertainment and, through games, it seeks learning on a particular subject matter in a dynamic way. The relevance of this type of approach is that it allows the user to have theoretical and practical, specific and dynamic knowledge, but it has little diffusion in Nursing education with few publications on the subject matter<sup>(9)</sup>.

## CONCLUSION

The study showed that several strategies can be used for educational actions with health professionals in the ICU to prevent incidents, such as training sessions, interactive classes and discussions, targeted professional support, use of brief messages, videos and playful activities.

However, when comparing the results found, we noticed scarcity of studies related to the development of playful educational activities aimed at health professionals for the prevention of incidents. There was predominance of educational activities performed through the traditional education modality, such as training sessions, classes and videos with little participation of the professionals.

Thus, it is expected that more research studies involving playful and/or interactive activities may be carried out, in view of the great potential for learning on the part of the participants, as shown in the literature.

It is concluded that the potential of education described in the studies analyzed allows monitoring the technical-scientific advances in the health area in favor of the quality of care provided and the construction of the professionals' scientific knowledge, which should be encouraged and carried out. This will contribute to fostering a patient safety culture in educational and care institutions, contributing to the prevention of health incidents.

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