Strategies to minimize medication errors in emergency units: an integrative review

Estratégias para minimizar erros de medicação em unidades de emergência: revisão integrativa

Estrategias para minimizar los errores de medicación en unidades de emergencia: una revisión integrativa

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ABSTRACT

Objective: To assess the strategies used by the Nursing team to minimize medication errors in emergency units. **Method:** Integrative literature review in the PubMed, *BDenf*, Cochrane and LILACS databases. Timeless research, without language limitation, performed by peers. Articles published in full that answered the guiding question were included in research. **Results:** Educational strategies (conducting campaigns, elaborating explanatory manuals, creating a multidisciplinary committee involved in the prevention and reduction of adverse drug events); organizational (meetings, *Deviance positive*, creation of protocols and changes in the work process) and new technologies (implementation of prescription by computerized system, introduction of the unit doses and of the bar code in the administration of medicines) were evidenced in the studies with the purpose of minimizing medication errors in an emergency unit. **Conclusion:** The strategies identified were effective in minimizing medication errors in emergency units.

Descriptors: Medication Errors; Nursing Team; Emergency Hospital Service; Strategies; Health Education.

RESUMO

Objetivo: Avaliar as estratégias utilizadas pela equipe de Enfermagem para minimizar os erros de medicação nas unidades de emergência. **Método:** Revisão integrativa da literatura realizada nas bases de dados *PubMed*, BDenf, *Cochrane* e *LILACS*. Pesquisa atemporal, sem limitação de idioma, realizada por pares. Foram incluídos nesta pesquisa artigos publicados na íntegra que respondessem à pergunta norteadora. **Resultados:** As estratégias educacionais (realização de campanhas, elaboração de manuais explicativos, criação de comissão multidisciplinar envolvida com a prevenção e redução dos eventos adversos aos medicamentos); organizacionais (reuniões, *Deviance positive,* criação de protocolos e mudanças no processo de trabalho) e novas tecnologias (implementação de prescrição por sistema informatizado, implantação da dose unitária e do código de barras na administração de medicamentos) foram evidenciadas nos estudos com a finalidade de minimizar os erros de medicação em unidade de emergência. **Conclusão:** As estratégias identificadas mostraram-se eficazes para minimizar erros de medicação nas unidades de emergência.

Descritores: Erros de Medicação; Equipe de Enfermagem; Serviço Hospitalar de Emergência; Estratégias; Educação em Saúde.

RESUMEN

Objetivo: Evaluar las estrategias utilizadas por el equipo de Enfermería para minimizar los errores de medicación en las unidades de emergencia. **Método:** Revisión integrativa de la literatura realizada en las bases de datos *PubMed*, *BDenf*, *Cochrane* y *LILACS*. Búsqueda atemporal, sin limitación de idioma, realizada por pares. Se incluyeron en esta investigación artículos publicados en su totalidad que respondieran a la pregunta orientadora. **Resultados:** Las estrategias educativas (realización de campañas, elaboración de manuales explicativos, creación de una comisión multidisciplinaria involucrada con la prevención y la reducción de los eventos adversos a los medicamentos); organizacionales (reuniones, *Deviance* positive, creación de protocolos y cambios en el proceso de trabajo) y nuevas tecnologías (la aplicación de prescripciones por un sistema informatizado, la implantación de la dosis unitaria y el código de barras en la administración de medicamentos) fueron evidenciadas en los estudios con la finalidad de minimizar los errores de medicación en la unidad de emergencia. **Conclusión:** Las estrategias identificadas se mostraron eficaces para minimizar los errores de medicación en las unidades de emergencia.

Descriptores: Errores de Medicación; Equipo de Enfermería; Servicio Hospitalario de Emergencia; Estrategias; Educación para la Salud.

INTRODUCTION

The World Health Organization (WHO) defines patient safety as "is the absence of preventable harm to a patient and reduction of risk of unnecessary harm associated with health care to an acceptable minimum"[1]. Above all, this discipline has gained worldwide importance since the beginning of 2000, following the publication of the Institute of Medicine's (IOM) report To Err is Human, which pointed out that about 98,000 people died in hospitals every year, victims of adverse events (AD) in the United States of America[2]. From these results, the IOM began to recognize "Patient Safety" as a fundamental dimension of care quality[3].

In view of the importance of this topic, the WHO established the World Alliance for Patient Safety in 2004 to identify and prioritize this area. Brazil is also part of this World Alliance and, in this context, the Ministry of Health (*Ministério da* Justiça) established, in 2013, the National Patient Safety Program - NPSP (*Programa Nacional de Segurança do Paciente - PNSP*), by the Administrative Rule MS/GM No. 529, of April 1, 2013. In that same year, the Brazilian Health Regulatory Agency (*ANVISA*), a government agency that operates in patient safety in Brazil, created the Resolution of the Collegiate Board of Directors (*Resolução da Diretoria Colegiada - RDC*) No. 36/2013, which "establishes actions for the patient in health services and gives other measures"[4-6].

In this context, medication error is highlighted as one of those responsible for potential risk to patient safety and is defined by the National Coordinating Council for Medication Error Reporting and Prevention (NCC-MERP) as any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient or consumer. Such events may occur at any stage of drug therapy[7].

Medication errors are estimated to cause more than 7,000 deaths per year in the US, resulting in significant tangible and intangible costs[2]. In Brazil, exclusive statistics on deaths related to medication errors are not yet available. However, through the National Notification System for Health Surveillance (*Sistema Nacional de Notificações para Vigilância Sanitária - NOTIVISA*), between March 2014 and July 2017, 3,766 notifications related to incidents involving medications were performed. It should be considered that notifications of incidents, with or without damage, are carried out voluntarily by registered institutions or professionals, as well as by any citizen who has witnessed or experienced any procedure that has caused damage to the user's health during the hospitalization/care[8].

In view of the above, medication errors pose a serious threat to public health and are a challenge to the professionals involved. Administering medication to patients is a complex, multiprofessional process with several stages (medical prescription, solicitation to, separation and dispensation of drugs from pharmacy, nursing receipt, nursing preparation and administration) involving interrelated decisions and actions. Errors can occur at any step of this process[9].

In this way, for Nursing, acting in direct care to patients, also the last possible barrier to the medication error, a more careful observation on the subject is needed, to develop strategies that provide greater safety to clients and to the Nursing team[10].

As a strategy to minimize the risks of medication errors and provide better care quality, a study published in 2010 identified and described the "right nine" drug administration (right patient, right medication, right route, right time, right dose, right record, right action, right way and right answer)[11], also adopted by ANVISA through the Safety Protocol in prescription, use and administration of medication, developed in partnership with the Oswaldo Cruz Foundation (*FIOCRUZ*) and with the Hospital Foundation of Minas Gerais State (*Fundação Hospitalar do Estado de Minas Gerais - FHEMIG*). The right nine do not completely prevent the occurrence of errors but following them can considerably minimize risks and related events[12].

Considering this, the urgency and emergency care units are shown as places of great vulnerability to adverse events, among them those related to medication errors. Some reasons related to this exposure, the risks for medication errors, permeate the large number of drugs prescribed by different routes, mainly through the intravenous route, use of potentially dangerous drugs during the critical care stage, stress exposure and lack of professionals[13].

In these situations, the medication process is considered a fundamental factor in patient care. However, Nursing is the professional category permanently involved in this process and emergency units are places of high exposure to the risks of medication errors. As a result of these considerations, the object of this study is the patient safety in the medication administration process in emergency units.

OBJECTIVE

To assess the strategies used by the Nursing team to minimize medication errors in emergency units.

METHOD

This is an integrative review that fulfilled the development steps of the guiding question, searching the literature for primary studies in databases, extracting data from these studies, evaluating the selected studies, analyzing and summarizing the results and presenting the review.

This review has adopted *PRISMA* recommendations (main items to report on systematic reviews and meta-analysis) which, even focusing on the report of randomized trials evaluations, can also be used as a basis for reporting systematic evaluations of other types of research, specially assessments of interventions[14].

The elaboration of the question of this study was inspired by the *PICO* structure, which describes all components related to the identified problem, and structured the research question, defining as population "errors in medication administration in patients" and intervention "strategies to foster patient safety". The comparison criterion was not applied, and the results were patient safety, risk reduction and adverse events. The guiding question for this review was: *What are the strategies used by the Nursing team to minimize errors in medication administration in emergency units?*

From the question of research and the objective, the descriptors (DeCs - Health Subject Descriptors and MeSH - Medical Subject Headings) and the keywords, combined with the Boolean

operators OR and AND, were defined from a protocol, with a description of the search strategies for each database, as observed in Table 1. The structured data collection took place between May and June of 2017, with advanced search in the databases: US National Library of Medicine (PubMed), Brazilian Library of Nursing (*BDenf*), The Cochrane Library, and Latin American and Caribbean Literature (LILACS).

The search was performed in pairs and the tiebreaker to decide whether to include or exclude certain studies was of a third researcher's responsibility.

Chart 1 – Search strategy for each database

Database	Strategy 1	Strategy 2	Strategy 3
LILACS	medication errors AND Nursing team AND strategies	near miss AND Nursing*	medication errors AND Nursing team
BDEnf	"medication errors" AND "Nursing team"	"medication errors" AND Nursing	"near miss" AND Nursing
PubMed	medication, errors AND qualificador Nursing	medication errors AND Nursing, team AND emergency health service	near miss AND Nursing, team
Cochrane	medication, errors AND Nursing	near miss AND Nursing	

The selection process of the studies was carried out by means of a thorough reading of titles and abstracts, following the previously established selection criteria. Inclusion criteria were primary studies, with no time limit, that indicated clear results and reported medication errors and prevention strategies in urgency and emergency units. There was no temporal cut-off for the selection of the articles, thus allowing an analysis of the evolution of research on the subject. Exclusion criteria were studies in pediatric units and other non-emergency and emergency units, theses, dissertations and annals, qualitative approach studies and duplicate studies.

For the final selection, all articles were read in full and those who presented strategies to minimize medication errors in the emergency units were selected.

The analysis of the studies was performed in pairs by means of a validated instrument[15], adapted to meet the objective of research. The instrument contains variables that respond to the guiding question of the study, having as topics of interest article title, authors, year of publication, place of study, periodical, objectives related to the outcome of this study, methods, population/sample, results, evidence of medication errors, level of evidence and the most prevalent errors. The studies were analyzed in detail and grouped in a way that facilitated the integration of these findings, emerging in the discussion in three categories: participation of the Nursing team in the drug process; participation of the multiprofessional team in this process; strategies to minimize medication errors (educational, organizational, and new technologies in the work process).

Table 1 - Number of articles obtained in the databases, São Carlos, São Paulo, Brazil, 2017

Database	Articles found (n)	Duplicate articles (n)	Excluded articles (n)	Selected articles (n)	Total articles analyzed (n)
BDEnf	130	37	66	19	0
LILACS	63	4	36	23	1
PubMed	27	1	23	7	0
Cochrane	117	1	97	19	1
Outros	–	–	–	–	1
Total	337	43	222	68	3

In the databases, 337 articles were found, of which 43 were duplicate articles and 219 did not meet the inclusion criteria and were excluded by the title. After reading the abstracts, 70 articles were rejected according to the inclusion and exclusion criteria of the study, culminating in 2 articles selected for the review of literature. A secondary search was carried out in other databases, which found another article that answered the guiding question of this study, according to Table 1. The chosen selection criteria were used as guidelines, followed by analysis, evaluation and synthesis of the evidences found.

The studies were classified respecting the level of evidence according to Oxford Centre for evidence-based Medicine[16].

Chart 2 - Synthesis of articles included in the integrative review

Title	Authors/Year/Country/Language	Type of Study	Casuistry	Results	Outcomes/Recommendations	Study Limitations	Level of Evidence
S1 - Using positive deviance to reduce medication errors in a tertiary care hospital[17]	Ferracini FT *et al.*, 2016 Brazil/English	Prospective longitudinal study	Medication errors: reported in an electronic system (ENS) and analyzed in three stages. Descriptive analysis of errors was performed with Pearson's coefficient with C.I of 95%.	4013 medication errors, with greater prevalence of errors in the morning and handwritten prescriptions. Nursing team: more commonly associated with errors. After intervention: reduction in reported error rate by 0.12 (C.I 95%, 0.18 to 0.07)	*Positive Deviance* (PD) proved to be effective.	Subnotification	2B/B

Chart 2 (concluded)

Title	Authors/Year/ Country/ Language	Type of Study	Casuistry	Results	Outcomes/ Recommendations	Study Limitations	Level of Evidence
S2 - Drug Interaction in the Emergency Department[18]	Okuno MFP *et al.*, 2013 Brazil/ Portuguese	Transversal	Sample: 200 medical prescription of hospitalization of adult patients admitted in the Emergency Room from March to July/2012 Data collection: transcription of the prescriptions and analysis of drug interactions (database Drugs. com)	526 potential DI identified in 159 prescriptions (79.5%); 109 (21%) serious interactions; 354 (67%) moderate; 63 (12%) mild; and 41 prescriptions did not present DI.	To instrumentalize professionals involved in the drug process for the rational use of drugs and elaborate protocols to increase patient safety.	Did not perform the intervention stage.	2B/B
S3 - Strategies for prevention of medication errors in the Emergency Sector [19]	Oliveira RC, Camargo AEB, Cassiani SHB, 2005 Brazil/ Portuguese	Exploratory Survey	First stage: analysis of drugs prescription and development of nursing in the emergency sector, checklist completion. Second stage: plan to reduce medication errors directed to an educational process of professionals.	1st Stage: n: 1,585 prescriptions: 83.9% did not explain the presentation of the drug and 84.6% of the drug dose; 51.5% of the prescriptions were not signed by the prescriber with a Regional Medical Council (*CRM*) number (83.8%). Drug interaction (52.6%) 2nd Stage: lecture series	Lecture series established, during two weeks, in the three working shifts, becoming permanent and monthly with short, medium and long term recommendations.		2C/B

Note: DI – Drug Interaction; ENS – Einstein Notification System; PD – Positive Deviation; MSGs – Medication Safety Groups; C.I – Confidence Interval; S1, S2, S3 –I Study 1, Study 2, Study 3

RESULTS

The studies were presented according to their author, year, country, language, type of study, casuistry, results, outcomes and/or recommendations, study limitation and level of evidence/degree of recommendation (Chart 2). A detailed analysis of these factors was carried out regarding their contribution to the objective of research.

All selected articles are national[17-19]. Of the 3 articles selected, 2 are authored by nurses and one authored by other professionals (doctors, pharmacists and statisticians). As for the research application sites, 2 were made in university hospitals and 1 in a private hospital. Regarding the coverage units, 2 articles developed their research only in emergency services and 1 of the articles covered other units including emergency. Emergency services are understood as a medical finding of health conditions that imply an imminent risk of life or intense suffering, requiring immediate medical care[20]. Emergency, Early Care and Emergency Units were considered as synonyms, regardless of whether they were called services, sectors or units. The publications took place in Nursing, Pharmacy and Health journals in general.

The study designs were diversified, being a prospective, another transversal and an exploratory survey. The levels of evidence for two of them were classified as 2B and grade of recommendation B, and an article as 2C and grade of recommendation B. The main results found were errors in the administration phase, prescription failures and decrease in the amount of errors reported after using the *Positive Deviance* method.

As for the strategies for prevention of medication errors used or recommended in the studies it was found strategies for continuing education, application of the *Positive Deviance* method, elaboration of protocols and manuals, creation of a multidisciplinary committee involved in the prevention and reduction of adverse drug events, implantation of the prescription by computerized system and implantation of the unit dose and of the bar code in medication administration.

DISCUSSION

The present study aimed to evaluate strategies to minimize medication errors by the Nursing team in emergency units. However, the results found surpass the proposed goal. Thus, with a view to critical reflection, the discussion was categorized into three parts: participation of the Nursing team in the drug process, participation of the multiprofessional team in this process and strategies to minimize medication errors.

Participation of the Nursing team in the medication process

The drug process is a complex activity performed within health institutions and involves the performance of qualified professionals from different areas. The prescription is of medical responsibility, as well as the separation, dispensing and distribution of medication are a pharmaceutical task and the conditioning, preparation and administration, registries and monitoring of medication administered are functions of the Nursing team[21].

Nursing plays a fundamental role in this process and many studies show that Nursing staff is most commonly associated with medication errors[22-23]. In the present study, data analysis from one of the studies[17] showed that the errors occurred in a higher prevalence in the morning, especially when the prescription was handwritten and the greater number of errors at the time the drugs were administered by the Nursing team.

Factors that contribute for these errors to occur mostly during the morning include the fact that the Nursing team performs many activities during this period, so that it is not exclusively dedicated to the preparation and administration of medications. It is in the morning that the medical team reassesses patients, changes the prescription data, requests new laboratory and imaging exams, which can lead to a greater work load and overload/distraction for the Nursing team, responsible for preparing and administrating medication.

A study carried out in a medium-sized hospital located in the south of Minas Gerais State, proposed to test the hypothesis that distraction during the preparation and administration of medications may lead to error. It found that some factors, such as the absence of planning telephone calls from the institution's telephone or cellular phone of professionals, the execution of care activities other than the preparation of medication, with consequent overlapping of tasks, interruptions of the medication process by interference of other professionals and the non-standardized change in medical prescription were responsible for the distraction of this professional during the preparation and administration of medications[24].

In addition, there is a direct relation on the influence of stress, fatigue and work overload in the drug process. Stress and fatigue are evaluated as causes frequently associated with medication errors, such as dose, time, technique and drip rate[25]. Stress negatively influences relationships between professionals and work overload, difficulties related to the number of patients, quantity of medications prescribed, and failures in medical prescriptions increase the chances of error[11,26-28].

Although the Nursing team is involved in the process of drug preparation and administration and is the last barrier to prevent error from occurring, there are still few studies on this subject. In one of the studies analyzed, there was no participation of nurses in the development of research and it was verified that Nursing was involved in most steps of the medication process[17]. In addition, research on strategies to minimize medication errors in urgency and emergency units is even scarcer, since only three studies were found.

Given such a small sample, it may be suggested that strategies to minimize medication errors in emergency units is an unexplored issue. The shortage of studies addressing this issue can be justified by the recent introduction of patient safety, which in Brazil, presented a greater focus after 2013, with the institution of the National Patient Safety Program (*Programa Nacional de Segurança do Paciente*)[4]. Nevertheless, there is still much to be done, since errors are underreported and the statistics of deaths related to medication errors in Brazil are not available[8].

Participation of the multiprofessional team in the drug process

The studies analyzed in present research showed important data for the discussion of the role of the multiprofessional team in the drug process. In one of them, 526 potential drug interactions were identified in 159 prescriptions (79% of prescriptions analyzed). Of these, 109 (21%) were serious interactions; 354 (67%) moderate; 63 (12%) mild; and 41 prescriptions showed no drug interactions. Still in the prescribing stage, 51% of the 1,585 prescriptions were considered illegible because they present a greater degree of reading and comprehension difficulty, besides lacking the signature of the prescriber (84%)[18].

Another study pointed out similar results regarding errors in the prescription process. In a hospital in the south of the country, all prescriptions of the hospital within six months were analyzed, using a screening instrument elaborated based on current legislation. It was found that of the 2,687 prescriptions analyzed, errors were found in the dosage (93%), absence of pharmaceutical form (83%), presence of abbreviations (70%), absence of age (64%), absence of hospitalization unit (57%), absence of concentration (38%), lack of professional stamp (18%), absence of bed (16%), presence of code, acronyms or number (16%), illegibility (12%), absence of registration number in the Professional Council (13%), presence of erasures (12%), incomplete name of patient (8%), absence of date (2%), absence of administration route (1%) and absence of signature of the professional (0.9%)[29].

Focusing on prescription errors a retrospective study in Saudi Arabia observed 2,073 of them. They concluded that the analysis of medication prescription was the main factor in reducing medication errors and the involvement of pharmacists in the process of clinical indication of medications and patient history prior to distribution is fundamental for patient safety[30].

To reduce error in this chain, it is necessary for hospitals to seek intervention strategies. The prescriber's lack of knowledge about medications and about the patient are factors that can lead to errors[31], as well as the lack of knowledge of the pharmacist and the Nursing team. It is essential to discuss health education activities in these work environments.

Prescription is the first step in the drug process, and before these results it is necessary to look at this problem with a view to patient safety. Thus, the cooperation of the entire multiprofessional team is fundamental, so that the error link is undone until the last step of this process.

To understand how errors occur, the "Swiss Cheese" model was created. This model consists of multiple slices of Swiss cheese placed side by side as barriers to occurrence of error. When the alignment of these "holes" is allowed, the error passes through all the barriers causing damage[32]. The pharmacist can identify and prevent prescription errors, as well as guide the correct use of medication[29] and Nursing, the last link in the drug process, is responsible for preparing and administering errors free. It is important to emphasize that the error can happen at any hierarchical level within a hospital, and in this way, it can assume different forms and consequences.

Strategies to minimize medication errors

a) Educational strategies to minimize medication errors

After discussing medication errors, it is important to critically reflect on the strategies that have been found to minimize these errors. As an educational strategy, campaigns were carried out on the "Safe route in the medication process"[17], lectures on "Errors in the

medication system", "Adverse reactions", "Drug interaction", courses on Safety in Drug Administration, creation of a "Multidisciplinary Committee" in the institution and explanatory manuals were made available in the sectors[19].

Educational strategies must be introduced inside institutions and internationally. In connection with this, WHO launched in the third WHO Global Patient Safety Challenge in 2017 the theme "Medication Without Harm," a meeting in Germany for health ministers from fifty countries and representatives of organizations with the objective of reducing damage associated with the use of drugs[33].

Another educational strategy that has been used to minimize errors in the drug process, besides the introduction of campaigns and lectures, is the clinical simulation. One study used clinical simulation with undergraduate Nursing students at an Australian university to encourage reflexive learning with simulation experience. After this, it was possible to perceive that, by exposing students to clinical experiences in a safe environment, positive learning experiences were acquired and there was improvement in deductive reasoning and in the analysis of practical situations[34]. The use of this strategy can be applied to professionals who are working in daily practice.

b) Organizational strategies to minimize medication errors

The organizational strategies used in one of the studies were meetings held with employees and managers and the *Deviance positive*, which is a technique to improve processes using the suggestions of those involved[17].

Near these experiences, research has shown that engaging key people in work processes, so that they are given greater flexibility to design and experiment with specific problem solutions that are present in institutions significantly, accelerates human performance and processes. It also showed that fragile work processes are prone to medication errors. This means that in addition to the performance, skills and knowledge of people involved in processes, the systems in which they are inserted are directly related to the causes of errors[35].

In addition to these strategies, changes in the work process were also observed as standardization of a double checklist between the Nursing technician and the nurse and double verification of preparation and planning of vasoactive drugs in an infusion pump[19]. It is inferred that correct management of high-risk medications should be considered a priority issue in clinical practice. In this logic, protocols for the storage, prescription, dispensing, preparation and administration of high-risk drugs should be introduced with the aim of reducing variability in clinical practice and reducing the incidence of errors[36].

Being the Nursing team who is next to the patient 24 hours a day, it is necessary to discuss the importance of this team in the therapeutic process. For the accomplishment of a safe and quality Nursing care, Nursing works in a systematic and organized way.

c) New technologies used in the work process to minimize medication errors

To conclude the discussion about strategies to minimize errors in drug administration, it is necessary to explain the use of new technologies in conjunction with health care. With the constant increase of patients' complexity, the complexity of care offered also increases, and it is necessary to think about the implementation of health information technology, providing an opportunity for continuous improvement of the work processes within health institutions, to the detriment of the traditional way of care[37].

In the present study, there was the long-term implantation of the prescription by computerized system and unit dose, besides the use of bar codes in medication administration[19]. The use of electronic prescriptions, with mandatory field fillers and suggested doses can reduce errors.

A study[38] conducted at a university hospital in Spain evaluated the prevalence of medication errors before and after the implementation of electronic medication administration record. The authors analyzed 2,835 prescriptions before and 2,621 after introducing the electronic medication administration records and found that medication errors decreased from 48% (before) to 37% (after) (p<0.05), proving that records significantly reduce the error rate and its potential risks. However, it is important to note that the benefit of technology can be hampered if there is resistance from employees to use it properly[39]. Allied to this, the use of a barcode system, which identifies medication, can support safe administration of drugs[40].

Study limitations

The present study lacks work related to the subject explored. A detailed search in the databases with well-defined strategies was carried out. Notwithstanding, it is highlighted as a limitation of the study the non-inclusion of studies of greater evidence.

Contributions to Nursing, Health or Public Health

It is possible to ensure that the results presented in this review bring a comprehensive knowledge about medication errors and strategies to minimize them. Therefore, the present review brings information that can contribute to professional clinical practice by guiding the work process of the multiprofessional team in the drug process. Nurses, as part of this multidisciplinary team, can contribute to patient safety and prevention of drug interactions. Hence, the study may contribute to the Science of Care aiming at ensuring patient safety.

CONCLUSION

We conclude that, to minimize medication errors, the interdisciplinary team is required in the search for a safe working environment, with good communication among health professionals and execution of strategies to dissolve the drug error link. In this study, educational, organizational strategies and new technologies were identified and these were effective in minimizing and preventing medication errors.

We reiterate that further investigations are being carried out to find greater evidence to guarantee the safety and good quality of patient care.

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