

TYPES, CAUSES AND INTERVENTION STRATEGIES FACING MEDICATION ERRORS: AN INTEGRATIVE REVIEW**TIPOS, CAUSAS E ESTRATÉGIAS DE INTERVENÇÃO FRENTE A ERROS DE MEDICAÇÃO: UMA REVISÃO INTEGRATIVA****TIPOS, CAUSAS Y ESTRATEGIAS DE INTERVENCIÓN CARA A ERRORES DE MEDICACIÓN: UNA REVISIÓN INTEGRADORA**

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ABSTRACT

Objective: Integrative review study that aimed to search for scientific evidences on major medication errors and their causes observed by nursing in in-patient facilities of hospital institutions, as well as to describe the strategies used to promote medication safety in such institutions. **Method:** The research was proceeded in the databases: *Literatura Latino-Americana e do Caribe em Ciências da Saúde*, *Base de Dados da Enfermagem* and National Library of Medicine, using the descriptors Nursing; Medication Errors; Patient Safety; Medication Systems, Hospital. Seventy-nine (79) articles were selected between 2004 and 2015. **Results:** The most frequently reported errors were inappropriate dosage 35 (13,3%), dosage omission 30 (11,5%), and wrong time 29 (11.1%). The most cited causes were related to human factor 41 41 (34,2%), system-related factors 37 (30,9%) and communication 22 (18,3%). The strategies that stood out were the implementation of safety protocols for drug preparation and administration, electronic prescription, inclusion of the pharmaceutical in the team and team training/counselling. **Conclusion:** It is believed that this review may contribute to improving the medication process, as well as the creation of prevention strategies which promotes patient safety.

Descriptors: Nursing; Medication errors; Patient safety.

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RESUMO:

Objetivo: Estudo de revisão integrativa que objetivou buscar evidências científicas que abordassem os principais erros de medicação e suas causas observados pela enfermagem nas instituições hospitalares de internação integral, bem como, descrever as estratégias utilizadas para promover a segurança medicamentosa nestas instituições. **Método:** Procedeu-se busca nas bases de dados: Literatura Latino-Americana e do Caribe em Ciências da Saúde, Base de Dados da Enfermagem e *National Library of Medicine*, utilizando os descritores *Nursing; Medication Errors; Patient Safety; Medication Systems, Hospital*. Foram selecionados 79 artigos entre os anos de 2004 a 2015. **Resultados:** Os tipos de erros mais citados foram dose imprópria 35 (13,3%), omissão de dose 30 (11,5%), e horário errado 29 (11,1%). As causas mais citadas foram as relacionadas ao fator humano 41 (34,2%), sistema 37 (30,9%) e comunicação 22 (18,3%). As estratégias que se destacaram foram implantação de protocolos de segurança de preparo e administração de medicamentos, prescrição eletrônica, inclusão do farmacêutico na equipe e treinamento/orientação da equipe. **Conclusão:** Acredita-se que esta revisão possa contribuir para melhoria do processo de administração de medicamentos e para criação de estratégias de prevenção que fomentem a segurança do paciente.

Descritores: Enfermagem; Erros de medicação; Segurança do paciente.

RESUMEN

Objetivo: Estudio de revisión integrativa que objetivó buscar evidencias científicas que abordasen los principales errores de medicación y sus causas observadas por la enfermería en las instituciones hospitalarias de internación integral, así como, describir las estrategias utilizadas para promover la seguridad medicamentosa en estas instituciones. **Método:** Se buscó en las bases de datos: *Literatura Latino-Americana e do Caribe em Ciências da Saúde, Base de Dados da Enfermagem ye National Library of Medicine*, utilizando los descriptores *Nursing; Medication Errors; Patient Safety; Medication Systems, Hospital*. Se seleccionaron 79 artículos entre los años 2004 a 2015. **Resultados:** Los tipos de errores más citados fueron dosis improprias 35 (13,3%), omisión de dosis 30 (11,5%), y horario equivocado 29 (11,1%). Las causas más citadas fueron las relacionadas al factor humano 41 (34,2%), sistema 37 (30,9%) y comunicación 22 (18,3%). Las estrategias que se destacaron fueron la implantación de protocolos de seguridad de preparación y administración de medicamentos, prescripción electrónica, inclusión del farmacéutico en el equipo y entrenamiento / orientación del equipo. **Conclusión:** Se cree que esta revisión puede contribuir a mejorar el proceso de administración de medicamentos y para la creación de estrategias de prevención que fomenten la seguridad del paciente.

Descriptorios: Enfermería; Errores de medicación; Seguridad del paciente.

INTRODUCTION

Safe administration of medicines is included, among other practices, in a

global movement for patient safety involving efforts of the entire health

system, promoting risk management and safe environment.¹

The medicine - as a therapeutic strategy - is used for control, treatment and cure of diseases and has cooperated extensively to increase the quality and even the life expectancy of the patient.² However, it is not free of risks when one understands that the medication therapy chain is a complex system composed of interconnected and interdependent processes, including different phases and different professionals.³ Any irregularity in drugs prescription, transcription, dispensing, preparation or administration presents a potential risk to the patient.⁴

The nursing professional is the protagonist in the risk analysis process for the subsequent reduction and prevention of incidents⁵ and its performance is evident at the end of the medication process: in preparation, administration, evaluation of the effectiveness of the drug administered and documentation of the care conducted. This increases the responsibility of these professionals, because they represent the last chance to intercept and prevent an error occurred in the earlier stages of the process. Thus, the nursing staff is one of the last barriers of prevention.⁶

The National Coordinating Council for Medication Error Reporting and

Prevention (NCCMERP) defines medication error (ME) as "any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is under the control of the health care professional, patient or consumer".^{7:1} It also defines harm as the "impairment of physical, emotional or psychological function or body structure and/or pain resulting from it."^{8:6}

The frequency of ME and preventable harm involving drug-related events has been a concern. A patient is exposed at, at least, one ME a day and it can be said that a quarter of all drug-related harm are preventable, so that these errors are the most common type in health services, frequently in hospitals.⁹⁻¹⁰ Not every ME cause harm to the patient; however, every error can cause anxiety for the staff and patient and also reduce patient's confidence in treatment.¹¹ Even when there is no damage, the occurrence of errors often causes increased workload and especially the costs involved in the treatment. Therefore, the safe use of drugs is serious source of concern, so much for health care providers and for the patients.¹⁰

Thus, to identify the nature and determinants of errors involving medications becomes relevant when

evaluating the possibilities for prevention and contribution to the security of the patient.¹² Then, it is highlighted the need for the nursing team to have a broad view of the medication system and all processes involved in the medication chain, contributing to safe medication therapy.¹³

In this context, this study aims to seek scientific evidence addressing the main ME - and its causes - observed by nurses in full admission hospitals, as well as to describe the strategies used to promote drug safety in these institutions.

METHOD

This is an integrative review (IR) literature, in which six methodological steps were followed: I. Selection of assumptions or review questions; II. Demonstration of the research to be reviewed; III. Representation of the characteristics of the study and its findings; IV. Analysis of the findings; V. Interpretation of results; and VI. Report of the review.¹⁴

In the first stage, it was formulated the guiding questions aiming to guide the study: What are the main types and causes of ME reported by nurses in full admission hospitals? Which strategies are being used by nurses to promote safety regarding the

use of medications in full admission hospitals?

In the second stage, the search of the study was performed electronically, in March 2016, using the following databases: Latin American and Caribbean Health Sciences Literature (Literatura Latino-Americana e do Caribe em Ciências da Saúde) (LILACS), Nursing Database (Base de Dados da Enfermagem) (BDENF) e National Library of Medicine (PubMed). For this purpose, the following searching strategy was used, with standard descriptors chosen from the *Medical Subject Headings* (MeSH): *Nursing; Medication Errors; Patient Safety; Medication Systems, Hospital*. The Boolean operator AND was used for the combination among them.

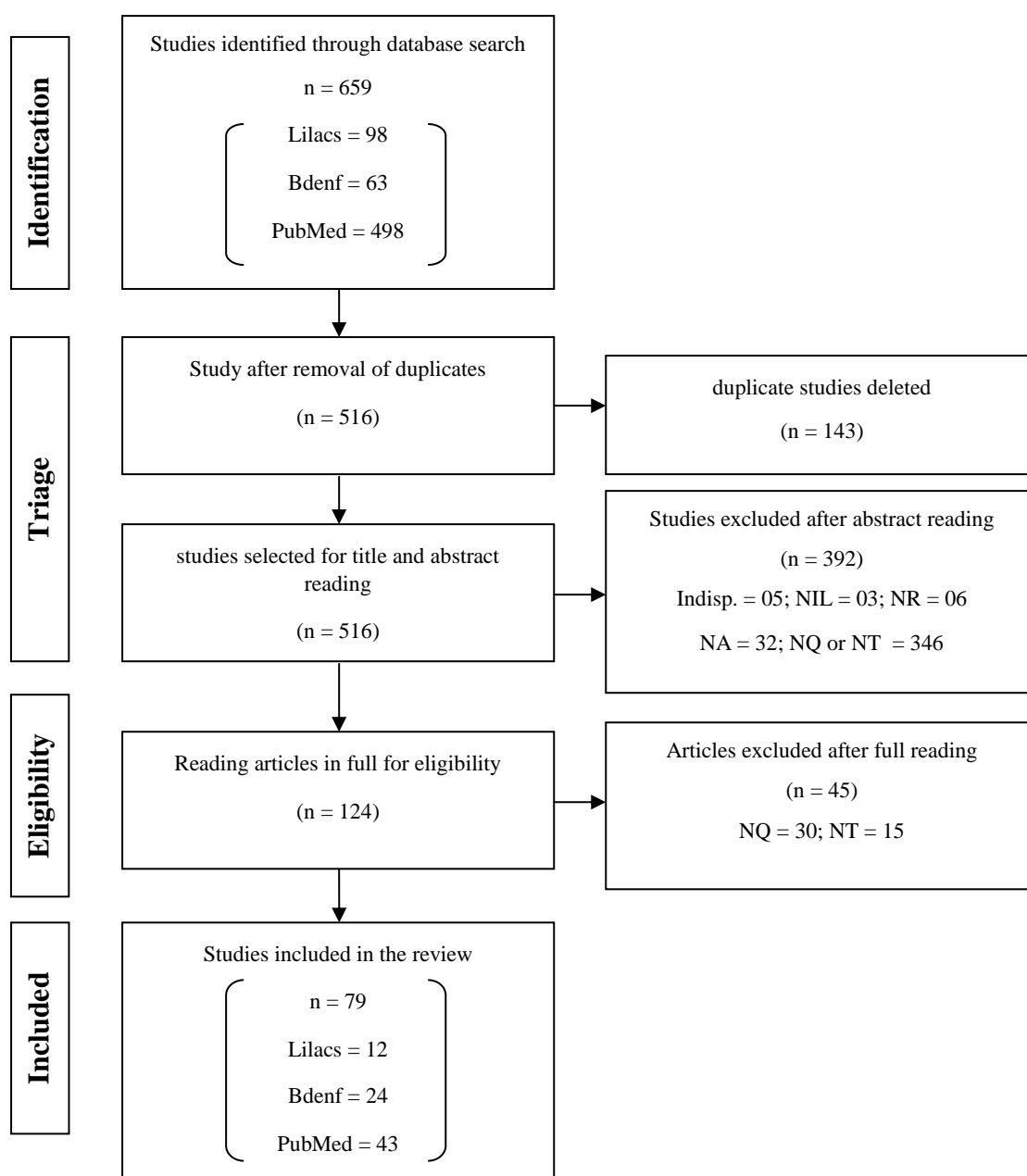
The criteria of the studies for inclusion in the review were: scientific articles published in national and international literature - from January 2004 to December 2015 – which could answer the research questions in English, Portuguese or Spanish, published in full and available online. Articles that have not met the objective proposed and the selection criteria were excluded.

In search of databases, 659 articles were found, of which: 98 in LILACS; 63, in BDENF; and 498 in PubMed. After the

search, repeated articles were excluded. Then the reading of the titles and abstracts was performed to select those that fit the purpose of the study. From this selection, the full articles were read. These steps were performed by two reviewers,

independently. The process of items selection that composed the sample was based on the criteria of *Preferred Reporting Items for Systematic Review and a Meta-Analyses*, according to the (PRISMA)¹⁵ flowchart below (Figure 1).

Figure 1 - Flowchart of the selection of scientific articles in the sample of the integrative review. Curitiba, Brazil, 2016



NA = not an article; NR = not a research; NIL = not in the language; NQ = no response to questions; NT = not the subject; Indisp. = Article electronically unavailable in full.¹⁶

For the implementation of the third stage of the study, an instrument was produced by the reviewers, which was completed during the reading of the articles in full, containing: Database; Descriptors; Journal; Year of publication; Authors; Category; Language; Title; Objective; Approach; Type/Study design; study location; Subjects; Types of ME; Causes of ME; Intervention on the error; Level of evidence of the study.

For this last item, it was considered: Level 1 - meta-analysis of multiple controlled studies; Level 2 - individual study with experimental design; Level 3 – quasi-experimental study design, as a study with no randomization, with a unique pre and post-test group, time series or case-control; Level 4 - non-experimental study design, as descriptive correlational research and qualitative or case studies; Level 5 – Case reports or data obtained in a systematic way, with verifiable quality or program evaluation data; Level 6 - opinion of respected authorities based on clinical competence or opinion of expert committees, including information interpretations not based on researches, regulatory or legal opinions.¹⁷

A full reading of the articles and the completion of the data collection instrument made possible the article analysis and interpretation of the results (fourth and fifth steps of IR) that will be presented below.

RESULTS

This IR consisted of 79 articles. Regarding the year, 2011 was the year with more publications (11), followed by 2006 (ten). The years of 2005, 2007 and 2010 had nine publications each and the years of 2012 and 2014, eight. 2008 had four publications. The years with fewer publications were: 2004, 2009 and 2013, with three each; and, 2015, with two articles. Concerning the approach: 17 studies were qualitative, 56 quantitative and six classified as quali-quantitative. As for the type, the descriptive, exploratory studies predominated.

Regarding the location of the study, only those carried out in hospitals were selected, in order to answer the research question. Of the 79 studies, 39 (49%) are national and 40 (51%) International. In the international studies, the predominant country was the United States - with 12 (30%) studies - followed by Canada, with

five (12.5%) and the UK, with four (10%). As for the national studies, most were carried out in the South and Southeast: 28 (72%). The others were carried out in the Midwest: five (13%); Northeast: three (7.5%); and the remaining - three (7.5%) - were multicenter studies, carried out in hospitals in various regions of the country.

As regards the study participants, 41 (52%) were conducted with nurses and/or nursing staff. Six (7.5%) had doctors and/or pharmaceutical professional as participants concurrently with nurses or nursing staff. There have also been studies for which data collection were performed from documentation (prescriptions, medical records of patients, incident

reporting system) or the purpose of the study was to analyze the medication system, such as the dispensing process, 26 (33%). The other six (7.5%) were studies for which data collection was simultaneously made up of both professionals and documentation.

In Chart 1, types of errors are displayed in accordance with to the classification of NCCMERP.⁸ According to the findings, 35 (13.3%) studies stood out as the error type in the medication delivery, such as improper dose; 30 (11.5%) as a dose omission; and 29 (11.1%), as medication administered at the wrong time. It is noteworthy that some studies have found more than one option.

Chart 1 - Medication errors according to the type. Curitiba, PR, Brazil, 2016

Medication error types	Definition	Frequency	
		n	%
Inappropriate dose ^{1,5,18-50}	Results in overdosing, underdosing or extra dose	35	13.3
Dose omission ^{5,18,19,21,22,24,25,27-32,35-39,42-48,50,51-53,54}	Failure to deliver a prescribed dose to a patient. Patients who refused to take medication were excluded	30	11.5
Wrong time ^{1,18,19,21,22,24,25,27-38,40,45,46,49,50,51,55-57}	Administering the drug not in a predefined time interval	29	11.1
Wrong technique ^{19,21,22,25,26,29,32,33,35,36,43-45,49-51,54-59}	Error of drug grinding/dilution preparation	22	8.4
Wrong route of administration ^{1,18,19,22,25,26,28,29,31,32,34,36,37,40,45,46,50,51,54,55,57,60}	Medication administration by different route than desired	22	8.4
Wrong drug ^{1,5,18,19,24,26,28,29,31,33,34,36-38,40,41,44,45,49,51,57}	Dispensing and/or drug administration different than the prescribed	21	8.0
Wrong infusion speed ^{19,22,23,28,29,31-33,36,44-46,49,54,57}	Infusion faster or slower than the recommended	15	5.7
Wrong patient ^{1,18,19,25,26,32,34,36,37,40,47,49,51,55}	Drug delivery to the wrong patient	14	5.3
	Contraindicated drugs, drug-drug interactions,	12	4.6

Wrong monitoring ^{19,26,32,36,38,43,49,53,57-59,61}	diet-drug interaction, allergies documented, disease-medicine interaction, clinical evaluation		
Wrong pharmaceutical formulation ^{19,25,35,43-45,54,62}	Presentation/pharmaceutical formula different from the prescribed	08	3.0
Damaged drug ^{19,24,29,35,36,44,45}	Dispensing and/or delivery of expired medication	07	2.7
Drong drug duration ^{32,36,39,46,54}	Length of treatment for longer or shorter time than recommended	05	1.9
Wrong concentration ^{19,63}	Different, higher or lower concentration of the medicine than the prescribed	02	0.8
Others [†]	Unspecified error ^{39,52,64-76}	15	5.7
	Prescription Error ^{18,25,32,43,46,52,53,58,67,68,77-79}	13	5.0
	Register error ^{18,28,31,38,43,48,50}	07	2.7
	Administration error by the patient ^{68,80,81}	03	1.1
	Transcription error ^{73,79}	02	0.8
Total		262	100

[†]The categorization of column "Others" was made by the authors of this study.

Chart 2 shows the causes of medication errors, also grouped according to the NCCMERP⁸ classification. The review pointed out that the studies mentioned as main causes of errors the human factor, with 41 (34.2%) citations. It

is also important to emphasize: problems with the system 37 (30.9%) and communication 22 (18.3%). It is noteworthy that some studies have found more than one option.

Chart 2 - Causes of medication errors. Curitiba, PR, Brazil, 2016

Medication error causes	Definition	Frequency	
		n	%
Human factor ^{1,5,19,22,26,27,30,33-37,41,42,45,46,48-51,54,55,57,60,64,65,69,70-73,80-89}	Poor knowledge or performance; storage error; preparation or transcription errors; stress; work load; fatigue and sleep	41	34.2
System ^{1,19,20,22,25-27,30,32,34,36,37,40-43,45,48-51,53,55,64,65,67,70,71,74-76,80-83,87,90}	Lighting; noise; interruptions and distractions; training; team; lack of staff training; team inexperience; policies and procedures	37	30.9
Communication ^{1,5,19,22,25,26,39,46,49,51-53,60,67,70,71,73,80-84}	Failure in verbal or written communication; failure when interpreting prescription	22	18.3
Packaging, conditioning ^{19,49,72,86}	Inappropriate packaging; confusion in the pharmaceutical formulation; similar colors and forms; malfunctioning of appliances and meters	04	3.3
Name confusion ^{19,25,51}	Commercial or chemical names with similar writing or sounds	03	2.5
Tagging or labeling ^{19,28,82}	Similar label or incomplete tag, or with wrong information about the product; symbols that cause distraction; lack of tag and/or label	03	2.5
Others [‡] _‡ ^{18,25,27,30,32,34,37,43,50,68}	Patient-related factors	10	8.3
Total		120	100

[‡] The categorization of column "Others" was made by the authors of this study.

As for the item intervention on the error, 27 studies showed no intervention; 22 had only suggestions; other 22 pointed out actions implemented; and eight had implemented interventions concomitant with new suggestions for improvements. The results found were classified according

to the interventions related to the system and the human factor. Both in the category "implemented action" as "suggested", the security protocols for the medication preparation and administration were highlighted, as well as the training and/or orientation of the team.

Chart 3 - Interventions regarding the medication errors. Curitiba, Brazil, 2016

			Frequency		
			n	%	
Interventions related to the system	Suggested	Safety protocols of drugs preparation and management ^{5,25,52,53,62,71,84,90}	8	6.7	
		Electronic prescription ^{1,25,52,53,67,91}	6	5	
		Staff dimensioning ^{1,49,50,91}	4	3.3	
		Workload reduction ^{49,50,55,91}	4	3.3	
		dispensing system of drugs per unit-dose ^{25,53,83,91}	4	3.3	
		drug identification system through the use of barcodes ^{25,35,53,64}	4	3.3	
		active pharmaceutical presence in units ^{25,52,80}	3	2.5	
		Use of wristbands for patients identification ^{25,52,67}	3	2.5	
		Improving of work environment ^{49,67}	2	1.7	
		Change the process of drugs management ⁷²	1	0.8	
Interventions related to the system	Implemented	Safety protocols of drugs preparation and administration ^{59,73,77,92,93}	5	4.3	
		Pharmacist inclusion in the team ^{46,49,59,74}	4	3.3	
		Electronic prescribing ^{64,78,85,93}	4	3.3	
		Investment in electronic equipment to error detection ³³	1	0.8	
		Change of drugs management process ⁷⁵	1	0.8	
		Preparation of medicines in pharmacy ⁹³	1	0.8	
Interventions related to the human factor	suggested	Team training ^{5,25,35,45,49,51-53,55,57,58,62,64,67,71,73,86,91}	18	15	
		Effective presence/greater nurse participation ^{1,25,50,57,67,91}	6	5	
		Incentive to incident notification ^{19,39,45,79,84}	5	4.3	
		Improved communication between the links: physician, pharmacy and nursing ^{25,42,45,54,87}	5	4.3	
		Effective and efficient communication with the patient ^{5,52}	2	1.7	
		Health education for patient ⁸¹	1	0.8	
		Avoid stock of medicines in unit ²⁵	1	0.8	
		Improvement in academic education of pharmacology professionals ⁴⁹	1	0.8	
	implemented	Training/guidance of the team ^{1,26,28,38,44,48,51,53,63,69,75,83,87,88,91}	15	12.5	
		Guidance on service/warning ^{26,51,55,83,91,94}	6	5	
		Timely intervention done by the researcher in observational research ^{35,43,62}	3	2.5	
		Stock removal of drugs from unit ⁸⁷	1	0.8	
Total		120	100		

The last item of the data collection instrument is the evidence level of the studies. For this item, two studies were classified as level 2; eight, as level 3; 68 as level 4; and one study, as level 5. None of the studies was classified as level 1 or 6.

DISCUSSION

Considering the research in databases, the years 2011 and 2006 corresponded to the highest rates of publications on this issue: 11 (13.9%) and 10 (12.6%), respectively. However, despite the growing scientific interest in patient safety and the ME by the health authorities, and this theme be the focus of many campaigns and national and international scientific events, findings showed that, in 2015, there were only two (2.5%) publications on this topic, what reveals the insufficient scientific literature on ME by the nurses.

The results presented in Chart 1 demonstrate that the nursing studies have as main types of ME the ones related to human error, such as inappropriate dose 35 (13.3%); dose omission of 30 (11.5%); wrong time 29 (11.1%); wrong administration route 22 (8.4%); and wrong technique 22 (8.4%). The findings are corroborated by a documentary study carried out in a general hospital of Goiás,

which had as one of its objectives to identify the adverse events related to ME²¹ and also by a Canadian study performed with nurses, whose purpose was to examine the factors within the work environment that contribute not only to errors of medication administration, but also to increase the severity of these. This study also pointed out that wrong time and improper dose were the most frequent errors.³⁴

A study²¹ conducted with professionals involved in the medication process in a university hospital, in order to get opinions on ME, pointed out that the professionals blame themselves for mistakes, ignoring, then, the view that the system in which they are involved is also defective, both in the physical and in the organization environment, which can also collaborate - a lot - for the occurrence of medication errors. This information may be related to the fact that human error is more easily observed.

Improper dose of the drug was indicated as the main type of error: 35 (13.3%). Improper dose is what results in overdosing: when there is overdosing of the prescribed drug; underdosing, when the dose was less than required; and extra dose, when the patient receives more doses than was prescribed.⁸ In a study aiming to

analyze the ME reported in a teaching hospital, using 13 types of errors categories, improper dose resulted in the third most recurrent error.¹⁹ A study that investigated the presence of factors that can distract the nursing professional during the preparation and administration of drugs - and used six categories of types of errors - also pointed out the improper dose as the third most frequent error.²²

In 30 (11.5%) studies, omission error was identified as one of the main types of failures in the administration of medication. This error is defined as failure to administer a prescribed dose to a patient and when there is not evidence of completion of the medication by checking the prescription, excluding from this category patients who refuse to take the medication. Regarding this fact, a study conducted in three pediatric wards of a university hospital in São Paulo aimed to identify ME through the analysis of 68 records, pointing out that 75.7% of the failures were presented relating to omission errors. In this study, the authors pointed out that the failure was directly related to failures in the records of care process.³¹

It is understood, for "wrong time" the administration of the drug out of a preset interval of time. This failure was reported

by 29 (11.1%) studies as one of the main types of errors in drug therapy. A study conducted in an intensive care unit, in order to identify factors that might lead to the nursing staff to get distracted during drug preparation and administration observed administration of 136 drugs and found 43 errors, among which: omission infusion rate, route, dosage, dilution, and schedule.²²

A documentary study, which analyzed nursing records to identify the types of ME, highlighted that the errors of omission and time were not "related only to intrinsic factors to the nursing staff, but also to factors associated with the distribution of drugs by the pharmacy and prescribers"^{21:6}, drawing the attention of that, many times, "the factor determining the error is present in more than one subsystem"^{21:6}

It should be noted, in this sense that nursing acts as the last chance to intercept and prevent an error occurred in the early processes of the drug chain. This fact increases the responsibility of these professionals, transforming them into one of the last barriers to prevention and assurance of patient safety.

Given the findings of this study concerning the types of errors, it is believed that the implementation of the

practice of verification of the rights of drug therapy - right drug, right dose, right way, right time, right patient, right registration, right action, right pharmaceutical form and right answer - can contribute to nursing advance the safety assurance to patient.¹²

Among the main causes of errors mentioned in the studies, the most prominent, as shown in Chart 2, are: Human factor 41 (34.2%); in the system 37 (30.9%); and communication, 22 (18.3%). It is understood as "causes of human factors" those related to deficient knowledge or performance, storage error, preparation or transcription error, stress, workload, fatigue and sleep. As discussed previously, nursing is a key element in the chain that involves the process of medicating and can contribute extensively in the safety of the process. On the other hand, the insufficient staff contingent; low wages: which results in double or even triple bond of work; low quality of life; stress; excessive hours of work, many times in scenarios with unsafe environments due to the lack of supplies and proper materials, being sometimes necessary to improvise: all of these factors contribute to the occurrence of different errors.

In the system-related causes, identified in 37 (30.9%) studies, situations

fall into situations such as lighting, noise, interruptions and distractions, training, lack of training or staff inexperience, policies and procedures. Several studies^{1,19,65,67,90} also point, in most hospitals, the unavailability or need to adapt the physical area for the execution of nursing processes related to medication, as well as improvements in the lighting conditions of the working environment and actions that provide reduction of acoustic discomfort. It is understood that these are key factors to ensure safety concerning the medication process.

Another cause referenced in 22 (18.3%) articles was communication. In this study, one understands this cause as failures in verbal or written communication, as well as errors of prescription interpretation. Studies^{19,25,52,80,83,84} show the gap that, unfortunately, still exists when the subject is communication among members of the medical and nursing staff and among members of the same team, especially regarding the clarification of doubts about the prescription, suspension or change of drugs and schedules. Patient safety is increased when there is the integration between medical and nursing staff. Therefore, it is necessary the communication to be present in a clear and

effective way, in all stages of drug treatment.

As for the intervention facing the ME, only 30 of the 79 articles showed the implementation of them (Chart 3). Interventions implemented related to the system, which were most mentioned were: implementation of safety protocols of drugs preparation and administration, implementation of electronic prescribing and inclusion of the pharmacist on staff. This reinforces the involvement of professional actions of three different areas: medical, nursing and pharmacy.⁶ A study that examined the effectiveness of electronic prescribing system concluded that this measure isolated is not able to reduce errors; therefore it is necessary it is tied to other interventions, such as education, training and review of protocols.⁷¹

The intervention implemented related to the human factor most cited was: training and/or orientation of the staff. Studies using pre and post- intervention training analysis of the team concluded that there was an improvement in performance and reduction of ME.^{63,69,77} This strategy was also pointed out, firstly, to improvement of the safety with medicines in a study conducted in southern Brazil, with nursing technicians, whose

objective was to identify, in the opinion of these professionals, the reasons for the occurrence of drug administration errors.⁶⁵

Finally, it emphasizes the need for hospitals to direct efforts for the formation of safety culture toward the patient, within which all professionals involved in the medication process are aware of the importance of identifying, reporting and prevention of ME. In addition, managers need to be aware of the need for enhancement of the aspects of the continuous education of their professionals for pharmacological issues involving hospitalized patient care.²¹

CONCLUSION

This study had as main types of ME: improper dose, dose omission and wrong time. This review has also shown that the studies indicate as the main causes of ME the human factor, factors related to the system and communication. And in relation to what has been pointed out as intervention to prevent ME in hospital environment, interventions connected to the system and the human factor were observed, highlighting the implementation of safety protocols of preparation and administration of medicines, electronic prescribing, inclusion of the pharmacist on staff, training and team orientation.

Knowing the main types and causes of errors prevalent in hospital is critical to improving the drug delivery process. It is believed that reporting the incidents related to ME may contribute to this identification, as well as for the implementation of administrative measures aimed at planning the medication system in the institution.

The continuing education of nurses related to drug process is a low-cost strategy; therefore, we should be increasingly exploited and valued by managers in order to prevent errors in medication administration, ensure patient safety and the success in nursing work process.

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