Use of safety strategies to identify children for drug administration

Utilização de estratégias de segurança na identificação da criança para administração de medicamentos

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Abstract

Objective: To understand the use of safety strategies in child identification for drug administration.
Methods: In this cross-sectional study at a pediatric unit, drugs were distributed in a centralized and unique manner. We conducted 373 observations of the process for preparing and distributing drugs carried out by 25 nursing professionals.
Results: The pharmacy had distributed 198 (53.1%) medicines without identifying the drugs' label, which, while in storage, was identified with the child's first name handwritten on adhesive tape. At the time of drug preparation, the professional transcribed the drug's name as described in the prescription to the drug label for 173 (90.6%) observations of injectable drug preparation and 161 (88.5%) observations of preparation of oral drugs. Information regarding the five rights of medication administration and preparation, such as the full name of the child, appeared on 10.7% of drug labels.
Conclusion: No safety strategies to identify children during drug administration were found, nor were any standards for data identification observed.

Resumo

Objetivo: Conhecer a utilização de estratégias de segurança na identificação da criança para administração de medicamentos.
Métodos: Foi realizada uma pesquisa de desenho transversal em uma unidade de internação pediátrica, onde a dispensação de medicamentos é centralizada e única. Foram realizadas 373 observações do processo de dispensação e preparo de medicamentos por 25 profissionais de enfermagem.
Resultados: A farmácia dispensou 198 (53,1%) medicamentos direcionados ao paciente sem identificação no medicamento que no armazenamento foram identificados pelo primeiro nome da criança manuscrito em fita adesiva. No momento do preparo do medicamento, o profissional transcreveu o medicamento da prescrição médica para rótulo em 173 (90.6%) observações de preparo de medicamentos injetáveis e em 161 (88.5%) observações de medicamentos orais. Quanto às informações relacionadas às cinco certezas do preparo e administração de medicamentos, o nome completo da criança apareceu em 10,7% dos rótulos.
Conclusão: Não são utilizadas estratégias de segurança na identificação da criança para administração de medicamentos e não existe padronização dos dados de identificação.

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Conflicts of interest: none to report.

Introduction

Improving strategies for quality of care is the goal of all health professionals. For 15 years, institutions delivering health care have recognized that misidentification of patients is related to the occurrence of adverse effects and, as a consequence, to patient safety.

In 2007, the World Health Organization emphasized that institutions and health professionals must pay particular attention to correct patient identification. The safety practices must entail appropriate structures and processes that reduce the occurrence of adverse effects.[1]

These premises are essential mainly for pediatric patients, who need specialized care because the ability to understand and communicate and level of development vary with age. They are also important to ensure that therapeutic decisions involve the greatest degree of safety possible.[2,3]

In Brazilian institutions, where drug distribution is centralized and unique manner, patient identification is crucial. This type of distribution generates two forms of receipt of medicines in pediatric inpatient care units: one for drugs for individualized use and the other for drugs for collective use. In the individualized form, the medicine is identified with the number on the patient's record and his/her first name. In the collective form, injectable drugs are used by more than one child; thus, solutions are placed in bottles.

This study sought to analyze patient identification in the process for drug administration and preparation at a pediatric inpatient care unit based on guidelines established by the World Health Organization.

Methods

This quantitative, exploratory, and descriptive research was carried out in the pediatric inpatient care unit at a teaching hospital in southern Brazil from September 2011 to January 2012.

Data were collected by using an observation instrument based on patient identification published by World Health Organization. The study variables were age of the nursing professionals, specific instruction on patient identification in the last two years, training on patient safety in drug preparation, drug distribution, patient identification during drug distribution, patient identification at the area where drugs are stored, medical prescription records, patient identification on medical prescriptions, information on prescribed medicines, manual transcription of medications as given on drug label, the presence of the five rights of medication administration and preparation on drug transcription label, location of drug label fixation for drug transcription, and drugs stored on the same tray.

The study sample was calculated considering the number of admissions per month and the number of drugs administered daily to pediatric patients that were recorded from July to December 2011. In six months, we identified 12,549 drug administrations (mean, 4.40 administrations per patient daily). Data were recorded in a statistical analysis program (SESTATNET®) of the Universidade Federal de Santa Catarina to calculate the sample size with a confidence level of 95%. The final sample represented 373 observations of drug preparation carried out by 25 nursing professionals who worked in the pediatric care inpatient unit.

Data obtained were organized by using an electronic spreadsheet (Microsoft Office Excel®). Descriptive statistics (mean, median, and standard deviation) and comparisons (chi-square tests) were analyzed by an electronic system.

This study followed national and international ethical and legal guidelines on research in humans.

Results

A total of 25 nursing professionals participated in the study: two nurses (8.0%), 22 (88.0%) nursing technicians, and one (4.0%) nursing auxiliary. The mean employee age was 39.0 (range, 59.9 – 23.0) years, and the average years of formal education was 15.2± 8.4 years.

When professionals were questioned if they have received specific instruction concerning pa-

tient identification within the last two years, seven (28.0%) mentioned that they have. Ten (40.0%) professionals reported participating in training on patient safety in drug preparation within the last year, and seven (28.%) other professionals reported participating in such training for more than one year ago.

Of 373 observations during drug preparation, 191 (51.2%) were of injectable medicines to be administered intravenously and 182 (48.8%) were for oral medications. Of the latter medicines, 127 (69.8%) were in solution form and 55 (30.2%) were pills. Among all drugs, 198 (53.1%) were administrated in the pharmacy and directed to patient; however, no observations for patient identification were found on the drug label. In addition, when drugs were stored in patient compartments, only the patient's first name, handwritten on adhesive tape, was observed. Results of comparison among the three types of drugs and directed distributions are described in table 1.

Table 1. Drug distributed in the pharmacy directed to the patient

Directed drugs	Injectable drugs to be administered intravenously n(%)	Drugs to be administered orally (pills) n(%)	Drugs to be administered orally (solution) n(%)	p-value*
Yes	148 (77.5)	34(61.8)	16(12.6)	
No	43 (22.5)	21(38.2)	111(87.4)	<0.0001
Total	191(100)	55(100)	127(100)	

* Pearson's chi-squared test

Most of drugs from the pharmacy were administered intravenously, followed by pills and oral solutions. This prevalence of intravenous administration is justified because the large amounts of drugs stored in the pharmacy are in solution form. A statistically significant difference between type of drugs and directed distribution was found (p<0.0001) (Table 1).

Of 373 observations recorded on medical prescriptions, the patient identification was typed for 207 (55.5%), handwritten for 81 (21.7%), and both typed and handwritten for 85 (22.8%). Of these, 166 (44.5%) identifications were registered manually, 3 (0.8%) were illegible, and 6 (1.6%) featured the patient's name written incorrectly.

A total of 182 (48.8%) drug prescription were typed, 90 (24.1%) were handwritten, and 101 (27.1) were both typed and handwritten. Of handwritten prescriptions, 16 (4%) featured illegible writing. Information on medical prescriptions related to patient identification and drugs is presented in table 2.

Table 2. Information of patient identification and drugs found on medical prescription

Information	n(%)
Patient full name	371(99.5)
Date	359(96.2)
Place of issuance	373(100)
Drug	373(100)
Dosage	366(98.4)
Professional signature	360(96.5)
Assinatura do profissional	365(97.9)
Professional register number of physicians	373(100)
Address of the institution of the patient	373(100)

In addition to information shown in table 2, the medical prescriptions also showed 348 (93.3%) observations with the number of the patient's record, 290 (77.7%) with the date of issuance, 3 (0.80%) with the date of birth, 293 (78.5%) with the patient's age, and 2 (0.5%) with the diagnosis. No prescription listed the patient's personal address.

At the time of drug preparation, the professional transcribed the drug from the medical prescription to the drug label in 173 (90.6%) observations for injectable medicines and 161 (88.5%) for oral medicines. Information on the five rights of medication administration and preparation (full patient name, drug, dosage, route, and time) is presented in table 3.

Table 3. Information related to five rights of medication administration and preparation

Information	Drugs to be administered intravenously n(%)	Drugs to be administered orally n(%)	Total n(%)
Full patient name	21(12.1)	19(11.8)	40(10.7)
Drug name	172(99.4)	160(99.4)	332(89.0)
Dosage	163(94.2)	157(97.5)	320(85.1)
Route	160(92.5)	145(90.1)	305(81.8)
Time	166(95.9)	160(99.4)	326(87.4)

The child's name as transcribed from drug labels included only the first name for 152 (87.9%) observations of injectable drugs and 142 (88.2%) observations for oral drugs; the first name and nickname of the child were found for observation of one (0.6%) injectable drug.

Concerning the area to which drug labels were affixed to be positioned on the tray for administration, we verified that for 10 (5.8%) injectable drugs, the labels were left loose on the tray; 56 (32.4%) labels were affixed on the package of the syringe; ten (5.8%) labels were affixed on the tray; and 97 (56.1%) labels were affixed on the syringe for the medicine. For drugs administered orally, seven (4.3%) labels were left loose on the tray, 16 (9.9%) labels were affixed on the tray, 22 (13.7%) labels were affixed on the drug bottle, and 88 (54.7%) labels were affixed on the package of the syringe where the drug was prepared.

Different drugs were stored on the same tray in 106 (55.5%) observations of injectable drugs and in 102 (56.0%) of drugs administered orally. We conducted a correlation analysis to verify the way that labels were placed on tray when more than one medicine was transported. We found that for injectable drugs, among the ten observations in which labels were left loose on the tray four (40.0%) had different medicines for the same patient or another patient. For the drugs to be administered orally, among the seven observations in which labels were left loose on the tray, three (42.8%) also had different medicines for the same patient or other patients.

Discussion

A limitation of this study was the use of observations as a research method; direct observations might interfere in the professionals' performance because they knew the objective of the study.

These study results can be directly applied to the institution where the research was conducted; after the study, administrative measures must be taken to correct the process used medicine identification with regard to pediatric patient safety.

Identifying patients during the process for administering and preparing drugs is part of the nursing role. When the nursing team understands the complexity involved in patient identification, they are more likely to ensure that medicines are prepared correctly, thereby facilitating patient treatment and decreasing the risk of errors.[4]

For this to happen, the team must receive updated instructions on how to correctly identify the patient during all aspects of drug administration and preparation. Thus, it is important to highlight that adequate training of the nursing team depends on continuing education efforts that include a technical and scientific foundation, along with professional commitment to improve safety for professionals and patients.[5] In a Brazilian study, authors verified that professionals' lack of knowledge in the drug system might be responsible for the failure of the system and for the differing degrees of patient harm.[6] Drug identification directed from the pharmacy with the patient's record is an important safety strategy. A system of individual administration is recommended over a collective system because it avoids inadequate storage of drugs and decreases the opportunities for errors by avoiding the availability and variability of drugs in a unit.[7]

The current legislation in Brazil determines what must be listed with a medical prescription. A prescription must identify the professional who prescribed the drug, the professional counseling register, the address of the institution, any active substances, dosage concentration, pharmaceutical formula, quantities, units and posology, use, date, place of issuance, patient's identification, and patient's home address. For adequate identification of pediatric patients, three identifiers must be used: the child's full name, the mother's full name, and child's date of birth.[8] Although the current legislation is clear, the results of a study conducted in a medical clinic unit at a Brazilian teaching hospital showed that 279 (94.9%) of medical prescriptions analyzed in that study were incomplete.[9]

The observation of transcribed labels of medical prescriptions by nursing professionals with information that identified patient and drugs can be compared with results of a study carried out in a pediatric unit of Minas Gerais, southeast Brazil. That studied found that in 71 (93.4%) observations, the professional checked medical prescription; in five (6.6%) observations, the medical prescription was not checked—instead, the drug was prepared according to the on professional's memory of previous prescriptions. This practice is extremely harmful

because the medical transcription is often changed because it is a communication instrument among health professionals, it must be checked every time a drug is prepared.[4]

Transcription of a medical prescription on the label is a strategy that avoids drug preparation only based on memory but, if information on the label is incomplete, it can contribute to errors. In addition, checking the medical prescription and information transcribed on the label is mandatory to guarantee that the medicine prepared was really prescribed for a specific patient.

Therefore, the patient's rights for medication administration and preparation must be considered; these rights are correct patient identification, drug name, time, route, and dosage. It is also necessary to make the right notes.

Other rights that must be considered are the patient's right to refuse a medication, to obtain patient guidance, and to be informed of drug compatibility.[10] The drug expiration date as a safety and effectiveness of treatments factor. In the institution where this study took place and that uses collective drug storage, to check a drug's expiration date is a security measure.

A safety strategy that must be incorporated is organizing drugs on trays at the time of preparation, especially when different drugs for several patients are on the same tray. In such a situation, labels must be adequate affixed and identified with the name of each patient to avoid confusion. Several studies show a number of identification systems that could be implemented in inpatient units, such as guidelines to identity patients, identification wristbands, and electronic medical record systems based on information technology. These systems, along with competent care, promote patient safety because they create barriers against identification errors and help reduce damages.[11-13]

Improvement in practice depends on a combined approach that includes better comprehension of sources of errors, reduction of complexity of routine procedures that require patient identification, as well as ongoing training of the team that emphasizes the importance of correct identification and regular follow-up of practice.[14]

In the institution where this study was conducted, we found that safety strategies regarding patient identification as published by the World Health Organization were not followed.

Although the importance of patient safety has been widely diffused worldwide, it is still necessary to readdress this topic in order to implement barriers and safety strategies to decrease the risk of errors and improve safety and quality care.

Conclusion

In the study institution, no safety strategies to identify children during drug administration were found, nor were any standards for data identification.

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Collaborations

Souza S and Cabral PFA declare that contributed to the conception of the study and assisted with the analysis and interpretation of the data and critical drafting of the manuscript to improve its intellectual content. Rocha PK contributed to the conception of the study and assisted with the analysis and interpretation of the data and critical drafting of the manuscript to improve its intellectual content and approval of manuscript final version. Kusahara DM contributed with the analysis, interpretation of data, critical drafting of the manuscript relevant to its intellectual content and approval of manuscript final version.

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