

DRUG PRESCRIPTION ERRORS: EVALUATION OF PRESCRIPTIONS IN THE PEDIATRICS CLINIC OF A SCHOOL HOSPITAL

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ABSTRACT

Background: Medication errors are common adverse events and may have significant economic and social repercussions. The prescription errors significantly contribute to the overall rate of medication errors and have high potential to result in harmful consequences for the user. **Objective:** The research aimed to analyze the quality of prescriptions in pediatrics with emphasis on prescription errors. **Methods:** It is an observational, descriptive, cross-sectional study with a retrospective design. It was performed at the Pediatric Clinic of a teaching hospital. The variables under study followed the recommendations of the Protocol of Safety in the Prescription, Use and Administration of Medications of the Ministry of Health. Data were stored, organized and statistically treated with the help of *SPSS version 20* software. **Results:** A total of 898 prescriptions were analyzed, containing a total of 3858 items, and the following analyzed variables were absent in the prescriptions: full name of the patient 2.7%, patient number 61.5%, wing 1.2%, bed 80.5%, infirmary 15.9%. The pharmaceutical form was absent in 26.1%, the drug concentration was not specified in 20.3% and the treatment time was not evidenced in 85.2% of the prescriptions evaluated. The volume and type of the diluent were not reported in 12.8% and 7.4% respectively, nor were the 96.6% and 79.3% infusion rates and speeds specified in the study prescriptions. **Conclusions:** The research shows that the quality of the prescription of the hospital in question needs major adjustments in several aspects, especially regarding drugs.

Key words: Patient safety, medication errors, pediatrics.

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INTRODUCTION

Adverse drug-related adverse events (AE) can cause significant health problems to patients and are currently considered an important public health problem. Among these adverse events, medication errors are common occurrences and may have significant economic and social repercussions¹.

Medication errors are any avoidable event that can lead to inappropriate use of drugs, irrespective of the risk of injuring the patient or not, and of the fact that the drug is in the possession of health professionals, the patient or the consumer².

The causes of these errors can be related to any point in the medication system, however, it is not uncommon to happen some medication error and only one professional is responsible, which corroborates for the low rate of notifications³.

Dean *et al.*⁴ define prescription error as an unintentional decision error that may reduce the probability of the treatment being effective or increase the risk of injury to the patient. Afterwards, Cassiani⁵ brings new elements for the definition of prescription errors and defines them as errors related to incorrect selection of the drug, according to contraindications, known allergies, and among other factors, monitoring, dose, route of administration, speed of infusion, concentration, inadequate or insufficient instructions for use, illegibility of the prescription or orders that may lead to error.

The errors due to prescription contribute significantly to the overall rate of medication errors and have high potential to result in harmful consequences for the user.⁶ Research shows that for every ten patients admitted to a hospital unit one is at potential or effective risk of medication error⁷.

Health professionals are aware that ambiguous, illegible, difficult to understand or incomplete prescriptions, as well as the lack of standardization of prescribed drug nomenclature (commercial or generic name), the use of abbreviations, the use of vague expressions and the presence of errors are factors that contribute directly to the occurrence of these events⁸.

With the implementation of the National Program for Patient Safety, some strategies were designed to try to minimize the occurrence of drug-related adverse events, among these strategies are the elaboration of protocols with themes relevant to patient safety, in this way, one of the protocols elaborated by the Ministry of Health in partnership with health surveillance and the Oswaldo Cruz Foundation was the safety protocol in the prescription, use and administration of drugs that brings some points that must be observed and followed in order to have a prescription considered safe⁹.

This research aimed to analyze the quality of prescriptions in pediatrics with emphasis on prescription errors, in order to contribute to the reduction of medication errors and promote the rational use of drugs, thus providing greater efficacy and safety to the patient in his or her life. pharmacological treatment.

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METHODS

It is an observational, descriptive, cross-sectional study with a retrospective design. It was carried out at the pediatric clinic of the University Hospital Lauro Wanderley (HULW) in João Pessoa – PB, the evaluation of the quality of the prescriptions was done through the evaluation of the prescriptions of internal users in said sector. The hospital in which the study was carried out has a pediatric hospitalization unit in full operation, with twenty-two beds and is the gateway to hospitalizations from the entire state of Paraíba. Data were collected from the second routes of the prescriptions of internal children in the pediatric clinic in the period of May and June of 2015.

The study sample consisted of prescriptions of children and adolescents admitted to the pediatric hospitalization unit of this hospital during the study period. The inclusion criteria for the analysis of the prescriptions were: to have at least one prescribed drug and more than twenty-four hours of permanence in the sector.

The variables followed advocating the security protocol in prescription, use and administration of drugs of the Ministry of Health⁹, therefore, evaluated the following: identification of the patient, prescriber identification, institution identification, prescription date identification, legibility, type of prescription used, adequate expression of doses, indication of drug allergies, specification of duration of treatment, specification of dosage prescription, dilution, speed, time of infusion, route of administration and use of expressions vacancies

The terms considered by the safety protocol in the prescription, use and administration of drugs of the Ministry of Health⁹ as vague expressions are: “if necessary”, “at medical discretion”, “use as usual”, “continuous use”, “do not interrupt” and “use as usual”, the use of these expressions predisposes the administration of the drug without judgment, which corroborates directly to the event of incidents¹⁰.

Due to the great subjectivity involved in the variable readability, it was decided to establish evaluation standards, thus reducing aspects of the subjectivity involved in the judgment. The variable was classified into two possibilities: a) Writing with good readability: normally handles without problems for understanding the writing; and (b) Unreadable writing: impossible to understand writing¹¹.

Data were stored, organized and statistically treated with the help of the SPSS version 20 software. A descriptive analysis of all the variables included in the study, frequency distributions and descriptive statistics of the quantitative variables was performed.

It is noteworthy that for the development of this research, all the ethical principles that are foreseen in the new Resolution 466, dated December 12, 2012 of the National Health Council (CNS) that approves guidelines and regulatory norms of research involving human beings. A total of anonymity was guaranteed to the individuals surveyed, with the free access to the results of the research, according to the Resolution. This research was approved by the Research Ethics Committee of the University Hospital Lauro Wanderley with the following protocol number: 1.138.356.

RESULTS

We analyzed 898 prescriptions, containing a total of 3858 items, which were observed individually. The average number of drugs per prescription was 4.2 drugs.

Demographic and clinical characteristics are shown in Table 1, which provides data on gender, age, diagnosis and prescription drugs for internal users in the pediatric clinic. Regarding gender, there is practically no difference among users.

The users were between 0 and 18 years old and it is worth noting that 12.8% of the prescriptions did not specify the age of the user, given extremely important for the choice and calculation of the dose of the drug. We found 69 different diagnoses. 102 different active principles were prescribed, which are described in Table 1.

Table 1: Distribution of prescriptions related to demographic and clinical data

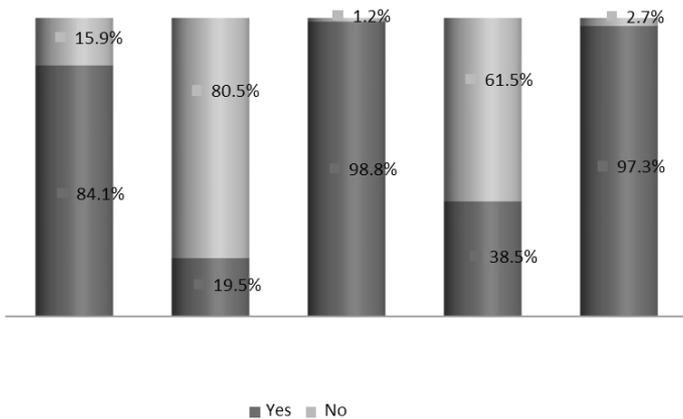
Variable	Frequency	Percentage (n = 898)
Age (years)		
0 – 4	465	51.8%
5 – 9	115	12.8%
10 – 14	169	18.8%
15 – 18	34	3.8%
Not informed	115	12.8%
Gender		
Female	429	47.8%
Male	449	50.2%
Not informed	20	2.2%
Diagnosis		
Pneumonia	129	14.4%
Systemic lupus erythematosus	58	6.5%
Urinary tract infection	50	5.6%
Bronchiolitis	31	3.5%
Leukemia	29	3.2%
Not specified	87	9.7%
Others	514	57.1%
Prescribed Medications		
Dipyron	615	15.9%
Simethicone	260	6.7%
Omeprazole	253	6.6%
Paracetamol	213	5.5%
Ceftriaxone	128	3.3%
Ondansetron	126	3.3%
Hydrocortisone	111	2.9%
Domperidone	104	2.7%
Furosemide	97	2.5%
Prednisone	80	2.1%
Spironolactone	78	2.0%
Other drugs	1793	46.5%

Graph 1 presents information necessary for a safe prescription according to the Ministry of Health prescription, use and administration of drugs,⁹ it was observed that the medical record number was not found in 61.5%, and in 80.5% did not mention the bed in which the patient was hospitalized, the name of the ward did not appear in 15.9% of the prescriptions evaluated.

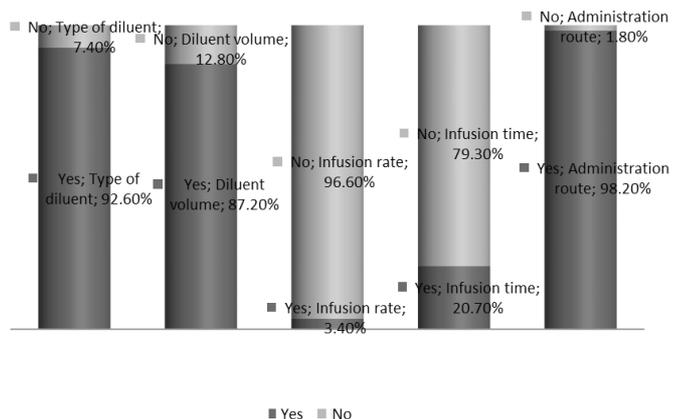
Regarding the identification of the prescriber, in 4.7% there was no full name of the prescriber responsible for the prescription and in 3.6% there was no registration number in the professional council. The date of prescription was not specified in 1.4% of the documents evaluated. The signaling of prescription drug allergies was found in 0.4% of the prescriptions under study.

The name of the establishment was present in 100% of the prescriptions, however, the address and telephone number of the health establishment are not part of the standard prescription of the hospital under study, thus, 100% of the prescriptions evaluated were absent.

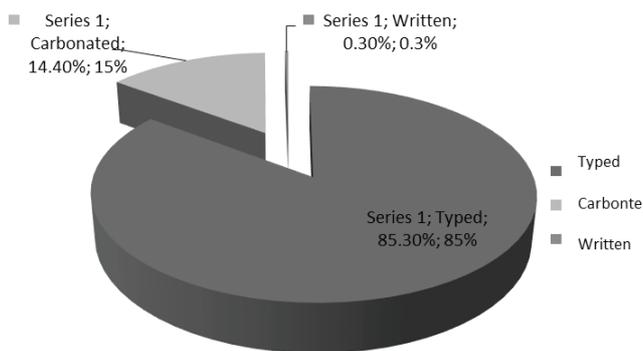
Regarding readability, 98.8% of the prescriptions were classified as readable, however, 1.4% could not identify the prescribed items, thus making it illegible. Regarding the type of prescription, 85.3% were prescriptions of the type typed, 15% carbonates and 0.3% prescriptions made by hand without the use of carbon to generate the second route, as can be observed in Graph 2.



Graph 1: Distribution of prescriptions regarding the presence of patient identification data.



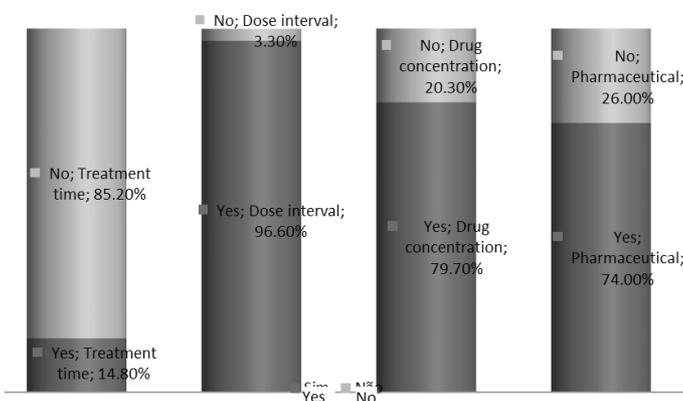
Graph 4: Distribution of prescriptions regarding the presence of essential information related to drugs and their route of administration.



Graph 2: Distribution of prescriptions according to the type of prescription

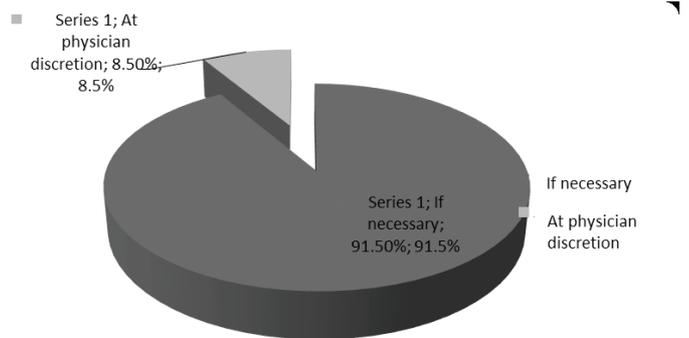
As regards the essential information related to the drug such as: pharmaceutical form, drug concentration, dose interval, treatment time, type and volume of the diluent, speed and time of infusion and route of administration, graphs 3 and 4 present the main data obtained in the research.

The pharmaceutical form was absent in 26.1%, the drug concentration was not specified in 20.3%, the treatment time was not evidenced in 85.2% of the prescriptions evaluated. The volume and type of the diluent were not described in 12.8% and 7.4% respectively, nor were the speed and time of infusion specified in the study prescriptions in 96.6% and 79.3%, respectively.



Graph 3: Distribution of prescriptions regarding the presence of essential information related to drugs.

As for the presence of abbreviations, it was observed that 96.2% of the prescriptions presented some type of abbreviation, occurring more frequently the abbreviations VO in 51.1% and EV in 38%. The use of vague phrases, such as “use as usual”, “at physician discretion”, “use if necessary” without the correct written explanation of how drug therapy should be performed, was evidenced in 24.4% of prescriptions, of the total 91.5% were “use if necessary” expressions expressed in the prescriptions by means of the abbreviation SN, 8.5% “use at physician discretion” expressed by the abbreviation ACM, as can be seen in Graph 5.



Graph 5: Distribution of prescriptions regarding the type of vague expression found.

DISCUSSION

Some studies, such as the one by Uchôa and Araújo,¹⁰ evaluated the quality of prescriptions and found an average of drugs prescribed per patient equal to 4.47, compatible with the value found in this research, however, the World Health Organization (WHO)¹² recommends that two drugs be prescribed per prescription, and therefore, the data found in the cited studies are well above what is recommended by WHO for the rational use of drugs. In addition to the number of drugs prescribed for the rational use of drug products, adequate prescribing, availability of the medicine at affordable prices, dispensing under appropriate conditions, the set of doses indicated, at defined intervals and in the indicated period of effective, safe and quality medicines¹³.

Patient identification consists of a process by which the patient is assured that he is assigned some specific type of procedure or drug treatment, preventing the occurrence of errors and mistakes that could lead to an injury. Identification errors can occur from patient admission to discharge, that is, at all stages of diagnosis and treatment, in this way the patient identification protocol of the Ministry of Health recommends that for the patient's identification to be safe it is necessary to use at least two identifiers, among them the full name of the user and the number of the medical record⁹.

The problems related to patient identification constitute a serious situation that may increase the probability of errors, lower data were found when compared with a study conducted by Rosa *et al*¹¹, in which it was observed that 47% of the prescriptions presented some absence of information on patient identification and 33.7% on prescriber identification, Bózoli¹⁴ observed that in 34.5% of the prescriptions there was no specification of the prescriber, Araújo and Uchôa¹⁰ mention in their study that 80% of the prescriptions did not present a prescribing physician's stamp and in 41.07% there was no professional registration number.

The prescription is a legal document, and as such, must contain the identification not only of the patient, but also of the issuer, so that in situations of doubt, it is possible to locate the person responsible for the prescription¹⁵. In addition to the patient's name, other tools may be used to minimize identification errors, such as the patient's number, however, Araújo and Uchôa¹⁰ found the absence of this information in 41% of the prescriptions given equivalent to the study described here. In a hospital environment, where there are hundreds of internal patients omitting this type of information can lead to serious incidents¹¹.

Regarding readability, a much lower percentage was found than those described in the studies by Silva *et al.*¹⁶, where 28.92% of the prescriptions were considered illegible, Leite and Silvério¹⁷ found 36% illegibility in the prescriptions evaluated. The low percentage of illegible prescriptions can be explained because the great majority of prescriptions evaluated in this research are of the typed type, thus minimizing the chances of not being understood or being misinterpreted.

When comparing the data from this research with the literature, we observed that the results (Graph 3) were close to those found by Rosa *et al.*, where the information on the pharmaceutical form was not mentioned in 84%, concentration 62%, dose 17% dose interval between 12% and route of administration in 13% of prescriptions¹¹, Aldrigue *et al.*, found lower percentages, where there was absence of the pharmaceutical form in 0.5%, concentration in 20%, dose 0.5%, interval between doses 1% and duration of treatment in 55% of the prescriptions evaluated¹⁸. Silvério and Leite¹⁷ stated that there was a lack of information regarding the pharmaceutical form in 64%, concentration in 47%, dose in 22%, interval between doses in 63%, duration of treatment in 30% and administration was absent in 84% of the prescriptions, the data of Silvério and Leite¹⁷ were the ones that approached quantitatively the study in question. Aspden *et al.*, affirm in their study that to prevent these types of errors in hospital environments the recommendations with the most scientific evidence are: the adhesion and implementation of electronic prescription with due clinical support, inclusion of pharmacists in clinical visits, viabilization of direct contact with the pharmacist for 24 hours to minimize drug-related doubts and the presence of specific procedures for safe prescription¹⁹.

Federal Law 5.991/1973, which provides for the sanitary control of the trade in drugs, medicines, pharmaceutical inputs and related items, in chapter VI, article 35, states that the hospital prescription must be legible, complete and clear, the name, registration number and bed of the user, date, name of the medicine to be administered, dosage, route, frequency and or time of administration, duration of treatment, legible signature of the physician and his professional registration number, nevertheless, even with specific legislation it is notable that the absence of such information in the prescriptions evaluated is not uncommon¹⁵.

The results referring to the presence of abbreviation are compatible with the data described by Silva *et al.*,¹⁶ Gutierrez *et al.*,²⁰ and Oliveira *et al.*,²¹ where abbreviations were found in 91.5%, 92.2% and 91.3%, respectively.

The use of abbreviations in medical prescriptions is among the most mentioned causes of medication errors due to their high potential for confusion and communication failures, being cited by some authors such as Rosa *et al.*, the possibility of extinguishing its use¹¹. The safety protocol in the prescription, use and administration of drugs of the Ministry of Health, condemns the use of abbreviations in the names of medicines and proposes that in hospital environments, that play extremely necessary the use of abbreviations, a standardized list of these is made and that this list is widely disseminated among all service professionals⁹.

The lack of information in the prescriptions can make treatment difficult and have serious consequences for the life of the patient.

Nevertheless, this research showed that it is common practice to omit information in the prescriptions, whether this information refers to the identification of the patient, the place of hospitalization, the diagnosis, the prescriber responsible and referring to the drug.

CONCLUSION

The research shows that the prescription of the hospital under study needs to be reevaluated in several aspects, especially regarding drugs, in order to avoid medication errors and that the care provided to users is of quality and increasingly safe.

The insufficiency of information and the lack of clarity in the prescriptions can confuse the professionals and cause serious damages to the users, therefore, it is necessary to create mechanisms to enable a prescription as correct as possible, taking into account the specific legislation and the protocol safety in prescription, use and administration of drugs of the Ministry of Health.

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Conflict of Interests

There are no conflicts of interest related to the execution of the study.

Authors' Contributions

DBC, LLAM, ALS and RADMS contributed with the design, planning, analysis and interpretation of data, performed writing and critical review of content. All involved approved the final version to be published.

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REFERENCES

1. Storpirtis S, Mori ALPM, Yochiy A, et al. *Ciências Farmacêuticas. Farmácia Clínica e Atenção Farmacêutica*. Rio de Janeiro: Guanabara Koogan; 2008. 251
2. National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP). *The Council: Moving into the Second Decade "Developing Recommendations and Offering Tools"*, 2000. [acessado 2015 abril 27, 8h50min]. Disponível em: http://www.nccmerp.org/pdf/fifteen_Year_report.pdf
3. Silva BK, Silva JS, Globo AFF, et al. Erros de Medicação: Condutas e propostas de prevenção na perspectiva da equipe de enfermagem. *Revista Eletrônica de Enfermagem*, 2007, 9(3):712-723.
4. Dean B, Barber N, Schachter V. What is prescribing error? *Health Care. Oxford*, 2000, 9: 232-237.
5. Cassiani SHB. A segurança do paciente e o paradoxo no uso de medicamentos. *Revista Brasileira de Enfermagem*, 2005, 58(1): 95 – 99.
6. Lopes LN, Garcia KP, Dias LG, et al. Qualidade das prescrições médicas em um Centro de Saúde Escola da Amazônia Brasileira. *Revista Sociedade Brasileira Clínica Médica*, 2014, 12(2): 135-139.
7. Zangwil AB, Bolinger AM, Kamei RK. Reducing prescribing errors through a quiz program for medical residents. *Ann. J. Health Syst Pharm*, 2000, 30(2):1396-1397.

8. Cassiani SH, Freire CC, Gimenes FRA. A prescrição Médica Eletrônica em um Hospital Universitário: Falhas na redação e opinião dos usuários. *Revista Escola de Enfermagem USP*, 2003, 37(4): 51-60.
9. Brasil. Protocolo da Segurança na Prescrição, Uso e Administração de Medicamentos. Ministério da Saúde; Fundação Oswaldo Cruz; Agência Nacional de Vigilância Sanitária. *Ministério da Saúde*, Brasília, 2013.
10. Araújo PTB, Uchôa SAC. Avaliação da qualidade da prescrição de medicamentos de um hospital de ensino. *Revista Ciência & Saúde Coletiva*, 2011, 16 (1): 1107-1114.
11. Rosa MB, Perini E, Anacleto TA, et al. Erros na prescrição hospitalar de medicamentos potencialmente perigosos. *Revista de Saúde Pública*, 2009, 43(3): 490-498.
12. Organização Mundial de Saúde (OMS). *Como investigar el uso de medicamentos en los servicios de salud. Indicadores seleccionados del uso de medicamentos*. Ginebra, 1993.
13. João WSJ. Reflexões sobre o Uso Racional de Medicamentos. *Revista Pharmacia Brasileira*, 2010, 78. Disponível em: http://www.cff.org.br/sistemas/geral/revista/pdf/128/015a016_artigo_dr_walter.pdf [acesso em 2015 abril 28].
14. Bozoli LFB. *Análise de prescrições para tratamento de câncer de mama em hospital universitário* [monografia]. Ribeirão Preto (SP): Universidade de São Paulo; 2013.
15. Brasil. Lei nº 5.591, de 17 de dezembro de 1973. Dispõe sobre o controle sanitário do comércio de drogas, medicamentos, insumos farmacêuticos e correlatos e dá outras providências. Brasília. [acesso em 2015 abril 28, 15h30min]. Disponível em: http://www.planalto.gov.br/ccivil_03/leis/L5991.htm
16. Silva BK, Silva JS, Globo AFF, et al. Erros de Medicação: Conduas e propostas de prevenção na perspectiva da equipe de enfermagem. *Revista Eletrônica de Enfermagem*, 2014, 9(3):712-723.
17. Silvério MS, Leite ICG. Qualidade das prescrições em município de Minas Gerais: Uma abordagem farmacoepidemiológica. *Revista Associação Médica Brasileira*, 2010, 56: 675-680.
18. Aldrigues RFT, Correr CJ, Melchioris AC, et al. Análise da completude de prescrições médicas em uma farmácia comunitária de Fazenda Rio Grande – Paraná (Brasil). *Acta Farm Bonaer*, 2006, 25: 454-459.
19. Aspden P. Committee on identifying and preventing medication errors. preventing medication errors. institute of medicine of the national academies. Washington. *The National Academies Press*, 2007: 544.
20. Gutiérrez E, Moggi A, Beron A, et al. Errores de medicación em niños hospitalizados. *Archivos de Pediatría del Uruguay*, 2011, 82(3).