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ABSTRACT

Introduction: The act of documenting in the medical records the activities related to pharmacotherapeutic monitoring has been emphasized by societies and organizations of hospital pharmacists over the years in several countries, thereby reinforcing the need to orderly record their activities through writing standards to optimize care and enhance recognition among the multidisciplinary team. **Objective:** To develop semi-structured models to implement pharmaceutical progress in electronic medical records in the pediatric unit of the University Hospital at the Federal University of Juiz de Fora – Minas Gerais. **Material and Methods:** A descriptive cross-sectional study was conducted with patients admitted to the non-COVID-19 pediatric ward from December 1, 2021, to January 31, 2022, whose clinical activities by the pharmacist were recorded in the electronic medical records. Information from users was collected through medical history and input from other professionals, in addition to evaluating prescriptions and documenting pharmacist-suggested interventions related to identified inconsistencies in dosage, dilutions/diluents, drug interactions, occurrence of adverse reactions, therapeutic duplicity, Y-site incompatibilities, and health education. **Results:** Fourteen semi-structured models based on the SOAP method (Subjective; Objective; Assessment; Plan) were included and implemented for the application of pharmaceutical progress with standardized recording. During the study period, there were 66 hospital admissions. Of these, 45 were eligible and had records in the electronic document of pharmaceutical history and daily prescription assessment results, whether or not pharmaceutical interventions were present. **Conclusion:** The study aimed at creating a model for clinical progress notes, aiming to enhance effectiveness and continuity of care in the pediatric sector, as well as to enrich communication and recognize the value of the clinical pharmacist's service.

Keywords: Pharmacy Service Hospital; Pharmacists; Electronic Health Records; Hospital Information Systems; Pediatrics.

RESUMO

Introdução: O ato de documentar no prontuário as atividades relacionadas ao acompanhamento farmacoterapêutico foi enfatizada por sociedades e organizações de farmacêuticos hospitalares ao longo dos anos em diversos países, na qual reforça a necessidade de registrar de maneira ordenada suas atividades por meio de padrões de escrita para otimizar os cuidados e ampliar o reconhecimento por parte da equipe multiprofissional. **Objetivo:** Construir modelos semiestruturados para implementar a evolução farmacêutica em prontuário eletrônico na unidade de pediatria do Hospital Universitário da Universidade Federal de Juiz de Fora – Minas Gerais. **Material e Métodos:** Estudo descritivo transversal realizado com os pacientes que foram admitidos no setor de pediatria não COVID-19, no período de 1 de dezembro de 2021 a 31 de janeiro de 2022, que tiveram as atividades clínicas do farmacêutico registradas no prontuário eletrônico. Foi realizada coleta das informações dos usuários por meio da anamnese médica e de outros profissionais, além da avaliação das prescrições e registro das intervenções sugeridas pelo farmacêutico de acordo com a identificação de inconsistências referentes à dose, diluições/diluentes, interações medicamentosas, ocorrência de reações adversas, duplicidade terapêutica, incompatibilidades em Y e educação em saúde. **Resultados:** Foram incluídos e implementados 14 modelos semiestruturados baseados no método Subjetivo, Objetivo, Avaliação, Plano (SOAP) para aplicação da evolução farmacêutica com padronização do registro. No período do estudo houveram 66 internações. Destas, 45 foram elegíveis e tiveram registro no documento eletrônico da anamnese farmacêutica e resultado da avaliação das prescrições diárias, na presença ou não de intervenções farmacêuticas. **Conclusão:** O estudo direcionou a criação de um modelo para as evoluções clínicas, com o intuito de melhorar a efetividade e a continuidade do cuidado no setor de pediatria, além de enriquecer a comunicação e valorizar o serviço do profissional farmacêutico clínico.

Palavras-chave: Serviço de Farmácia Hospitalar; Farmacêutico; Registros Eletrônicos de Saúde; Sistema de Informação Hospitalar; Pediatria.



INTRODUCTION

The concept of pharmaceutical care is relatively recent and began to be discussed in the last decades, at the same time that the professional's activities advanced from the act of dispensing medications to the application of clinical pharmacy and pharmaceutical assistance concepts. The act of documenting in the health record the activities related to pharmacotherapeutic follow-up has been reinforced by societies and organizations of hospital pharmacists over the years in several countries, emphasizing the need to orderly record their activities through writing standards to optimize care and broaden recognition by the multidisciplinary team.^{1,2}

Despite this, the percentage of hospital pharmacy professionals in Brazil who record their activities in health records is around 50%.³ This result can be explained by the issues addressed by Pullinger and Franklin⁴ about the potential documentation barriers in patient health records: the preference for verbal communication, fear of litigation, criticism by medical staff, the acceptance by multidisciplinary professionals, lack of training, and the limited sense of ownership of the health record.⁴

Evolutions recorded in health records ensure the improvement in the dialogue between the professionals of the team and the patient, allowing a historical record of health and therapeutic problems, as well as, if necessary, tracking the processes carried out. Furthermore, it guarantees safe and easy interaction with your data and helps you make decisions aligned with the patient's overall health.⁵

Through Resolutions n° 555 of November 30, 2011, and n° 585 of August 29, 2013 from the Federal Council of Pharmacy of Brazil, the pharmacist is now encouraged for the practice of documentation in health records and this activity is considered to enable improvements in health care, manage and reduce the risks inherent in to the procedures aimed at the patient, contribute to the assistance and health service, enrich teaching and research, and assist in promoting the rational use of medication and patient safety.^{6,7}

One of the most used formats by other clinicians to structure the evolution and facilitate the record is the SOAP. The acronym encompasses the information collected in the care process into Subjective and Objective data, Patient Assessment, and the elaboration of a Plan.⁸ Within the pharmaceutical field, it comprises the patients' clinical and medication history, existing health problems, medication-related problems, interventions performed, and care plan for each health problem with the definition of goals to be achieved, besides exploring the patient's experience with the medication.⁹

Before the implementation of the pharmaceutical record in the health records of the Pediatric sector of the University Hospital at the Federal University of Juiz

de Fora (UFJF), the documentation of activities was performed by means of a spreadsheet of non-compliance accessed only by the pharmacy sector, not being visible to the other professionals of the interdisciplinary team.

Therefore, the study aimed to create semi-structured models and implement pharmaceutical evolution in electronic medical records in the pediatrics unit of the University Hospital of the Federal University of Juiz de Fora.

MATERIAL AND METHODS

The descriptive cross-sectional study was conducted at the University Hospital of the Juiz de Fora Federal University – Minas Gerais. In this service, there was the development of semi-structured models for the implementation of pharmaceutical evolution in the Management Application for University Hospitals (AGHUX) electronic system using individuals who were admitted to the non-COVID-19 pediatrics sector from December 1, 2021, to January 31, 2022.

Computerized prescriptions, inpatients, patients with a length of stay longer than one day were included in the study. The exclusion criteria were medical prescriptions for outpatients, patients with less than a day of hospitalization and those discharged on weekends, patients admitted to the COVID-19 pediatrics, in which in-person medication reconciliation was not carried out due to isolation. This study was submitted to the ethics committee of the University Hospital of the Juiz de Fora Federal University (UFJF) and approved under opinion number 4.825.872.

Initially, record templates of the pharmaceutical history taking were built, including templates for medication reconciliation, pharmacotherapeutic follow-up for dose confirmation, volume, diluent, and infusion time, Adverse Drug Reaction (ADR) reporting, drug interaction, guidance on stability and expansion after reconstitution, Y-incompatibility, interaction with enteral nutrition, and pharmaceutical guidance at patient discharge.

For later record of the pharmaceutical history taking, the main information (reason for hospitalization, continuous use medications, drug allergies) of the patient admitted in the last 48 hours was collected by means of health history taking of other professionals and of the medication reconciliation service by the pharmacist together with the patient and his/her companion, with application of the Informed Consent Form (ICF). Then, the presence of intentional and unintentional discrepancies was analyzed, as well as adverse reactions/allergies to medications for documentation in the electronic health record in the "Anamnese" (Pharmaceutical History Taking) tab, after confirmation with the medical team.

The documentation in the "Evolution" field started with the pharmacotherapeutic assessment of the prescriptions to identify inconsistencies regarding dose, dilutions/diluents, drug interactions,

occurrence of adverse reactions, therapeutic duplicity, Y incompatibilities, and health education. After the analysis, the prescriber was also contacted when it was necessary to perform an intervention and, soon after, it was documented in the system using the standard models built for record.

When recording the activities carried out by the pharmacist, the use of judgmental terms regarding other professionals on the team should be avoided. The study by SHPA (2013), cited by Amorim and collaborators¹², also recommends the use of terms such as "suggest", "consider", "confirm" and abbreviations that are standardized in the institution in question.^{10,11}

The semi-structured models built to be used in the AGHUX system were based on the SOAP (Subjective, Objective, Assessment, Plan) model because it is the most usual among health professionals, favoring communication between the pharmacist and other members of the multidisciplinary team.¹² It is important to emphasize that even in cases where the medical prescription does not require interventions, it is valid to record in the evolution all the parameters related to pharmacotherapy for consultation and demonstration of daily follow-up and/or whenever necessary.

RESULTS

Fourteen semi-structured templates based on the SOAP model were created to implement pharmaceutical

evolution in the Electronic Medical Record (RES). The models were developed according to the activities carried out by the clinical pharmacist as a way of standardizing writing.

In addition, the templates were structured so that they contain information in an orderly manner based on patient's health conditions, indication and analysis of the prescribed medications therapeutic objective, identification of Pharmacotherapy-Related Problem (PRP), identification of allergies/ARR (Adverse Drug Reaction), and the conduct adopted for each clinical case. This provision is supported by ASHP (2003) and American College of Clinical Pharmacy (2014), which reports the importance to record the clinical services of the pharmacy professional according to this objective organization to make pharmacotherapy-related guidance available to other professionals on the team and provide comprehensive care to the user.^{2,21,22}

During the study period there were 66 admissions to the non-COVID-19 Pediatrics sector. Of these, 35 (53%) were included in the sample and the clinical activities of the pharmacist were recorded in the patient's electronic health record. Of the 21 not eligible for the study, 09 (42.9%) were hospitalized for less than 24 hours, and 02 (9.5%) were transferred before medication reconciliation.

Table 1 shows the information included in the template created during the study for recording in the electronic health record in the "Pharmaceutical History

Table 1: Information present in the model for recording in the "Anamnesis" field of the medical chart AGHUX electronic, University Hospital (UFJF), 2022.

SOAP Acronym	Information
Subjective and objective patient data	Identification: name, age, weight, BSA, city of origin; History of current illness, comorbidities, reason for hospitalization Medication reconciliation: medications for home use with name, presentation, route of administration and posology; Medications prescribed at the institution with name, presentation, route of administration and posology Presence of allergies and/or adverse reactions to medications
Evaluation of the medication reconciliation process	Recording of problems related to pharmacotherapy; Identification of intentional and unintentional discrepancies Confirmation of whether or not the patient brought the home use medication and if it is in use in the hospital; Aspects such as validity and condition of use of the patient's medication Analysis of drug interactions and incompatibilities in Y
Plan after medication reconciliation	Record of recommendations discussed with the interdisciplinary team Record of patient orientation regarding pharmacotherapy; Record of identified drug interactions and Y incompatibilities

AGHUX: Management Application for University Hospitals; BSA: body surface area.

Taking" tab for Medication Reconciliation service.

Figure 1 illustrates an example of an evolution performed after the medication reconciliation process with the patient and companion in the Pediatrics sector, using the semi-structured model built to assist in the record.

Table 2 shows the information that should be recorded in the electronic health record in the tab "Pharmaceutical Evolution" after daily evaluation of inpatient prescriptions during pharmacotherapy follow-up.

Figure 2 illustrates an example of an evolution

using the semi-structured model created, which was carried out after the pharmacotherapeutic follow-up process, from the daily analysis of prescriptions in the Pediatrics sector.

DISCUSSION

The evolution models structured at the beginning of the study facilitated the implementation of pharmaceutical evolution in the patient's health record at the UFJF University Hospital. As corroborated by Lima¹⁴ and

<p># Identification</p> <ul style="list-style-type: none">- Name: - Weight: 6.435Kg SC: 0.34- Age: 5 months 12 days- City of origin: - <p># History of the current disease:</p> <p>According to the medical history, on 12/29/21 the infant started presenting incoercible vomiting that remained persistent until 12/31/21 and on this day she started presenting fever and diarrhea (several episodes per day). She was admitted to the HRJP on 03/01/22 for support and treatment. After stabilization, the patient was transferred on the day and today 11/01 to this hospital for neurological and nephrological follow-up. Last febrile peak: 37.9° at 2 am on 09/01/22.</p> <p># Diagnostic hypotheses:</p> <ul style="list-style-type: none">- Schizencephalic type brain malformation with open lips and polymicrogyria.- Facial dysmorphisms.- Epilepsy.- Polyuric syndrome.- Hyperosmolarity/Hyponatremia.- Anemia. <p># Admission medication reconciliation performed on 12/01/2022 with attendant.</p> <ul style="list-style-type: none">- Caregiver reports that patient uses home use of: <p>Levetiracetam 100mg/ml (0.6- 0 - 0.6ml) (Patient medication used in the hospital); Clonazepam (2.5mg/ml 0-0-1 drop) (Institution medication used during hospitalization); Ferrous sulfate solution (7 drops 1 x day) (not prescribed during hospitalization).</p> <ul style="list-style-type: none">- Intentional discrepancy: non-prescribed ferrous sulfate. <p>- Allergies and/or adverse reactions to medications: Deny.</p> <p>#All drugs were validated by the pharmacy team, receiving the labels according to the indication of use in the institution or not, and stored in the patient's locker on the ward so that the nursing team is responsible for administering them.</p> <p>PAY ATTENTION TO THE DELIVERY OF MEDICATIONS AT HOSPITAL DISCHARGE.</p> <p>This list of medications is attached to the patient's chart in the "Other" section, duly signed by the person responsible.</p> <p>#Conduct</p> <ul style="list-style-type: none">- It is suggested to switch from the patient's clonazepam to the institution's clonazepam;- Confirmed with prescriber the non-inclusion of ferrous sulfate, awaiting laboratory test results;- Y-incompatibility: No Y-incompatibilities were detected in the database consulted;- Drug Interaction: No relevant drug interactions were identified in the database consulted (UpToDate);-Follow.

Figure 1: Example of a record in an electronic health record in the "Health History Taking" tab after medication reconciliation at the University Hospital UFJF, 2022.

Table 2: Information present in the template created for recording in the "Evolution" tab of the AGHUX electronic health record at the University Hospital UFJF, 2022.

SOAP Acronym	Information
Subjective and objective patient data	Identification: Patient name, age, weight, CS; Reason for admission
Reassessment after the pharmacotherapeutic follow-up process/Pharmacist's conduct after reassessment	<p>Adequacy of the protocols followed by the institution; Follow-up of antibiotic therapy (when present)</p> <p>Pharmacotherapy follow-up and prescription adjustment after contact with the interdisciplinary team, according to the identified non-conformity, among them:</p> <ul style="list-style-type: none"> a) therapeutic duplicity b) drugs that cannot be administered by tube Dose, volume, diluent and/or c) infusion time d) ADR Reporting e) drug interaction Y-incompatibility f) pharmaceutical guidance on drug stability g) pharmaceutical guidance of expansion after reconstitution of the drug h) guidance at the hospital discharge of the health user

AGHUX: Management Application for University Hospitals; BSA: body surface area; ADR: adverse drug reaction.

Identification Name: -
 Age: 14 years 10 months Weight: 65.4 Kg SC: 1.73
 City of origin: -

History of the disease on admission:
 According to medical anamnesis, the patient has nephrotic syndrome (diagnosed at 02 years of age). Poor adherence to treatment due to psychological condition (does not take medications correctly). According to the mother's report, an antibiotic was given on the day of admission (05/01/22), but without information on the prescription from the hospital of origin. Patient went for a routine consultation, and hospital admission was indicated for treatment of possible cellulitis on left thigh + decompensated nephrotic syndrome (worsening of edema/anasarca + increased abdominal volume + decreased diuresis). Patient admitted to this sector, hemodynamically stable, complaining of low back and abdominal pain, in addition to pain in the left thigh.

Diagnostic hypothesis
 Corticor-resistant and calcineurin inhibitor-resistant nephrotic syndrome
 Bacterial peritonitis under treatment
 Acute venous thrombosis involving portal, splenic and superior mesenteric veins
 Portal hypertension
 Splenic ischemia
 Appendectomy (on 06/01/2022).

Follow-up on antibiotic therapy
 D10/D14 of VANCOMICIN 500 mg; DS=1 FRA; IV; every 6/6 hours. Dose: 33 mg/kg/day. Started 01/17/2022.
 D20/D21 of MEROPENEM 1 g; DS=1 FR; IV; 8/8 HOURS; Dose: 3 g/day. Started 08/01/2022

Pharmaceutical follow-up and prescription adjustment
 Correction of the omeprazole reconstitution step was requested (use proper diluent). Request met
 Y-incompatibility:
 Onsasetron and Furosemide: Preferably, do not administer together.
 Suggestion: Space out the schedule= 1h before or 2h after or flush the circuit with DES between medications.
 I follow.

Figure 2: Example of an electronic health record in the "Evolution" tab after daily analysis of the prescriptions at the University Hospital UFJF, 2022.

FRA: vial; IV: intravenous; mg/kg/day: milligram/kilogram/day; g/day: gram/day; SS: saline solution.

Freitas¹⁵, most professionals said that it is necessary to document in the health record all their clinical services, while the same number of participants reported not having understanding about health record documentation models, being one of the main impediments to perform their functions, as well as the lack of structuring and standardization of processes.^{13,14}

According to a study by Lima and collaborators¹⁴, more than half of the participants said they work in more than one sector in the institution and reported that the overload of activities and unavailability of time hinder or prevent the recording of clinical activities. This result further strengthens the relevance of structuring models for documentation based on a clinical technique and developing training with professionals as a way to encourage recording their assessments, interventions, conducts in a document common to all professionals of the multidisciplinary team.^{13,2}

The fact that the institution, where this study was conducted, adopts electronic health record was another facilitating factor for the implementation of the pharmaceutical evolution. The same was stated by Vedel¹⁶, where they reported that the electronic record allows information to be accessed from any device in the hospital using the system, besides enabling its simultaneous use by different professionals of the team. The documentation plays the role of ensuring the continuity of care and establishes the contributions of each profession, besides being a way to define the activities inherent to each employee of the team.¹⁵

This fact is reinforced by the American Pharmacists Association (APHA), 2007, in which it says that the pharmacist is experienced in keeping several records, but many are not experienced in documenting patient care activities in patient's health record.¹⁶

According to Pullinger & Franklin⁴, most of the research analyzed on the documentation of the multidisciplinary team in hospital settings did not detect records of pharmacists. In the smaller portion of the studies where there was documentation of the professional, much of this documentation did not cover all of the activities performed by pharmaceutical care. The importance of implementing pharmaceutical records in hospitals as a way of documenting the pharmaceutical care provided to the patient.

Before the introduction of semi-structured models, no clinical activity of the professional had been registered in the health record of patients admitted to the pediatric ward, and after its introduction, 100% (45) of eligible patients in the study period had at least one of their activities documented in the health record.

The result is corroborated by the American Society of Health-System Pharmacists (2003), which through results demonstrated that there are flaws in the process and the semi-structured models can encourage the professional to incorporate the record of activities in their routine, and thereby establish good communi-

cation and flow of information, since documentation is performed by all other health professionals.²

The documentation of clinical activities of the pharmacist brought benefits after being incorporated into the routine related to the pediatrics sector, such as easy and fast access to patient history, clear organization, and simultaneous sharing of information with the entire multidisciplinary team. The predicted advantages were also reported by Canêo & Rondina¹⁹, who describe the benefits as improving therapeutic planning and decision making.

It is necessary to pay attention to the complete recording of patient information to reduce the damage in care and not underestimate the therapeutic and safety strategies of users.^{18,19,20}

CONCLUSION

With the elaboration of semi-structured models based on the SOAP method, it was possible to implement the pharmaceutical evolution in electronic health records of patients admitted to non- COVID-19 pediatric unit, and consequently, a better organization of the information related to the activities of the pharmacist and his/her valorization in relation to other professionals, since the act of documenting validates responsibility.

Therefore, it is expected that the implementation of the pharmaceutical evolution be extended to other clinical units of the institution, and that the pre-elaborated models in the study, in addition to team training, will facilitate the service implementation process.

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