RBFHSS
Revista Brasileira de Farmácia Hospitalar e Serviços de Saúde

Original Paper

Open Access

Good practices in dispensing materials and medicines in a home care in Porto Alegre/RS from a technical-scientific perspective

Carlos Roberto KRAMER-FILHO[1], **Rafaela MARIN**[1]

[1]Centro Universitário Metodista - IPA, Porto Alegre, Rio Grande do Sul, Brasil

Corresponding author: Kramer-Filho CR, ckramerfilho@gmail.com

Submitted: 02-03-2023 Resubmitted: 08-06-2023 Accepted: 11-06-2023

Peer review: blind reviewer and Maria Fernanda Barbosa

Abstract

Objective: To analyze the process for dispensing materials and medications of a home care company from Porto Alegre/RS, in order to devise possible actions of good practices to be used during future dispensing processes, as well as to contribute to improving the service provided. **Method:** The research had a quantitative-qualitative approach: a documentary study, to analyze the occurrence of possible failures/near failures in the records of requests for dispensing materials and medications; and a case study, with the objective of investigating and contributing to possible good practices to be applied during future dispensing processes. As data collection instrument, a questionnaire was used, with open, closed and multiple-choice questions, so that the opinions of active Pharmacy professionals could be collected in the processes for dispensing materials and medications in different existing scenarios. **Results:** Through this study it can be seen that, during immersion in the company, there was a low percentage of failures/near failures while dispensing materials and medications to patients, and that the most frequent failure/near failure was "Pharmacy professional distraction during the dispensing processes". **Conclusion:** From the bibliographic deepening and the analysis of the results, development of this research made it possible to establish and implement good practices in the processes for dispensing materials and medications of the home care company under study. Among the best practices, the creation of an awareness booklet for employees who work directly with dispensing was obtained; the entire medication register was updated using the CD3 method as a basis, correcting items with similar spelling/appearance/sound; as well as separating them on different shelves and improving the ways of identifying items that had similar labeling or packaging. It is expected that, with these good practices, these professionals may minimize the failures/near failures observed in future dispensing processes.

Keywords: good dispensing practice; drugs dispensing; dispensing errors; home care.

Boas práticas na dispensação de materiais e medicamentos em uma *home care* em Porto Alegre/RS sobre o olhar técnico-científico

Resumo

Objetivo: Analisar o processo de dispensação de materiais e medicamentos de uma empresa home care de Porto Alegre/RS, a fim de criar possíveis ações de boas práticas a serem utilizadas durante os processos de dispensação futuros, bem como contribuir na melhoria do atendimento prestado. **Método:** A pesquisa contou com uma abordagem quanti-quali: um estudo documental, para analisar a ocorrência de possíveis falhas/quase falhas nos registros de requisição de dispensação de materiais e medicamentos; e um estudo de caso, com intuito de investigar e contribuir com possíveis boas práticas a serem aplicadas durante as dispensações futuras. Como instrumento de coleta de dados, utilizou-se um questionário, com perguntas abertas, fechadas e de múltipla-escolha, para que pudessem ser coletadas opiniões dos profissionais de Farmácia atuantes, nos processos de dispensação de materiais e medicamentos em diferentes cenários existentes. **Resultados:** Através deste estudo, pode-se verificar que durante a imersão na empresa, houve um percentual baixo de falhas/quase falhas durante a dispensação de materiais e medicamentos aos pacientes, e que a falha/quase falha de maior ocorrência foi a "distração do profissional de Farmácia durante os processos de dispensação". **Conclusão:** O desenvolvimento desta pesquisa possibilitou a partir do aprofundamento bibliográfico e da análise dos resultados, estabelecer e implementar boas práticas nos processos de dispensação de materiais e medicamentos da empresa home care estudada. Dentre as boas práticas obteve-se a criação de uma cartilha de conscientização dos colaboradores que atuam diretamente com a dispensação; atualizou-se todo o cadastro de medicamentos, usando como base o método CD3, corrigindo-se os itens com escrita/aparência/sonografia semelhantes; bem como separou-se em prateleiras diferentes e melhorou-se as formas de identificação, dos itens que possuíam rotulagem ou embalagens semelhantes. Espera-se que, com estas boas práticas estes profissionais possam minimizar as falhas/quase falhas observadas, nas dispensações futuras.

Palavras-chave: boas práticas de dispensação; dispensação de medicamentos; falhas na dispensação; serviços de assistência domiciliar.

Introduction

Through humanized service to their patients, Pharmacy professionals are responsible for providing an effective, safe and quality service regarding medication use in different performance areas. Among them, there is performance in home care, allowed through Resolution RDC No. 11of January 26th, 2006, which provides for the technical regulation of the operation of services that provide home care. In the patient safety issue, several proposals and studies have emerged in the last decades[1].

In mid-2000, the United States Institute of Medicine prepared the report called "*To Err is Human: Building a Safer Health System*" with the objective of clarifying the best practices to be adopted to reduce medical errors in quality of the care provided and, consequently, increase patient safety[2]. Through the "*Patients for Patient Safety*" program, established in 2013, the World Health Organization (WHO) sought to unite efforts among patients, health professionals, family members and public policy makers[3]. In Brazil, the main action was the creation of the National Patient Safety Program (*Programa Nacional de Segurança do Paciente*, PNSP), prepared by the Brazilian Ministry of Health and instituted by GM/MS Ordinance No. 529/2013, with the proposal to qualify the different Brazilian spaces in relation to health care[4].

Drug dispensing has been regulated since 1973 and defined as the "act of supplying the consumer with drugs, medications, pharmaceutical supplies and related items, either paid or not"[5]. However, dispensing "continues to be treated as an act of delivering a product devoid of its technical and professional function"[6]. It is up to pharmacists to be aware of the processes for dispensing, administering and prescribing medications. However, this is a process under construction and may be subjected to failures, which often jeopardizes provision of services, thus increasing, mainly, the rates of failures/near failures in the dispensing process[7].

Studies carried out in the United States and England have shown failure rates in the dispensing process close to 10%, even in hospitals that use advanced and automated dispensing systems[8,9]. Rates above 10% are reported in Brazil[10-13]. Among the most relevant failures and/or near failures, the following stand out: lack of update in the systems that generate electronic prescriptions; high prices of the information systems; sale of over-the-counter antibiotics; lack of good practices by the pharmacists; need for a protocoled and recorded dispensing process[14]; factors related to the work environment; factors related to the medications; and factors related to the tasks[15]; system barriers that limit adherence to treatments; availability of treatments; incidents where physician evaluation is essential[16]; dose omission; medication dispensed even with essential data absent or incorrect in the prescription; medication dispensed with wrong concentration; overdose; wrong medication dispensed; medication dispensed in the wrong pharmaceutical presentation; medication dispensed with wrong labeling; medication dispensed with quality deviations; medication dispensed at a time or shift other than prescribed[17,18]; lack of hand hygiene before preparation; non-use of aseptic technique in the preparation; incorrect identification of the medication; not checking the patient's identification; dilution of the medications in volumes smaller than that recommended by the manufacturers; incorrect administration speed and lack of pulse measurement[19]; medication name similarity- length of the names and number of groups of characters or the same characters within the names; similarities in potency; environment in which medications are used; administration route; use frequency and product labeling[20]; expired medications[21]; and diluent missing[22]. When the topic is brought to the "home care" sphere, the studies are even more scarce.

In this context, the objective of this paper was to analyze the process for dispensing materials and medications at a Home Care company from Porto Alegre/RS and, based on the results obtained, contribute to discussions about the theme of dispensing materials and medications in a home care company and seek possible alternatives for good practices to be used during future dispensing processes and, thus, enable improvements in the care provided to their patients.

Methods

The research consisted of a case study and had a quantitative-qualitative methodological approach, as it combined closed data (quantitative nature) with open data (qualitative nature)[23].

The research method was a bibliographic study in the PubMed, ScienceDirect, SciELO and CAPES/MEC databases, in addition to books in the Pharmacy and Health areas. Papers published in the last 5 years were evaluated and the following topics were researched in the databases: "dispensing of materials and medications", "errors in dispensing materials and medications", "errors in dispensing materials", "errors in dispensing medications", "dispensing materials and medications in a home care company", "errors in dispensing materials and medications in a home care company", "dispensing materials in a home care company", "dispensing medications in a home care company", "errors in dispensing materials in a home care company" and "errors in dispensing medications in a home care company", in English, Portuguese and Spanish. Articles that had the same author(s) as researchers were excluded from the research, provided that the line of thought was the same, as well as articles that did not refer to the study topic. A documentary study was carried out in the system employed by the study company, referring to the records of requests for sending supplies to patients, with the objective of analyzing in real time the possible records of failures/near failures during the study period[24,25].

The study was developed during six (6) months at a "Home Care" company in the Health area located in Porto Alegre/RS. As participating population, there were 7 professionals responsible for dispensing materials and medications in the company researched, one of them being a clinical pharmacist and the rest pharmacy assistants who work in the Pharmacy department, where dispensing takes place. When a patient is referred to home care, the attending physician, responsible for prescribing the medications, makes a manual/electronic prescription available to the company. This patient's prescription is transcribed into the company's system and checked by the medical coordination area. It is also up to the clinical pharmacist to make the due verification according to the institutional protocols and to clarify any doubt with the prescriber. Once this is done, the Requests department

1 BRASIL. Resolução RDC nº 11, de 26 de janeiro de 2006. Available in: https://bvsms.saude.gov.br/bvs/saudelegis/anvisa/2006/res0011_26_01_2006.html. Accessed on: 04 Jun 2023.

releases the medications/materials to be delivered to the patients, according to a weekly, biweekly or monthly route and periodicity. Pharmacy assistants receive requests via the system, separate the supplies and dispatch them to the patients' homes.

At the same time, there were 51 pharmacists outside the company working in different segments, but who had already worked with processes for dispensing materials and medications and answered the collection instrument (a questionnaire prepared on the Google Forms platform) with their experiences during dispensing-related activities.

The questionnaire had 11 questions that were configured as open, closed and multiple-choice, elaborated from the theoretical framework, which indicated the most incident failures/near failures throughout a process for dispensing materials and medications and divided into 4 sections, as can be seen in Appendix 1.

Section 1 contained 5 questions with the objective of knowing the gender, the age group included, the range representing the time since graduation, the range that indicated the time of experience as a pharmacist, and whether the participant had any experience with dispensing materials and medications. Section 2 had two questions and was targeted at the participants who had no experience with dispensing materials and medications, with the objective of collecting their opinion on the topic. Section 3 included two questions and was focused on collecting the opinion of the participants who had already had experiences with dispensing materials and medications. Finally, Section 4 had two questions with the objective of knowing whether to train employees and present a booklet with a ranking of the 10 failures/near failures with highest occurrence rates, along with tips on how to act if they occur, which might be considered a good practice to mitigate failures/near failures during the dispensing processes and also ask the participants which would the most frequent failures/near failures be and which ones, in their opinion, would be in a 10-position ranking.

The research was only initiated when the Ethics and Research Committee of the Methodist University Center – IPA, approved the study on 05/26/2022, through opinion No. 5,433,510. The research data were only used for the purpose of the study proposed.

Results

In order for the research objective to be achieved, it was necessary: a) to conduct a bibliographic survey of the last 5 years on the main failures/near failures during processes for dispensing materials and medications in the hospital environment and in home care, as well as the measures that were adopted to mitigate the failures/near failures pointed out; b) to perform an analysis of the requests for dispensing materials and medications from the home care company under study, in order to know the possible failures/near failures during the dispensing processes and what the company has been adopting as measures to mitigate them; c) to apply a data collection instrument, elaborated through the bibliographic studies listed and the analysis of dispensing requests, with the objective of knowing the pharmacists' opinion on the main failures/near failures during dispensing of materials and medications and which practices would they use to minimize and/or eradicate failures during future dispensing processes; and d) to prepare a booklet with a 10-position ranking on the main failures/near failures during dispensing of materials and medications, presenting the company with suggestions for improvements in terms of good practices to be adopted during new dispensing processes.

In view of this, the research had two moments: the documentary analysis of the material and medication dispensing process records, to understand where the company presented the highest occurrences of failures/near failures, and what it has been doing so that such instances are not repeated; and application of a questionnaire to pharmaceutical professionals from different segments, but active in the dispensing processes for materials and medications, so as to also understand which failures/near failures occurred during their experiences with dispensing materials and medications and their possible suggestions for mitigation.

During the first data collection stage, referring to the processes for dispensing materials and mediations carried out in the company, 60 dispatches of material and medication inputs to different patients were analyzed, accounting for a total of 14,957 items dispensed. Weekly, fortnightly and monthly deliveries can be found among them. Such deliveries had 14, 36 and 10 dispatches, respectively. With regard to failures/near failures, it can be seen that there were occurrences in the 3 types of dispatches, as shown in Table 1. There was a total percentage of 1.7% occurrences during the study company's dispensing processes.

Among the 260 items classified as failures/almost failures, the most frequent ones were the following: Pharmacy professional distraction during the dispensing process, 140; Similar labeling or packaging, 95; Incorrect identification of the medication (similar spelling/appearance/sound), 15; Divergent amount in relation to the prescription/request, 8; and Failure to verify the patient's identification at the time of dispensing the material(s) and medication(s), 2.

For the second data collection stage, which aimed at analyzing the pharmacists' experiences about their actions in processes for dispensing materials and medications, with regard to the occurrence of failures/near failures, answers were obtained from 51 professionals. 49 (96.1%) of the participants have already worked or work with dispensing processes for materials and medications, and shared their experiences during activities related to dispensing and only 2 (3.9%) professionals have not yet done so.

In view of this, the questionnaires answered by the participants who selected "No" in question 5, that is, if the professionals had already worked with processes for dispensing materials and medications, and their other answers in the subsequent questions, were excluded from the analysis, as the intention was to only use data from pharmacists who had already encountered some failure/near failure during the dispensing processes, seeking an interaction directed at the professionals' experience.

Regarding the profile of the professionals answering the questionnaire, 48 (93.9%) identified themselves as female and 3 (6.1%) as male, 42.9% were in the age group from 30 to 35 years old, 22.5% were aged between 25 and 30 years old, 10.2% belonged to the age groups from 35 to 40 and from 40 to 45 years old, respectively, 8.2% were between 20 and 25 years of age, 4.1% belonged to the age group from 45 to 50 years old, and 2.0% were over the age of 50.

As for the time since graduation in Pharmacy, 22 (44.9%) participants were within the range of 1 to 5 years since graduation,

Table 1. Items checked and dispensed that were observed by the author at the company under study x type of failure/near failure

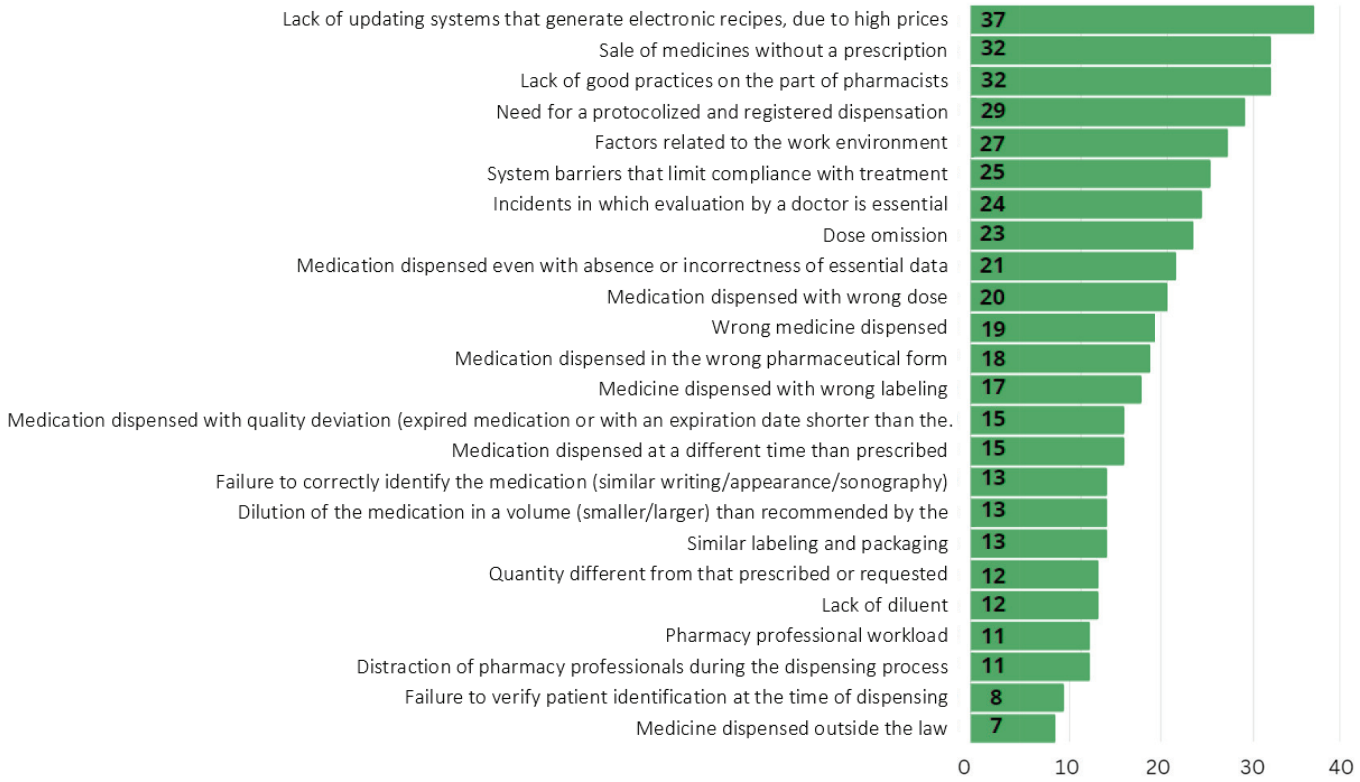
Dispatches	Total = 60	Failure/Near failure observed
Weekly, n (%)	**14 (23,3)**	**Near failures:** Pharmacy professional distraction during the dispensing process (2); Divergent amount in relation to the prescription/request (2); Similar labeling or packaging (2).
Items checked and dispensed, n (%)	2888 (19,3)	
Dispatches with failures/near failures, n (%)	6 (42,9)	
Items with failures/near failures, n (%)	67 (2,3)	
Fortnightly, n (%)	**36 (60,0)**	**Near failures:** Pharmacy professional distraction during the dispensing process (15); Failure to verify the patient's identification at the time of dispensing the material(s) and medication(s) (2); Similar labeling or packaging (3); Incorrect identification of the medication (similar spelling/appearance/sound) (2); Failure: Similar labeling or packaging (1).
Items checked and dispensed, n (%)	9948 (66,5)	
Dispatches with failures/near failures, n (%)	19 (52,8)	
Items with failures/near failures, n (%)	188 (1,9)	
Monthly, n (%)	**10 (16,7)**	**Near failures:** Pharmacy professional distraction during the dispensing process (4); Similar labeling or packaging (1).
Items checked and dispensed, n (%)	2121 (14,2)	
Dispatches with failures/near failures, n (%)	5 (50,0)	
Items with failures/near failures, n (%)	5 (0,2)	
Total items checked and dispensed, n	**14957**	Not applicable
Total dispatches with failures/near failures, n (%)	**30 (50,0)**	Not applicable
Total items with failures/near failures, n (%)	**260 (1,7)**	Not applicable

followed by 13 (26.5%) who fell into the range of 5 to 10 years, 4 (8.2%) participants within the ranges of less than 1 year, from 10 to 15 years and from 15 to 20 years since graduation, respectively, and 2 (4.1%) participants in the group with more than 20 years since graduation.

In relation to the time of experience as pharmacists, 17 (34.7%) participants have between 3 and 6 years of experience in the profession, followed by 11 (22.5%) with between 1 and 3 years of experience, and 6 (12.2%) participants in the ranges between 9 to 12 years and more than 15 years of experience, respectively; 5 (10.2%) participants have between 6 and 9 years of experience as pharmacists, and 4 (8.2%) have less than 1 year of experience in the profession.

In question 6, the participants had to list from 25 options presented the one(s) they had already experienced in their work routines. Among the total number of selections, 454 were obtained and Figure 1 shows the most and least frequent failures/near failures.

Figure 1. Failures/Near failures already experienced by the pharmacists during the dispensing processes for materials and medications ointed out in the questionnaire



Question 7 asked the participants to indicate improvement suggestions that might minimize the failures/near failures they had listed in the previous question. It should be noted that, in order for the data of their answers not to identify the respondent, the answers were listed by participant number and the identification nomenclature "Participant" was used for the cases when it was important to emphasize their opinions. For example: Participant 5, Participant 23... (see Table 2).

Question 8, using the Likert scale with the "I totally agree", "I partially agree", "I neither agree nor disagree", "I partially disagree" and "I strongly disagree" options, sought to know the participants' on the assertions made regarding the importance of training employees working in the dispensing processes and of using a booklet with good practices to enrich and assist in the team's routine. Of the 49 respondents, 42 selected the "I totally agree" option and 6 chose "I partially agree", which indicates 98% representativeness of positive answers to the assertions, with only 1 (2.0%) of the participants choosing the "I neither agree nor disagree" option.

Table 2. Improvement suggestions pointed out by the pharmacists in the questionnaire x number of indications

Improvement suggestions	n (%)	Participants' testimonies
Training sessions	22 (44.9)	"I recommend that they have periodic recycling of good practices, indispensable for good work performance." (Participant 8); "that the CRF, for example, offer monthly training sessions for pharmacists." (Participant 10); "[...] training and guidance to physicians on the importance of dispensing medications in pharmacy, as well as knowledge of the current legislation." (Participant 22)
Computerized Systems (Alert/ Barrier Systems, Digital Prescription, Electronic Dispensing)	16 (32.7)	"Computerized systems that assist in the GPs. [...]" (Participant 3); "Investing in an electronic prescription system given the need for continuous updating of the Home Care patient's prescription. [...]" (Participant 23); "[...] implementation of automated systems." (Participant 30)
Double-checking	11 (26.2)	"Checking each stage of the dispensing process twice. [...]" (Participant 4); "Performing a double-check from the unitization process to dispensing to the patient." (Participant 12)
Hiring New Pharmacists/Ending Work Overload	9 (18.4)	"They should hire more professionals so as not to overload employees and be able to provide care with caution." (Participant 17); "improvement in the pharmacists' workplace, with less exhausting hours." (Participant 18); "lower hour load and task division." (Participant 24)
Pharmaceutical Technical Validation	7 (14.3)	"100% pharmaceutical validation before dispensing, [...]" (Participant 15), "[...] pharmaceutical technical validation performed before dispensing medications [...]" (Participant 20); "[...] each prescription should go through the pharmacist, in order to review the entire prescription and notify if there is any problem, this would also be useful to schedule the medications administered." (Participant 21)
Creation of Processes/Review/ Compliance with Established Processes	6 (12.3)	"Obligation to follow the legal processes, creation of standard operating processes [...]" (Participant 5); "[...] standardization and routinization of processes, periodic process audits, [...], automation of processes [...]" (Participant 15); "Nursing organization in shift handoffs." (Participant 25)
Safe Medication Identification Practices	5 (10.2)	"[...] standardization of medications, [...] rigorous control of electronic records of medications, [...] implementing safe practices for identifying medications [...]" (Participant 15); "[...] Medications with similar presentations and packaging, not keeping them close, keeping them more separate." (Participant 19); "[...] adequacy of spelling and packaging by the suppliers | adequacy and differentiation of this spelling in the identification of the input internally in the stock [...]" (Participant 20); "[...] Implementing the practice of placing stickers warning about medications with similar nomenclatures." (Participant 23)
Talking to the Prescriber/Pharmacist	4 (8.2)	"Talking to the prescriber." (Participant 13); "[...] contacting the physician if there is any difference in dose or in doubt about the prescription [...]" (Participant 19); "[...] Better communication between physicians and other health professionals. [...]" (Participant 33); "[...] Always look for the pharmacist to solve any doubts." (Participant 42)
Awareness/Informative materials	3 (6.1)	"[...] in commercial pharmacies, leaving informative banners on important topics of the legislation." (Participant 28); "[...] Reinforcing the importance of proper dispensing. [...]" (Participant 36)
Checklist	2 (4.1)	"Creation of a checklist model to check all prescription items before dispensing." (Participant 1) and "[...] checklist." (Participant 11)
Total, n	85	

In question 9, the participants had to list among the options for failures/near failures the 10 with the greatest occurrence impact in their opinion, so that a booklet could be prepared with a ranking of these failures/near failures. Of the 49 respondents, the answers from 13 of them were disregarded, as they did not respond adequately: they did not create the 10-position ranking, as stated in the question. In view of this, only 36 answers were considered (see Table 3).

Discussion

During the six-month stay at the study company, it was possible observe the work of 7 employees in charge of the processes for dispensing materials and medications, allocated in the same department. It was possible to monitor 60 dispatches of supplies to different patients, carried out in weekly, biweekly and monthly delivery modalities, in addition to witnessing 259 near failures that could be repaired in time by the researcher, along with

Table 3. Failures/Near failures during the dispensing processes pointed out by the pharmacists in the questionnaire x impact rates

Failures/Near failures during the dispensing processes for materials and medications	P1	P2	P3	P5	P6	P7	P10	P11	P12	P13	P15	P16	P17	P18	P19	P20	P22	P23
Lack of update in the systems that generate electronic prescriptions, due to high prices of the information systems				10						9						1	10	1
Sale of over-the-counter medications	6			3			1			1		7	6	1		2		
Lack of good practices by the pharmacists												8				8		
Need for a protocoled and recorded dispensing process			1	2			2					9		4				
Factors related to the work environment	9				8							6						
Barriers inherent to the system that limit adherence to treatments													10					4
Availability of treatments			2					10									9	
Incidents where physician evaluation is essential							3									4		9
Dose omission	5		4	1		4	4	8	7		1			9	3	10	8	
Medication dispensed even with essential data absent or incorrect in the prescription	10	10	3	4			6		5				7		1	3	7	
Medication dispensed with the wrong dose	1	9		6		3	7	9	1		9		1	10	5		6	
Wrong medication dispensed		4			2	2		6	2	8	8		2		4	6	1	
Medication dispensed in the wrong pharmaceutical presentation		8	5		3	5		7		10					7		2	7
Medication dispensed with the wrong labeling (without the information about its concentration)		6	6		7				3				4	3	6			
Medication dispensed with quality deviations (expired medication or with an expiration date before the patient's consumption period ends)		2	7	5					4						9			
Medication dispensed at a time or shift other than prescribed	4				1	7												
Incorrect identification of the medication (similar spelling/ appearance/sound)		7	8		4	1	5		6	4	2	5	8	5		9	3	6
Medication dilution by volume (lower/higher) than recommended by the manufacturer	7									5	10							
Similar labeling or packaging	2	5			9		8	5	8	6	5	4		2				2
Divergent amount in relation to the prescription/request	3			7		6	9	4					9		8		5	8
Diluent missing					10	10	10				7							
Work overload in the Pharmacy professional	8		9	8	5			2		7	4	2	5	8	10	5		5
Pharmacy professional distraction during the dispensing process		1	10	9		9		1	9	2	6	1	3			7	4	3
Not checking the patient's identification when dispensing the material(s) and medication(s)		3			6	8		3	10	3	3	3		7	2			10
Medication dispensed outside the Brazilian legislation												10		6				

	P24	P26	P28	P29	P30	P31	P32	P33	P34	P36	P37	P38	P39	P42	P43	P45	P47	P48
Lack of update in the systems that generate electronic prescriptions, due to high prices of the information systems						6							1			7		1
Sale of over-the-counter medications			1				1	9	5		10	2	6		3	2		
Lack of good practices by the pharmacists	7						3				2				4		2	
Need for a protocoled and recorded dispensing process					9	7	7	8	8		6							
Factors related to the work environment		10			10				9			9					3	
Barriers inherent to the system that limit adherence to treatments									10	10		8						
Availability of treatments										9								
Incidents where physician evaluation is essential								1			9							10
Dose omission		1	3		6	9						7	8	7			10	
Medication dispensed even with essential data absent or incorrect in the prescription					2		5			8	5		4			1	1	
Medication dispensed with the wrong dose	1	2	2	5	1	3	6	2	7	1		6		9	8	10	5	9
Wrong medication dispensed	8		7	4		8	2	7	6	6			9		5	6	4	5
Medication dispensed in the wrong pharmaceutical presentation	9	9	4	6				6		7				8	6	4		6
Medication dispensed with the wrong labeling (without the information about its concentration)	5			7	7	4					4						6	7
Medication dispensed with quality deviations (expired medication or with an expiration date before the patient's consumption period ends)	6			8	8	1							7	10				
Medication dispensed at a time or shift other than prescribed		3		9		10								6				
Incorrect identification of the medication (similar spelling/ appearance/sound)	4	7						5	2		3		5		9	3	7	2
Medication dilution by volume (lower/higher) than recommended by the manufacturer					5		8									9		
Similar labeling or packaging		8	5		4					3		10	3	5	2			3
Divergent amount in relation to the prescription/request				10				10	4		1	5		1	7	5	8	8
Diluent missing		6																
Work overload in the Pharmacy professional	3		10	1			9	3	3	4	7	3	2	4	10			
Pharmacy professional distraction during the dispensing process		5	6	2		2	10	4		2		1	10	3				
Not checking the patient's identification when dispensing the material(s) and medication(s)	2	4	9	3	3	5					8	4		2		8	9	4
Medication dispensed outside the Brazilian legislation	10		8				4		1	5					1			

the team of collaborators, even before being dispensed; and a single failure, which was repaired after signaling by the Nursing team, which works directly at the patient's home. The following can be mentioned among the most frequent failures: Pharmacy professional distraction during the dispensing process; Similar labeling or packaging; Incorrect identification of the medication (similar spelling/appearance/sound); Divergent amount in relation to the prescription/request; and Failure to verify the patient's identification at the time of dispensing the material(s) and medication(s). In turn, in relation to the strengths, it was verified that the company assists its employees with training and develops process alignment meetings with all those involved.

This number of failures/near failures during the dispensing processes presented a percentage of 1.7%, an extremely low value over the total number of items dispensed, even below the rates mentioned by the studies conducted in United States, England and Brazil[8-13,29]. It is believed that in a longer research period and with another group of active professionals might be analyzed if this rate was maintained, due to the training applied by the company, or even analyze other organizations from the same segment, in order to test whether the low rate of failures or near failures would be extended.

When experiencing failures/near failures during the processes for dispensing materials and medications, while immersed in the company and in relation to items with similar spelling/appearance/sound, the researcher can update the entire registry of medications, using the CD3 method as a reference[26]; the items that contained similar labels or packaging were separated on distant shelves and the means to identify them were improved, so that the employees who handle them avoid exchanging one for the other.

When applying the questionnaire, of the 51 participants, 49 (96.1%) have already worked or work with dispensing processes of materials and medications, 23 (47.0%) have from 5 to more than 20 years since graduation and 34 (69.4%) have more than 3 years of experience as pharmacists, which represents good levels of professional maturity and knowledge of the subject matter.

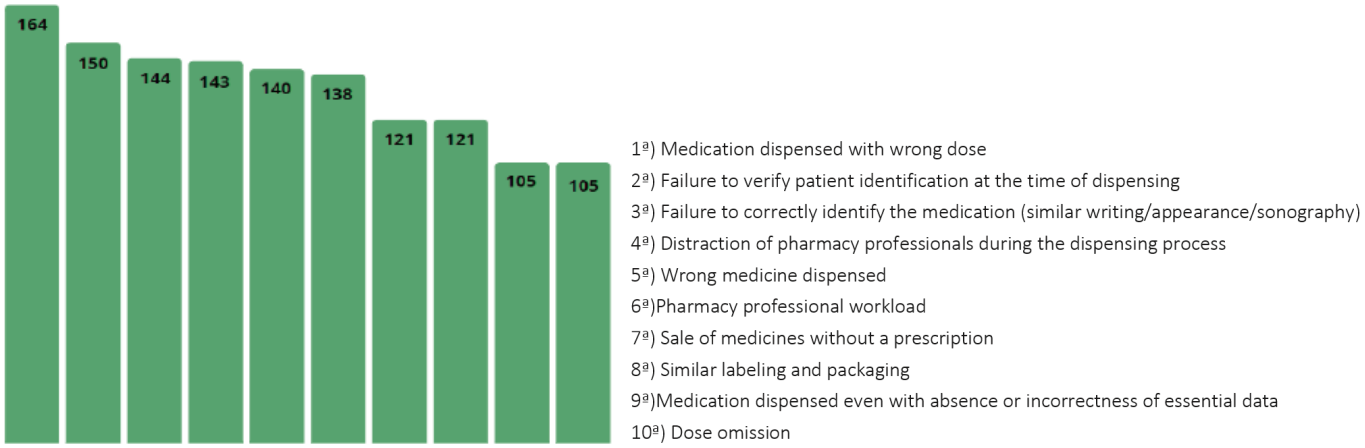
Of the 25 types of failures/near failures pointed out by the authors, 24 were experienced by the pharmacists in a total of 454 selections, namely: Lack of update in the systems that generate electronic prescriptions, due to the high prices of the information systems; Sale of over-the-counter medications; Lack of good practices by the pharmacists; and Need for a protocoled and recorded dispensing process, the 4 most representative ones during the selections, with 37 (8.1%), 32 (7.0%), 32 (7.0%) and 29 (6.4%) selections each, respectively. Such failures/near failures were also evidenced in studies[14,27-29].

In relation to the improvements presented by the pharmacists as proposals so that failures/near failures can be mitigated, "training" was the option considered most appropriate, according to 22 (44.9%) of the participants. In addition to that, 48 (98.0%) of the participants agreed with the assertions that training employees working in the processes for dispensing materials and medications, as well as creating a booklet that presents a ranking with the 10 most frequent failures/near failures, along with tips on how to act if they occur, could be considered as good practices in mitigating failures/near failures in dispensing processes.

This high agreement level among the respondents in the assertions from question 8 reinforces what most of them selected as an improvement option to mitigate failures/near failures in the process for dispensing materials and medications: training. This fact collaborates with the need for improvement analyzed by the researcher to be adopted by the company, as the most frequent near failure during his on-site observation was "Pharmacy professional distraction during the dispensing process". It is worth noting that all the professionals were aware of such action during the observation.

From the ranking presented by the pharmacists through question 9, it was possible to elaborate the final ranking to be included in the booklet. Each option chosen by the participants was scored with an importance value, according to the position selected in the ranking. Options that were assigned Position 1, the one with the highest occurrence impact, received 10 points each. Those that were ranked in Position 2, the second with the highest occurrence impact, received 9 points each, and so on, until the options that were placed in the 10th position, with the lowest importance impact, received 1 point each. The sum of these points for each chosen option generated the ranking with the 10 positions of failure/near failure options with the highest occurrence rates, as shown in Figure 2.

Figure 2. Ranking of the most frequent failures/near failures during the dispensing processes for materials and medications according to the pharmacists' answers to the questionnaire



As can be seen in the image, the "sale of over-the-counter medications" and "similar labeling or packaging" options, as well as the "medication dispensed even with absence or inaccuracy of essential data in the prescription" and "dose omission" options, had a draw and the criteria used to break the tie were the highest number of Positions 1, in the case of the first tiebreaker, which assigned Position 7 to the "sale of over-the-counter medications" option and the highest number of Positions 1 followed by the number of Positions 2, in the case of the second tiebreaker, which assigned Position number 9 to "medication dispensed even with absence or inaccuracy of essential data in the prescription", as the options remained tied in the number of Positions 1.

In turn, regarding the final ranking, it is in line with the failures/near failures experienced by the researcher during his immersion in the company, which further strengthens the existing alignment between both data collection moments proposed.

In general lines, it is believed that the company is well-positioned in relation to its processes and conduct. It is expected that the improvements presented will add to what the company has already been adopting, in order to continue serving its patients with safety and quality.

Conclusion

The objective of this research was to analyze the process for dispensing materials and medications at a Home Care company from Porto Alegre/RS and, based on the results obtained, to contribute to discussions about the issue of dispensing materials and medications in home care and seek possible alternatives for good practices to be used during future dispensing processes and, thus, enable improvements in the care provided to their patients.

In view of this, a more targeted study is required, investigating how such failures/near failures occurred during the processes for dispensing materials and medications in home care in the company under study, making an in-depth analysis of the dispensing request records.

Based on the results observed, actions aimed at improving the indicators were proposed through research in the literature, in order to understand which failures/near failures had the highest occurrence rates and which possible suggestions for improvements were applied; as well as, due to the scarcity of papers published in this scope, professionals working in the segment were consulted by applying a questionnaire to collect experiences underwent during the processes for dispensing materials and medications.

Among the failures/near failures observed and already experienced, the four (4) most representative ones were as follows: lack of update in the systems that generate electronic prescriptions, due to high prices of the information systems; Sale of over-the-counter medications; Lack of good practices by the pharmacists; and Need for a protocoled and recorded dispensing process. In turn, regarding the improvements presented as proposals to mitigate failures/near failures, "training" was the option considered most adequate.

Based on the bibliographic deepening and the analysis of the results, development of this research made it possible to establish and implement good practices in the processes for dispensing materials and medications of the home care company under study. Among the best practices, we can mention the creation (see Appendix 2) of an awareness booklet for employees who work directly with dispensing, presenting the company with a ranking of the 10 most frequent failures/near failures; in addition, the entire medication register was updated using the CD3 method as a basis, correcting items with similar spelling/appearance/sound; as well as separating them on different shelves and improving the means to identify the items that had similar labeling or packaging. It is expected that, by following these good practices, these professionals will be able to minimize the failures/near failures observed in their future dispensing processes.

As future work to be done, the intention is to expand the horizons in the analysis of material and medication dispensing processes to other segments operated by pharmacists, with the objective of knowing whether the most frequent failures/near failures remain the same and how the professionals are acting to mitigate them, as well as carrying out other research studies in the field of dispensing materials and medications in home care, due to the scarcity of studies evidenced.

Funding sources

The research did not receive funding for its conduction.

Collaborators

CRKF: Main author of the paper. Responsible for data collection, as well as for elaboration and writing of the article. RM: Paper supervisor. She assisted in structuring and reviewing the project and the article.

Conflict of interest statement

The authors declare that there are no conflicts of interest in relation to this article.

References

1. Villar VCFL, Duarte SCM, Martins M. Segurança do paciente no cuidado hospitalar: uma revisão sobre a perspectiva do paciente. Cad Saúde Pública. 2020;36(12):e00223019. DOI: 10.1590/0102-311X00223019.
2. Kohn LT, Corrigan JM, Donalson MS. To err is human: building a safer health system. Washington, DC: National Academy Press; 2000.
3. Who. Patients for patient safety: partnerships for safer health care. Geneva, Switzerland: WHO Document Production Services; 2013.
4. Brasil. MS. Documento de referência para o Programa Nacional de Segurança do Paciente. Brasília: Ministério da Saúde; 2014.
5. Brasil. Lei nº 5.991 de 17 de dezembro de 1973. Available in: http://www.planalto.gov.br/ccivil_03/leis/l5991.htm. Accessed on: 16 Oct 2022.
6. Angonesi D. Dispensação farmacêutica: uma análise de diferentes conceitos e modelos. Ciência & Saúde Coletiva. 2008;13(Sup):629-640.
7. Costa LA, Valli C, Alvarenga AP. Erros de dispensação de

medicamentos em um hospital público pediátrico. Rev Latino-am Enfermagem. 2008;16(5).

8. Hughes RG, Edgerton EA. Reducing pediatric medication errors: children are especially at risk for medication errors. AJN, American Journal of Nursing. 2005;105(5):79-84.
9. Allan EL, Barker KN. Fundamentals of medication error research. Am J Hosp Pharm. 1990;47(3):555-71.
10. Sartor VB, Freitas SFT. Modelo para avaliação do serviço de dispensação de medicamentos na atenção básica à saúde. Rev. Saúde Pública. 2014;48(5):827-836. DOI: 10.1590/S0034-8910.2014048005135.
11. Arrais PSD, Barreto ML, Coelho HLL. Aspectos dos processos de prescrição e dispensação de medicamentos na percepção do paciente: estudo de base populacional em Fortaleza, Ceará, Brasil. Cad. Saúde Pública. 2007;23(4):927-937. DOI: 10.1590/S0102-311X2007000400020.
12. Oliveira MGG, Loureiro S, Costa LA. Errores de medicación de dos hospitales de Brasil. Farmacia Hospitalaria. 2006;30(4):235-239. DOI: 10.1016/S1130-6343(06)73981-2.
13. Anacleto TA, Perini E, Rosa MB, *et al*. Medication errors and drug-dispensing systems in a hospital pharmacy. Clinics. 2005;60(4):325-32. DOI: 10.1590/S1807-59322005000400011.
14. Oñatibia-astibia A, Aizpurua-arruti X, Malet-larrea A, *et al*. El papel del farmacéutico comunitario en la detección y disminución de los errores de medicación: revisión sistemática exploratoria. Ars Pharmaceutica. 2021;62(1):15-39. DOI: 10.30827/ars.v62i1.15901.
15. Gouveia CS. Estratégias para prevenção de erros de look-alike sound-alike: experiência profissionalizante na vertente de investigação, farmácia hospitalar e farmácia comunitária. [Dissertação de Mestrado]. Universidade Beira Interior, Covilhã, Portugal, 2020.
16. Alfaro IG, Rodríguez JDC. Receta electrónica: limitaciones y posibles mejoras para asegurar una mayor adherencia a los tratamientos. Rev Esp Salud Pública. 2019;93:1-9.
17. Araújo MTFL, Wanderley LAS, Rosa MB, *et al*. Perfil de erros de dispensação de acordo com o sistema de dispensação adotado em um hospital público. Brazilian Journal of Health and Pharmacy. 2019;1(1):40-52. DOI: 0.29327/226760.1.1-5.
18. Reis AF. Perfil de erros de dispensação de medicamentos no sistema dose individualizada em um hospital geral do município do Rio de Janeiro – RJ. [Monografia de Conclusão de Curso]. Universidade Federal Fluminense, Rio de Janeiro, 2016.
19. Mendes JR, Lopes MCBT, Vancini-campanharo CR, *et al*. Tipos de frequência de erros no preparo e na administração de medicamentos endovenosos. Einstein (São Paulo). 2018;16(3):1-6. DOI: 10.1590/S1679-45082018AO4146.
20. Ismp. Programa nacional de segurança do paciente: indicadores para avaliação da prescrição, do uso e da administração de medicamentos- parte I. Boletim ISMP Brasil. 2016;5(1):1-5.
21. Jayme MO, Carneiro MB. Tecnologia de código de barras e a prevenção de erros na dispensação de medicamentos. Rev. Bras. Farm. Hosp. Serv. Saúde São Paulo. 2016;7(2):22-25.
22. Sutili L. Erros na dispensação de medicamentos em hospitais. [Trabalho de Conclusão de Curso]. Universidade Federal de Mato Grosso, Sinop, 2016.
23. Creswell JW, Creswell JD. Projeto de pesquisa: métodos qualitativo, quantitativo e misto, 5ª ed. Porto Alegre: Penso, 2021.
24. Duffy B. Análise de evidências documentais. "In": Bell, J. Projeto de pesquisa: guia para pesquisadores iniciantes em educação, saúde e ciências sociais, 4ª ed. Porto Alegre: Artmed, 2008:107-117.
25. Yin RK. Estudos de caso: planejamento e métodos, 5ª ed. Porto Alegre: Bookman, 2015.
26. Ismp. Nomes de medicamentos com grafia ou som semelhantes: como evitar erros? Boletim ISMP Brasil. 2014;3(6):1-8.
27. Albino AVD. Revisão integrativa sobre dispensação segura de medicamentos. [Trabalho de Conclusão]. Universidade Federal do Rio Grande do Norte, Natal, 2022.
28. Lemos GS, Macêdo CS, Miranda DB *et al*. Psicotrópicos: erros de prescrição e dispensação em farmácia de unidade básica de saúde. Rev Saúde.Com. 2021;17(4):2427-2435. DOI: 10.22481/rsc.v17i4.9461.
29. Oliveira ST, Farias PO, Drummond BM, *et al*. Taxas de erro de prescrição e dispensação de um hospital público especializado em urgência e trauma. Rev Med Minas Gerais. 2018;28 (Supl 5): e-S280507.