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Survey of the profile of pharmacy and hospital pharmacist in a prospective cross-sectional study of the State of São Paulo in the year 2018-2019

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Abstract

Objective: To identify the structures of hospital pharmacies and the performance of hospital pharmacists in the State of São Paulo. **Methods:** A cross-sectional study, developed by the Technical Working Group of Hospital Pharmacy of CRF-SP by forwarding emails to Pharmacists of the State of São Paulo and dissemination in the CRF-SP Portal in the period from October 2018 to February 2019, the collection instrument was a questionnaire in Google Docs format containing 55 questions addressing the aspects general characterization of the hospital, hospital pharmacy and the pharmacist. The qualitative data were tabulated in Excel spreadsheet and analyzed by absolute and relative frequency being presented in forms of tables. We used non-parametric statistical tests with p-value < 0.05 and 95% confidence interval by the JAMOVI system (version 1.6.23). **Results:** A total of 434 pharmacists participated in the survey, representing 4.8% with work activity in the hospital area. It was observed that administration of the hospital area is more related to private service in own administration 173 (45.9%) (p< 0.001), the segment with the specialty hospital 246 (65.3%) (p< 0.001), specialties with oncology 40 (14.9%) (p= 1.000), contributing with strategic, tactical and operational decisions, improving the technical structures and strengthening the health service and the activities of pharmacists related to discharge orientation with 148 (48.5%) (p< 0.001), intervention in prescriptions 236 (77.4%) (p< 0.001), multidisciplinary visit 229 (75.1%) (p< 0.001), medication reconciliation 220 (72.1%). **Conclusion:** We observed the challenge and the need to improve the narrowing of communication between the professionals and the entity, and new technologies may bring closer and stimulate a productive dynamic of the category.

Keywords: hospitals private; hospitals public; hospitals general; pharmacies; pharmacists.

Levantamento do perfil da farmácia e do farmacêutico hospitalar em um estudo transversal prospectivo do Estado de São Paulo no ano de 2018-2019

Resumo

Objetivo: Identificar as estruturas das farmácias hospitalares e a atuação do farmacêutico hospitalar no Estado de São Paulo. **Métodos:** Trata-se de um estudo transversal, desenvolvido pelo Grupo Técnico de Trabalho de Farmácia Hospitalar do CRF-SP por encaminhamento de e-mails para os Farmacêuticos do Estado de São Paulo e divulgação no Portal do CRF-SP no período de outubro de 2018 a fevereiro de 2019, o instrumento de coleta foi um questionário no formato Google Docs contendo 55 questões abordando os aspectos caracterização geral do hospital, farmácia hospitalar e do farmacêutico. Os dados qualitativos foram tabulados em planilha Excel e analisados por frequência absoluta e relativa sendo apresentados em formas de tabelas. Foi utilizado os testes estatísticos não paramétricos com o valor de p< 0.05 e o intervalo de confiança de 95% pelo sistema JAMOVI (versão 1.6.23). **Resultados:** Participaram da pesquisa 434 farmacêuticos representando 4,8% com atividade laboral na área hospitalar. Observa-se que administração da área hospitalar está mais relacionada ao serviço privado na administração própria 173 (45,9%) (p< 0,001), o segmento com o hospital de especialidades 246 (65,3%) (p< 0,001), especialidades com oncologia 40 (14,9%) (p= 1,000), contribuindo com decisões estratégicas, táticas e operacionais, aprimorando as estruturas técnicas e o fortalecimento do serviço de saúde e as atividades dos farmacêuticos relacionados a orientação de alta com 148 (48,5%) (p< 0,001), intervenção nas prescrições 236 (77,4%) (p< 0,001), visita multidisciplinar 229 (75,1%) (p< 0,001), conciliação medicamentosa 220 (72,1%). **Conclusão:** Observamos o desafio e a necessidade de aprimorar o estreitamento da comunicação entre os profissionais e a entidade, e às novas tecnologias poderão aproximar e estimular uma dinâmica produtiva da categoria.

Palavras-chave: hospitais privados; hospitais públicos; hospitais gerais; farmácias; farmacêuticos.

Introduction

Hospital pharmacy is related to pharmaceutical care activities, where the hospital pharmacist's performance permeates many areas, such as: logistic activities, handling/production, patient-centered care, quality assurance and intersectoral activities, bringing the pharmacist into the context of the hospital practice, working directly throughout the medication chain, managing storage, distribution and dispensing to ensure that the drug and health products reach the patient safely and with quality,[1] working incessantly on the best therapy at the lowest cost.[2,3]

The role of the hospital pharmacist is to ensure the safe, effective and economical use of medications, optimizing results through medication reconciliations, prevention of drug-related problems and reduction of polypharmacy, especially in the aged population. A number of studies show the importance of the pharmacists' participation in drug therapy management and in providing patient education with improved adherence, increasing cost-effectiveness of the treatment and quality of life, as well as enhancing understanding about use of the medication and lifestyle changes in chronic diseases.[4]

In Brazil, Law No. 13,021/2014 recognized the importance of the pharmacist's comprehensive assistance in the hospital and health services area. The minimum standards for hospital pharmacy recommend at least one pharmacist for every 50 hospital beds for basic dispensation services. Hospital pharmacy services improve the patients' clinical outcomes[5-7] and must provide pharmaceutical assistance efficiently and effectively to ensure that the patients receive high quality care.[8]

The study shows the importance of the pharmacist in identifying medication errors (MEs), which are the most common type of error (nearly 0.03%-16.9% in hospitals), including Rx prescriptions and transcriptions. The negative consequences are longer hospitalization time, increased costs, patient discomfort and increased morbidity and mortality.[9] The hospital pharmacy's responsibility is to ensure that the medication use process, including prescription, transcription, dispensing, administration and monitoring, is accurate and error-free. New practices and technologies have shown to improve its effectiveness and safety.[10,11]

The evaluation of the profile of hospital pharmacies and pharmacists was a process that made it possible to systematically and effectively identify and assess the skills and potential of the professional pharmacists working in the hospital area, in order to capture data on the general characterization of hospitals, hospital pharmacies and pharmacists, without the purpose of comparing groups.

The general objective of the project is to identify the structures of hospital pharmacies and the performance of hospital pharmacists in the state of São Paulo. The specific objectives of the project were to identify the health services and the pharmacists' activities in the hospital area in the state of São Paulo.

Methods

This is a cross-sectional study, developed by the Hospital Pharmacy Technical Work Group belonging to the Regional Council of the State of São Paulo. The data collection instrument was a questionnaire in Google Docs format, consisting of 3 parts: general characterization of the hospital, hospital pharmacy and pharmacist, with a total of 55 questions: 27 closed questions, 24 yes/no questions and 4 open questions, all mandatory. The study was based on an article published in the CRF-SP journal, carried out by the Hospital Pharmacy Technical Work Group of the Guarulhos Section. The difference was that the questionnaire was delivered exclusively to hospital pharmacists in the region of Guarulhos. Comparing with this study, the questionnaire was sent to all registered pharmacists in the state of São Paulo by electronic means, with an expansion of the questions mentioned in the article. The questionnaire was emailed to all pharmacists registered with the Regional Council of Pharmacy of the State of São Paulo (*Conselho Regional de Farmácia do Estado de São Paulo*, CRF-SP) and posted on the Portal, without distinction of work field, from October 2018 to February 2019. Selection included pharmacists who electronically signed the FICF, which was forwarded to all the pharmacists with an updated email on the CRF and posted on the Portal. All the pharmacists who electronically signed the consent form and considered themselves hospital pharmacists were included in the study. The exclusion criterion was not signing the consent form. The nominal qualitative variables collected in general are related to logistics, clinical pharmacy and hospital management. The nominal qualitative variables addressed in this study were the following: segment, service, health service administration, specialties, discharge guidance, pharmacovigilance, commissions, multidisciplinary team, interventions, medication reconciliation, intervention adherence indicator, handling of antineoplastic agents, and multidisciplinary visit in the state of São Paulo.

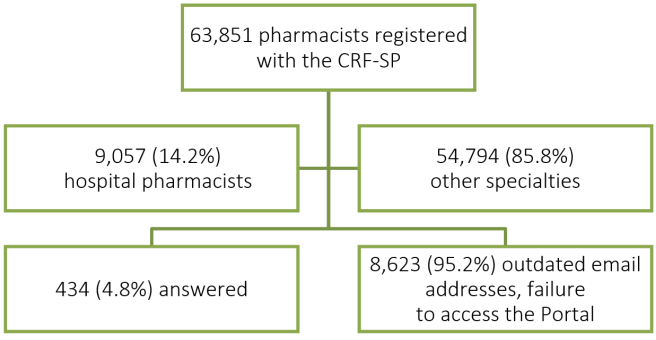
The data were tabulated in an Excel spreadsheet. For the qualitative variables, we used descriptive statistical analysis with frequencies and the non-parametric chi-square test or Fisher's exact test for dichotomous variables. A p-value<0.05 and a 95% confidence interval by the JAMOVI system (version 1.6.23) were used.

The project was approved by the Ethics and Research Committee of the Medical School at the University of São Paulo (CAPPesq) for analysis of research projects and in *Plataforma Brasil* with number 2,339,859.

Results

A total of 63,851 pharmacists with active registrations at the CRF-SP between 2018 and 2019 participated in the study. Of these, 9,057 (14.2%) reported working in the hospital pharmacy as technicians and alternates. In this study, 434 (4.8%) answered that they developed activities in the hospital area. A percentage of 95.2% corresponded to outdated email addresses and failure to access the research portal (Figure 1).

Figure 1. Description of the registered pharmacists active in the Regional Pharmacy Council of the State of São Paulo during the 2018–2019 period.



As for the hospital characteristics and administration, they are related to the services, with the most frequent being the private service, in the own administration (173; 45.9%) (p<0.001); the segment with the specialty hospital (246; 65.3%) (p<0.001); specialties with Oncology (40; 14.9%) (p=1.000); passive pharmacovigilance (136; 52.1%) (p=0,461); participation in hospital commissions with pharmacy and therapeutic committee (268; 26.1%) (p=0.978); and own chemotherapy (104; 65.8%) (p=0.831) (Table 1).

The distribution of the hospital pharmacists' most frequent activities is correlated with prescription assessment and other variables: discharge guidance (148; 48.5%) (p<0.001); intervention in prescriptions (236; 77.4%) (p<0.001); multidisciplinary visit (229; 75.1%) (p<0.001); medication reconciliation (220; 72.1%); and intervention adherence indicator (196; 64.3%) (p<0.001) present a statistically significant association (Table 2).

Table 1. Distribution of the hospital and administration characteristics in the state of São Paulo during the 2018–2019 period. (Continued)

Information	All	Administration			p-value[1]
		Own	Outsourced	Mixed	
Characteristics of the hospital					
Service n (%)	**N=434**	**N=377**	**N=28**	**N=29**	
Private	183 (42.2)	173 (45.9)	2 (7.1)	8 (27.6)	
Public	96 (22.2)	65 (17.2)	18 (64.3)	13 (44.8)	
Philanthropic	67 (15.4)	63 (16.7)	2 (7.1)	2 (6.9)	<0.001
Social Health Organization (SHO)	43 (9.9)	37 (9.8)	5 (17.9)	1 (3.4)	
Mixed	39 (8.9)	33 (8.8)	1 (3.6)	5 (17.2)	
Charity	6 (1.4)	6 (1.6)	-	-	
Segment n (%)	**N=434**	**N=377**	**N=28**	**N=29**	
General hospital	285 (65.7)	94 (24.9)	4 (14.3)	4 (13.8)	
Specialty hospital	102 (23.5)	246 (65.3)	18 (64.3)	21 (72.4)	
Emergency service	9 (2.1)	7 (1.9)	-	2 (6.9)	
24-hour ECU	7 (1.6)	3 (0.8)	4 (14.3)	-	
Day hospital	4 (0.9)	4 (1.1)	-	-	
Veterinary hospital	4 (0.9)	4 (1.1)	-	-	
Clinical	4 (0.9)	3 (0.8)	-	1 (3.4)	
"Safeguard" Hospital	3 (0.7)	3 (0.8)	-	-	
Central hospital	3 (0.7)	3 (0.8)	-	-	<0.001
Outpatient clinic	2 (0.4)	1 (0.3)	1 (3.6)	-	
Welcoming institution	2 (0.4)	2 (0.5)	-	-	
Home care	1 (0.2)	1 (0.3)	-	-	
Chemotherapy and nuclear medicine hospital	1 (0.2)	1 (0.3)	-	-	
Municipal hospital	1 (0.2)	-	-	1 (3.4)	
Psychiatric hospital	1 (0.2)	1 (0.3)	-	-	
Surgical hospital	1 (0.2)	1 (0.3)	-	-	
Basic Health Unit	2 (0.4)	1 (0.3)	1 (3.6)	-	
Pediatric hospital	1 (0.2)	1 (0.3)	-	-	
Cooperative	1 (0.2)	1 (0.3)	-	-	
Specialties n (%)	**N=300**	**N=269**	**N=10**	**N=21**	
Oncology	45 (15.0)	40 (14.9)	2 (20.0)	3 (14.3)	
Pediatrics	36 (12.0)	30 (11.2)	3 (30.0)	3 (14.3)	
Maternity	33 (11.0)	28 (10.4)	2 (20.0)	3 (14.3)	
Cardiology	32 (10.7)	29 (10.8)	1 (10.0)	2 (9.5)	
Orthopedics	31 (10.3)	29 (10.8)	1 (10.0)	1 (4.8)	
Infectology	27 (9.0)	23 (8.6)	1 (10.0)	3 (14.3)	
Nephrology	25 (8.3)	23 (8.6)	-	2 (9.5)	
Psychiatry	23 (7.7)	22 (8.2)	-	1 (4.8)	
Pneumology	21 (7.0)	18 (6.7)	-	3 (14.3)	
Burns	5 (1.7)	5 (1.9)	-	-	
Medical clinic	3 (1.0)	3 (1.1)	-	-	
Gynecology	2 (0.7)	2 (0.7)	-	-	=1.000
Transplants	2 (0.7)	2 (0.7)	-	-	
Gastroenterology	2 (0.7)	2 (0.7)	-	-	
Surgical	2 (0.7)	2 (0.7)	-	-	
Neurology	2 (0.7)	2 (0.7)	-	-	
Ophthalmology	1 (0.3)	1 (0.4)	-	-	
Plastic surgery	1 (0.3)	1 (0.4)	-	-	
Physical rehabilitation	1 (0.3)	1 (0.4)	-	-	
Allergology	1 (0.3)	1 (0.4)	-	-	
Mastology	1 (0.3)	1 (0.4)	-	-	
Urology	1 (0.3)	1 (0.4)	-	-	
Intensive/Palliative care	1 (0.3)	1 (0.4)	-	-	
Endocrinology	1 (0.3)	1 (0.4)	-	-	
Tuberculosis	1 (0.3)	1 (0.4)	-	-	

Table 1. Distribution of the hospital and administration characteristics in the state of São Paulo during the 2018–2019 period. (Conclued)

Information	All	Administration			p-value[1]
		Own	Outsourced	Mixed	
Pharmacovigilance n (%)	**N=301**	**N=261**	**N=18**	**N=22**	
Passive	156 (51.8)	136 (52.1)	11 (61.1)	9 (40.9)	=0.461
Active	145 (48.2)	125 (47.9)	7 (38.9)	13 (59.1)	
Participation in hospital commissions n (%)	**N=1,163**	**N=1,026**	**N=65**	**N=72**	
Pharmacy and Therapeutics Commission (*Comissão de Farmácia e Terapêutica*, CFT)	305 (26.2)	268 (26.1)	17 (26.2)	20 (27.8)	
Nosocomial Infection Control Commission (*Comissão de Controle de Infecção Hospitalar*, CCIH)	240 (20.6)	212 (20.7)	14 (21.5)	14 (19.4)	
Waste commission	139 (12.0)	121 (11.8)	8 (12.3)	10 (13.9)	
Commission for the Management of Hospital Risks	136 (11.7)	119 (11.6)	8 (12.3)	9 (12.5)	
Nutritional Therapy Multidisciplinary Team (*Equipe Multidisciplinar de Terapia Nutricional*, EMTN)	127 (10.9)	114 (11.1)	6 (9.2)	7 (9.7)	=0.978
Antineoplastic Therapy Multidisciplinary Team (*Equipe Multidisciplinar de Terapia Antineoplásica*, EMTA)	81 (7.0)	71 (6.9)	3 (4.6)	7 (9.7)	
Permanent Education Commission	79 (6.8)	69 (6.7)	7 (10.8)	3 (4.2)	
Medical Records and Deaths Commission	56 (4.8)	52 (5.1)	2 (3.1)	2 (2.8)	
Chemotherapy n (%)	**N=184**	**N=158**	**N=8**	**N=18**	
Own	123 (66.8)	104 (65.8)	6 (75.0)	13 (72.2)	=0.831
Outsourced	61 (33.2)	54 (34.2)	2 (25.0)	5 (27.8)	

[1]Tests used: chi-square and Fisher's. **

Table 2. Distribution of the Hospital Pharmacists' activities in the state of São Paulo during the 2018–2019 period.

Pharmacist's activities	All N=434	Prescription evaluation		p-value[1]
		Evaluates N=305	Does not evaluate N=129	
Discharge guidance[2] n (%)				
Yes	167 (38.5)	157 (51.5)	10 (7.8)	<0.001
Interventions in the prescriptions[2] n (%)				
Yes	177 (40.8)	236 (77.4)	21 (16.3)	<0.001
Multidisciplinary visit[2] n (%)				
Yes	251 (57.8)	229 (75.1)	22 (17.1)	<0.001
Medication reconciliation[2] n (%)				
Yes	232 (53.5)	220 (72.1)	12 (9.3)	<0.001
Adherence to the intervention indicator[2] n (%)				
Yes	203 (46.8)	196 (64.3)	7 (5.4)	<0.001

[1]Test used: chi-square. [2]Dichotomous variable for which information of only one category was presented.

Discussion

According to Santos T., the following legal regimes were observed: private (1,511; 31.5%), non-profit (1,170; 24.4%) and public (2,109; 44.0%) among these categories of services, such as general hospitals (3,732; 77.9%) and specialty hospitals (1,058; 22.1%).[8] When compared to this study, the most frequent service was the private service with its own administration in the state of São Paulo.

According to Santos, T R, Penm, J. Baldoni, A. O. *et al*., of the 1,058 main pharmaceutical specialties in Brazil, there is psychiatry with 230 (21.7%); maternity hospital with 154 (14.6%); pediatrics with 114 (10.8%); cardiology with 64 (6.1%); oncology with 56 (5.3%); orthopedics with 47 (4.4%) and not applied with 393 (37.1%). Mapping the workforce of hospital pharmacy in Brazil, higher frequency of hospital pharmacists was evidenced in the Southeast region, with 1,478 (30.9%), and in specialized non-profit hospitals.[8] Our study notices new performance areas, such as: oncology, infectology, nephrology, orthopedics and pulmonology, oncology being the most frequent, continuing with significant growth in the segment.

The role of the pharmacist during hospital discharge, medication reconciliation and multidisciplinary visits improves adherence to the therapy, reduces the occurrence of adverse events related to medications and diminishes the need for new interventions and readmissions.[12] A study carried out from June 2004 to June 2005 reported that the pharmaceutical intervention was effective in preventing 49.5% (191/227) of the drug-related problems.[13] A number of studies have shown that the presence of a pharmacist reduces the incidence of adverse events by two-thirds. The interventions in the six-month period were related to clarification or correction of the prescribed medication (45.0%), offering information about the drug (25.0%) and recommending an alternative therapy (12.0%), with rates of 99.0% acceptance of the

pharmaceutical interventions.[14] The reduction in the prevalence of adverse drug-related events was significantly associated with the multidisciplinary team, involving the pharmaceutical intervention related to the medications.[15] The pre-discharge intervention led to shorter hospital stay. The post-discharge intervention, which included follow-up visits, resulted in lower use of high-risk medications and a 30-day reduction in the readmission rates.[16] This scenario shows the need for development in this area, with the implementation of guidance and monitoring before and after hospital discharge and intervention in hospital prescriptions. These services minimize the patient's health risks by identifying potential drug-related problems (DRPs).

The study shows that the passive surveillance system only captures between 1.0% and 10.0% of the adverse reactions,[17] highlighting the prioritization of active search methodologies in identifying adverse drug events.[18] Belincanta M *et al*. show that the Southeast region was the one that most contributed to the transfer of information to health surveillance, with 53.5% of the technical complaint notifications.[19] This reflects the importance of developing activities in the hospital area, necessary for the expansion of active pharmacovigilance, which consists of the collection of visits to the wards, review of medical records, medical prescriptions, monitoring of inpatients or outpatients and implementation of *Trigger Tolls,* known as "triggers", aimed at the hospital's epidemiological profile.

It is up to the Pharmacist to actively participate in the Hospital Commissions in a dynamic, integrative and safe manner. The Pharmacy and Therapeutics Commission is a collegiate body, of a consultative and deliberative nature, whose objective is to select essential medicines to be used in the health system at the three care levels, in addition to advising the management on issues related to medications.[20] The Nosocomial Infection Control Commission (*Comissão de Controle de Infecções Hospitalares*, CCIH) follows Ordinance No. 2,616 of 1998, with the objective of creating guidelines and standards related to the prevention and control of hospital infections. The standards are aimed at private and public institutions.[20] In both Commissions, pharmacists play a fundamental role in technical and strategic contributions. It is noteworthy that they were the most frequent commissions in the study. The targeting of the questionnaire was the research instrument, whose purpose recognized the pharmacists' participation in the Commissions and Multidisciplinary Teams. Permeability of this professional is observed, contributing to strategic, tactical and operational decisions in strengthening and improving the technical structure and strengthening of the health service.

The main study limitations were the communication tools used (e-mail and CRF-SP Portal) related to receiving information for participation in the research.

Conclusion

Based on this study, the need to develop the hospital pharmacist's activities can be noticed, and the main processes for immediate actions are as follows: hospital discharge guidance, drug-related interventions and the active pharmacovigilance process in the state of São Paulo. The hospitals with pharmacists who participate in the multidisciplinary visit and in medication reconciliation show better results when compared to the institutions that do not have this professional, although there is a need for further studies related to the points reported in the study.

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Collaborators

Conception and design: BRPS, SZW, FFP, BHTS, JFM; Data analysis and interpretation: BRPS, SZW; Writing of the article: BRPS, SZW, FFP, BHTS, JFM; Relevant critical review of the intellectual content: BRPS, FFP; Coordination of the study project: BRPS.

Conflict of interest statement

The authors declare that there is no conflict of interest about this article.

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