

The importance of clinical pharmacy in the hospital context

A importância da farmácia clínica no contexto hospitalar

La importancia de la farmacia clínica en el contexto hospitalario

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RESUMO

Objetivo: Descrever a importância e a contribuição da farmácia clínica na promoção em saúde dentro de uma organização hospitalar, destacando os consensos sobre esta temática na literatura científica especializada. **Método:** revisão narrativa realizada por meio de busca online na Biblioteca Virtual de Saúde, com os seguintes descritores: Farmácia clínica; Hospital; Farmacêutico. Delimitou-se o período de 2010 a 2020, ou seja, nos últimos 10 anos, e artigos disponibilizados na íntegra. Os dados de cada estudo foram extraídos, sendo elaborado um quadro com as principais variáveis para analisar o perfil dos artigos coletados. **Resultados:** Após o cruzamento dos descritores, foi possível encontrar uma amostra de 64 artigos inicialmente. Adotando o critério de inclusão relacionado à necessidade de os artigos serem publicados no idioma português, dos últimos 10 anos e disponibilizados em sua íntegra, observou-se que, deste total, 31 atendiam a estes critérios. Por fim, a amostra final foi composta por 12 artigos. O farmacêutico clínico hospitalar tem diferentes responsabilidades, contribuindo para a promoção à saúde através da aquisição, provisão e controle de insumos essenciais para o paciente internado; tem função indispensável na prevenção de reações adversas e dos riscos das interações medicamentosas; garante a segurança do paciente por meio do uso racional dos medicamentos prescritos pelos médicos; e tem uma participação ativa na adesão ao tratamento e prevenção de agravos em geral. **Considerações finais:** a farmácia clínica hospitalar apresenta importância para a saúde pública de uma forma geral e o farmacêutico clínico torna-se uma peça chave dentro da equipe multiprofissional hospitalar.

Descritores: Farmácia Clínica; Farmácia Clínica Hospitalar; Atenção Farmacêutica.

ABSTRACT

Objective: To describe the importance and contribution of clinical pharmacy in health promotion within a hospital organization, highlighting the consensus on this topic in the specialized scientific literature. **Method:** narrative review carried out through an online search in the Virtual Health Library, with the following descriptors: Clinical pharmacy; Hospital; Pharmaceutical. The period from 2010 to 2020 was delimited, that is, in the last 10 years, and articles made available in full. The data for each study were extracted, and a table was created with the main variables to analyze the profile of the collected articles. **Results:** After crossing the descriptors, it was possible to find a sample of 64 articles initially. Adopting the inclusion criterion related to the need for articles to be published in the Portuguese language, from the last 10 years and made available in its entirety, it was observed that, of this total, 31 met these criteria. Finally, the final sample consisted of 12 articles. The hospital clinical pharmacist has different responsibilities, contributing to health promotion through the acquisition, provision and control of essential supplies to inpatients; it plays an indispensable role in preventing adverse reactions and the risks of drug interactions; guarantees patient safety through the rational use of medicines prescribed by doctors; and has an active participation in adherence to treatment and prevention of diseases in general. **Final considerations:** the hospital clinical pharmacy is important for public health in general and the clinical pharmacist becomes a key part of the hospital multiprofessional team.

Descriptors: Clinical Pharmacy; Hospital Clinical Pharmacy; Pharmaceutical attention.

RESUMEN

Objetivo: Describir la importancia y contribución de la farmacia clínica en la promoción de la salud dentro de una organización hospitalaria, destacando el consenso sobre este tema en la literatura científica especializada. **Método:** revisión narrativa realizada mediante búsqueda online en la Biblioteca Virtual en Salud, con los siguientes descriptores: Farmacia clínica; Hospital; Farmacéutico. Se definió el período de 2010 a 2020, es decir, en los últimos 10 años, y se pusieron a disposición los artículos en su totalidad. Se extrajeron los datos de cada estudio y se elaboró una tabla con las principales variables para analizar el perfil de los artículos recolectados. **Resultados:** Luego de cruzar los descriptores, fue posible encontrar inicialmente una muestra de 64 artículos. Adoptando el criterio de inclusión relacionado con la necesidad de que los artículos se publiquen en lengua portuguesa, de los últimos 10 años y estén disponibles en su totalidad, se observó que, de este total, 31 cumplían con estos criterios. Finalmente, la muestra final estuvo conformada por 12 artículos. El farmacéutico clínico hospitalario tiene diferentes responsabilidades, contribuyendo a la promoción de la salud a través de la adquisición, provisión y control de insumos esenciales para pacientes hospitalizados; juega un papel indispensable en la prevención de reacciones adversas y los riesgos de interacciones medicamentosas; garantiza la seguridad del paciente mediante el uso racional de los medicamentos recetados por los médicos; y tiene una participación activa en la adherencia al tratamiento y prevención de enfermedades en general. **Consideraciones finales:** la farmacia clínica hospitalaria es importante para la salud pública en general y el farmacéutico clínico se convierte en una pieza clave del equipo hospitalario multiprofesional.

Descritores: Farmacia clínica; Farmacia Clínica Hospitalaria; Atención farmacéutica

Introduction

The hospital clinical pharmacy is a service of great utility and importance within the context of hospital care in current organizations. This service was first implemented in Brazil in the mid-1980s, with the aim of providing the pharmacist with the possibility of reintegration into the health team. However, at first, a great difficulty was observed in the implementation of this type of service, since hospital administrators did not see advantages in this new practice.¹

However, over the years, the importance of the presence of this professional in the hospital context has been increasingly recognized, having a series of duties and responsibilities, contributing decisively to health promotion.

In this context, the figure of the pharmacist is that of a health care provider, who can actively participate in disease prevention and health promotion, along with other members of the health care team.²

Despite all the evolution in the provision of this service and the recognition of the importance of pharmaceutical professionals specifically in the hospital clinical pharmacy, there is still a lack of studies that address the attributions and importance, in practice, of this professional within the reality of hospital care in Brazil.

In the scientific literature, there are few studies that contemplate the pharmaceutical performance in hospitals in Brazil, especially with regard to pharmacotherapeutic follow-up.³

In this sense, the aim of this study was to describe the importance and contribution of clinical pharmacy in health promotion within a hospital organization, highlighting the consensus on this topic in the specialized scientific literature.

Method

This is a narrative review of the literature, carried out in order to answer the following guiding question: What is the importance of hospital clinical pharmacy and what are the duties of this professional in public health in general?

In this study, to survey the articles, an online search was performed at the Virtual Health Library (VHL), using the following Health Sciences Descriptors (Decs): Clinical pharmacy; Hospital; Pharmaceutical.

Data collection took place during the month of April 2020. The inclusion criteria were written in Portuguese and, furthermore, the period from 2010 to 2020 was delimited, that is, in the last 10 years and articles made available in full. As exclusion criteria, those articles that escaped the topic were excluded from the sample, as well as those that presented themselves only with their abstracts and that escaped the publication period of the last 10 years.

As a search strategy, the combination of descriptors was used: (tw clinical pharmacy) AND (tw hospital) AND (tw pharmacist)). The reading of the material was initially exploratory through summaries of the articles, followed by selective reading by the content and later analytical, aiming at the identification of the information and its synthesis through files to provide a partial report on the topic under study. The data for each study were extracted, and a table was created with the main variables to analyze the profile of the collected articles.

Results

After crossing the descriptors, it was possible to find a sample composed of 64 articles initially. Adopting the inclusion criterion related to the need for articles to be published in the Portuguese language, from the last 10 years and made available in its entirety, it was observed that, of this total, 31 met these criteria.

Making a more careful selection of the articles, it was observed that 19 had a different theme from the main theme that was the objective of this study, which is the importance of the hospital clinical pharmacy, as well as some of them were presented in duplicate, being, therefore, excluded. Finally, the final sample consisted of 12 articles, the results of which are shown in Table 1.

Table 1 - Summary of studies and their main results.

Author (year)	Objective	Method	Results	Conclusion
Bouças et al (2018) ⁴	Analyze the impact of the accreditation process on hospital pharmaceutical care, aiming to identify evidence of changes and improvements in the service provided by the hospital pharmacy.	Focus groups were conducted with pharmacists and internal customers of the pharmacy service of 5 private hospitals in the State of Rio de Janeiro intentionally selected. Recordings were made, later transcribed, for analysis of the content of the dialogues and thematic categorization.	Accreditation resulted in investments of infrastructure and human resources, implementation of new processes and a discreet change in the pharmacist's performance, leveraged by the clinical pharmacy. It was observed that such modifications contributed to a continuous transformation of hospital pharmaceutical assistance, with a modest improvement in the efficiency, quality and safety of the service provided. When considering the final results, satisfaction was partial, since the cycle of pharmaceutical assistance is not yet complete, weakening the newly implemented processes in favor of the quality of care offered to the patient.	The impact on the overall performance of the hospital pharmacy was considered positive, allowing to conclude that the accreditation guidelines pointed the way for the development of evaluated services, insofar as they demanded the fulfillment of the standards necessary for a pharmaceutical assistance quality.
Farias et al (2016) ⁵	Implement a clinical pharmaceutical service focused on the complete review of antineoplastic agents used in the treatment of hematological diseases.	An interventional study was carried out in a Brazilian tertiary teaching hospital in two different periods, based on the absence and presence of the clinical pharmaceutical service, respectively. This service consisted of pharmaceutical validation prescription medication antineoplastic agents (analysis of patient characteristics, laboratory tests, compliance with the therapeutic protocol and pharmacotechnical parameters). Inpatients and outpatients with hematological diseases were included.	There was an increase of 106.5% in the detection of problems related to medicines after the implementation of the service. Comparing the two periods, there was an increase in the age of the patients (26.7 years versus 17.6 years), a predominance of outpatients (54% versus 38%) and an increase in multiple myeloma (13% versus 4%) and non-Hodgkin's lymphoma (16% versus 3%). The most commonly encountered problems were related to the dose (33% versus 25%) and the day of the cycle (14% versus 30%). As for the clinical impact, the majority had a significant impact (71% versus 58%) and one could have been fatal in the second period. The main pharmaceutical interventions performed were dose adjustment (35% versus 25%) and medicines suspension (33% versus 40%).	The pharmaceutical service has contributed to the increase in the detection and resolution of problems related to medicines, being an effective method to promote the safe and rational use of antineoplastic agents.
Lima et al (2016) ⁶	Describe and analyze guidance drug offered at discharge of patients transplanted.	A cross-sectional, descriptive and retrospective study was carried out, which used the records of the guidelines performed by the clinical pharmacist at the inpatient unit of the Renal and Liver Transplantation Service,	The first post-transplant discharge involved the entire multidisciplinary team, with the pharmacist responsible for guiding drug treatment. The mean of discharge / month with pharmaceutical guidance during the study period was 10.6 ± 1.3 , totaling 74 guidelines. The prescribed clinical treatment had an average of 9.1 ± 2.7 drugs per patient. 59 drug-related problems were identified; 67.8% were related to	The orientation of the clinical pharmacist with the multidisciplinary team at the time of discharge of the transplanted patient is important, as it prevents negative results associated with pharmacotherapy, ensuring drug reconciliation and patient safety.

		Walter Cantídio University Hospital, in Fortaleza (CE), from January to July 2014. The following variables registered in the Database of the Clinical Pharmacy Service were analyzed: pharmaceutical guidelines at discharge, problems and negative results related to drugs, and pharmaceutical interventions performed.	the non-prescription of the necessary medication, resulting in 89.8% risk of negative results associated with medications due to an untreated health problem. The main intervention was the request for inclusion of the drug (66.1%), and 49.2% of the drugs involved acted in the digestive system / metabolism. All interventions were classified as appropriate, and 86.4% were able to prevent a negative result.	
Fideles et al (2015) ⁷	Analisar 3 anos de atividades clínicas e recomendações farmacêuticas aceitas durante a rotina diária do farmacêutico na unidade de terapia intensiva clínica adulta.	An exploratory, descriptive, cross-sectional study was carried out from June 2010 to May 2013, in a tertiary teaching hospital, during which pharmaceutical recommendations were categorized and analyzed.	834 pharmaceutical recommendations were analyzed, which were classified into 21 categories. Pharmaceutical recommendations were mainly directed to doctors (n=699; 83.8%), the most frequent being: dilution management (n=120; 14.4%), dose adjustment (n=100; 12.0%) and management of adverse drug events (n=91; 10.9%). Comparing the periods, there was an increase, over the years, of pharmaceutical recommendations with a greater clinical component and a decrease in those related to logistical aspects, such as the provision of medicines. The recommendations involved 948 drugs, with emphasis on anti-infectives for systemic use.	The role of the pharmacist in intensive care has evolved at the institution where the study was conducted, moving from reactive actions associated with logistics to effective clinical participation with the multidisciplinary team (proactive actions).
Bernardi et al (2014) ⁸	Report the process of computerization and systematization of pharmaceutical evaluations of medical prescriptions, as well as describe the profile of medical prescriptions and pharmaceutical interventions in an oncology hospital in southern Brazil.	The study was carried out from February 28 to November 11, 2011, in an oncology hospital. The collection was performed through the hospital's computerized system, taking into account the adult and pediatric inpatient wards. 3,221 medical prescriptions were evaluated, 28.0% of the total medical prescriptions in the period. A high rate of prescription of antibiotics (52.9%) and antineoplastic agents was evidenced (27.1%). Based on the evaluations, 284 pharmaceutical interventions (8.8%) were performed, mainly related to professionals doctors and pharmacists	Of the total, 93.7% of the interventions were considered adequate and accepted by the team.	The computerization process took place with good acceptance by the team, and the proper registration allowed the verification of the pharmacist's performance in the evaluations, reinforcing the importance of this professional for the multiprofessional team.
Penna (2014) ⁹	Raise expectations of the health team regarding the role of the Clinical Pharmacist in the Institution's Pediatric and Neonatal ICUs to guide the actions that will be performed during the service implementation process.	Questionnaire application prepared by the Division of Pharmaceutical Assistance to members of the Pediatric and Neonatal CII team at HCFMRP-USP.	Fifty professionals were interviewed, including nursing assistants / technicians, nurses, physiotherapists, doctors and other professionals. Nursing assistants / technicians and physiotherapists showed a greater expectation with questions related to medication administration; for resident doctors and nurses the expectation revolves around issues related to medical prescription.	The service of Clinical Pharmacy in Intensive Care Units is a work still little known.

<p>Paulo (2014)¹⁰</p>	<p>To better understand the steps taken by the medicine during its dispensing and distribution trajectory, the processes of each step of the flow and the most complex and important subprocesses, aiming at improvements and benefits both for health professionals and for the institution and, mainly, for the patient.</p>	<p>The data collection performed by the ethnographic method of description and observation of the phenomenon presented a context very close to the daily reality of the teams and provided a view of the complex scenario of the Hospital Pharmacy of the Health Complex of the Hospital das Clínicas of the State University of Campinas, São Paulo, from April to September 2010.</p>	<p>The professionals involved in dispensing and distribution, and even in the administration of medicines, make simple mistakes in these processes, usually associated with the lack of attention to the process and the distraction that the environment imposes on them, such as the large circulation of people, telephone service, exchange of information, information between teams and others. Despite not being the object of this study, it is recognized that the hospital pharmacy work environment can indirectly contribute to medication administration errors, and other studies need to be carried out to better understand this scenario</p>	<p>The study concluded that the medication dispensing and distribution flow includes 5 steps: (1) pharmacy warehousing, (2) preparation, (3) dispensing, (4) distribution in the wards and (5) return. There are 18 processes involved, and the critical points of greatest attention are the process of unifying medicines, sorting prescriptions, separating prescriptions and registering medications. It is vitally important to build a strategic plan focused on the prescription, distribution and dispensing of medicines, with short, medium and long term investments, with the objective of guaranteeing full safety to the users of the health system. He also concluded that the computerization of the Medical area, as in any activity, has become extremely important in updating and consolidating data, since in the hospital pharmacy, there are many areas in which the improvement of quality and productivity is associated with the use a more efficient computerized system in data processing and control, making it essential.</p>
<p>Nascimento et al (2013)¹¹</p>	<p>Assess the existence of associations between hospital pharmacy services variables.</p>	<p>30 variables from the Diagnosis project were used of Pharmacy Hospital in Brazil related to the general characterization of the hospital, general characterization of the hospital pharmacy service and stages of pharmaceutical assistance. Dimension 1 of correspondence analysis Multiple explained 90.6% of the variability, differentiating hospital pharmacy services according to the presence of activities, thus suggesting an axis of characterization of the structure of hospital pharmacy services.</p>	<p>The results indicated a direct relationship between fulfillment of activities and type of hospital and specialized pharmacists. The cluster analysis identified six groups related to the size of the hospital, with greater fulfillment of activities by hospital pharmacy services in large units and with pharmacists (more time dedicated to hospital pharmacy service and higher level of training).</p>	<p>It was concluded that the techniques were able to identify associations and a concise list of variables for a comprehensive assessment of hospital pharmacy services in the country.</p>
<p>Rabelo Borela (2013)¹²</p>	<p>The objective of this study was to propose the insertion of the pharmaceutical professional in the control of pain of oncological origin aiming at the rational use and monitoring of adverse reactions to medications.</p>	<p>For the effective control of pain, implementation of analgesic measures and evaluation of therapeutic efficacy of pain, the correct use of the World Health Organization (WHO) "Guide for Pain in Cancer" is essential, which provides guidelines for pain control in most patients with</p>	<p>The scales for measuring pain combined with the protocol recommended by the WHO have proved to be an essential tool for the rational use of medicines.</p>	<p>The pharmaceutical professional, in addition to fulfilling his current activity, is able to interact in multidisciplinary teams, assisting in the pain management of cancer patients, evaluating the length of this protocol established by WHO in pain control.</p>

		advanced cancer, and it is also essential to report the patient's painful experience to health professionals.		
Miranda et al (2012) ¹³	Demonstrate the role and importance of the clinical pharmacist in the First Care Unit in identifying, classification and survey of the number of interventions performed by the clinical pharmacist.	A retrospective study was carried out from January 1, 2010 to December 31, 2010, at the Morumbi First Care Unit of Hospital Israelita Albert Einstein. The interventions were carried out by the clinical pharmacist through work with the interdisciplinary team and active search in medical records, with the daily analysis of the medical prescription in the period of eight hours (10 am and 7 pm) from Monday to Friday	A total of 3,542 medical prescriptions were evaluated and 1,238 interventions occurred. The classifications and quantities of interventions were: route of administration: 105 (8.48%); frequency: 73 (5.89%); dose: 431 (35%); renal function: 14 (1.13%); compatibility: 50 (4%); dilution: 121 (9.77%); legibility: 39 (3.15%); pharmacovigilance: 7 (0.56%); adverse reaction to medications: 7 (0.56%); allergy: 35 (2.82%); infusion time: 76 (6.13%); indication: 52 (4.20%); drug reconciliation: 2 (0.16%); medicines via tube: 38 (3%); schedule: 7 (0.56%); protocol specific anticoagulants: 44 (3.55%); protocol specific hypoglycemic: 42 (3.99%).	The study allowed to demonstrate the importance of the clinical pharmacist working in the First Care Unit. From the classification and the number of interventions performed, it was possible to observe that the Clinical Pharmacy Service had a great impact in increasing patient safety and preventing adverse events.
Ferracini et al (2011) ¹⁴	Demonstrate the development and contribution of the clinical pharmacy to the safe and rational use of medicines in a large tertiary hospital.	The work involved the participation of the clinical pharmacist in all issues related to the use of medicines in the hospital. In the beginning it was related to the analysis of medical prescription, horizontal visit and implementation of protocols. Later, other activities were incorporated, such as: pharmacovigilance, participation in commissions and managed routines. After identifying the drug-related problem, the pharmacist contacted the doctor and, after the intervention, recorded the conduct on the prescription and / or on the patient's medical record.	There was an increase in the number of clinical pharmacists, reaching 22 in 2010. There was also an increase in the types and number of interventions performed (from 1,706 in 2003 to 30,727 in 2010) and we observed 93.4% adherence by the medical team in 2003, reaching to 99.5% in 2010	The clinical pharmacy has shown a positive impact in relation to the number of interventions performed, promoting rational use of medicines and increasing patient safety. The pharmacist was inserted and guaranteed his space with the multidisciplinary team and in the patient safety process within the institution.
Borges Filho et al (2010) ¹⁵	Highlight the contributions of the pharmacist and the hospital clinical pharmacy in the quest to reduce the use of human albumin by 20% with unsubstantiated indication at Hospital Israelita Albert Einstein.	During a period of 30 days (December, 2006), a preliminary prospective analysis was carried out using the medical prescriptions of patients with human albumin, and therapeutic indications were evaluated in relation to the guidelines established by ANVISA resolution RDC 115. Based on this information, an action project was prepared and a routine of daily monitoring of prescriptions by pharmacists was instituted as of January 2007.	From January to October 2007, 14,799 bottles of 20% albumin were consumed. Of these, 4,191 with unsubstantiated indication, corresponding to a loss of R\$ 1.36 million. In 2008 (from January to October), 13,519 vials of 20% albumin were prescribed. Of these, 1,648 with unsubstantiated indication, which accounts for a loss of R\$ 535 thousand. The ratio between the risk of loss and the amount consumed from January to October 2007 was 91.99. In the same period in 2008, it was 39.60. From January to October 2007, the average percentage of albumin prescribed with unsubstantiated indication was 28%. In the same period in 2008, this percentage dropped to 13%. A reduction of 54%.	The Pharmacist's involvement in the process of verifying the indication and justification for the use of the medication represented the guarantee of safe processes for the patient, ensuring that he receives the right medication for the correct indication, thereby reducing the likelihood of adverse events and helping to reduce bureaucracy and expenses unnecessary in this institution.

Discussion

Through the selected sample, it was possible to observe that, especially in recent years, it has been possible to observe that there was a great recognition about the importance of Clinical Pharmacy within the hospital environment specifically. This was possible to observe consensually among the different authors selected here. Still, for sure that the contributions that the Clinical Pharmacy can bring to the practices and care exercised in a hospital environment are, in our understanding, fundamental as a specialty inserted in a highly complex system - like the hospital - making possible the consolidation of a series of advantages and benefits for public health in general.

Likewise, over the past few decades it has also been possible to observe a profound evolution in hospital organizations, which have become much more complex and comprehensive, serving a very high number of patients / clients and requiring the performance of multidisciplinary teams, where each piece plays a very important role within a complex system.

Within this context, it was also observed that, specifically, the greater appreciation of the figure of the pharmacist was due to the finding that he is an indispensable professional to guarantee the quality of the service provided and especially the guarantee to the health of the population served, being their specific duties and which cannot be performed in an "adjusted" or "adapted" manner to other professionals under penalty of compromise of the entire complex system, which is good and efficient hospital management.

Its main duties within a multiprofessional team include the acquisition, provision and control of inputs considered essential for inpatients.¹⁵⁻¹⁶ Also, this is an active health professional and a member of the multidisciplinary patient care team is able to participate in therapeutic decisions, in addition to contributing to treatment adherence.¹²⁻¹⁶

Likewise, when working in the hospital clinical pharmacy, the professional is assuming a great responsibility in patient care and also contributing to the prevention of self-medication and the irrational use of medicines, a problem so common today.^{2-3,16} Specifically, self-medication has been the subject of intense debates and the search for alternatives in the last few years seeking its prevention, considering all the risks associated with it. The irrational use of medicines can bring numerous risks to the individual's health, risks related to problems of the most varied orders, from drug interactions, adverse effects, intoxications, among others.¹²⁻¹⁴

Final Considerations

The hospital clinical pharmacy is of great importance, making indispensable contributions to public health in general.

The figure of the hospital clinical pharmacist has several responsibilities operating in this sector, contributing decisively to health promotion through the acquisition, provision and control of inputs considered essential for inpatients. Also, the hospital pharmaceutical professional has an indispensable role in preventing adverse reactions and the risks of drug interactions, as well as ensuring patient safety through the rational use of medicines prescribed by

doctors, as well as an active participation and greater adherence to disease treatment and prevention in general, which can be considered a key part of the hospital's multiprofessional team.

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