Full Length Research Paper

Pharmaceutical care in Brazilian community pharmacies: Knowledge and practice

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This study aimed to assess the pharmacist's knowledge of the concept of pharmaceutical care and verify their practice in relation to this service. It involved a cross-sectional study carried out on community pharmacies in four Brazilian cities and involved pharmacists who work in community pharmacies. The pharmacists' knowledge of the concept of pharmaceutical care and their practice in respect of the service was measured. 486 pharmacies were visited and 112 pharmacists participated in the study. Of these professionals, 41% correctly identified the concept of pharmaceutical care and 70.5% said they perform it in pharmacies. The majority (n = 62) of the professionals followed standard operating procedures and four recorded data on the service offered (patient information, interventions and results). There is evidence that only 2.5% of the professionals effectively carry out the level of pharmaceutical care recommended by the Brazilian guidelines. Pharmacists are not yet ready to perform pharmaceutical care in community pharmacies. It is necessary to review the pharmacists' training and enable the professionals to properly perform this service.

Key words: Pharmaceutical care, pharmacists, knowledge, attitudes, community pharmacy.

INTRODUCTION

Pharmaceutical care (PC) was introduced in Brazil around 1995 (Lyra et al., 2000). However, this process did not consider the characteristics of the Brazilian health system, which still does not provide access to and quality care for the entire population in primary health care. Popular culture centers models of healing that focus on

hospitalization instead of preventing the emergence of diseases through health prevention strategies; the models are also an obstacle to the spread of PC. Moreover, the limitation of investment from public and private sectors restricts the promotion of rational use of drugs through PC (Chaud et al., 2004; Garcia-Subirats et

al., 2014).

Additionally, the deployment of PC ran into another important problem faced in the country: the lack of pharmacists in community pharmacies. This was evidenced by several authors (Farina and Romano-Lieber, 2009; França-Filho et al., 2008; Lucchetta and Mastroiani, 2010; Tomassi and Ribeiro, 2012) and represents a failure of Brazilian legislation that determines the presence of this professional during the entire period of operation of these establishments. The need for technical guidelines and training of pharmacists to perform the service was also not considered (Pereira and Freitas, 2008). Thus, the Brazilian Pharmaceutical Care Consensus (BPCC) to guide the performing of PC was developed (Ivama et al., 2002). This document defines PC as a professional practice model that seeks to achieve therapeutic outcomes defined in the health and quality of life through systematic pharmacotherapeutic monitoring of the patient. Furthermore, it establishes that this monitoring should include the registration of information relating to the patient, guidelines, pharmacotherapeutic interventions and obtained results, ensuring the measurement of the impact of comorbidities on prevention, promotion and restoration of life quality. It also proposes that macro constituents such as health education, counseling and pharmaceutical attendance are explored. Therefore it becomes essential that PC is performed in a private environment ensuring patient privacy (Ivama et al., 2002; Federal Council of Pharmacy, 2013a). In addition, a federal resolution determined that pharmacies should have protocols developed by the pharmacist to standardize the operational procedures involved in performing the service (National Health Surveillance Agency, 2009). Thus, the importance of the pharmacist to present appropriate professional conduct in relation to PC services is reinforced, implying the need for training which will promote the rational use of drugs (Pereira and Freitas, 2008).

In this context, curriculum changes were introduced in 2002 in pharmacy colleges in Brazil in an attempt to provide clinical training for future pharmacists, and enable them to perform a comprehensive and humanistic service, instead of working focused only on the management and production of drugs (Brazil, 2002). Thus, this would ensure the proper fulfillment of PC. However, little is known about the impact of these changes because there are only two studies in Brazil (Baldon et al., 2006; França-Filho, 2008) in which this type of analysis was performed and they were developed when the clinical training was being implemented.

Professional knowledge may come from the subjects learned in undergraduate and in continuing education strategies, which consist of improving professional skills through interactive workshops, courses and other activities performed after graduation (Dewulf et al., 2009; Watson et al., 2002). To measure pharmacists' knowledge and their actions in relation to PC, their performance of this service should be analyzed and this assessment should be performed in community pharmacies because there the patient has easy access to these professional (Anderson and Thornley, 2014; Pereira and Freitas, 2008).

In Brazil there are more than 70,000 community pharmacies, which extrapolate to nearly four times the ratio recommended by the World Health Organization, highlighting their importance in providing health care, and the need to assess the pharmacist who works in these health establishments (Federal Council of Pharmacy, 2013b; Zubioli, 1992). More than half of these pharmacies are private companies and they represent 85.6% of job positions occupied by pharmacists in the country (Federal Council of Pharmacy, 2013b). To work in these companies, it is necessary to be graduated in Pharmacy and this course usually lasts five years. The remuneration offered to pharmacists to work in private community pharmacies is different in each state of Brazil, ranging from two to five times the minimum wage (one minimum wage being approximately equivalent to US $285 in February, 2015).

Aim of the study

The aim was to assess the knowledge of the pharmacist on the concept of PC and verify their performance in relation to this practice in community pharmacies.

Article relevance

1. In order to perform pharmaceutical care (PC) properly in community pharmacies, the pharmacist must have knowledge of the aspects that involve the concept of this clinical practice and provide appropriate actions in relation to the therapeutic monitoring offered, following the guidelines of the service. The results of this study show that community pharmacists in socioeconomically important regions of the Brazilian territory are not prepared to perform PC.
2. Changes to the educational formation of the pharmacist and training of these professionals are required to qualify them in clinical practice which is so important to the success of treatment with medicine.
3. This study fills an important gap about the supply of PC in Brazilian community pharmacies. Besides being limited, the information available about PC held in Brazil was collected in public pharmacies and little was known about PC in private establishments.
4. Furthermore, this work is a pioneer in assessing community pharmacists from different regions of Brazil in relation to the concepts and issues involving PC.

METHODOLOGY

This is a cross-sectional study conducted with pharmacists who work in community pharmacies in the following Brazilian cities:

Ribeirão Preto and Araraquara (in São Paulo state), Londrina (Paraná state) and Alfenas (Minas Gerais state). The criteria for selection of these cities were: a population of up to one million inhabitants, be located at a maximum of 500 km away from the place of this study (Ribeirão Preto), and have at least two pharmacy colleges (one public and one private). No pharmacies sourced from public institutions or compounding pharmacies were included. All pharmacies in the four cities were visited during the data collection, which was conducted during business hours by a single researcher, to avoid bias. The addresses of the establishments were obtained from the Pharmaceutical Association of Alfenas and Regional Boards of Pharmacy of São Paulo and Paraná.

For data collection the researchers developed a semi-structured self-administred questionnaire, considering the knowledge and practice recommended for BPCC (Ivama et al., 2002). This instrument was composed of 47 questions and divided in three sections (sociodemographic information, knowledge and practices). The questionnaire was validated following models available in the literature (Armando et al., 2012; Njilele et al., 2012; Traverso et al., 2007) and validation was performed by systematic analysis of the questionnaire by two sets of judges with expertise in PC and community pharmacies. The first set consisted of ten researchers with expertise in these two areas and the second set consisted of five professors who teach the subject of PC and drug dispensation. In each of these sets, the questionnaire was modified according to guidelines issued by the judges until there was consensus among researchers and approved by the judges. Therefore the questionnaire was submitted to a pilot test with five pharmacists who work in community pharmacies, seeking to ensure reliability, clarity and effectiveness in the questionnaire. The data collected were not considered in the final analyses.

The variables analyzed were: age, gender, type of establishment where the pharmacist works (pharmacy chain or independent pharmacy), administrative role (owner, manager or employee), weekly working hours (up to 44 h or more than 44 h), remuneration (less than, equal to, or above the minimum wage, which is the minimum value established for the remuneration of the professional in each state of the federation), type of institution where they graduated (public or private), participation in continuing education activities; knowledge of the concept of PC, available resources for the realization of PC (forms, sources of drug information) and presented actions (standardization of PC operating procedures, record of interventions, privacy in attendance). Regarding education, pharmacists should respond if they graduated before or after the implementation of the curriculum changes of 2002.

The knowledge of PC concept was assessed through a multiple-choice question in which the definitions of PC (proposed by BPCC), Pharmaceutical Services and Clinical Pharmacy were available. Knowledge of the PC concept was classified as satisfactory by those who answered this question correctly. In addition, pharmacists' knowledge of the dispensing of drugs, which is considered by the BPCC as the starting point for the realization of PC, was also evaluated. Knowledge of dispensation was classified according to the number of affirmative responses in the six questions on the subject: unsatisfactory (0 to 2 affirmative responses), regular (3 to 4 affirmative responses) and satisfactory (5 to 6 affirmative responses).

Only one pharmacist in each pharmacy was invited to participate in order to avoid bias. Establishments where the pharmacist was not present received a second visit by the researcher not less than two hours following the initial visit, an acceptable time limit by the representing pharmacists' organizations, to pharmacies that function without the supervision of a professional. If the pharmacist remained absent on the second visit, the pharmacy was not included in the study. The same procedure was adopted in which pharmacies were closed down (no longer in business).

In turn, of the pharmacies included in the study, the pharmacist and the owner (or manager) of the pharmacy were informed of the

objectives of the study and signed a consent form agreeing to the study. Both were required to sign the document so that the pharmacist could answer the questionnaire. The completion of the questionnaire by the participants was performed in the presence of the researcher and without permission to query any research sources. On completion, participants received an envelope with no identification to deposit the questionnaire, which was sealed before returning to the researcher. The completion of questionnaire lasted 30 min on average.

The collected data were independently double entered by different researchers using a database created by the Epi Info™ (version 3.5.4) program. Subsequently, both entries were compared and discrepancies found were corrected by the principal researchers. Data analysis was performed by the same statistical software, calculating measurements-summary as absolute frequencies, means and standard deviation. The association between "perform PC" and "knowledge of PC" was verified through logistic regression with calculations of odds ratio (OR) and confidence interval (CI) of 95%. Statistical significance was established at $p < 0.05$.

The study followed the recommendations of the STROBE statement - Strengthening the Reporting of Observational Studies in Epidemiology (Malta et al., 2010) and was approved by the Ethics Committee of the School of Pharmaceutical Sciences of Ribeirão Preto, University of São Paulo.

RESULTS

A total of 486 pharmacies were visited for data collection, 54 of which were not included in the survey because they were either from public institutions, or compounding pharmacies, or were out of business. Seventy-three pharmacies were excluded because the pharmacist was absent during visits. In addition, 49 owners/managers did not authorize the professional to be approached, and 198 pharmacists refused to answer the questionnaire. Thus, 112 pharmacists comprised the study sample. The average age of participants was 33.4 years (SD = 8.6), 72.3% were female, 28.6% were pharmacy owners, 63.4% worked in independent pharmacies, 57.2% had a weekly workload exceeding 44 h, and 42.9% received lower pay than minimum wage determined by the associations of pharmacists in Brazil (Table 1).

More than 41% of participants were graduated according to curriculum changes from 2002. It was observed that 72.3% had graduated from private colleges. Regarding continuing education, it is shown in Table 2 that almost half of the participants attended conferences and short courses after graduation, although few pharmacists have attended activities that had as their thematic PC or related areas (such as clinical pharmacology, pharmacotherapy and drug interactions). The concept of PC was correctly identified by 41.0% of pharmacists. For every ten pharmacists who had participated in continuing education in clinical areas, seven knew about the definition of PC (p<0.01). However, only 40.0% of pharmacists who were trained in PC were able to identify the correct definition of the practice. The type of educational institution, year of graduation and reporting PC performing at pharmacies

Table 1. Occupational information of pharmacists who participated in the study (N=112).

Variables	Pharmacists				
	Technicians in charge N (%)	Substitutes N (%)	Assistants N (%)	Managers N (%)	Owners N (%)
Occupation in the company	62 (55.4)	14 (12.5)	4 (3.6)	13 (11.6)	32 (28.6)
Weekly workload exceeding 44 h	24 (38.7)	5 (35.7)	2 (50.0)	6 (46.2)	27 (84.4)
Lower pay to minimum wage	25 (40.3)	6 (42.9)	2 (50.0)	4 (30.8)	11 (34.4)

Table 2. Continuing education activities performed by pharmacists (N=112)[1]

Activities	Thematic areas			Total N (%)
	PC N (%)	Clinics N (%)	Others N (%)	
Improvement	1 (4.2)	3 (13.2)	19 (82.6)	23 (100.0)
Conferences and short courses	2 (3.2)	4 (6.5)	56 (90.3)	62 (100.0)
Specialization	2 (5.9)	12 (35.3)	20 (58.8)	34 (100.0)
Masters or Doctorate	-	-	2 (100.0)	2 (100.0)

[1]There were pharmacists who indicated more than one continuing education activity. PC - Pharmaceutical Care; Clinics - related to PC (clinical pharmacology, clinical pharmacy, pharmacotherapy, homeopathic therapeutics and drug interactions) areas; Other - not related to the PC (industry, teaching pharmacy and management) areas.

Table 3. Relationship between PC performing and PC knowledge (n=112)[1]

Performs PC	N (%)	Knowledge of PC		
		Satisfactory N (%)	OR (IC)	p-value
Yes	79 (73.8)	27 (34.2)	1.00	0.0069
No	28 (26.2)	18 (64.3)	3.47 (1.41-8.54)	

[1]Five pharmacists did not report if they perform PC. PC – Pharmaceutical Care; OR – odds ratio; IC – confidence interval.

did not show a significant relationship with knowledge of the concept of PC. Nevertheless, it is important to note that 70.5% of the evaluated professionals mentioned that they perform PC and 78.5% of them developed operating procedures to standardize the service. From Table 3 it can be observed that most pharmacists who report performing PC were those who do not have satisfactory knowledge about the concept of PC.

Considering other specific aspects, 70% of professionals with regular or satisfactory knowledge for dispensing of drugs affirmed performing PC. In turn, all pharmacists with unsatisfactory knowledge for dispensing of drugs also reported performing this service. Approximately 80% of pharmacists recognized that PC is a practice that should be documented, but only 12.5% of professionals confirmed that they record guidance, interventions, and outcomes relating to this service. According to these professionals, managers of pharmacies do not provide material resources for the recording of information, and the need to maintain patient anonymity also prevents the storage of data relating to therapeutic monitoring. One in five pharmacists responded that PC is performed at the pharmacy counter and employees (non-pharmaceutical) are responsible for running the service in 6.3% of establishments.

According to the results, there is evidence that two of the 79 pharmacists who reported performing PC run the service according to Brazilian recommendations (Figure 1). For professionals, the biggest obstacles to deployment of PC in pharmacies is the lack of space reserved for individualized patient care (53.6%) and the lack of material resources such as computers, internet access, and books for searching for information on medicines and health-related aspects (14.0%).

DISCUSSION

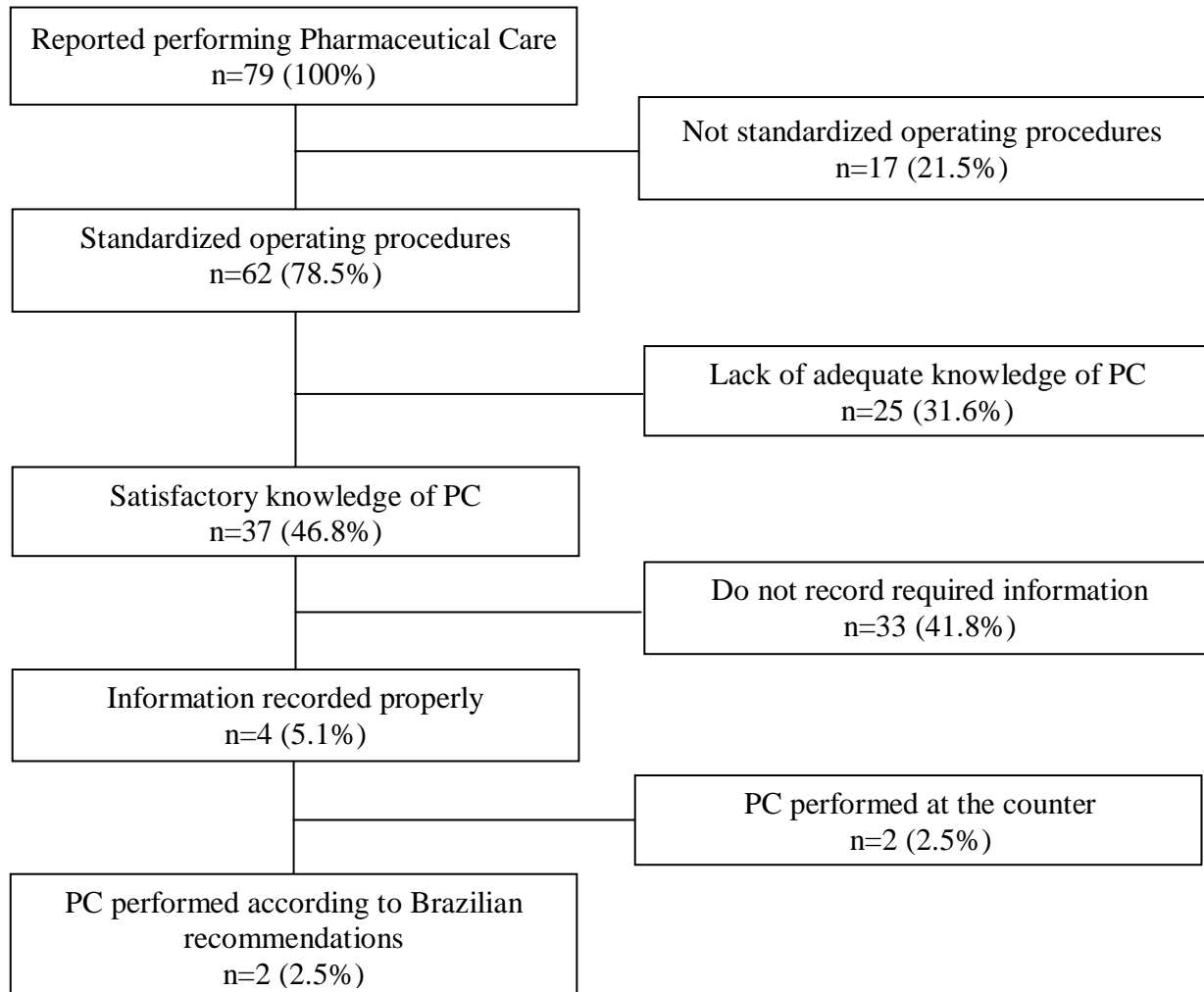In this study, the number of participants was more

Figure 1. PC service performing flowchart by pharmacists in visited pharmacies.

influenced by the refusal of pharmacists to collaborate with research than by non-consent of the owners/managers to approach the professionals. In other research with community pharmacists, participation was also considered low by the authors (Mak et al., 2013; McIntosh et al., 2012; Tomassi and Ribeiro, 2012). This reduced participation reflects insecurity or lack of preparation of pharmacists for PC, showing deficiencies in the recent curriculum amendments from 2002. In addition, 15.0% of the pharmacies visited were functioning without the supervision of the pharmacist, revealing a failure for the mandatory presence of a responsible full time technician in these establishments (National Health Surveillance Agency, 2009). This same finding was reported by other authors (Baldon et al., 2006; Farina and Romano-Lieber, 2009; Lucchetta and Mastroianni, 2010; Tomassi and Ribeiro, 2012) and represents a barrier to the realization of PC (Al Rahbi et al., 2014).

The gender and average age of the participants were similar to the community pharmacist profiles described in previous studies (Baldon et al., 2006; França-Filho et al., 2008; Hughes and Lapane, 2011; Mak et al., 2013; McIntosh et al., 2013; Silva and Vieira, 2004; Tomassi and Ribeiro, 2012). Unlike more developed countries such as Australia, Canada and European countries where PC is in an advanced stage of implementation, it was observed in this study that less than a third of participants were owners of the pharmacies visited, reflecting how young the subjects of the study are, who might not have sufficient financial resources to possess their own pharmacy (Farina and Romano-Lieber, 2009; Farris et al., 2005; Jones et al., 2005). In this sense, the long weekly working hours (> 44 h) and the low pay, also undermine the provision of clinical services in pharmacies. Also, depletion of pharmacists and the lack of financial resources disfavor the quest for continuing education, jeopardizing the implementation and execution of PC due to lack of professional training.

In addition, it was noted that the income of pharmacists

who are the owners of the establishment is not congruent with their extensive workload. This discourages investment in services in which the benefits of such services are only obtained in the longer term, as is the case with PC (Borges et al., 2011). Again, the commercial interests in drug selling becomes the priority, forcing the pharmacists, who are employees in these establishments, to devote themselves more to selling products than the realization of services that contribute to the rational use of medication, as in PC (França-Filho et al., 2008; Silva and Vieira, 2004). It is also important to highlight that the Brazilian government does not offer incentives, fees or reimbursement for PC practice in pharmacies, contrary to what happens in countries such as Canada and the United States (Pereira and Freitas, 2008). Thus, pharmacy owners prefer to invest in commercial products than in clinical services such as PC.

Accordingly, it is noteworthy that more than half of the pharmacists did not know the definition of PC. This shows that professionals were not prepared to perform the service since they did not have a satisfactory knowledge of PC. In countries such as China and Jordan, where PC is more widespread than in Brazil, at least 60% of pharmacists correctly knew the definition of this clinical practice (Aburuz et al., 2012; Fang et al., 2011). The lack of knowledge regarding PC could also be strengthened by the existence of pharmacies where employees (non-pharmaceutical) were responsible for the service. It is known that PC involves macro constituents that require specific knowledge and skills to identify, prevent and solve problems related to drugs (Ivama et al., 2002; Lucchetta and Mastroianni, 2010; Oliveira et al., 2013; Pereira and Freitas, 2008). In this context, trained employees are able to optimize the service performed by professionals (selecting patients who need pharmacotherapeutic follow-up by pharmacists, for example), but the lack of intrinsic pharmacist subsidies does not provide conditions for these workers to take responsibility for the service. Furthermore, the described situation reinforces the need for a rearrangement of functions between professionals and employees, to the extent that pharmacists are sometimes required to allocate part of their work time to non profession related activities (for example finalizing sales at the cashier desk or cleaning the establishment) (Blackburn et al., 2012; Davies et al., 2014; Farina and Romano-Lieber, 2009; Gregório and Velez Lapão, 2012; Van Mil and Fernandez-Llimos, 2013).

Corroborating the number of professionals who do not meet the PC concept, it was observed that pharmacists have conducted continuing education activities not related to PC (e.g. specialization courses in areas of drug industry and management of health, courses in acupuncture, hospital pharmacy workshops and handling of drugs) which obviously does not enable them for PCservice. However, it is noteworthy that less than half of the professionals who participated in activities in the area

of PC adequately answered this question. This demonstrates that the graduate courses offered in the area are not yet enabling professionals to practice PC, which reinforces deficiencies in the curriculum introduced in 2002. As a consequence, the social recognition of the pharmacist is compromised, making the professional "invisible" to the health system (Dewulf et al., 2009).

In this scenario it is worrying, verifying that almost three quarters of the professionals reported performing PC (Table 3) among which, are those with–unsatisfactory knowledge for dispensing drugs. Inadequate knowledge undermines the identification of problems related to drugs and the orientation on pharmacotherapy, damaging social recognition of the profession and compromising the therapeutic relationship that should exist between pharmacists and patients for the success of PC (Agu et al., 2014; Pereira and Freitas, 2008). The opposite happens in Canada, where 71% of patients prefer pharmacist counseling to medical care when they are suffering from symptoms of lesser severity. In the example of Canada, complaints are often resolved by pharmaceutical intervention, and PC has propagated more easily (Mansell et al., 2014).

Besides not identifying the PC concept proposed by the BPCC, the conduct of one in five participants disagreed with the Brazilian recommendations because of the lack of standardization of procedures and the systematic recording of pharmacotherapeutic monitoring performed. Health surveillance of each municipality has the responsibility to oversee the standardization and compliance with procedures performed in pharmacies, and this result shows failures in the inspection of these establishments. A survey conducted in the state of São Paulo in 2009 has shown a similar situation (Farina and Romano-Lieber, 2009). According to professionals, the lack of support from pharmacy owners in providing the material resources needed to complete the service is a major obstacle to PC, showing once again that the management of some private pharmaceutical establishments focuses on profit and not the quality of life of patients (Tomassi and Ribeiro, 2012).

In addition, the realization of PC at the pharmacy counter, as reported by participants, was also identified as a barrier to the spread of PC in Argentina and Scotland (Watson et al., 2002; Uema et al., 2008). In the UK, 80% of patients on pharmacotherapy follow-up claim that PC in a private room is critical to the success of the service, providing appropriate conditions for the pharmacist to assess the health problems of the patient and plan pharmacotherapeutic interventions (Merks et al., 2014).

It was also observed that the greatest difficulties for the implementation of PC were due to lack of finance and appropriate sources to consult information related to health and medicines, as pointed out in other studies (Farina and Romano-Lieber, 2009; Farris et al., 2005). In Brazil, to subsidize the work of professionals, the

pharmacy owners usually provide free booklets distributed by pharmaceutical companies, which are designed to serve as drug advertisements. However, these tertiary sources usually have synthesized and outdated information, prevailing commercial appeal and marketing of pharmaceutical products (França-Filho et al., 2008). On the other hand, it is important to highlight that there are free access databases with recognized scientific evidence on the Internet that could easily be accessed in community pharmacies.

From the observed results, it is possible to state that the pharmacist is not yet prepared to take responsibility for the systematic pharmacotherapeutic monitoring of patients. It is noteworthy that only 2.5% of pharmacists who informed that they perform PC have the knowledge and follow the recommended actions. Based on the considerations, this study presents important data for action planning that allows training of professionals and expands the supply of PC in Brazil, either by restructuring the curriculum of the School of Pharmacy, by the intervention on the knowledge and professional conduct, or to stimulate investments required in human and material resources to perform the service.

As limitations of the study, it is recognized that the number of participants may have compromised the statistical significance of the results and the issues may have limited the scope of the stated objectives. However, it is believed that the research method avoided biases in the collection and analysis of data and the results can guide the future of PC in community pharmacies. It is important to highlight that the four municipalities involved in the study are representative of the regional and national scenario. Besides being the health reference in regions where they are located, they have on average 3.6 pharmacies per 10,000 inhabitants (similar to the Brazilian ratio), gross domestic product per capita equivalent to the national average and they are located in the south and southeast of the country (where 73.6% of the Brazilian economic activity is concentrated) (Brazilian Institute of Geography and Statistics, 2011). Moreover, all universities of Pharmacy have adopted the curriculum changes of 2002, and so it is possible to affirm that the results show the knowledge level of a representative portion of pharmacists.

Accordingly a review showed that published researches about PC in Brazil, up until 2011, were developed exclusively at public pharmacies (Ambiel and Mastroianni, 2014). Thus, this study provides data to fill an important gap about the supply of PC in the private sector; it is also a pioneer in evaluating community pharmacists from different regions of Brazil in relation to the concepts and issues involving PC.

CONCLUSIONS

Less than half of the pharmacists who work in privately

owned community pharmacies in Brazil have knowledge about the concept of PC proposed by the BPCC. Moreover, the conduct shown by these professionals is not in accordance with Brazilian recommendations, because there is as lack of operational protocols standardizing the service, systematic recording of interventions and data relating to the patient, as well as physical and material resources for the proper conduct of the service. Moreover, it is possible to affirm that the curriculum changes introduced in 2002 did not achieve the aim of preparing pharmacists to perform comprehensive and humanistic services such as PC.

In light of this, it is necessary to intervene in the training of pharmacists in order to make them able to perform PC clinical services properly. In addition, it is essential to invest in resources that provide favorable conditions to implement and carry out this important practice, to promote rational use of drugs and the success of pharmacotherapy.

Conflict of interests

There was no conflict of interest in this study.

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