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Training of pharmacy technicians for dispensing drugs in Primary Health Care

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Abstract *Few Brazilian articles discuss the importance of pharmacy technicians who offer direct assistance to patients. This paper describes an experience of the training of pharmacy technicians in drug dispensing. A descriptive, cross-sectional study was conducted in the primary healthcare setting. The technicians were trained by the pharmacist to advise patients at the time of drug dispensing and to screen cases that needed pharmaceutical consultation. Problems were identified by verifying the prescription and return date for dispensing the medication as well as through direct questioning of the patients. Flowcharts for problem identification and intervention were created for use by the technicians. After training, pharmacy technicians identified 3944 problems, the most common of which were the use of a lower dosage than that prescribed (26%) and non-adherence to pharmacological treatment. The findings of the present study demonstrate the importance of training pharmacy technicians with regard to dispensing drugs so that they can assist pharmacists in the process of identifying and solving drug-related problems, thereby making them active members of the care process in the public health system.*
Key words *Pharmaceutical services, Primary Health Care; Pharmacy technician, Public Healthcare*

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Introduction

Dispensing medications is a pharmaceutical action classified in Brazilian public health policies as one of the macro-components of pharmaceutical care[1,2]. The change in the scope of pharmaceutical practice has led to the need to form well-trained pharmacy technicians due to the insufficient time pharmacists have to develop their activities[3-6].

Differences are found in the education, accreditation and functions of pharmacy technicians among different countries[7]. In the United Kingdom, pharmacy technicians act as pharmacists' apprentices and have greater effective participation in reviewing prescriptions depending on their degree of education and career plan established in the healthcare system[7,8]. In the United States, pharmacy technicians are defined as pharmacist assistants who assist in activities that do not require the pharmacist's judgment. In these countries as well as in Australia and the Netherlands, pharmacy technicians have different functions in accordance with their educational background and, together with robotic technology, provide support to enable pharmacists to play a broader role in patient care[7,8].

In the community, the responsibilities of pharmacy technicians have expanded. These health professionals now contact prescribing physicians for clarifications regarding prescriptions and participate in quality control and management activities, performing the functions of invoicing and accounting as well as participating in the creation, implementation and follow up of policies and procedures[8,9].

Although hiring technicians with a certificate from a technical pharmacy course can contribute to the selection of employees with better technical capacity, it is important for such employees to be trained, especially with regard to developing communication skills when dealing with patients and other members of the multidisciplinary health team[10,11]. Considering the importance of dispensing medications at primary healthcare units, the aim of the present study was to describe the results of an experience involving the training of pharmacy technicians for the dispensing of medications for the treatment of chronic, non-communicable diseases under the supervision of a pharmacist at a primary healthcare unit.

Materials and Methods

A descriptive, cross-sectional study was conducted at a public healthcare unit of the Municipal Secretary of Health of the city of São Paulo, Brazil, which includes outpatient care, primary health care and the Family Health Strategy of the Brazilian public healthcare system and is a reference center for 42,479 inhabitants in its area of coverage. The health unit offers urgent care and absorbs the demand for low-complexity and medium-complexity treatment at primary care units with the aim of avoiding the overload of municipal urgent care services and hospitals[12].

The pharmacy of the health unit studied fills prescriptions from the unit itself as well as other units in the public and private systems. The mean number of prescriptions filled on a daily basis was 336 in 2011. The unit received its first pharmacist in May 2007, when the pharmacy service was first established. The hiring of the team of four pharmacy technicians occurred gradually from 2007 to 2010. When the team was complete, the training program was intensified so that the technicians would perform administrative/managerial activities and also play an important role in orientating patients at the moment of dispensing medications and screening cases for which contact with the pharmacist was necessary. Prior to training for such interventions, the technicians were made aware of the need to orientate patients and offer humanized care, even if the structural conditions were less than ideal. This sensitivity training occurred in the form of lectures and guidance from the pharmacist (topics: verbal and non-verbal communication; humanization; pharmaceutical care; primary care) as well as through health education groups involving the participation of the pharmacist that provided the exchange of experiences with patients and monthly information on the patient follow up.

The education groups identified problems such as a) a lack of adherence to pharmacological therapy among patients with chronic diseases (failure to return for monthly refills or delayed return for monthly refills), b) prescription with doses above the maximum limit for anti-hypertensive and hypoglycemic agents according to the National Therapeutic Form and/or Micromedex® databank and c) duplicate therapy (use of two medications from the same pharmacolog-

ical class). Therefore, these were the main issues addressed during the training and work of the technicians. For such situations, memorandums were sent to physicians of the health unit and standardized printed material was sent to prescribing physicians at other units requesting the confirmation of the prescriptions. This standardized print material was attached to prescriptions from outside sources and the medication was only dispensed if the physician confirmed the prescription.

The pharmacy technicians were gradually trained from July to December 2010, medication by medication (one or two drugs per month) with the creation of a chart for quick consultation regarding doses above the maximum limit. Fifteen meetings were held, each lasting 30 minutes on average. After a brief class administered by the pharmacist about the drug in question (mechanism of action, pharmacological class, main adverse events described in the literature, posology and important orientations for dispensing), the technicians were encouraged to comment on what they perceived were the potential problems with the use of the medication during their previous work at the pharmacy of the health unit. Alternatives for sensitizing prescribing physicians to the problem and the best way to communicate with the patient were also discussed.

Due to the large number of patients at the health unit, training sessions were generally performed with half of the staff at a time to avoid the suspension of the service. Moreover, days and periods of slower movement were prioritized for the training sessions.

In cases that involved the suspicion of adverse reactions, the need for medication reconciliation, the need for greater technical knowledge, patients that continued to display doubt even after orientation and patients who had not adhered to treatment, the technician sent the patient to the pharmacist or, if the pharmacist was unavailable, to a physician at the health unit.

The identification of problems was based on the verification of the prescription, the return date for dispensing the medication and direct questioning of the patient. When inadequate use of medication was identified, due mainly to the patient's lack of understanding with regard to the posology because of 1) the large number of medications, 2) difficulty reading the prescription or 3) visual impairment, orientation was performed with the aid of a visual identification system employing colors and pictograms that had previously been created and standardized for use at the health unit as a way to ensure greater safety in the use of medications by patients.

Throughout the year 2011, with the technicians trained and the work process defined, problems identified on prescriptions for the treatment of non-communicable diseases, the interventions conducted and orientations given to the patients were recorded with the aid of the Excel® program at the moment of dispensing. The following data were collected: identification of patient, age, prescribing physicians (from the unit or outside source), problem identified [a) use of medication in quantity less than that prescribed; b) use of medication in quantity greater than that prescribed; c) non-adherence to pharmacological treatment; d) confusion in the use of medications; e) conflicting prescriptions; f) dose above the maximum recommended limit; and g) duplicate therapy]; intervention and the outcome of the intervention. The results were analyzed using descriptive statistics (frequency).

In the city of São Paulo, prescriptions for the treatment of chronic conditions that express the term "continuous use" are valid for 180 days and the patient should obtain monthly refills at the pharmacy of the primary health unit. As only the amount necessary for 30 days is dispensed, if the return date surpassed this period, the patient was not adhering to the prescribed pharmacological treatment[1]. Adherence was therefore determined based on the return date for the refill and direct questioning of the patient with regard to the posology adopted.

The term "conflicting prescriptions" was employed for situations in which the patient had more than one prescription of similar drugs with different posologies or drugs of the same therapeutic class prescribed by different physicians (cases of duplicate therapy, prescriptions of the same drug with different doses, when the patient did not know which prescription to follow or attempted to obtain medications from both prescriptions).

In the present study, pharmacy technician was defined as a professional who had completed a technical course or had at least two years of experience dispensing medications, which were the requirements of application for the position. Since the data were obtained from prescriptions and administrative records, this study did not require approval from a human research ethics committee, but was nonetheless conducted in compliance with the recommendations of Resolution nº 466/2012 of the Brazilian National Board of Health.

Results

Figure 1 displays the flowchart established following ample discussion during the training period for the pharmacy technicians to identify problems related to prescriptions or the use of medications for the treatment of non-communicable diseases. Between January and December 2011, 23,279 prescriptions with medications for the treatment of non-communicable diseases were handled. The team was formed by a pharmacist and four technicians, each of which handled an average of 80 cases per day. The technicians identified 3944 problems at the time of dispensing medications (Table 1).

Figure 2 summarizes the orientations given to the patients based on the problem identified. When failure to adhere to pharmacological treatment was identified, the technicians initially offered counseling, but when suspecting previous negative experiences with the medication, difficulty understanding the orientation or difficulty understanding the consequences of failing to control a non-communicable disease, the patient was sent for an appointment with the pharmacist (305; 31%) or to a health education group available at the primary care unit (593; 61%). For cases in which the patient was within the area covered by the Family Health Strategy, the technician requested a medical appointment directly from the team responsible (80; 8%).

Among most patients who took medications at a dose lower than or higher than the prescribed amount, the technician's counseling seems to have been well received, with acceptance rates of 92% (n = 923) and 95% (n = 465), respectively. Among the 819 patients confused with regard to the use of medications, 712 (87%) accepted the standardized orientation with colors and pictograms and 581 (82%) of these patients returned to refill their prescriptions in the subsequent months and reported complying with the prescribed posology. The majority (494; 69%) of these patients was elderly (aged 60 years or older). The mean number of medications in use was 5 ± 2, which were not always listed on a single prescription. No distinction was made between prescriptions originating from the health service and outside sources for this calculation, as only one patient fit this profile. The 131 cases (18%) for which the technician's orientation did not enable an understanding of the posology or in which other difficulties occurred, the patients were sent for an appointment with the pharmacist.

Among the 281 prescriptions containing drugs with doses above the maximum limit, 106 (38%) originated from prescribing physicians at the primary health unit and 175 (62%) originated from outside sources. Among the prescriptions originating from the primary health unit, the dose of the medication was adjusted in 98 cases (92%), whereas prescribing physicians from other health units accepted the recommendation to adjust the dosage in 114 cases (65%). In four (8%) of the 48 cases in which duplicate therapy was observed, the prescribing physicians did not change their conduct: two prescriptions containing amlodipine and nifedipine (both from prescribing physicians in the private sector) and two containing glibenclamide and gliclazide (both from the primary health unit).

Although the effectiveness of the counseling offered by the technicians in situations of partial adherence, non-adherence or the inadequate use of medications was not measured in a systematic manner, the multidisciplinary team reported a substantial increase in the interest of patients to participate in hypertensive and diabetic groups after the onset of the systematized work of the technicians. This increase in seeking groups led to the establishment of publicizing of the dates of meetings of health education groups by the pharmacy team, with scheduling and the creation of a wait list.

Discussion

Problems related to medications are complex. The identification and resolution of such problems is the responsibility of the pharmacist. Different situations require technical knowledge and clinical judgment, such as the determination of clinically relevant drug interactions or risks related to the inappropriate use of medications on the part of elderly individuals. Thus, the pharmacist is an essential member of the multidisciplinary team. However, the accumulation of functions requires adequate measures to optimize the clinical performance of this health professional. The training of pharmacy technicians and the systematization of drug dispensing as a way to contribute to the identification and even resolution of some situations are of considerable importance, especially in primary care.

The inadequate use of medications and difficulty understanding the prescribed posology were among the most frequently identified problems by the pharmacy technicians, which

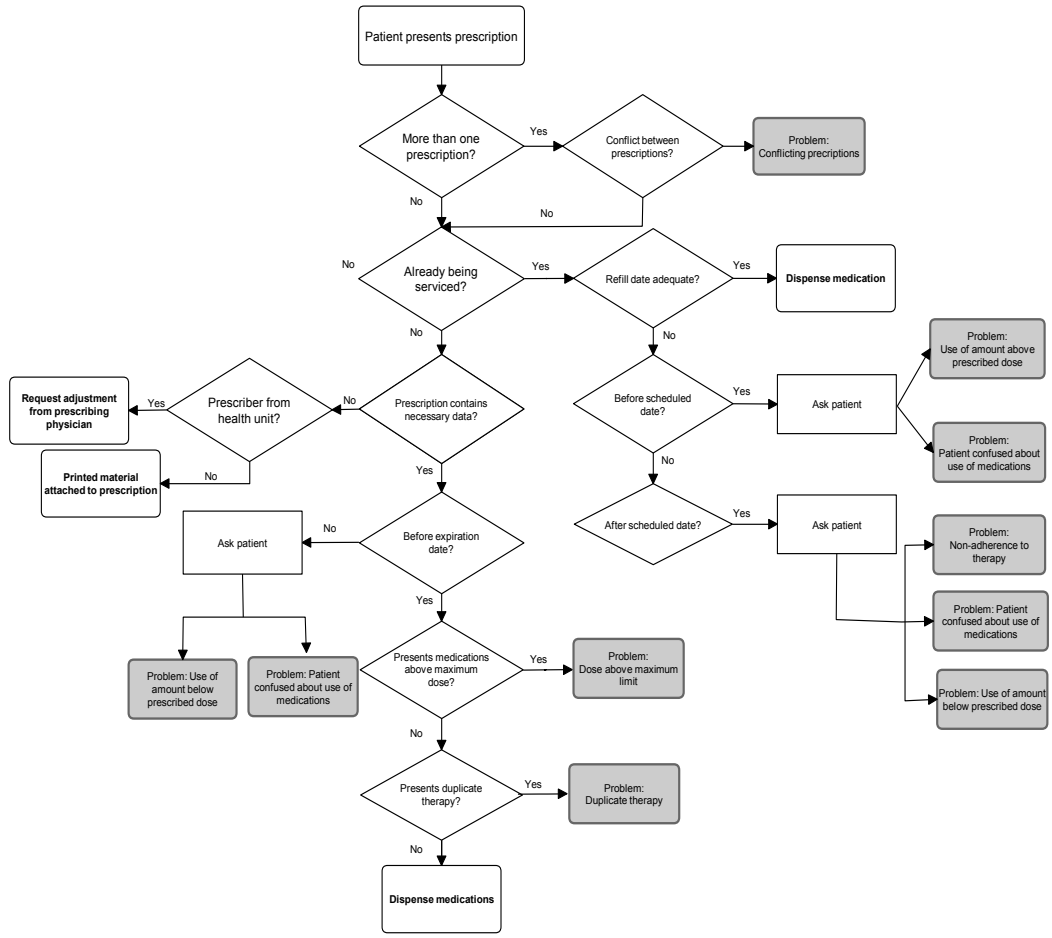

Figure 1. Flowchart of work established after training period for technicians to identify problems related to prescriptions or use of medications for treatment of chronic non-communicable disease at primary care unit.

Table 1. Problems identified at time of dispensing medications for treatment of non-communicable diseases by pharmacy technicians at primary care unit in 2011.

Medication-related problem	N (%)
Use of medication in quantity less than prescribed dose	1006 (26%)
Use of medication in quantity more than prescribed dose	487 (12%)
Non-adherence to pharmacological treatment	978 (25%)
Patient confused about use of medications	819 (21%)
Conflicting prescriptions	325 (8%)
Dose above maximum recommended limit	281 (7%)
Duplicate therapy	48 (1%)
Total	**3944 (100%)**

is similar to data reported in previous studies conducted in Brazil[13-17]. Similarities in the packaging of different medications, reduced vision among elderly individuals, illiteracy, an inability to understand the writing of the prescribing physician or the abbreviations employed and complex therapeutic protocols involving different administration times are among the factors that contribute to confusion with regard to the use of medications[18]. In a previous Brazilian study, only 18.7% of the 450 patients interviewed following an appointment in a primary care unit fully understood their prescription and only 56.3% were able to read it[18]. Depending on the methodology employed in studies conducted in different cities, the rate of patient understanding with regard to prescriptions ranges from 344 to 70%[16,19,20]. However, a visual identification system with the use of

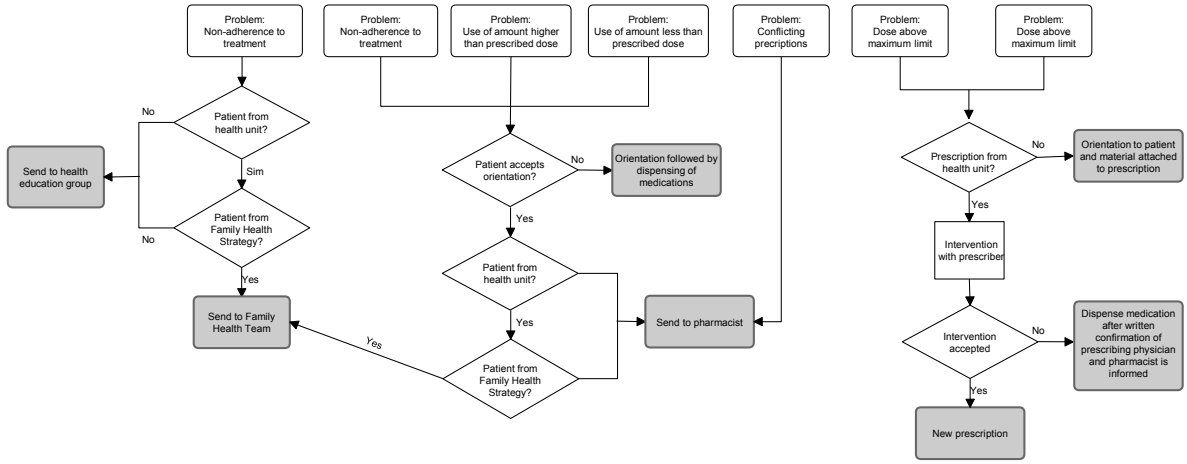

Figure 2. Flowchart of work established after training period for technicians to perform interventions or refer patients for whom problems were identified with prescriptions or use of medications for treatment of chronic non-communicable disease at primary care unit.

colors and standardized printed material enabled most patients in the present investigation to fulfill the prescription adequately (according to the patients' own reports) without the need for the direct action of the pharmacist, which demonstrates the effectiveness of the orientation given by the pharmacy technicians.

As expected, the non-adherence to pharmacological treatment was a common problem. Indeed, the World Health Organization estimates that 50% of patients with chronic diseases in developed countries do not adhere to drug therapy and this proportion is even higher in developing countries[21]. The determinant factors of non-adherence include complex therapeutic regimens, difficulty understanding prescriptions, dissatisfaction with healthcare services, an absence of symptoms, socioeconomic aspects and personal beliefs[21,22]. The present results suggest that orientation from pharmacy technicians contributes to an increase in adherence to pharmacological treatment.

The need for medication reconciliation due to conflicting prescriptions was one of the problems that the pharmacy technicians were unable to resolve due to the complexity of the cases, which restricted their actions to obtaining a complete list of medications in use by the patient. In 2003, Michels and Meisel discussed the fact that pharmacy technicians could be employed in the initial review process of patient pharmacotherapy by obtaining a complete list of medications in use to assist in the work of medication reconciliation on the part of clinical pharmacists in hospitals[23]. Most studies discuss the need for medication reconciliation upon discharge from hospital, when the patient returns for treatment in primary care[10,11,24]. However, the majority of cases was caused by flaws in the exchange of information between specialists and general practitioners as well as cases in which the patients was in treatment at both public and private services and ended up becoming confused with regard to which prescription to follow. Indeed, communication problems are among the main causes of incidents and errors in the use of medications[10,11]. Nonetheless, the pharmacy technicians were important to the identification of the need for referring patients so that they could receive adequate care.

The results demonstrate that dispensing medications should go beyond the availability and delivery of medications and should integrate the care process in the public health system, providing access to pharmaceutical services based on the needs of the patient[25].

It should be clarified that the acceptance of the recommendations of the prescribing physicians with regard to duplicate therapy and doses above the maximum limit is the consequence of a set of actions that began in the years prior to

the period analyzed in the present study, with the divulgation of internal memorandums to the medical staff, discussions at meeting of the multidisciplinary team and the use of standardized printed material for prescriptions from outside sources. The establishment of a relationship of trust between the pharmacy staff and physicians requires time and communication skills, the latter of which should be addressed by the pharmacist during technician training activities[10,11]. Indeed, prescribing physicians who trust the pharmacist's work also tend to accept the recommendations of a pharmacy technician due to the understanding that both health professionals are part of the pharmacy staff[5].

The consensus is that well-trained pharmacy technicians contribute so that the pharmacist can dedicate himself/herself more to clinical activities rather than administrative and managerial activities.[4,9,26,27] Nonetheless, the supervision and involvement of the pharmacist are essential to giving support and legitimacy to the actions of pharmacy technicians. Even when performed by technicians, the technical and legal responsibility of the service and interventions conducted fall on the pharmacist.

The Pharmacy Guild of Australia establishes that the proportion of the number of technicians to pharmacists should not surpass 2:1[28]. According to the State of São Paulo Regional Pharmacy Council, the number of pharmaceutical assistants should be sufficient for each to serve 80 clients per day and one pharmacist should be responsible per establishment, without establishing the proportion in relation to the number of prescriptions or number of assistants[29]. Thus, the proportion of technicians to patients serviced was within the number recommended for the pharmacy analyzed in the present study.

In a publication on Municipal Pharmaceutical Care, the State of São Paulo Regional Pharmacy Council denominates the position as "pharmacy assistant", which is described as a professional who assists a pharmacist in administrative and drug dispensing activities following the pharmacist's orientation and must have undergone a training/educational process at an institution recognized by the Ministry of Education[29]. The Pharmaceutical Care manual of the city of São Paulo was the first to describe this profession. The city was also the first in the country to include the position of pharmacy technician on the list of public service professions and offer a technical course through the Municipal Health School[30].

The main limitation of the present study is the fact that it was conducted at a single primary care service, which limits the generalization of the findings. However, this paper presents a successful training experience involving pharmacy technicians in primary health care, the actions of which could be applied at other health units with similar characteristics. Moreover, the findings underscore the need for discussions on the greater inclusion of pharmacy technicians to the multidisciplinary staff as support to the actions of pharmacists in the primary care setting.

Collaborations

DO Melo: conception and project, data analysis and interpretation, drafting of manuscript and approval of final version for publication; CGRC Molino: data analysis and interpretation, drafting of manuscript and approval of final version for publication; E Ribeiro: data analysis and interpretation, drafting of manuscript and approval of final version for publication; NS Romano-Lieber: critical review of manuscript and approval of final version for publication.

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