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Pharmacist prescribing: a review of perceptions and attitudes of patients, pharmacists and other interested professionals

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Abstract *Pharmacist prescribing is a growing reality in some developed counties, with varied health systems. Understanding the contribution that this activity can offer in the healthcare process, and investigating its acceptance is of utmost importance for the countries that implement and regulate this type of system. This literature review aimed to design a state-of-the-art academic investigation on the perception, opinions, and attitudes in the context of pharmacist prescribing practices in countries that have adopted this system. To achieve this, the present study conducted an investigation of the Medline, Scopus, Embase, SciELO, and Lilacs databases, resulting in the selection of 17 studies. From the analysis of the articles, three categories of discussion arose: "understanding of the practice and perceived benefits", "acceptance and adherence to the practice, and "hindrances to the practice". The results showed varied acceptance and perceptions among the different publics, depending, among other questions, on the level of knowledge and experience of the patients and health professionals, on the profile of the pharmacists, or on the prescribing modality. This study highlights some challenges involved in the practice of pharmacist prescribing, and its findings can be useful in suggesting a means through which to strengthen the practice.*

Key words *Health care, Pharmacists, Medical prescriptions, Professional practice*

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Introduction

The functions and responsibilities of all health professionals underwent a major transformation in the beginning of the twenty-first century. In this context, what stands out is the implementation of pharmacist prescribing by non-medical healthcare professionals in many countries, including Australia, Canada, the United States (USA), New Zealand, and the United Kingdom (UK)[1], aimed at contributing to improvements in health care, providing safer and more efficient access to medicines, and optimizing the application of healthcare professionals' skills[2,3].

Despite the diversity of prescribing models used in the different countries, in general, two modalities can be pointed out: dependent prescribing and independent prescribing. In the dependent prescribing, there is a prior diagnosis and a clinical handling plan, developed in collaboration with the patients and their doctors. In this, the pharmacist may select, monitor, modify, or discontinue the pharmacotherapy[4-6].

By contrast, in independent prescribing, the pharmacist is responsible for evaluating the patient, beginning the therapy, and managing the clinical outcomes. Faced with a patient who has already been diagnosed by a doctor or is undergoing treatment, the pharmacist decides, without the need for a collaborative agreement, on the renewal of the prescription, its adaptation, or the issuing of a new prescription. In any of these situations, the pharmacist follows a list of pre-defined medications that regulate their range for use in prescriptions[5,7].

The UK and Canada are the two most experienced countries in the practice of pharmacist prescribing. In the UK, dependent prescribing was introduced in 2003 and independent prescribing in 2006[8]. In this context, being a non-medical prescriber requires the acquisition of a professional title and demands training and validation[9].

The pharmacist in Canada is both dependent and independent, encompassing three execution modalities: 1) the continuation of existing prescriptions, 2) the adaptation of existing prescriptions, and 3) the issuing of new prescriptions. The possible modalities and the need for collaborative agreements vary according to the Canadian province[10,11]. Today, in all of the 11 provinces of the country, it is possible to renew or modify prescriptions; in nine provinces, one can provide a substitution within the same therapeutic group, while in eight, pharmacists can provide new prescriptions for less severe disorders[12].

In the USA, 49 states currently allow the pharmacist to prescribe under the dependent prescribing model. The first state, Washington, implemented this system in 1979. In the USA, the authorization for the pharmacists to prescribe was set forth in the Collaborative Practice Agreement, defined as an independent prescriber[13]. Together with this scenario, states have regulated dependent prescribing, based on state Collaborative Practice Agreements, that is, without the need for prior doctor's appointments[14].

In Israel, dependent and independent prescribing coexist, regulated, respectively, in 2014 and 2016[15]. In Australia, pharmacists can only prescribe over-the-counter medications for specific health situations, minor disorders[2]. In New Zealand, pharmacist prescribing has been authorized since 2013, so long as it is dependent prescribing, with the pharmacist working in collaboration with other healthcare professionals[16].

The expansion of prescriptions in all of the countries mentioned above has boosted academic production in countries in which there is still no regulation regarding pharmacist prescribing. Researchers, therefore, mobilize themselves to produce relevant information that can sustain the planning of the incorporation of this innovation, such as the expectations of the pharmacists and the identification of factors that can interfere in a possible implementation of the practice. In the literature, there are records of these studies, for example in Qatar[17], Nigeria[18], and Malta[19].

All changes require observation and analysis. Pharmacist prescribing in Brazil was recently regulated and can still be considered an innovation in professional practice, since it dates back to 2013. Stewart et al.[1] consider that two questions are crucial in the implementation of new practices of non-medical prescribing: development of sustainable models of health care, as well as robust and strict evaluative research.

In this light, understanding state-of-the-art pharmacist prescribing in the world makes it necessary to subsidize the planning and evaluation of health policies and interventions in Brazil. Faced with this scenario, the present study, through a literature review, aimed to explore the perception, opinions, and attitudes of patients, the general population, healthcare professionals, and pharmacists regarding pharmacist prescribing.

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Methodology

The present study is a literature review about pharmacist prescribing in countries that have adopted this system, developed through the systematic selection of scientific literature.

The guiding question that characterizes the first stage of this study was: What is the perception, experience, and reception of pharmacist prescribing practices by any group of the interested parties (pharmacists, other health professionals, patients, health managers, and society in general)?

In the subsequent stage, the following databases were defined to conduct the search for articles: MEDLINE (National Library of Medicine); Scopus; Embase; SciELO (Scientific Electronic Library Online); and LILACS (Literatura Latino-Americana e do Caribe em Ciências da Saúde). The survey was carried out in June 2020 and was adjusted according to the following filters: period of publication in the last ten years and the English, Spanish, or Portuguese languages.

To conduct the search for articles, this study used free terms and their combinations in three languages treated in this literature review, given that the terms indexed in the Health Sciences Descriptors and in the Medical Subject Headings (MESH) did not contemplate the aim of the present study.

In the search, the descriptors were used together with the aid of the Boolean operator OR, resulting in the following combination: "prescri* farmacêutic*" OR "prescri* colaborativ*" OR "prescri* suplementar" OR "prescri* independente" OR "prescri* não-médica". For the databases of *Medline*, *Scopus*, and *Embase*, terms in English were used ("pharmacist prescri*" OR "collaborative prescri*" OR "supplementary prescri*" OR "independent prescri*" OR "non-medical prescri*"). For the *Scielo* and *Lilacs* databases, terms in the English, Portuguese, and Spanish languages were used. The *Lilacs* database was accessed through the Virtual Health Library (BVS, in Portuguese). The character "*" was used at the end of some terms to increase its reach, including different terminologies, such as *prescrição* and *prescritor*, in addition to synonyms for the same terms in English, such as *prescription* and *prescribing*.

Since the *Lilacs* and *Scielo* databases did not present results, a new search was conducted, only in these two databases, with the simple combination of the terms "*prescribing*" AND "*pharmacist*", in the English, Portuguese, and Spanish languages.

The combination of the terms, as well as the results found for each electronic database platform, are presented in detail in Chart 1.

Selection criteria were applied in an attempt to achieve the objectives of this study. The inclusion criteria for the selection of material were: 1) publication within the last ten years, from June 2010 to June 2020; 2) articles in the English, Portuguese, and Spanish languages; and 3) available as a full text in one of the databases used in this study, through the researcher's institutional network access. The exclusion criteria adopted to the studies were: 1) the space for healthcare practices of the subjects studied in this work, when applicable, were exclusively or to a great extent in a hospital environment; 2) the study is related only to the teaching of skills and attributes of non-medical prescribing; 3) the study involved participants that are only undergraduate students or the majority were made up of non-pharmaceutical health professionals; 4) review article, editorial, opinion article, report, letter or free communication, book chapters, or event abstracts; and 5) articles that deviated from the intended theme of the scope of the present study.

The article selection process, which begins with the exporting of results from the databases, was performed using the Zotero software. The stages that followed in this process were the exclusion of duplicate articles and the judgement of the studies, observing if they were adequate to the inclusion and exclusion criteria and if they met the objectives of the present study. The layout of the article selection process is presented in Figure 1.

To characterize the selected publications for this literature review, the following variables were extracted: main author, year of publication, location of study, objectives, methodology, participants of the study, prescription modality, study limitations, and conclusions.

For the qualitative analysis of the content, the reading, analysis, and interpretation of each article were performed, using the Thematic Content Analysis, proposed by Minayo[20], which carries out the exploration of the material in a systematic manner, aimed at achieving the subjective interpretation of the texts and the presentation of the finding in an organized and categorized manner. The process of analysis enabled its classification in three empirical categories: Understanding of the practice and perceived benefits, acceptance and adherence to the practice, and hindrances to the practice.

Chart 1. Search strategies and results in the selected databases.

Base	Search terms	Number of publications
Medline	"pharmacist prescri*" OR "collaborative prescri*" OR "supplementary prescri*" OR "independent prescri*" OR "non-medical prescri*"	514
Scopus	"pharmacist prescri*" OR "collaborative prescri*" OR "supplementary prescri*" OR "independent prescri*" OR "non-medical prescri*"	673
Embase	"pharmacist prescri*" OR "collaborative prescri*" OR "supplementary prescri*" OR "independent prescri*" OR "non-medical prescri*"	959
Scielo	pharmacist AND prescribing	28
Scielo	prescrição AND farmacêutica	63
Scielo	prescripción AND farmacéutica	86
Lilacs	pharmacist AND prescribing	22
Lilacs	prescrição AND farmacêutica	283
Lilacs	prescripción AND farmacéutica	190

Source: Authors.

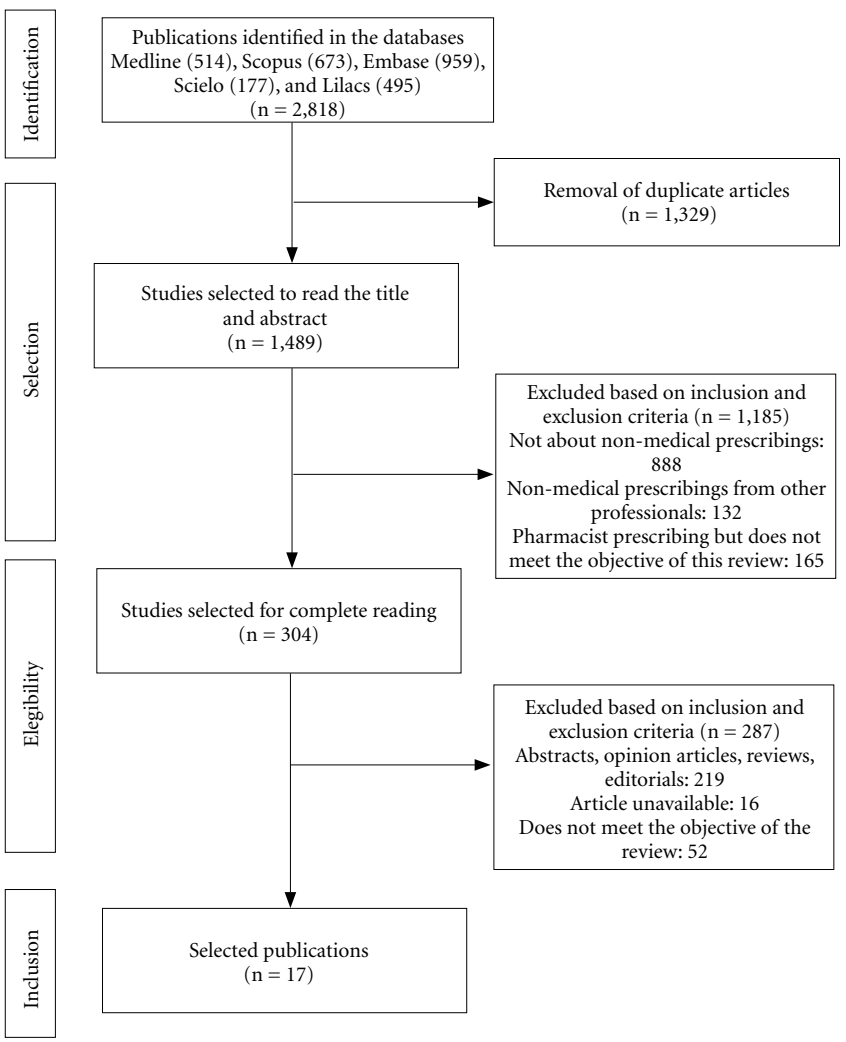

Figure 1. Flow chart of the selection of studies.

Source: Authors.

Results

The search in all of the databases found a total of 2,818 publications. When all of the selection stages had been concluded, the final number was 17 articles included in this literature review. Some publication variables, which characterize the articles, were organized in charts 2 and 3.

Most of the studies were published in 2013 (23%), 2015 (18%), and 2019 (18%). As regards the prescription model, 18% of the studies were only about the dependent prescribing, 23% only about the independent prescribing, and 59% made no distinction, including both models. The analyzed studies were developed about the contexts of the following locations: the UK (41.2%), Canada (47.0%), and the US (11.8%).

As of the analysis of the selected material, empirical categories were formed: understanding of the practice and perceived benefits, acceptance and adherence to the practice, and hindrances to the practice.

Chart 2. Characterization of the studies included in the literature review as regards the main author, year of publication, study location, objectives, methodology, and study participants.

Main author, year of publication	Study location	Objectives	Methodology	Study participants
Famiyeh[21] (2019)	Canada	Describe the opinion of the community pharmacy users about pharmacist prescribing and identify their support to the services of pharmacist prescribing.	Descriptive study using semi-structured individual interviews.	Users
Feehan[22] (2016)	USA	Investigate the perception of the demand for pharmacist prescribing and the hindrances to the practice in the community pharmacy environment.	Descriptive study using individual interviews.	Users; pharmacists; health care civil servants
Hobson[23] (2010)	UK	Explore the opinions of the patients about the development of non-medical prescribing.	In-depth interviews conducted with patients from four regional health clinics.	Users
Hughes[24] (2014)	Canada	Evaluate what "prescribe" means to the pharmacists in Alberta and the application of the prescribing in the pharmacy practice.	Semi-structured telefone interviews.	Pharmacists
Irwin[25] (2019)	USA	Characterize public perceptions of self-administered hormonal contraception by pharmacists through comments published in response to online news articles.	Cross-sectional and mixed retrospective analysis of comments published in response to online articles.	Not applicable
Isenor[26] (2018)	Canada	Identify the relationship between hindrances and facilitators to pharmacist prescribing.	Electronic study conducted with all pharmacists registered in the study's target province.	Pharmacists
Lane[27] (2020)	UK	Investigate what the subjects interested in the implementation of pharmacist prescribing services in a nursing home would consider as hindrances and facilitators to this type of implementation.	Focal group and interviews.	Doctors; pharmacists; professionals form the nursing home; residents and relatives
Lloyd[28] (2010)	UK	Explore the experiences of the pharmacists and their training mentors at least 12 months after the pharmacists were qualified as supplementary prescribers.	Cohort of pharmacists who obtained prescribing authorization. Focal groups with pharmacists and semi-structured interviews with mentors.	Pharmacists; doctors

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Chart 2. Characterization of the studies included in the literature review as regards the main author, year of publication, study location, objectives, methodology, and study participants.

Main author, year of publication	Study location	Objectives	Methodology	Study participants
Makowsky[29] (2013)	Canada	Understand which factors influenced the adoption of pharmacist prescribing using a model for the Diffusion of Innovations in the health services.	Semi-structured interviews with pharmacists from different fields of practice.	Pharmacists
Mccann[30] (2012)	UK	Provide an understanding of pharmacist prescribing from the perspective of pharmacists, medical colleagues, and other interested parties in Northern Ireland.	Semi-structured interviews	Pharmacists; doctors; key actors
Mccann[31] (2015)	UK	Explore the perspectives of the patients who were attended to by prescribing pharmacists.	Focal groups with patients who were attended to by independent prescribing pharmacists.	Patients
Maclure[32] (2013)	UK	Explore the opinions of the Scottish public about non-medical prescribing.	Questionnaire sent randomly by mail to Scottish citizens.	Society in general
Mcintosh[33] (2016)	UK	Explore the points of view and reflections of undergraduate students in pharmacy who still are not registered as pharmacist prescribers.	Semi-structured telephone interviews with pharmacists who are not registered as prescribers.	Pharmacists
Norman[34] (2015)	Canada	Explore the acceptability and feasibility of the independent supply of contraceptives in pharmacies of the province of British Columbia.	Questionnaires followed by structured interviews among all of the rural pharmacies and a sample of urban community pharmacies in British Columbia.	Pharmacists
Pokskic[35] (2014)	Canada	Verify the initial perceptions of the government of the province of Ontario and of interested groups related to the perspective of the concession of prescribing authority to pharmacists.	Analysis of documents and interviews with key informants.	Local government members; member of professional pharmacist organizations; members of professional medical organizations
Schindel[36] (2013)	Canada	Expand the understanding of the view of pharmacists about the professional development and identify their learning needs.	Homogeneous focal groups of pharmacists and pharmacy students.	Pharmacists; Undergraduate students
Schindel[37] (2019)	Canada	Analyze the coverage of the journalistic media about the pharmacist prescriber one year before and two years after the prescribing practice has been implemented.	Analysis of discourse used to examine a sample of published newspaper articles covering one year before and two years after the law regulating pharmacist prescribing took effect.	Not applicable

Source: Authors.

Chart 3. Characterization of the studies included in the literature review regarding the prescribing modality, study limitations, and conclusions of the authors of the study.

Main author, year of publication	Prescribing modality	Study limitations	Conclusions
Famiyeh[21] (2019)	Dependent and independent	Convenience sample that is not representative for an extension of results to other environments or subject groups that are not the same as those from this study.	The availability to use the services varies and depends on the type of prescription service, which is greater due to the perception of personal convenience, but is inhibited by the perception of the lack of access of pharmacists to clinical information, concerns about the pharmacist-doctor collaboration, and the inexperience of the user with the use of pharmacist prescribing services.
Feehan[22] (2016)	Undefined by the authors	The data presented, as they are of a qualitative search, may not present the real demand for pharmacist prescribing in general.	The consumers are generally resistant to pharmacist prescribing, having difficulty breaking away from the dispensing pharmacist's vision. The pharmacists supported the prescription in well-defined conditions. The hindrances included a lack of awareness about the pharmacist prescribing and the pharmacist's training.
Hobson[23] (2010)	Undefined by the authors	Sample considered to be limited.	The concerns increased regarding the clinical governance, privacy, and space. The participants recognized the pharmacists' knowledge and accessibility.
Hughes[24] (2014)	Undefined by the authors	Authors did not present limitations	The pharmacists presented a variety of ways to describe the meaning of prescribing but regularly described a high degree of responsibility. The prescribing definitions evolved as the pharmacists gained experience with prescribing practices.
Irwin[25] (2019)	Independent	The answers were limited to subjects with access to the Internet and sufficient interest to read and answer the text.	The public's perception recognized various benefits, such as the increase in access to health care, the reduction in unintentional pregnancies, and the support provided to autonomous individuals. They also recognized that these benefits would need to be balanced with concerns about safety and logistics associated with the rendering of clinical services in a community pharmacy environment.
Isenor[26] (2018)	Undefined by the authors	Low rate of response; data collection procedure did not allow for questions answered insufficiently to be further explained, nor did it clarify questions that were not understood by the participants.	The structure of theoretical domains proved to be useful to identify various hindrances and facilitators to pharmacist prescribing. The three theoretical domains that the interviewers more positively associated with prescribing were Knowledge, Reinforcement, and Intentions.
Lane[27] (2020)	Independent	Possibility of bias due to the participants having been self-selected and, therefore, who might have favorable expectations of the role of the prescribing pharmacist and thus may not have captured the individual opinions more prone to be resistant to innovation.	The introduction of a prescribing pharmacist was welcome, but was conditioned to: a clearly defined function; collaboration among the doctors, pharmacists, and home-care teams; dialogue about the development of the service with residents and family members, based on trust and effective communication.

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Understanding of the practice and perceived benefits

The studies analyzed in this literature review, in general, demonstrated that the users of healthcare services have little knowledge about pharmacist prescribing, with few having already experienced a care accompanied by the prescription by this professional[21-23,31]. The users tend to make positive observations about the traditional functions of the pharmacist, valuing their advice[23]; however, they tend not to recognize the

Chart 3. Characterization of the studies included in the literature review regarding the prescribing modality, study limitations, and conclusions of the authors of the study.

Main author, year of publication	Prescribing modality	Study limitations	Conclusions
Lloyd[28] (2010)	Dependent	The authors presented no limitations.	Pharmacist prescribing was accepted in practice, but it is not widespread. To a great extent, this can be attributed to the logistic and organizational barriers, rather than to tensions among the professionals
Makowsky[29] (2013)	Dependent and Independent	The answer bias would suggest that the pharmacists that answered would probably prescribe; methodology did not follow observations over time and did not have the relationship provided by in-person interviews.	Prescribing was dependent on the following variables: innovation, adaptation, readiness of the system, configuration of the practice, communication, and influence.
Mccann[30] (2012)	Dependent and Independent	The authors presented no limitations	Although it is believed that the pharmacist prescribers were specialists in medicines and quite focused regarding patient safety and accuracy, it was felt that they may not be as properly equipped to deal with patients with complex conditions as a doctor.
Mccann[31] (2015)	Independent	Small number of participants and findings could not be generalized.	Pharmacist prescribing is widely accepted and the patients consider pharmacist prescribing to be positive. Despite the positive attitudes, there was a general lack of awareness of this new mode of practice.
Maclure[32] (2013)	Undefined by the authors	Lacked clarity if the answers to the instrument result from the interest of the participant or result from the study questions. The results of the study are also limited due to the potential bias (recruitment, answer, and social convenience).	The findings identified support for non-medical prescribing, but they indicate the need for non-medical prescribers to become more involved with the public in general.
Mcintosh[33] (2016)	Undefined by the authors	Low rate of response, small sample, and lack of generalization of the results for other countries.	Graduates in Pharmacy were anxious to be trained as prescribers, despite recognizing the need to first acquire practical experience. They saw prescribing as an appropriate function, but they were perfectly aware of the barriers surrounding the organizational strategy.
Norman[34] (2015)	Independent	The authors presented no limitations.	The division of tasks to prescribe hormonal contraceptives independently is highly acceptable and feasible.
Pokskic[35] (2014)	Undefined by the authors	Inability to recruit high-level government managers for interviews, generating limitations to understand the political factors that guide the definition of the agenda and political choices.	Very different opinions were expressed by the government of Ontario and by pharmacist associations, one the one hand, and medical associations on the other, regarding the potential impact of pharmacist prescribing on patient safety and on access to primary care.
Schindel[36] (2013)	Undefined by the authors	The study's rate of response was low and, therefore, the data from the study may not be representative of all the pharmacists in the province and in other regions in the country.	The need for learning manifested by the participants reflected the current and future roles of the pharmacists. The pharmacists valued the accreditation and certification as mechanisms through which to build knowledge and trust. The pharmacists emphasized the social aspect of continuous professional development.
Schindel[37] (2019)	Undefined by the authors	Results presented a limited generalization for other regions of the country.	The texts treated varied questions concerning pharmacist prescribing, such as qualification, diagnosis, patient safety, medical support, and conflicts of interest. Results highlight the tensions between the perspective of the pharmacists and that of doctors about the role of prescribing.

Source: Authors.

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possibilities involved in pharmacist prescribing and distrust their execution[22].

Despite the lack of user knowledge regarding pharmacist prescribing[21-23,31], they stand out in relation to the possible prescriptions issued by non-medical professionals. In Scotland, although various professionals are authorized to prescribe, pharmacist prescribing is more well-accepted by the population and a synonym of non-medical prescribing[32].

This situation of unfamiliarity can change when users go through the experience of receiving a prescription from a pharmacist, as shown in a study from the UK[31]. In this study, the users found advantages in pharmacist prescribing, since they considered that the pharmacists had a greater knowledge about medicines, interactions, and side effects than did doctors in general. They recognized that health professionals should use their own professional skills in a complementary fashion: diagnosis (doctor) and management of the drug therapy (pharmacist).

In addition, the users highlighted as advantages: the increase in time for doctor´s appointments, in-depth information provided about their medicines, and a better feeling of the control and comprehension of their medical condition[31]. In a probable implementation of the work of a prescribing pharmacist in a nursing home in the UK, the patients saw the insertion as a very positive proposal, acting as a necessary and useful channel of opportune and reassuring communication about medicines[27].

For the population in general, the practice brings individual and collective benefits. Individual, as they witnessed the convenience of needing less doctor's appointments, and collective, as they saw benefits for the health system, such as the reduction in the doctors' workload and, consequently, a greater focus of these doctors on patients with more complex needs[21,32]. Other advantages were that the prescription acquired could include the change in the current doctors' prescriptions in the case of adverse effects or the independent prescribing in clear situations of the need for urgent care or in prescribing for less complex diseases[22]. The increase in the access to medicines in a situation in which there was a hindrance to the access to medical services, or personal demands that made the search for a doctor difficult, were also pointed out as clear benefits[25].

The benefits of the practice can also be perceived by health professionals. For pharmacists, the prescription would provide greater access of the patients to essential medications, diminish the costs for patients, promote patient comfort, and reduce the burden on the health system[22,34].

In one study conducted in a Canadian province[35], with professionals from the associations of pharmacists and local managers, these professionals pointed out the many benefits within the proposal for the implementation of independent prescribing in the province: the increase in patient access to primary health care; improvements in patient results through improvements in the continuity of drug therapy; reductions in side effects to medicines; and the diminishing of healthcare costs by redirectioning less expensive healthcare costs to the health professionals.

British and Canadian doctors saw, with the incorporation of a prescribing pharmacist in work teams, the following advantages: collaboration in the division of the workload and responsibilities, allowing the pharmacist to fill a gap in activities in which the doctor was unable to dedicate him/herself fully to the exercising of multiple tasks; the review of pharmacotherapy; and the management of drug therapy[28]. In another study, in the UK, the inclusion of pharmacist prescribing, in a nursing home, was seen by doctors and pharmacists as capable of contributing to combatting chronic diseases, in which the reviews of pharmacotherapies are complex due to the multiple comorbidities of the residents[27].

In another study conducted with British doctors, the pharmacists were especially useful for patients with multiple morbidities, as their education in pharmacology enabled them to have a broader overview of the patient. The pharmacist's general knowledge of medicine was seen as an advantage because of their attention to detail. In this sense, pharmacist prescribing was deemed to be safe[32].

Acceptance and adherence to the practice

The patients suggested that an increase in the popularity of the pharmacist prescribing among the population would be directly linked to the time that it would take for the patients to construct an image of a relationship with this prescribing pharmacist[23], as well as with other prescribing professionals, such as the nurses, who, according to the authors, are more well-accepted by the population due to their practice of prescribing medicines, as they are more well-known for the health care they provide.

From the pharmacists' point of view, doctors and nurses consider pharmacist prescribing in a collaborative institutional environment to be

positive, since, in this sense, they can divide the workload, allowing them to concentrate on other clinical tasks[28]. The pharmacists believe that the doctors are more receptive if the pharmacist prescribing is done within a limited scope[22].

There is still a certain fear on the part of society concerning the prescribing functions of a pharmacist, with varying support. The majority of the target public in a study conducted by Maclure et al.[32], consisting of citizens, would suggest that pharmacists should only to prescribe for less complex diseases or medications considered to be low risk, within their competency, and appropriate for their field of practice. However, the authors also noted in participants' answers that having had a prior experience with pharmacists or having a reliable pharmacist, made them more receptive to pharmacist prescribing.

When doctors and pharmacists seem to disagree about the prescribing role of the pharmacist, the discourse about the safety of the patient is generally the main point of conflicting opinions. This disagreement tends to occur in relation to independent prescribing. While doctors claimed that pharmacist prescribing means a danger to the patients, the pharmacists also questioned the safety of medical prescribing, given the magnitude of the problems related to the medicines that occur in locations without pharmacist prescribing. They also argue that, rather than cause damage, the pharmacist prescribing would increase patient safety due to the more proactive involvement of the pharmacist in the management of the patient's drug therapy[35,36].

It was also notable in the studies that the pharmacists have a very clear notion of responsibility when prescribing medicine. This can often generate a certain fear among pharmacists of prescribing, but this dissipated over time with experience. This also contributed so that they could make a proper documentation of the prescribing process and could expand the time and care provided to other traditional functions, such as the review of the clinical situation of the patients and the monitoring of pharmacotherapy[24,29]. The pharmacists also give value to prescribing within the context of an interdisciplinary team for the management of patients with long-term conditions and multimorbidities, since this would bring different advantages to the prescribing exercise, resulting in a better and more effective patient care[30].

One study conducted with Canadian pharmacists pointed out that, even the conceptions that pharmacists have of prescribing practices impact the adherence to this activity. Those that brought a more integrated definition of the prescription to the healthcare process generally showed a greater initiative toward independent prescribing[24].

In the study conducted by Makowsky et al.[29], the pharmacists who thought that there were few advantages in prescribing were less prone to prescribe or to obtain authorization to prescribe, much like those who did not believe that prescribing was a part of their professional role. The authors also observed that the pharmacists were less prone to prescribe in more complex situations in which the patient used various medicines, had an unclear diagnosis, or did not fit within the typical clinical guidelines. By contrast, in situations in which the pharmacist felt that he/she had command of the problem, the intention to prescribe was greater. When the pharmacists had a habit of prescribing, they mentioned the advantages of prescribing for their professional practice, such as an increase in their sense of professionalism, improvement in their self-image as a health professional, and their own work satisfaction.

The field of practice and the prescribing modality produce different impacts on the adoption of pharmacist prescribing. In a longitudinal study conducted in the UK with pharmacists, one year after receiving the authorization to prescribe, only 25% of these professionals actively prescribed, and they performed this act mainly within hospitals, with little or no activity in other environments, following primarily the dependent prescribing modality[28].

Hindrances to the practice

In the studies selected for this literature review, the patients voiced some fears about pharmacist prescribing: they would approve this type of prescription only in less complex cases[23], or chronic conditions, in which there was a certain control[21], or areas of pre-determined work[31]. They tended to be leery that pharmacists would not have access to the necessary clinical information from medical records to make a proper evaluation[21], or were even worried about the confidentiality of the data[23].

Studies with pharmacists have shown that these professionals have a major interest in prescribing practices, but they claim, as hindrances to the practice, a need for better training, the acquisition of knowledge, and the development of skills[22,26,29,37]. This need may not seem to be ho-

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mogenous, as it depended on the profile of the pharmacist in relation to the number of years in the practice, the environment of the practice (community or hospital), prior education, and status of authorization for additional prescribing[37]. In this Canadian study, the authors noted that pharmacists with extensive experience (over 20 years) and in a non-collaborative work environment (community pharmacy) reported the need for additional training more emphatically.

Pharmacists from the UK who are recent graduates and are still without proper registration and training expressed their concern about their own competence to prescribe, highlighting the lack of diagnostic skills, feeling more comfortable with dependent prescribing, which requires an agreement with a doctor[33].

The lack of an organizational strategy that encourages pharmacist prescribing, the fear of an increase in responsibility and an increase in workload were pointed out by the pharmacists as hindrances to their beginning to prescribe. Add to these factors the lack of specific financing for the activity, the bureaucracy involving the clinical management plan, the lack of governmental support from regional health clinics, and the reluctance to create incentives for the practice. Another important point cited was the lack of general knowledge of other health professionals about the practice itself[28,33].

In a study conducted by Feehan et al.[22], the pharmacists who had no interest in prescribing pointed to the lack of training added to the concern over the reaction of doctors and other healthcare professionals, who may not be receptive to the practice, seeing pharmacist prescribing as a threat to their business and, subtly, to their professional position.

For the pharmacists, the lack of a teamwork environment presented a hindrance to prescribing. In one study with pharmacists who had recently been authorized to prescribe[28], the subjects believed that the hospital pharmacists were in an ideal position to provide dependent prescribing and saw difficulties in prescribing in the community pharmacy practice, mainly due to the natural distance of the independent prescriber and due to the easier access to patient records in the hospital environment.

Knowledge about the regulation of prescribing is highly relevant for the adoption of this practice. In Canada, as it is necessary to obtain an authorization for independent prescribing in most provinces, it is crucial that the pharmacist understand the conditions necessary to obtain it. Nevertheless, studies have observed that the majority of pharmacists were unaware of certain prerequisites needed to obtain the authorization to prescribe or were unaware of the possible prescribing practices[24,29].

Discussion

This is the first literature review worldwide, originally written in Portuguese, about pharmacist prescribing. In this review, the experiences and viewpoints were explored, as well as the opinions of the general public, pharmacists, doctors, and other interested parties in relation to pharmacist prescribing, presenting an exploratory character about the acceptance of pharmacist prescribing for distinct publics.

Other reviews have been published in other languages on the same subject[5,6,16,38-40]. These revisions, in general, noted that the hindrances for the implementation of non-medical prescribing practices (including pharmacist) are multifactorial and that the practice should be successful and should involve all of the interested parties in a coordinated approach. Personal questions, to understand what the professional's "area of competency" was and to see the relationship between the health professionals were relevant for the prescriptions to be issued. Moreover, the impact of the prescribing activity in the opinions and results of the patients, as well as in the opinions of the doctors and other health professionals, was generally positive.

One can consider that the literature that treats the subject is still limited to the countries that have regulated pharmacist prescribing some time ago and that have a greater variety of practices, such as the UK and Canada. In Canada, the possibilities of pharmacist prescribing differ by province, and this was reflected in the results with the larger number of studies conducted in the province of Alberta, where the practice is more advanced.

This literature review did not identify articles published with Brazilian experiences on the issue. This absence is an important finding that indicates that the academic production in Brazil in this area is still incipient, which most likely reflects an unconsolidated practice of pharmacist prescribing in the country. These affirmations are even more consistent when the authors, experimentally (outside of the data collection presented here), increased the range of research (gray literature) in order to search for articles that include

Brazilian experiences, an action which was also unsuccessful. The absence of studies about this practice in Brazil shows the need for incentives for further research and make the understanding of the practice in other countries a possible path through which to explore the theme.

This literature review noted that the patients and the public in general (non-patients) tend to express different views about the expansion of pharmacist prescribing practices[21-23,25,27,31,32]. In general, they are in favor of prescribing, but they are leery about the limits of the practice, and often do not understand how the pharmacist prescribing is done and how pharmacists are trained to perform this act[21-23,25,27,31,32]. It was noted that much of the lack of knowledge regarding the practice came from their lack of experience regarding this type of service with the pharmacist[31,32].

The process of consolidation of new professional practices may well be time-consuming. The pharmaceutical profession in the world has undergone a deep historical transformation. As of the expansion of the industrialization of medicines, the traditional function of producing the medicine for the patients has practically disappeared and the pharmacist has been forced to find another model of community-based pharmacy practice. This new and necessary direction of the pharmaceutical practice was slow to take place, but today it is firm in the proposal to treat the patient as the main focus, in an effort to provide the patient with satisfactory health results, in turn improving their quality of life[41,42]. In the Brazilian context, where the demands for health care are not fully met and the community-based pharmacy ends up occupying the place as a health establishment that is more accessible to the population, self-medication and therapeutic recommendations have become commonplace practices[43]. A transition from one scenario of self-medication and the informal medical recommendations by the clerks and pharmacists for a documented and professional practice of pharmacist prescribing represents a goal set by the regulation of pharmacist prescribing in Brazil, under resolution CFF 586/13[44].

In the present study, patients and the public in general tended to show greater support when they had a history of care with the pharmacist prescriber. The perception of this public was that the pharmacists provide more detailed information; they are accessible and didactic; they invest their time to determine the best treatment and drug safety; and they are open to give a more detailed explanation about their medical condition[21]. Other reviews have also found positive viewpoints and experiences from the same group of subjects interested in this research regarding pharmacist prescribing, listing the following positive points: easier access to the pharmacist; better results for the patient; better use of the skills and knowledge of the pharmacists; good communication with the prescribing pharmacist; and the reduction in the doctor's workload[5,16].

Regarding the adherence of the pharmacist to prescribing, what was found in this review was that it was not homogeneous, as it was related to the perception that this professional has of the prescribing activity itself, of the perception of the pharmacist's role, of the demands that they believe pharmacists should have in order to prescribe, and of the work environment where this is implemented.

For Hughes et al.[24], the concept of the pharmacist prescribing is relatively new and may require a redefinition of the professional identify. Thus, as more pharmacists expand their practices within the context of legal structures, it is quite possible that their views about prescriptions and professional identities may also evolve.

Hindrances related to the work environment (adequate time, pharmacy structure, guarantee of privacy, and access to data), regulation (concerns related to responsibility), and support provided to other professionals (pharmacist-doctor relationship) were present. Similar hindrances were also identified in a review conducted by Zhou et al[6].

Despite these hindrances, pharmacists, when prescribing, saw highly positive results for their own professional satisfaction, for the quality of pharmacist-patient relationship, and for improvements in health care. For Lloyd et al.[28], prescribing generates a transformation in the confidence of the pharmacist and in their contact with the patient, with improvements seen in the continuity, quality, and safety of the care provided.

The investigation of hindrances to the execution of an innovative practice in a traditional profession is essential in order to break new ground for incentives to this practice. As argues Batra et al.[45], a single legal change may not be sufficient to change the practice effectively and quickly. Therefore, it is necessary to understand the particularities of adherence to the practice so as to design strategies to overcome these barriers.

Regarding the environment of the prescribing practice, this study observed that, in those locations in which the pharmacist works in

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partnership with other health professionals, especially doctors, pharmacist prescribing takes place more fluidly, generally in a collaborative manner. By contrast, the pharmacists who work independently tend to feel greater difficulties and apprehension in prescribing. For Weiss and Sutton[46], even with the authorization to prescribe, pharmacists can see themselves as subordinate within a hierarchy dominated by the medical field, seeking an approval from the doctor before prescribing.

It was common for pharmacists to demand further training and qualification, be it to begin to prescribe or to prescribe independently. When the participants felt that they had the necessary skills to conduct the activity, they were more prone to put it into practice.

The results showing the apprehension of pharmacists to begin to prescribe[26,33] should serve as a warning for the reorganization of educational programs for undergraduate pharmacy students. It is necessary that these programs prepare the pharmacist with clinical and managerial skills that provide them with the proper qualification in order to propose the implementation of new pharmacist prescribing services at the level of prescribing within the organizations in which they work. Pharmacists engaged in applying their knowledge and skills will enhance support provided to society, as well as from other health professionals and pharmacists to the prescribing activity.

McIntosh et al.[33], observing the scenario in the UK, suggest, as a probable path, a review of the education of pharmacists and of the pre-registration training for a possible integrated program that leads to undergraduate studies and registration, promoting a contextualization of the learning process in a more clinically focused manner.

In the USA, where prescribing is mostly dependent, the expansion of prescriptions has taken off, varying depending on the state and with new models of practice[47]. This advance is accompanied by the desire of the professional category, who show interest in exercising this activity[48]. Adams et al.[13] believes that, as the public and their health service providers become more accustomed to the idea of pharmacist prescribing, independent prescribing models (uncommon in the USA) will become more widely used for a broad range of medicines.

The conditional support of doctors to this modality of pharmacist prescribing has been prone to conflicts of narratives, which can be seen in one study[35] that points out a confrontation in the views of the Ontario Pharmacists Association and the Ontario Medical Association. While the representatives and the documents of the medical association were against pharmacist prescribing, arguing that they would place the safety of the patient at risk, documents from the pharmacist organizations argue much to the contrary. This type of conflict was also pointed out in studies in other countries that seek the expansion of the pharmacist's prescriptive authority[2].

One limitation of the present study is related to the choice of the English, Portuguese, and Spanish languages, given that, although they provide a broad search, they may not have contemplated material published in other languages in the databases. Another limitation is the non-extension of the texts beyond those found in the search platforms; however, this was necessary due to the objective of this study. Finally, it is important to consider that, despite the effort to consider high-end databases in the area of health research, the methodological strategy adopted does not presuppose an exhaustive review of all of the articles produced on the subject.

Final considerations

Given the scientific literature found through this literature review, it can be concluded that there is a variety of perceptions among the interested parties regarding pharmacist prescribing. The public in general tends to show little knowledge about the practice, with varied support. The activity of pharmacist prescribing was regulated more than ten years ago in the UK and Canada, but it is still mostly unknown for the majority of the population. In this sense, it is understood that more time is needed for a new practice to become more widely accepted by the population.

Studies show that pharmacist prescribing is generally accepted in practice, but it is not widespread. To a great extent, this can be attributed to logistic and organizational barriers. Although the pharmacists are being trained as prescribers, the necessary structural and organizational changes to support this change did not take place in a collaborative manner. To increase the diffusion of this practical innovation, a radical reorganization of the traditional structures can be considered.

The results of this study show that advances in the area of pharmacist prescribing are recent and have already become significant; however, the professional category of pharmacists still fac-

es major and innumerous challenges to consolidate the practice in the field of health care. Studies geared toward a better understanding of the hindrances of acceptance and adherence to the practice of pharmacist prescribing are essential in order to guide educational actions that seek to overcome these difficulties. As it represents an innovation in health care, a natural resistance to change is expected, especially in such a traditional field as health care. The advantage that the pharmacists have in this field is the confidence of the population in providing clinical activities that involve the follow-up of the professional.

CoAlthough the results do not show studies conducted in Brazil, the knowledge of the international experience is extremely valid in order to anticipate possible scenarios in the country. It is also important to highlight that further study is necessary to open the door to a more in-depth knowledge of pharmacist prescribing practices in the countries that have adopted this system.

Collaborations

DC Ramos contributed to the study design, methodological design, search, data analysis and interpretation, and writing of the article. L Ferreira and GA Santos Júnior collaborated in reviewing the manuscript. LR Ayres and CDD Esposti contributed to the study design, methodological design, manuscript review and approval of the final version to be published.

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