

Profile of the most requested compounded formulations and user perceptions at a compounding pharmacy in Viçosa, Minas Gerais, Brazil

Perfil das formulações magistrais mais solicitadas e percepção dos usuários em uma farmácia de manipulação em Viçosa, Minas Gerais, Brasil

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RESUMO

A farmácia magistral desempenha um papel fundamental na personalização de medicamentos, permitindo a adequação de fórmulas às necessidades individuais dos pacientes. O crescimento deste setor no Brasil, nos últimos anos, reafirma sua importância na promoção do acesso a medicamentos personalizados uma vez que amplia as possibilidades terapêuticas. Assim, este estudo realizou um levantamento das principais fórmulas farmacêuticas solicitadas em uma farmácia de manipulação em Viçosa, MG, bem como avaliou a aceitação e a satisfação dos usuários em relação a estas fórmulas. Trata-se de um estudo transversal, em que 93 participantes maiores de 18 anos responderam a um questionário online sobre o tema proposto. Os resultados mostraram que 45.2% das fórmulas manipuladas foram destinadas a fins estéticos, seguidas por produtos homeopáticos (20.3%). Além disso, 44.0% dos usuários relataram utilizar esses produtos há mais de cinco anos, e 62.7% consideraram as fórmulas manipuladas tão eficazes quanto ou superiores às industrializadas. A principal motivação para o uso foi a possibilidade de combinar vários ativos em uma única cápsula (48.9%). A maioria das prescrições foi realizada por médicos (51.1%), seguidos por farmacêuticos (18.5%). Entretanto, 8.7% dos usuários relataram o uso sem orientação profissional, destacando a necessidade de conscientização sobre o uso seguro desses medicamentos. Apesar dos resultados indicarem uma percepção positiva da eficácia das fórmulas manipuladas, ressalta-se que estes dados refletem exclusivamente a realidade da farmácia participante do estudo, não podendo ser generalizados para outras regiões ou serviços. Novos estudos, abrangendo outros estabelecimentos farmacêuticos poderão contribuir para uma compreensão mais abrangente e representativa do uso das fórmulas manipuladas.

Palavras-chave: Composição de medicamentos; adesão à medicação; farmácias; controle de qualidade.

ABSTRACT

Compounding pharmacies play a key role in personalizing medications, allowing formulas to be tailored to the individual needs of patients. The growth of this sector in Brazil in recent years reaffirms its importance in promoting access to personalized medications, as it expands therapeutic possibilities. Thus, this study surveyed the main pharmaceutical formulas requested at a compounding pharmacy in Viçosa, MG, and evaluated user acceptance and satisfaction with these formulas. We conducted a cross-sectional study involving 93 adults who completed an online questionnaire regarding the use of compounded medications. The results showed that 45.2% of the compounded formulas were intended for aesthetic purposes, followed by homeopathic products (20.3%). In addition, 44.0% of users reported using these products for over five years, and 62.7% considered the compounded formulas to be as effective as or superior to the commercial medications. The primary motivation for use was the ability to combine multiple active ingredients in a single capsule (48.9%). Most prescriptions were made by physicians (51.1%), followed by pharmacists (18.5%). However, 8.7% of users reported using them without professional guidance, highlighting the need for awareness about the safe use of these medications. Although the results indicate a positive perception of the effectiveness of compounded formulas, it should be noted that these data reflect only the reality of the pharmacy participating in the study and cannot be generalized to other regions or services. New studies covering other pharmaceutical establishments may contribute to a more comprehensive and representative understanding of the use of compounded formulas.

Keywords: Drug compounding; medication adherence; pharmacies; quality control.

INTRODUÇÃO

Compounding pharmacies play a key role in providing personalized medications, tailoring formulations to the specific needs of patients. In Brazil, this sector has grown significantly in recent decades, driven by technological advances and stricter health regulations (ANFARMAG, 2022).

One of the main advantages of compounded medications over commercially manufactured drugs is the possibility of customizing doses and pharmaceutical forms, making them more suitable for specific patient profiles, such as children, the elderly, and individuals with particular restrictions (Bonfilio et al., 2010; Dias et al., 2020). In addition, compounding allows the combination of active ingredients, facilitating the treatment of multiple pathologies and enhancing patients' convenience (Dias et al., 2020). The financial viability of compounded medications

is also a relevant factor, as costs are reduced through customized production that minimizes waste of inputs and packaging. Since compounded medications are formulated according to the treatment period, it is possible to avoid leftovers, preventing self-medication, ensuring rational use and contributing to the reduction of medication-related problems (Bonfilio et al., 2010; Petroceli, Baianense, 2023; Carvalho, Almeida, 2022).

Despite the numerous advantages associated with compounded medications, the misconception that these products are unreliable still persists. Such resistance is frequently associated with the perception that both raw materials and final products undergo insufficient quality control, which supposedly compromises therapeutic results. However, this view disregards the technical and regulatory advances in the compounding sector, which require high standards

of quality, traceability and safety in compounding, ensuring the effectiveness of personalized treatments (Bonfilio et al., 2010).

Currently, compounding pharmacies are mainly regulated by Collegiate Board Resolution (RDC) No. 67/2007, which provides for Good Practices in the Compounding of Magistral and Official Preparations for Human Use in Pharmacies. In this regard, it is essential that compounding pharmacies ensure the control of raw materials, the qualification of suppliers, the control of all processes, and the control of finished products, as determined by RDC 67/2007, of ANVISA (ANVISA, 2007).

Regarding the quality assurance of compounded formulas, the Federal Pharmacy Council (CFF, 2023), through Resolution No. 753 of April 13, 2023, which defines, regulates, and establishes the duties and responsibilities of pharmacists in the compounding of medicines and other health products, establishes that the pharmaceutical professional is responsible for ensuring the quality of compounded products. This responsibility must be guaranteed through the implementation and maintenance of a Quality Assurance System that covers all stages of the compounding process, from the receipt of inputs to the dispensing of the final product to the user. Thus, it is the pharmacist's responsibility to ensure that the manipulated medicines meet the previously established technical specifications, thereby guaranteeing the safety, efficacy, and sanitary compliance of both magistral and official preparations.

Considering the importance of compounding pharmacies in the healthcare system, we hypothesized that the main formulas requested at the participating pharmacy would be associated with the pharmacological treatment needs of the main chronic noncommunicable diseases present in the population served. Thus, this study aimed to evaluate the profile

of the most requested compounded formulations and the perception of users at a compounding pharmacy in Viçosa-MG. The results obtained may contribute to the improvement of compounding processes and the development of educational strategies for the rational use of compounded medications.

METHODS

Sampling Design and Study Population

This was a cross-sectional study based on a convenience sample, conducted at a compounding pharmacy located in the municipality of Viçosa, state of Minas Gerais, Brazil. Viçosa is one of the main cities in the Zona da Mata region of Minas Gerais, with approximately 80,000 habitants and five compounding pharmacies. It is a municipality whose economy is heavily influenced by the presence of a federal university and a private university center that offers, among other programs, an undergraduate degree in Pharmacy. The pharmacy chosen for the study is strategically located in the city center and has been in operation for nearly three decades, being regarded as a regional reference in pharmaceutical compounding. In addition to its commercial and technical relevance, the establishment serves as a site for academic practice, regularly receiving students for internships and for the development of extension projects, contributing to professional training and enhancing the integration of teaching, service, and community.

The study involved the application of a questionnaire among pharmacy users, including individuals aged 18 or older who visited the participating pharmacy for the compounding of pharmaceutical formulations between June and November 2023. Participants who did not complete the questionnaire in its entirety were excluded. Moreover, a retrospective search of the pharmacy's archives was conducted to identify the main pharmaceutical formulas requested between 2018 and 2023.

The study was approved by the Sylvio Miguel Research Ethics Committee, under protocol number 6,040,718, and followed the recommendations of the STROBE checklist. The sample size was determined according to Barbetta's (2012) proposal, adopting a tolerable error of 5%.

Data Collection and Statistical Analysis

Participants were approached via an invitation letter when they contacted the pharmacy to request their pharmaceutical products through WhatsApp®. This letter included the primary goal of the research, the researcher's identification and contact details, and general details about the questionnaire. Only participants who accepted the invitation and signed the informed consent form were given access to the questionnaire, which was administered via the Google Forms® platform. The 9-item questionnaire included demographic questions (age and gender), followed by type and duration of use of compounded formulas, motivating factors for purchase, prescribing professional, perception of needs being met, and any questions about use. A pre-test was conducted with 10 users of the participating pharmacy, who provided written feedback on the clarity of the questions,

response time, and overall experience. These responses were not included in the final analysis of the results. Descriptive data analysis was performed using GraphPad Prism 9 software.

RESULTS AND DISCUSSION

The present study included 93 individuals aged 18 to 77 years old, with a mean age of 38.5 ± 16.9 years. There was a predominance of female participants, representing 71 individuals (77.2%), while male participants represented 22.8% of the sample.

The main products requested at the participating pharmacy from 2018 to 2023 are shown in Table 1. The most frequently requested formulations were for aesthetic purposes, including hair care, nails, and dermatological applications, totaling 42 requests (45.2%). This was followed by alternative medicine products, such as floral and homeopathic remedies, with 19 requests (20.4%). Nutritional supplements, including those prescribed by nutritionists and those used in gyms, accounted for 16 requests (17.2%). Conventional medicines, such as antidepressants, hypnotics, and syrups, totaled 14 requests (16.1%). Finally, two participants did not disclose the products they requested.

Table 1. Distribution of the Most Requested Medications and Products in a Compounding Pharmacy.

| GROUP | INCLUDED CATEGORIES | TOTAL (N = 93) |
|--|--|----------------|
| Dermatological and Aesthetic Products | Creams and products for hair and nails | 42 (45.2%) |
| Alternative and Natural Medicine | Flower essences and homeopathic remedies | 19 (20.4%) |
| Supplementation and Nutrition | Supplements and other products prescribed by nutritionists | 16 (17.2%) |
| Medications for Clinical Conditions | Antidepressants, sleep aids, and syrups | 14 (16.1%) |
| Others | Not specified | 2 (2.2%) |

The high demand for aesthetic products observed in this study aligns with the national scenario. According to the Brazilian Association of the Personal Hygiene, Perfumery, and Cosmetics Industry (ABIHPEC), in 2020, Brazil ranked fourth in the global market for personal hygiene, perfumery, and cosmetics products, generating approximately US\$ 23.7 billion (ABIHPEC, 2021).

Dermocosmetics are products containing active ingredients intended for the treatment and prevention of skin conditions, such as rejuvenation, skin lightening, scar and acne treatment, among others. Compounded dermocosmetics, in turn, have a significant impact on these treatments, as they allow the combination of various active ingredients, such as firming agents, whitening agents, moisturizers, and antioxidants in a single formulation. Thus, the composition of these products allows for a wide variety of treatments at lower costs compared to commercial products, justifying their high demand (Gonçalves, Pina, 2017; Juvenat et al., 2023, Dlugosz et al., 2021).

According to the Technical Working Group (GTT) on Cosmetology of the Regional Pharmacy Council of São Paulo, compounded cosmetic products offer additional benefits, such as tailor-made formulations for different skin types, selected active ingredients, and customizable fragrances and colors. This sector is highly innovative, constantly seeking to develop biocompatible products for different skin types (Noronha, 2022).

Hair and nail care products are formulations composed of bioactive substances, minerals, and proteins designed to act from the inside out. The main pharmaceutical form for this type of treatment is the capsule, which combines minerals, bioactive substances, and vitamins. This blend of micronutrients promotes healthier hair and nail growth, preventing hair loss and breakage while enhancing shine and resistance (Fernandes et al., 2021).

Regarding the homeopathic products, the raw materials most frequently prescribed by homeopathic doctors include Pulsatilla, Sulphur, Nux vomica, Natrum muriaticum, Lycopodium, Calcarea carbonica, Lachesis muta, Sepia, Arsenicum album, Silicea, and Arnica montana. They are used to treat or prevent chronic diseases and can be compounded into various pharmaceutical forms, with drops and globules being the most commonly requested. The preparation of homeopathic formulations requires the definition of ultradilution scales, the most commonly used being Hahnemann's centesimal (CH) and continuous flow (CF) scales (Modolon et al., 2012).

The pharmacy where the study was conducted has a pharmacist who is qualified and licensed to prescribe homeopathic products, contributing to the high demand for these formulations. According to Resolution 586/2013 of the Federal Pharmacy Council (CFF), pharmacists must be properly qualified and certified in homeopathy to prescribe homeopathic formulations. This ensures pharmaceutical care, providing safe prescriptions to increase patient well-being (CFF, 2013).

In addition to dermocosmetics and homeopathic products, dietary supplements and formulations prescribed by nutritionists also showed significant demand, accounting for 17.2% of requests. In Brazil, from 2010 to 2016, consumption of dietary supplements increased by more than 200.0%, reflecting the population's growing interest in nutritional support and physical performance strategies (Santos & Pereira, 2017). This increase may be related to greater awareness of the role of nutrition in health promotion and disease prevention (Molin et al., 2019).

Allopathic drugs, including antidepressants and hypnotics, accounted for 16.1% of orders. Psychiatric disorders, such as depression and insomnia, account for 22.8% of the global burden of disease, requiring

frequent pharmacotherapeutic monitoring (Murray, Barder, 2015). Accordingly, in addition to conventional drugs, herbal medicines emerge as therapeutic alternatives, offering personalized treatments with less potential for side effects (Byungjick et al., 2022). As the study did not permit the characterization of the herbal medicines requested by participants, it was not possible to associate these products as therapeutic alternatives for the treatment of depression or insomnia.

Regarding the duration of use of these products, 44.0% (n=40) of participants had been using the compounded formulations for over five years (Figure 1), suggesting their confidence in these medications. However, these results may present a sampling bias, since participants are exclusively pharmacy customers, and individuals from other groups were not included. This limitation precludes drawing a causal conclusion regarding the participants' perceptions.

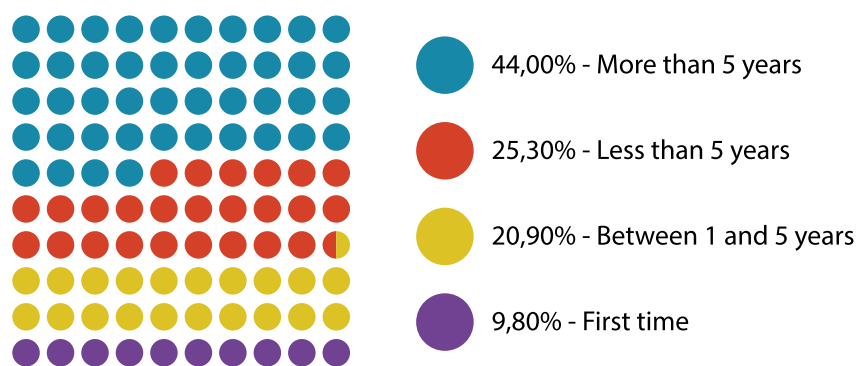


Figure 1. Duration of use of compounded products by users of a compounding pharmacy in Viçosa, MG.

Among the 93 study participants, 62.7% considered compounded formulations to be as effective as or even superior to commercially manufactured drugs, as 38.5% (n=35) of participants considered compounded formulations to be superior to commercial ones and 24.2% believed that both formulations have the same effect. Among the participants, 34.1% had never used

the commercially manufactured version (Figure 2). This last finding can be explained by the fact that many compounded formulations are not available in the pharmaceutical industry, underscoring the importance of compounding pharmacies in providing personalized patient care.

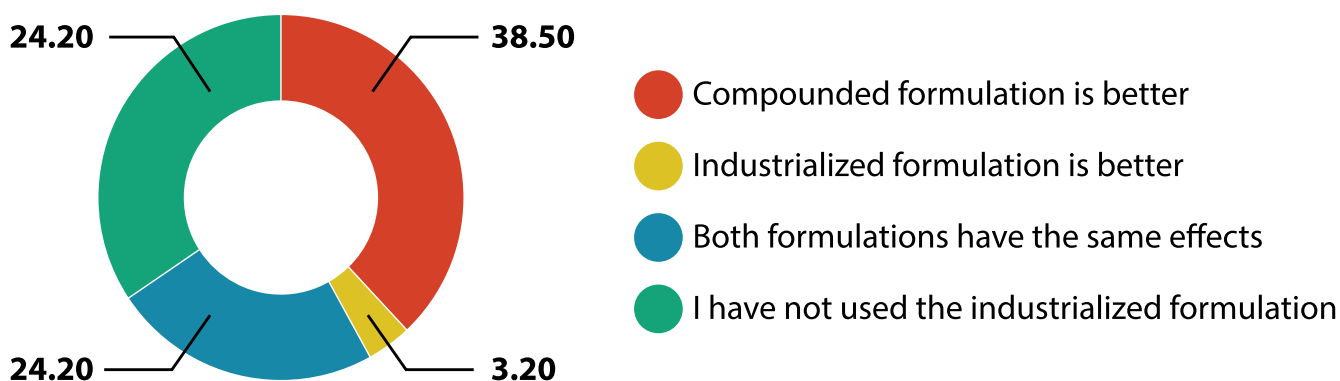


Figure 2. Perception of users of a compounding pharmacy in Viçosa, MG, regarding compounded formulations.

The primary reason for seeking compounding pharmacies among the individuals evaluated is the ability to combine several active ingredients into a single capsule (48.9%). According to Vieira (2007), this characteristic of compounded formulas promotes treatment adherence and enables for a more personalized approach to patient needs.

Furthermore, 34.8% of participants reported turning to compounding pharmacies due to the unavailability of certain formulations in conventional drugstores,

highlighting the role of compounding pharmacies in providing personalized medications especially for those who need specific dosages or specialized formulations, such as the elderly and children.

The economic factor, although relevant for 16.3% of respondents, was not the main reason for choosing compounded medications (Figure 3), indicating that personalization and access to specific formulations are the primary appeal of this service.

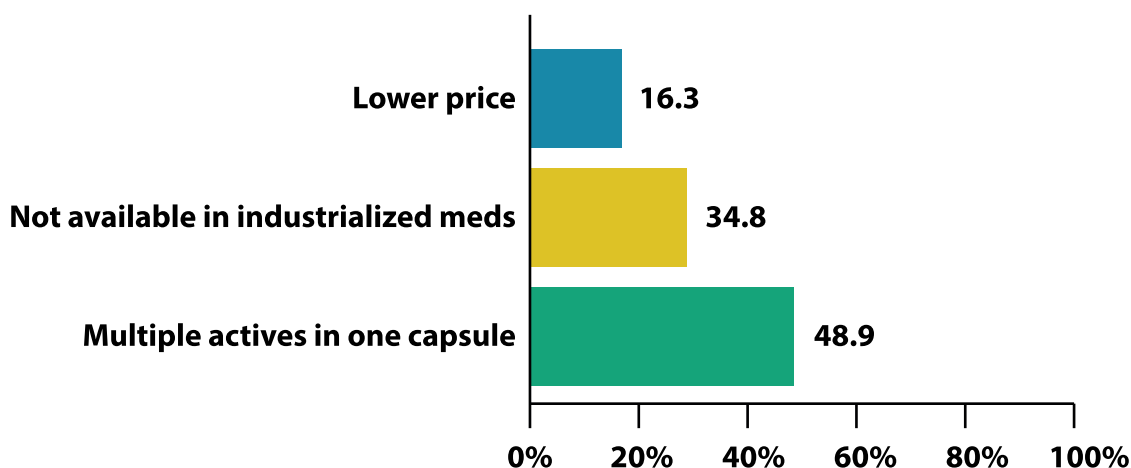


Figure 3. Reasons for seeking compounded formulations among users of a compounding pharmacy in Viçosa, MG.

The study also evaluated the main prescribers of compounded medications. Physicians were responsible for 51.1% (n=47) of prescriptions (Figure 4), probably due to their legal authority to prescribe any medication within their professional scope. Pharmacists ranked second, accounting for 18.5% (n=17) of prescriptions.

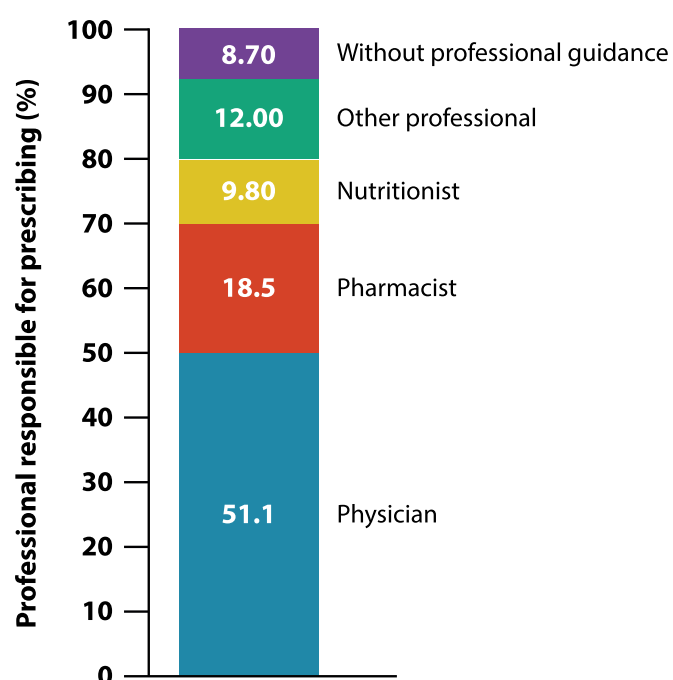


Figure 4. Professionals responsible for prescribing compounded formulations requested by users of a compounding pharmacy in Viçosa, MG.

According to Federal Pharmacy Council (CFF, 2013) Resolution No. 586, dated August 29, 2013, pharmacists must be certified to prescribe medications either independently or in collaboration with other professionals. They are authorized to prescribe non-prescription drugs, therapeutic products, herbal drugs, allopathic and dynamized drugs, as well as compounded or commercially manufactured formulations. It is the pharmacist's responsibility to issue prescriptions that foster the rational use of drugs and ensure patient safety.

Pharmaceutical prescribing is recognized as an important strategy for improving access to medicines, both by increasing the proportion of patients receiving a medicine and the total number of medicines dispensed, and by reducing the time required for patients to receive the medicine (Walpolo et al., 2024). Although pharmaceutical prescribing was regulated as a pharmaceutical practice in 2013 by CFF Resolution No. 586/13, its implementation still faces difficulties in different scenarios. This highlights the importance of pharmaceutical professionals establishing actions to improve training and/or professional development (CFF, 2013, Ramos et al., 2024).

A notable finding is that 8.7% (n=8) of participants reported using medications—whether for therapeutic or cosmetic purposes—without professional guidance. Much of this behavior appears to be directly related to recommendations from friends and family members. Brazil ranks first in Latin America in terms of self-medication, with the highest rates of indiscriminate consumption of medications without a prescription, putting individuals at potential risk (Ferreira et al., 2021). According to Paim et al. (2016), this practice poses significant risks due to the possibility of masking diseases, poisoning, and drug interactions. The elderly population is significantly affected by self-medication, with 30.0% of hospitalizations in this group attributed to drug poisoning due to inappropriate use of medications.

Although the role of the compounding pharmacist in promoting the rational use of medicines is still under-explored in the literature, it could be expanded in health systems, for example, through a patient-centered composition design (PCCD) process, as proposed by Carvalho and Almeida (2022). According to these authors, this methodology, adapted from the patient-centered pharmaceutical drug design process (PCDPD), can contribute to assessing patients' needs and preferences, as it facilitates the selection of a more suitable formulation that promotes adherence to treatment.

Recent studies have shown that pharmaceutical interventions carried out in the context of clinical pharmacy practice directly improve treatment adherence and reduce risks associated with self-medication. Interventions such as prescription review, individualized follow-up, and promotion of lifestyle changes have demonstrated a positive impact not only on treatment adherence but also on patient self-empowerment in conditions such as diabetes, hypertension, and kidney disease. In addition, the role of the clinical pharmacist places them as a strategic link between patients and other health professionals, strengthening continuity of care and enabling more comprehensive management, with the potential to improve clinical and economic outcomes in public health (Assaf et al., 2022; Calleja et al., 2023; Smith-Ray, 2024).

This study has limitations, including the lack of validation of the questionnaire used and the fact that its results reflect only the context of a single compounding pharmacy in Viçosa-MG. However, critical analysis of these data can generate relevant reflections for pharmaceutical practice and public health. The participating establishment is part of the private sector and has characteristics common to other Brazilian compounding pharmacies, such as the offer of dermocosmetics, personalized formulas, and service under medical or pharmaceutical prescription. The

decision to conduct the study in a single compounding pharmacy was based on specific characteristics that make it a strategic setting for research. Situated in a central area of the city, the pharmacy is highly visible and easily accessible, which encourages different types of users to seek its services. Additionally, it is a long-standing partner of the undergraduate Pharmacy program, regularly receiving students for internships and extension projects. This integration between professional practice and academic training creates an environment conducive to evaluating perceptions, experiences, and demands related to pharmaceutical formulas. This study also has limitations inherent to the cross-sectional design, which precludes the establishment of causal links between the variables analyzed, restricting the analyses to the associations observed during the period assessed.

The limitations identified reduce the external validity of the study and restrict the generalization of the results, as they may not apply to other population groups or different contexts. However, the findings may serve as a basis for the development of strategies and models that inspire new pharmaceutical practices, which can be adapted and applied in diverse settings, thereby expanding their potential impact beyond the municipality where it was conducted.

CONCLUSION

This study found that the majority of formulations compounded by the participating pharmacy are intended for aesthetic purposes, which does not confirm the initial hypothesis of a predominance of allopathic medicines used for the pharmacological treatment of chronic noncommunicable diseases. The use of pharmaceutical formulas without professional guidance, observed in some participants, underscore the complexity of the demands on compounding pharmacies and highlights the pharmacist's central role in promoting the rational use of medicines,

providing individualized clinical guidance, and developing educational strategies that support therapeutic adherence.

This study reflects a specific context, which limits the generalizability of its findings to other regions or services. Therefore, further studies in different settings are suggested to broaden understanding of the topic, as well as to develop local or regional practices that improve pharmaceutical care in the context of compounding pharmacies, thereby supporting decision-making in clinical practice.

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CONFLITO DE INTERESSE

Nothing to declare.

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