ORIGINAL ARTICLE

"WHAT DO YOU NEED TO KNOW TO CARE FOR PEOPLE WITH ASTHMA?": EDUCATIONAL NEEDS FOR PHARMACIST TRAINING

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Highlights: (1) Most pharmacists report having educational needs in the area of asthma. (2) Questions about asthma among patients are frequent, mainly about the use of inhalers. (3) Patients use popular expressions about asthma and hold beliefs about treatment.

PRE-PROOF

(as accepted)

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ABSTRACT

Objective: To assess pharmacists' educational needs in asthma care in order to inform the design of a nationwide educational strategy. **Methods:** A descriptive, quantitative study was conducted using an online survey with convenience sampling. The questionnaire was disseminated through the Federal Pharmacy Council's Instagram® account and included open- and closed-ended items addressing professional practice, patient questions and beliefs, and training needs. Data were analyzed descriptively, with thematic coding of qualitative responses. **Results:** A total of 576 responses were obtained from pharmacists working across different regions of Brazil. Most reported providing care to individuals with asthma (94.7%). Overall, 89.1% identified at least one educational need, most commonly related to treatment and clinical protocols (32.7%) and the use of inhalation devices (23.2%). The most frequent patient questions concerned correct inhaler use (60.7%) and understanding the chronic nature of the disease (20.7%). Colloquial expressions (e.g., *chiado*, *piado*) and beliefs related to the use of teas, homemade remedies, and traditional practices were also reported, with implications for treatment adherence. **Conclusion:** Pharmacists' educational needs closely mirror patients' most common questions, highlighting the importance of training programs that address the sociocultural context of care and support the development of practical and communication skills for asthma management.

Keywords: Asthma; Pharmacists; Professional Training

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INTRODUCTION

The global burden of noncommunicable diseases (NCDs) represents one of the greatest challenges to public health and development in the 21st century, particularly in low- and middle-income countries[1-2]. Among NCDs, chronic respiratory diseases are highly prevalent, with asthma being the most common worldwide[3].

In 2019, asthma affected approximately 262 million people worldwide and caused more than 461,000 deaths[3]. This condition poses substantial challenges for diagnosis and management, leading to reduced quality of life, as well as significant social and economic impacts and increased burden on public health systems[4-6]. Despite the development of new medications, the publication of evidence-based guidelines, and improved access to treatment, nonadherence, incorrect inhaler technique, underdiagnosis, and poor disease control remain the main factors contributing to asthma-related morbidity and mortality[5-9].

Pharmacists can play a key role in screening and assessing disease control, as well as in optimizing therapy[8]. In this context, in September 2021, the International Pharmaceutical Federation (FIP) issued a call to action aimed at mobilizing pharmacists, organizations, and leaders on the importance of mitigating the health impacts of air pollution, while advocating for an expanded role of pharmacists and their contribution to addressing the challenges posed by chronic respiratory diseases. The organization emphasized that pharmacists are strategically positioned to screen and monitor individuals with respiratory signs and symptoms and respiratory conditions, as well as to optimize pharmacotherapy, support patient education, promote vaccination, and improve health outcomes[10].

Studies conducted in various countries have shown that pharmacists can provide clinical services in community pharmacies, such as screening and health education, contributing to: (i) increased knowledge of the disease and its treatment; (ii) improved adherence; (iii) correct inhaler technique; and (iv) improved quality of life, lung function, and asthma control. Pharmacists may also contribute to reduced healthcare utilization,

hospitalization rates, use of reliever medications, and the frequency of nocturnal symptoms. Significant positive economic outcomes of pharmacists' clinical interventions in asthma management have also been reported[11-17].

However, for pharmacists to reach their full potential in the care of individuals with asthma, it is essential to strengthen their professional development through training programs aligned with the context in which they work[10,18]. The literature has shown that asthma-focused educational programs lead to positive changes in professional behavior and improvements in patients' clinical outcomes[19-21]. Nevertheless, to achieve these outcomes, careful course planning is required, taking into account the needs of the target audience and the expected performance objectives [21].

Trahentem® is one of the methods used in educational planning and includes, as an initial step, an assessment of the educational needs of the target audience within their real-world practice context[22]. This stage is intended to inform the definition of content, pedagogical strategies, and assessment methods aligned with the expected professional performance. Although its application is more common in corporate settings, particularly in the design of competency-based training programs[22], its learner-centered approach has also proven valuable in educational processes in the health field. Against this background, the present study aims to assess the educational needs of pharmacists in the care of individuals with asthma, in order to inform the planning of future educational strategies at the national level.

METHODS

This is a quantitative descriptive study based on the results of a survey, which is part of the project entitled "Development of a training program for pharmacists focused on the care of individuals with asthma," approved by the Research Ethics Committee of the Federal University of Sergipe (CAAE[9] No. 3665022.4.0000.5546).

[9] CAAE (Certificado de Apresentação para Apreciação Ética) is a unique identifier assigned to research protocols submitted for ethical review in Brazil through the national research ethics system.

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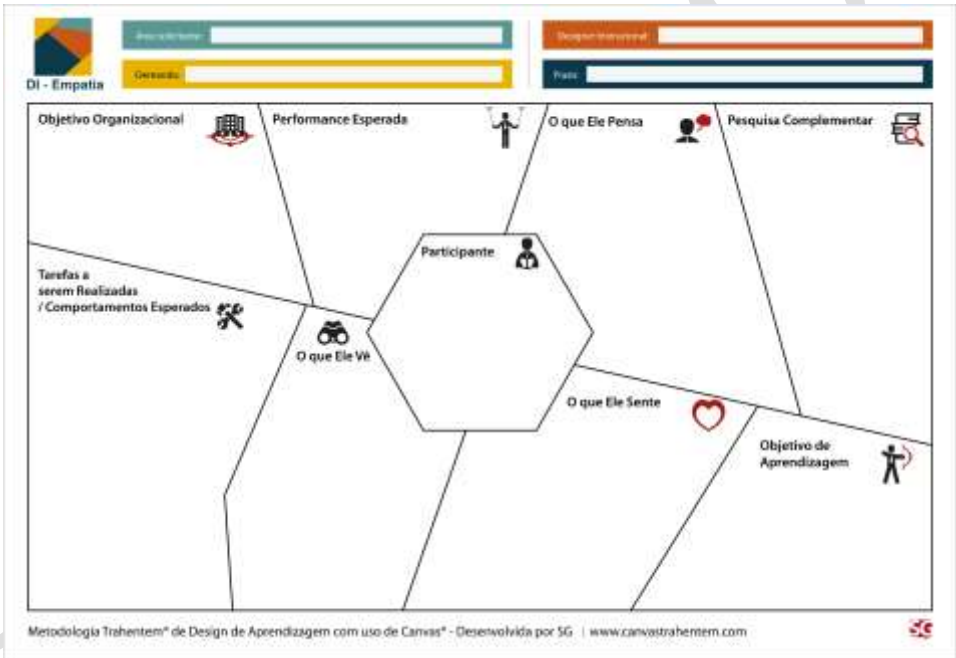
The Trahenten® method, selected to guide the development of the pharmacist training program, includes a "complementary survey" as one of the initial steps in the process. It is grounded in the principles of meaningful learning and design thinking. Trahenten® promotes a collaborative approach to course development and makes use of tools known as canvases[22]. The process begins with the completion of the "DI empathy canvas" (Figure 1), which contains multiple fields designed to support the identification and analysis of learners' needs[22].

Figure 1 – Trahenten® method "DI Empathy Canvas"



*Source: Learning design using Trahentem® canvas[22].

Placing the learner at the center of the educational design requires the design team to listen to prospective participants, for example through a complementary survey (a structural component of the DI empathy canvas). This approach enables the development of a learner "persona" (the "participant" component) and the identification of "what they think," "what they see," and "what they feel," in order to define the "expected performance" and "expected behaviors"[22]. Accordingly, this study addressed this stage of course planning by surveying pharmacists about aspects of their daily practice related to

chronic respiratory diseases, including their educational needs and the main demands of the patients they care for.

Study population, sample, and data collection

The study population comprised all 322,405 pharmacists registered with the Regional Pharmacy Councils as of early April 2023, based on centralized national data publicly available on the website of the Federal Pharmacy Council (CFF)[23]. From this population, a minimum sample size of 384 pharmacists was calculated, assuming a 95% confidence level and a 5% margin of error for heterogeneous populations. A convenience sampling approach was used, with participants self-selecting into the study by voluntarily responding to the survey.

Data were collected using an anonymous, self-administered, semi-structured online questionnaire developed by the researchers. The questionnaire was hosted on the Google Forms platform and made available to pharmacists across all regions of Brazil. The survey link was disseminated through the official Federal Pharmacy Council (CFF) Instagram® account (@conselhofederaldefarmacia), allowing for voluntary and anonymous participation. Data collection was conducted entirely remotely and asynchronously. Responses were accepted over a 15-day period, from April 25 to May 10, 2023, at which point the minimum sample size had been reached.

Data collection instrument

The data collection instrument consisted of a questionnaire comprising both open- and closed-ended items, developed to investigate pharmacists' educational needs and the demands reported by patients in their care in the context of chronic respiratory diseases, with an emphasis on asthma. The questionnaire included the following items: (1) whether respondents provide care for individuals with chronic respiratory diseases in their daily practice and which conditions are involved; (2) whether individuals with asthma have

questions about the disease or its treatment, and what these are; (3) whether individuals with asthma use regional or colloquial expressions to refer to the disease, its signs and symptoms, or its treatment, and what these are; (4) whether individuals with asthma express any beliefs about the disease, its cure, or its treatment, and what these are; (5) their main training needs to better support patients with respiratory symptoms; and (6) whether they have implemented any services or conducted research focused on asthma care.

Data analysis

Descriptive analysis was based on a full review of the responses, followed by qualitative data coding by the researchers, which enabled the estimation of absolute and relative frequencies. All quantitative and qualitative analyses were carried out in Microsoft Excel®.

RESULTS

A total of 576 questionnaire responses were obtained. Most respondents reported providing care to individuals with chronic respiratory diseases (n=549; 95.3%). Asthma was the most commonly encountered condition, with 94.7% of pharmacists reporting care for individuals with asthma (n=520), followed by rhinitis (n=488; 88.9%) and chronic obstructive pulmonary disease (COPD; n=311; 56.6%). However, only 6.9% (n=40) of respondents reported having implemented a service or conducted research related to asthma.

A total of 513 pharmacists (89.1% of respondents) reported at least one educational need to improve care for patients with respiratory symptoms. The most frequently identified needs (≥4%) are presented in Table 1.

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Table 1 – Main educational needs reported by pharmacists for the care of patients with respiratory symptoms (n=513). 2023. Brazil.

Training needs	**Frequency n(%)***
Treatment and treatment protocols	168 (32.7)
Correct use of inhalation devices	119 (23.2)
Pathophysiology and differences between respiratory diseases	75 (14.6)
Pharmacology of medications used in treatment	40 (7.8)
Management of acute episodes and emergency situations	28 (5.5)
Non-pharmacological measures	26 (5.1)
Drug interactions	25 (4.9)
Adverse effects of treatment	25 (4.9)
Signs and symptoms	23 (4.5)

* Each pharmacist who reported at least one training need (n=513) may have reported more than one need.

Most pharmacists (n=535; 92.9%) reported that patients with asthma have questions about the disease and its treatment. The most frequently reported questions are presented in Table 2.

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Table 2 – Main patient questions about asthma and its treatment, as reported by pharmacists (n=535), Brazil, 2023.

Topic of questions	Frequency n(%)*
Use of inhalation devices, medication administration, and dosing	325 (60.7)
Treatment duration and chronicity	111 (20.7)
Differences between drugs and dosage forms	99 (18.5)
Adverse effects, contraindications, and drug interactions	78 (14.6)
Disease characteristics, signs and symptoms, and curability	71 (13.3)
Management of acute episodes and emergency situations	56 (10.5)
Treatment effectiveness and mechanism of action	54 (10.1)
Adjunct therapies and non-pharmacological measures	39 (7.3)
Use of corticosteroids	26 (4.9)
Cost of and access to treatment	20 (3.7)
How to perform nebulization	9 (1.7)
Need for and interpretation of tests	3 (0.6)
Medication storage	3 (0.6)

* Pharmacists who reported that the patients with asthma in their care have questions (n=535) may have reported more than one question topic.

Most pharmacists (n=464; 80.6%) also reported that patients with asthma use regional or colloquial expressions to refer to the disease, its signs and symptoms, or its treatment. The most frequently reported term was *chiado*[10] and its variants (e.g., *chiadeira*, *chiado no peito*, *chiando*, *chieira*, *chiadeira de gato*, *peito chiando*, *chiasso*, *chiasso de gato*, *chio*) (n=347; 74.8%). Other commonly reported terms included *piado* and its variants (e.g., *piadeira*, *piado no peito*, *pianço*; n=49; 10.6%); *cansaço* and its variants (e.g., *canseira*, *canseira no pulmão*, *fadiga*, *pulmão cansado*; n=43; 9.3%); *falta de ar* and its variants (e.g., *falta de fôlego*, *tampando o fôlego*, *sem ar*, *cortando o ar*,

[10] Terms are presented in Portuguese to preserve the original patient-reported expressions and their cultural and linguistic nuances; for example, "chiado" and "piado" refer to wheezing sounds, "cansaço" to fatigue or breathlessness, "falta de ar" to shortness of breath, and "peito cheio" to a sensation of chest tightness or congestion.

trancamento, *afogamento*, *sufocamento*; n=41; 8.8%); and *peito cheio* and its variants (e.g., *peito pesado*, *peito carregado*, *pulmão cheio*, *peso ao respirar*, *aperto no peito*; n=31; 6.7%). Other terms were reported with frequencies below 6%.

Pharmacists also frequently reported patients' beliefs about asthma, its treatment, and the possibility of cure (n=318; 55.2%), with the use of teas and natural products as treatment being the most commonly reported (n=159; 50.0%). Other beliefs with a relative frequency of ≥4% are presented in Table 3.

Table 3 – Main beliefs reported by patients with asthma about the disease, its treatment, and cure, as reported by pharmacists (n=318), Brazil, 2023.

Type of belief	**Frequency n (%)***
Use of teas or natural products	159 (50.0)
Use of homemade syrups, herbal remedies, or molasses-based preparations	45 (14.2)
Engagement in folk healing practices (e.g., *simpatias*)	44 (13.8)
Inhalation of steam, herbal infusions, or smoke	37 (11.6)
Use of specific foods for treatment	22 (6.9)
Seeking traditional or faith healers (e.g., *benzedeiras*, *rezadeiras*, *curandeiros*) or religious practices	17 (5.3)
Use of herbal concoctions (*garrafadas*)	14 (4.4)
Use of home remedies or poultices	15 (4.7)
Use of products derived from insects or other animals	13 (4.1)

* Each pharmacist (n=318) may have reported more than one type of belief.

DISCUSSION

This study identified the main educational needs of pharmacists regarding chronic respiratory diseases, as well as the questions and beliefs of patients in their care, to inform the development of a nationwide training program. This approach is distinguished by its pedagogical framework, which centers on the learner profile and expected performance, rather than on a unilateral, educator-centered perspective.

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Pharmacists' educational needs were mainly related to the pharmacological management of asthma, familiarity with clinical protocols, and the appropriate use of inhalation devices (Table 1). International evidence consistently points to gaps in pharmacists' knowledge of current asthma management guidelines, including those from the Global Initiative for Asthma (GINA)[24-26]. These findings align with the competencies defined by the International Pharmaceutical Federation (FIP) for professional development in chronic respiratory diseases[18]. In parallel, the most frequently reported patient questions concerned the correct use of inhalation devices, understanding the chronic nature of the disease, differences between medications and their formulations, and potential adverse effects of treatment (Table 2).

These findings are in line with the literature, which highlights the high prevalence of errors in inhaler use in clinical practice, directly associated with reduced therapeutic effectiveness and an increased incidence of adverse events[8,9,27]. It is also important to note that these challenges are not limited to patients: a systematic review found that only about 15% of healthcare professionals are able to perform inhaler technique correctly[28].

In this context, to provide high-quality care for individuals with asthma, the course should support the development of competencies that enable pharmacists to distinguish between types and classifications of inhalation devices, assess their suitability to each patient's clinical and social profile, and identify and correct errors in use or, when necessary, recommend switching devices[8,29]. Accordingly, the training program proposed in this study should incorporate not only theoretical content but also practical activities that foster the development of clinical competencies for patient care.

The findings indicate that pharmacists' educational needs closely mirror the most common patient questions. This suggests gaps in knowledge and confidence in addressing these issues, highlighting the need for training that strengthens the quality of care and patient guidance in asthma management.

Another notable finding is the lack of reference to key components of comprehensive asthma care, such as clinical services, the clinical method, listening, and communication skills. This suggests the persistence of a pharmacy practice model

predominantly centered on the disease and medication, rather than on patients’ health needs and lived experiences. This result contrasts with the authors’ initial hypothesis, which anticipated a broader range of educational needs, including clinical competencies. The data further support this interpretation: only 6.9% of pharmacists reported having implemented any service or conducted research related to asthma, indicating limited clinical experience.

Limited involvement in clinical services may constrain pharmacists’ understanding of the complexity of managing chronic respiratory diseases. Accordingly, an alternative hypothesis can be proposed: lack of experience in clinical services may hinder pharmacists’ ability to recognize the health needs of patients with asthma, perpetuating a medication-centered focus and limiting the development of more comprehensive and effective practices.

This scenario may be partly explained by the prevailing training model in recent decades. Only in recent years have the National Curriculum Guidelines for undergraduate pharmacy programs in Brazil explicitly incorporated Health Care as a core component of professional training, emphasizing the importance of clinical competencies and person-centered care beyond pharmacotherapy knowledge[30]. As these guidelines have been more widely implemented only since 2019, it is plausible that many pharmacists have not yet received systematic training in this area, contributing to the persistence of practices focused primarily on medication use.

The study findings also highlight the need to incorporate health education into the training program. The identification of regional terms, colloquial expressions, and beliefs related to chronic respiratory diseases points to cultural specificities that should be recognized and considered when designing training programs at the national level. Integrating these elements into educational strategies is essential to make patient guidance more effective, accessible, and culturally responsive, ensuring that pharmaceutical care takes patients’ sociocultural context as a central element of clinical practice.

Beliefs and behaviors influence asthma-related health outcomes, as they are integral to patients’ experiences of their condition and medication use[8]. For this reason,

managing a complex condition such as asthma requires competencies that support patient-centered care grounded in patients’ experiences, as well as effective communication using plain language, as essential components of pharmacist training[31-35].

Among the regional or colloquial expressions reported, most were related to the signs and symptoms of asthma. The term *chiado* and its variants were the most frequently mentioned by pharmacists (n=347; 74.8%). The Global Initiative for Asthma (GINA) has highlighted the wide range of terms used to describe wheezing. This variation has been observed across countries and even within the same country, creating challenges in patient–healthcare professional communication and hindering early identification or adequate control of diagnosed cases[9]. Understanding these terms is essential for identifying patients’ needs, as they may indicate poor disease control or the need for diagnosis. Studies suggest that a large proportion of individuals with asthma remain undiagnosed or have inadequately controlled disease[9,36].

Patient-reported beliefs were also frequently described (55.2%), particularly those related to the treatment of chronic respiratory diseases, such as the use of teas, *garrafadas* (herbal mixtures prepared by macerating ingredients in liquid), natural products, and homemade remedies and syrups. Another Brazilian study found that seeking traditional or home-based remedies is common before accessing formal healthcare, and may persist even after care has been received[37]. In the Brazilian context, awareness of these beliefs and practices — and of their potential risks, benefits, and implications for asthma management — is therefore essential when designing initiatives aimed at developing pharmacists’ clinical competencies. Incorporating this knowledge into the training process can make care more responsive to patients’ sociocultural context and, consequently, more effective. Recognizing and respecting that each individual brings their own culture, meanings, values, life context, and ways of knowing is essential for understanding their responses to illness and for developing care strategies that are more effective and attuned to their realities[18,38].

Among the study limitations, the lack of information on pharmacists’ practice settings and the distribution of respondents across Brazilian states should be considered.

In addition, exploring beliefs and perceptions directly with patients would have provided further insight. The educational needs identified in this study will inform the development of a nationwide training program that is more closely aligned with real-world professional practice.

CONCLUSIONS

This study identified a range of educational needs in asthma care from the pharmacists' perspective. These needs closely aligned with the most common patient questions about the disease and its treatment. Together, these findings suggest that pharmacists encounter recurring challenges in addressing patients' concerns in routine practice, highlighting the importance of evidence-based training programs grounded in real-world needs. When this alignment is taken into account, educational planning becomes more responsive, supporting the development of relevant competencies, enhancing the effectiveness of care, and contributing to improved clinical and educational outcomes.

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