International Pharmacy Acta. 2025; 8(1): e7
Original Research Article
OPEN ACCESS
ISSN: 2645-3266

Asthma Patient Education and Counselling in Community Pharmacies in Kurdistan Region, Erbil, Iraq: A Cross-Sectional Study

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Article Info:
Received: April 2025
Accepted: October 2025
Published online: October 2025

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ABSTRACT:

Asthma is a chronic inflammatory disorder of the airways, and its prevalence is rising in Iraq, where community pharmacists are often the most accessible healthcare providers. This study evaluated the knowledge, practices, and challenges faced by community pharmacists in Erbil, Iraq, to identify gaps and opportunities for improving asthma care and control. A cross-sectional study was conducted from November to December 2023, involving 199 community pharmacists. Data was collected using a structured questionnaire assessing asthma medication knowledge, patient counselling practices, and barriers to care. 75.4% of pharmacists educated patients on medication roles, 77.4% discussed side effects, and 75.9% assessed concomitant medication use. Key barriers included staffing (26.1%), time constraints (22.1%), lack of interest (21.1%), lack of knowledge and training (20.1%), and insufficient infrastructure (19.1%). Bachelor of pharmacy holders and more experienced pharmacists reported better patient education practices ($p<0.01$ and $p<0.05$, respectively). Females were more likely to report the need for additional training ($p<0.05$), and younger groups (18 to 25 years old) and students expressed less interest in patient counselling ($p<0.05$). Pharmacists reported good patient education practices. The study highlights the need for targeted training programs and systemic improvements to enhance pharmacists' role in asthma care.

Keywords: Asthma care; Barriers; Community pharmacists; Counselling practices; Iraq; Knowledge gaps; Patient education; Training.

Please Cite this article as: Yassen AO, Shlaymoon AS, Salem NG, Shakir ShA. Asthma Patient Education and Counselling in Community Pharmacies in Kurdistan Region, Erbil, Iraq: A Cross-Sectional Study. Int. Pharm. Acta. 2025; 8(1):e7.
DOI: https://doi.org/10.22037/ipa.v8i1.48211

1. Introduction

Asthma is a chronic inflammatory disorder of the airways characterized by recurrent symptoms such as cough, chest tightness, wheezing, sputum production, and dyspnea. Around 75% of people with asthma also have atopy, a genetic tendency to develop allergic conditions [1]. According to the Global Initiative for Asthma (GINA) and the World Health Organisation (WHO), approximately 300 million people worldwide have asthma, and around 1,000 people die from it each day, making it a significant public health disorder [2, 3]. The Global Asthma Report further notes that asthma affects around 1 in 10 children and around 1 in 15 adults, making it the most common non-communicable disease (NCD) [4]. The primary mechanisms of asthma development are inflammation and its impact on airway structures. Therefore, limiting exposure to triggering factors and using anti-inflammatory agents to reduce inflammatory processes are considered the primary goals of asthma therapy. Additional therapies, such as symptom control and maintaining optimal airway calibre, guarantee adequate asthma control and improve quality of life.

Relievers and controllers are the two primary classes of medications used to treat asthma. The best type of relievers is inhaled short-acting β2-agonists (SABAs) such as salbutamol. These fast-acting bronchodilators are only prescribed when necessary, at the lowest possible dosage and frequency to treat acute symptoms of ongoing asthma. Inhaled (and oral) glucocorticosteroids (e.g., budesonide), leukotriene-receptor antagonists (LTRAs) such as montelukast, and anti-allergic or inhaled nonsteroidal drugs like cromoglycate and nedocromil are

examples of controllers (or preventers) of inflammation. To manage asthma and avoid flare-ups, these medications are typically used daily, with inhaled glucocorticosteroids (ICS) being the most effective [5]. A proper treatment plan can be developed based on multiple factors, including safety, efficacy, price, patient satisfaction, and pharmacology. These points are considered after determining the factors associated with uncontrolled asthma. According to Kawamatawong et al. (2022), asthma management follows a stepwise approach based on symptom control and risk of exacerbation. Step 1 involves: Short-acting bronchodilators or ICS/formoterol are considered for patients with controlled asthma. For mild or asymptomatic asthma with a risk of exacerbation, LTRAs are used with an intermittent ICS/formoterol. Step 2: Low-dose ICS combined with long-acting β2-agonist (LABA) is considered for uncontrolled asthma. For step 3, if asthma remains uncontrolled even after undergoing step 2, medium-dose ICS/LABA in combination with short-acting bronchodilators or ICS/formoterol are used. Lastly, in step 4, if asthma persists after step 3 and the patient shows deterioration in pulmonary function, medium to high dose ICS/LABA are combined with SR xanthine, LTRA, LAMA such as tiotropium bromide, low dose ≤7.5 mg prednisolone/day, and biologic agents (omalizumab, mepolizumab, or benralizumab). An asthma specialist referral is also required [6].

While global guidelines, such as GINA, emphasise the critical role of healthcare providers in asthma management, there is limited research exploring the specific contributions of community pharmacists to asthma patient education and counselling, particularly in low- and middle-income countries. A literature review done on 20 studies in different regions showed that community pharmacists do improve asthma control through their interventions, such as patient education, inhaler technique training, asthma action plans (AAPs), self-management support (SMS), and counselling and referrals; however, it is underutilized due to time, financial, and structural constraints [7]. Similarly, a study in Saudi Arabia found that pharmacists possessed sufficient knowledge and skills to counsel patients with asthma effectively; however, time constraints significantly impacted their counselling abilities [8]. In contrast, a study in Jordan revealed inadequate knowledge and counselling practices in asthma management among pharmacists [9]. In a simulated patient study in the UAE, pharmacists often did not adequately question the clinical need for cough syrup or albuterol inhalers, nor did they inquire about a prior asthma diagnosis or current asthma medications, and very few evaluated patients' adherence or correct inhaler techniques. Only a small percentage provided sufficient counselling on medications or inhaler use, even when prompted. Independent pharmacists were more likely than those in chain pharmacies to conduct thorough assessments. More than half of the pharmacists supplied both cough syrup and albuterol, potentially missing the fact that the cough could have been a sign of poorly controlled asthma. However, 65% of pharmacists appropriately referred the patients for proper management [10]. Training pharmacists on asthma management is believed to improve asthma control. According to a meta-analysis, community pharmacists' educational interventions have been shown to significantly improve asthma control, quality of life (QoL), and medication adherence among patients with asthma [11]. Another meta-analysis showed that training asthma educators in SMS improves asthma patients' QoL and asthma control compared to the usual care [12]. Additionally, asthma education was associated with a 54% reduction in hospitalization risk and a 31% reduction in emergency department visits among children with asthma, compared to a control group [13].

In Iraq, where asthma prevalence is rising and healthcare access is variable [14, 15], community pharmacists often serve as the most accessible healthcare professionals. Despite their potential to enhance patient outcomes through education on medication adherence, inhaler techniques, and side effect management, limited research has examined their actual involvement in asthma care or the challenges they face in practice in Iraq, particularly in Erbil. This study aims to address this gap by evaluating the knowledge, practices, and challenges faced by community pharmacists in Erbil, Iraq, in providing asthma care. By providing localised data, it aims to inform future efforts to involve pharmacists in asthma care better and improve patient outcomes in settings with limited resources.

2. Materials & Methods

2.1. Research Design

A quantitative, cross-sectional research design was employed to evaluate asthma patient education and counselling in community pharmacies in Erbil, Iraq. This design allows for the collection of data at a single point in time.

2.2. Study Setting

The study was conducted in pharmacies located in Erbil, Iraq, during the period from November 22nd, 2023, to December 26th, 2023. The choice of community pharmacies as the study setting reflects their crucial role in providing asthma education and counselling in the region. Verbal consent was obtained from participants willing to take part in the study.

2.3. Population and Sampling

The study targeted community pharmacists practising in Erbil, Iraq, who met the following inclusion criteria: community pharmacists practising in Erbil, Kurdistan Region, Iraq. Pharmacists with direct interaction with patients and responsibility for asthma medication counselling. Exclusion Criteria: pharmacists practising outside Erbil city. Pharmacists are not involved in patient education and counselling.
The sample size consisted of 199 community pharmacists who voluntarily agreed to participate in the study. A convenience sampling technique was employed, wherein participants were selected based on their accessibility and willingness to participate during the data collection period. Consent was obtained prior to participation. While this method allows for efficient data collection within a short timeframe, it introduces certain limitations. Convenience sampling does not ensure random selection, which may result in sampling bias and limit the generalizability of the findings. Pharmacists who were more accessible or more interested in asthma care may have been overrepresented, while those with less interest may have been underrepresented. Nurses working in community pharmacies were also included, as current regulations in Erbil, Iraq, which restrict community pharmacy practice exclusively to licensed pharmacists, are poorly enforced [16]. While this provides a realistic overview of who is delivering patient care in these settings, it may limit the generalizability of the findings to professionally licensed pharmacists alone.

2.4. Data Collection

Data was collected using a structured questionnaire that included both closed-ended and open-ended questions. The questionnaire was developed from previous similar studies [8, 9] to assess pharmacists' knowledge of asthma medication, patient counselling practices, and the challenges they face. The seventh question in the questionnaire was subdivided into seven branches for a more detailed exploration. The questionnaire was distributed and completed online under the investigator's supervision to clarify questions and prevent any misunderstandings. Since no standardized tool exists to measure asthma-related knowledge among pharmacists objectively, the study relied on self-reported data. However, this approach may introduce bias, particularly social desirability bias, where participants overestimate their knowledge or report ideal rather than actual practices.

2.5. Statistical Analysis

For the statistical analysis of social science data, SPSS version 27 software was used. Data were summarized using descriptive statistics, and the relationship between variables was examined using correlation analysis. The chi-square test was used for assessing associations between categorical variables when cell counts were large (≥5). Fisher's exact test was applied in cases where cell counts were small (<5), ensuring accurate significance testing. The chi-square test was used to examine associations between years of experience and patient education practice, as well as between gender and the need for additional training. Fisher's exact test was used to examine the associations between educational level and both patient education and lack of interest in patient counselling, as well as between age and lack of interest in patient counselling. A p-value <0.05 was considered statistically significant.

3. Results & Discussion

3.1. Demographics and Educational Background & Experience

The study included 199 participants (Table 1), with 60.3% (120/199) males and 39.7% (79/199) females. 42.2% (84/199) were aged 18-25 years, and nearly half (49.2%, 98/199) had between 1 and 4 years of professional experience, and 13.1% (26/199) had more than 10 years. This relatively young and early-career pharmacist population may influence the level of patient counselling provided.
Regarding the educational background, 50.8% (101/199) held a diploma in pharmacy, 20.1% (40/199) had a bachelor's in pharmacy (BPharm), 10.6% (25/199) were nurses, and 5% (10/199) were nursing students. Only 1% (2/199) held a master's in pharmacy. The presence of nurses and nursing students among participants reflects the regional workforce reality, where individuals with varying levels of formal training in pharmacy often staff community pharmacies.

3.2. Patient Education

The most commonly used asthma medications in Erbil were beta-agonist bronchodilators and corticosteroids (35.2%), followed by a combination of LABAs, SABAs, and corticosteroids (16.1%), and bronchodilators with corticosteroids (15.6%).
Regarding patient counselling (Table 2), the majority of pharmacists (75.4%, 150/199) provided information on the role of each medication, suggesting a good level of engagement in basic therapeutic education. However, the fact that nearly one in four pharmacists, 24.6% (49/199), did not emphasize this aspect indicates a substantial gap in practice, as understanding the purpose of each medication is important for patient adherence and effective asthma control. Similarly, 77.4% (154/199)

informed patients about potential side effects, whereas 22.6% (45/199) did not address this concern, potentially leaving patients unprepared for them, which could undermine treatment success or lead to nonadherence. Additionally, 75.9% (151/199) inquired about patients' concomitant medication use, while 24.1% (48/199) did not.

Table 1. Sociodemographic characteristics of the participants (n=199).

Variables		N (199)	%
Gender	Male	120	60.3
	Female	79	39.7
Age	>45	13	6.5
	18-25	84	42.2
	25-35	55	27.6
	35-45	47	23.6
Educational Level	Bachelor of Pharmacy	40	20.1
	Diploma in pharmacy	101	50.8
	Masters of Pharmacy	2	1.0
	Nurse	25	12.6
	Nursing student	10	5.0
	Pharmacy student	21	10.6
Experience	<1	30	15.1
	1-4	98	49.2
	5-9	45	22.6
	>10	26	13.1

N (number of participants), % (percentage of participants)

Table 2. Patient education (n=199).

Questions	Answers	N	%
Do you tell the patient about the role of each medication?	Yes	150	75.4
	No	49	24.6
Do you tell the patient about the side effects of the medications?	Yes	154	77.4
	No	45	22.6
Do you ask the patient if they take concomitant medications?	Yes	151	75.9
	No	48	24.1
Do you have a lack of adequate knowledge?	Yes	40	20.1
	No	159	79.9
Are you in need of additional training?	Yes	26	13.0
	No	173	87.0
Do you have a lack of interest in patient counseling?	Yes	42	21.1
	No	157	78.9

N (number of participants), % (percentage of participants)

3.3. Inhaler Use Instructions

As shown in Table 3, 61.8% (123/199) of patients were instructed to "take a slow, deep breath and press the inhaler to release the medicine, continue to breathe in until your lungs are full." While 38.2% (76/199) preferred to "hold the inhaler with the mouthpiece down. Place your lips around the mouthpiece so that you form a tight seal, as you start to breathe in through your mouth slowly".

Table 3. Instructions regarding inhaler usage given to patients (n=199).

Instructions given to the patient	N	%
Hold the inhaler with the mouthpiece down. Place your lips around the mouthpiece so that you form a tight seal. As you start to slowly breathe in through your mouth.	76	38.2
Take a slow, deep breath. As you start to breathe in, press the button on the inhaler to release the medicine. Continue to breathe in until your lungs are full.	123	61.8

N (number of participants), % (percentage of participants)

3.4. Key Barriers

The findings of this study highlight several key barriers to the effective provision of asthma patient education and counselling within community pharmacies (Table 4). A minority of pharmacists (22.1%; 44/199) reported that limited time constrained their ability to provide counselling, while the majority (77.9%; 155/199) did not perceive time as a significant obstacle. With respect to knowledge and training, most respondents (79.9%; 159/199) expressed confidence in their professional competence, although a notable proportion (20.1%; 40/199) indicated that they were not sufficiently prepared, underscoring the need for ongoing educational initiatives. Regarding infrastructure, only 19.1% (38/199) emphasized the necessity of a separate counselling room, whereas the majority (80.9%; 161/199) considered existing pharmacy spaces sufficient. A lack of interest in counselling was identified by 21.1% (42/199) of participants, suggesting that motivational and attitudinal factors may play a role in limiting patient engagement. Finally, staffing was perceived as a barrier by a relatively small subset of respondents, with 26.1% (52/199) advocating for the addition of pharmacists to enhance counselling services.

Table 4. Key barriers pharmacists face in asthma education (n=199).

Variables	N	%
Time constraint	44	22.1
Interest in counseling	40	20.1
Separate counseling room	38	19.1
Staffing	52	26.1

N (number of participants), % (percentage of participants)

These results, summarized in Table 4, collectively indicate that while structural limitations, such as time and infrastructure, were not widely perceived as challenges, attitudinal barriers and variability in professional preparedness may represent more significant determinants influencing the quality and consistency of asthma counseling practices in the studied setting.

3.5. Associations

As shown in Table 5, a significant association was observed between the educational levels of the participants and key counseling practices when it comes to patient education, where participants with a bachelor's degree in pharmacy were more likely to explain each medication role ($p<0.01$), and discuss the potential side effects of the medications ($p<0.01$) compared to the other groups. Students of either pharmacy or nursing were less likely to express interest in patient counselling ($p<0.05$).

Years of practice significantly influenced the counselling behaviours of the participants, as seen in Table 6, where those with more than 1 year of experience were more likely to educate patients on side effects ($p<0.05$). In comparison, those with less than 1 year of experience were more likely to report a lack of adequate knowledge ($p<0.05$). More experienced pharmacists were also less likely to express a lack of interest in patient counseling ($p=0.01$).

The gender of the participants was significantly associated with the need for additional training ($p<0.05$), as shown in Table 7, with females being more likely to seek further development.

Finally, individuals aged between 18 and 25 years were less likely to express interest in patient counseling ($p<0.05$), as shown in Table 8.

One hundred ninety-nine individuals participated in the study, comprising 120 males and 79 females. Nearly half (42.2%) were aged between 18 and 25, and had 1 to 4 years of experience (49.2%), as observed in most community pharmacies in Iraq [17, 18]. This may influence the quality of patient counselling provided. More than half (50.8%) held a diploma in pharmacy, unlike what is seen in some studies [17-19]. The high number of people with a diploma in pharmacy, also known as pharmacy technicians, in Iraqi community pharmacies, could be explained by several factors. Diploma holders are more readily available and are generally limited to working in community pharmacies, unlike pharmacists, who have broader career options and tend to pursue roles in hospitals, academia, pharmaceutical companies, or industries where standards are higher and opportunities for professional growth are greater. Additionally, diploma holders typically have lower salary expectations, a trend reinforced by the fact that privately owned pharmacies frequently prioritize reducing operational costs, leading them to hire diploma holders instead of BPharm graduates, who may demand higher salaries. The presence of nurses in Iraqi community pharmacies reflects the regional workforce reality, where regulations governing who is permitted to work in a community pharmacy are poorly enforced.

Approximately three in four pharmacists (75.4%) inform their patients about the role of each medication, consistent with findings in previous studies [8, 20]. This means that most pharmacists are at least attempting to educate patients, which helps improve patient adherence. In fact, two studies have shown that poor understanding of medications is linked to nonadherence, while better knowledge correlates with improved adherence [21, 22].

Table 5: Association between educational level and patient education.

Variables		Education level												Fisher Exact Test (p-value)
		Bachelor of Pharmacy		Diploma in Pharmacy		Masters of Pharmacy		Nurse		Nursing student		Pharmacy student		
		n	%	n	%	n	%	n	%	n	%	n	%	
Do you tell the patient about the role of each medication?	No	2	1.0	22	11.1	1	0.5	10	5.0	4	2.0	10	5.0	19.874 (0.001)**
	Yes	38	19.1	79	39.7	1	0.5	15	7.5	6	3.0	11	5.5	
Do you tell the patient about the side effect of the medications?	No	2	1.0	21	10.6	0	0.0	9	4.5	4	2.0	9	4.5	17.072 (0.004)**
	Yes	38	19.1	80	40.2	2	1.0	16	8.0	6	3.0	12	6.0	
Do you have a lack of interest in patient counseling?	No	30	15.1	87	43.7	2	1.0	20	10.1	6	3.0	12	6.0	12.212 (0.032)*
	Yes	10	5.0	14	7.0	0	0.0	5	2.5	4	2.0	9	4.5	

n (number of participants), % (percentage of participants). *p<0.05 (statistically significant), **p<0.01 (very statistically significant).
Note: Fisher Exact Test was used to find the association between education level (bachelor of pharmacy, diploma in pharmacy, masters of pharmacy, nurse, nursing student, and pharmacy student) and patient education.

Table 6: Association between years of experience and patient education practice.

Variables		Number of practicing year(s) at community level								Chi-square test (p-value)
		<1		1-4		5-9		>10		
		n	%	n	%	n	%	n	%	
Do you tell the patient about the role of each medication?	No	12	6.0	22	11.1	7	3.5	8	4.0	6.594 (0.086)
	Yes	18	9.0	76	38.2	38	19.1	18	9.0	
Do you tell the patient about the side effect of the medications?	No	12	6.0	18	9.0	7	3.5	8	4.0	8.461 (0.037)*
	Yes	18	9.0	80	40.2	38	19.1	18	9.0	
Do you have a lack of adequate knowledge?	No	19	9.5	77	38.7	39	19.6	24	12.1	9.010 (0.029)*
	Yes	11	5.5	21	10.6	6	3.0	2	1.0	
Are you in need of additional training?	No	23	11.6	87	43.7	40	20.1	23	11.6	3.282 (0.350)
	Yes	7	3.5	11	5.5	5	2.5	3	1.5	
Do you have lack of interest in patient counseling?	No	18	9.0	77	38.7	37	18.6	25	12.6	11.389 (0.010)*
	Yes	12	6.0	21	10.6	8	4.0	1	0.5	

n (number of participants), % (percentage of participants). *p<0.05 (statistically significant). Note: Fisher Exact Test was used to find the association between education level (bachelor of pharmacy, diploma in pharmacy, masters of pharmacy, nurse, nursing student, and pharmacy student) and patient education.

Table 7: Association between gender and the need for additional training.

Variables		Gender				Chi-square test (p-value)
		Female		Male		
		n	%	n	%	
Are you in need of additional training?	No	64	32.2	109	54.8%	4.045 (0.044)*
	Yes	15	7.5	11	5.5%	

n (number of participants), % (percentage of participants). Note: Chi-square test was used to find the association between gender and the need for additional training.

Table 8: Association between age and lack of interest in patient counseling.

Variables		Age								Fischer Exact Test (p-value)
		>45		18-25		23-35		35-45		
		n	%	n	%	n	%	n	%	
Do you have a lack of interest in patient counseling?	No	12	6.0%	58	29.1%	44	22.1%	43	21.6%	10.814 (0.013)*
	Yes	1	0.5%	26	13.1%	11	5.5%	4	2.0%	

n (number of participants), % (percentage of participants). Note: Fischer exact test was used to find the association between age groups and the lack of interest in patient counseling.

Similarly, a large percentage (77.4%) of pharmacists informed patients about potential side effects, which is consistent with earlier studies [8, 20]. This can help prepare patients for potential side effects; otherwise, it can lead to confusion, mistrust, and potentially nonadherence.

Additionally, most pharmacists (75.9%) inquired about concomitant medication use, a finding consistent with a previous study [8]. Regarding patient education, pharmacists reported a good level of patient counselling. However, this finding is based on self-reported data, which introduces a limitation to the study due to the potential for social desirability bias. Findings from an alternative study design, a simulated patient study conducted in the UAE, showed that pharmacists provide limited advice on counselling regarding medications and inhaler techniques, even when prompted. Many pharmacists also avoided giving information to patients

[10]. This eliminated the chance of social desirability bias because simulated patient studies assess actual behaviour rather than self-perception.

Regarding instructions on inhaler use, pharmacists were more likely to advise their patients to “take a slow, deep breath and press the inhaler to release the medicine, continue to breathe in until your lungs are full” rather than emphasizing the correct positioning and sealing technique "hold the inhaler with the mouthpiece down. Place your lips around the mouthpiece so that you form a tight seal, as you start to breathe in through your mouth slowly". This suggests a tendency to focus on the breathing component while overlooking critical steps in inhaler technique that ensure proper drug delivery. For instance, failing to instruct on proper mouthpiece positioning can lead to medication depositing on the teeth and tongue, decreasing the amount that reaches the lungs. Similarly, poor seal formation may cause air leakage, which would reduce the inspiratory flow. Both errors compromise drug delivery and reduce treatment efficacy [23].

The key barriers found that limited pharmacists from giving proper patient counseling were staffing (26.1%), where more staffing was believed to improve patient counseling, limited by time (22.1%), lack of interest (21.1%), lack of knowledge and training (20.1%), and lack of infrastructure (19.1%) where they believed a separate room for counseling would improve patient counseling. A lack of time was identified as a barrier in many previous studies [7-9, 20, 24-27]. Other barriers were also reported in previous studies, including staffing shortages [20], a lack of knowledge and skills [20, 24, 25, 27, 28], and inadequate infrastructure [7, 27]. These barriers underscore the need for targeted interventions that address staffing, training, and infrastructure to improve the quality of patient counseling.

In terms of the association between educational level and patient education, those who held a bachelor’s degree in pharmacy were more likely to explain the role of each medication and discuss the potential side effects of the medications ($p<0.01$). A similar study found that individuals with a pharmacy degree were associated with increased odds of having a positive attitude toward patient counselling, but were less likely to fall into the high practice group (9). This may be attributed to the previously mentioned barriers, which prevent pharmacists from translating their knowledge into practice. Students from either pharmacy or nursing school were less likely to express interest in patient counseling ($p < 0.05$). Studies have shown that pharmacy students’ confidence and positive attitudes toward patient counselling significantly improve after dedicated communication skills training, implying that the standard curriculum may not prioritize these skills enough [29]. Those with more than 1 year of experience were more likely to educate patients about side effects ($p < 0.05$). They were also less likely to express a lack of interest in patient counseling ($p = 0.01$) and report a lack of adequate knowledge ($p < 0.05$). This trend is likely due to increased clinical exposure, hands-on patient interactions, and confidence that naturally develop with time in practice. Supporting this, evidence shows that pharmacists with greater experience demonstrated significantly better counselling performance and stronger patient engagement skills compared to those early in their careers [30]. However, unlike our findings, a study showed that increased experience was associated with decreased knowledge and a less positive attitude toward asthma management, particularly when working in an independent community pharmacy. Conversely, increased awareness of asthma management guidelines was associated with higher knowledge levels (9).

Regarding gender, females were more likely to report a need for additional training ($p < 0.05$). This may reflect broader gender-related patterns in self-perception among healthcare professionals. Even though women and men do not differ significantly in their actual clinical performance, studies suggest that women in healthcare fields are more likely to perceive deficiencies in their abilities compared to their male counterparts [31]. Lastly, in terms of age, pharmacists aged between 18 and 25 years old were less likely to express interest in patient counselling ($p < 0.05$), similar to students and those with less than 1 year of experience.

The diversity in educational backgrounds among community pharmacy staff may indicate a potential shortage of qualified pharmacists in the region. Such a shortage could lead to significant challenges, including the risk of misunderstandings during medication counselling, improper medication use, and deviations from established standards of pharmacy practice. These issues raise concerns about the quality of patient care and underscore the need for measures to ensure adequate staffing in community pharmacies.

The study has several limitations, including the sample size, which, although adequate for primary observations, may not fully represent the diversity of community pharmacy staff in the region. The study also relied on self-reported data, which introduces the risk of social desirability bias, where participants may have overstated positive behaviours or underreported shortcomings, particularly in areas such as patient counselling and training needs. It also focused on a single region, limiting generalizability. Lastly, potential selection bias may have occurred if pharmacists who were more motivated or professionally engaged were more likely to participate.

4. Conclusion

The majority of pharmacists reported good patient education practices, including informing patients about

the roles of their medications, potential side effects, and proper inhaler techniques, as well as inquiring about the use of concomitant medications. However, notable gaps exist among demographic and educational groups. For instance, participants with a bachelor's degree in pharmacy reported higher patient education practices, while work experience improved patient counseling practices. Females were more likely to seek further training, and students and younger pharmacists were less interested in patient counseling. Most pharmacists reported no barriers related to time, physical space, staffing, or training; however, a quarter of them expressed challenges in these areas, indicating a need for targeted improvements, such as increased staffing and specialised training on asthma education, to enhance patient counselling. Future research could explore patient perspectives on the effectiveness of pharmacist counselling and assess the long-term impact of training interventions on patient outcomes. They could also conduct a simulated patient study to compare the reported behaviour with the actual behaviour.

Acknowledgements

We would like to extend our sincere gratitude and appreciation to all the participants who generously agreed to take part in this study. Their willingness to share valuable insights and experiences was crucial in helping us gather essential data and information for our research.

Conflict of interest

There is no conflict of interest.

Funding

This study received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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