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A Current Assessment of Family Physicians' Knowledge and Attitudes Toward Asthma Management in Primary Care in Turkey According to the GINA Strategy Report

Short Title: ***Family Physicians' Knowledge and Attitudes Regarding Asthma Management***

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Abstract

Asthma is a common respiratory disease that leads to significant morbidity and mortality. Family physicians play a fundamental role alongside pulmonologists in the diagnosis, treatment, and follow-up of asthma. Our study aimed to evaluate the knowledge and attitudes of family physicians in Turkey regarding asthma management in light of the GINA Strategy Report. A total of 596 family physicians from all 12 NUTS regions in the country participated in our cross-sectional analytical study. Data were collected through an online survey prepared by the researchers, referencing the GINA Strategy Report. Descriptive data are presented as numbers and percentages, and differences between independent groups were analyzed using the chi-square test. The majority of participants (96.8%) knew that spirometry is used in the diagnosis of asthma. Regarding asthma control, 11.9% of physicians used the Asthma Control Test, and more than half (61.2%) checked the number of attacks. While only 37.4% correctly understood that the regular use of SABA alone is not part of stepwise treatment, 77.2% correctly indicated that the combination of ICS and formoterol can be used as a reliever and for maintenance in stepwise treatment. About half of the participants believed that high-dose SABA use does not increase the risk of exacerbations (49.7%). A total of 96.9% of physicians reported that they request training in asthma management. Our findings indicate that there are gaps in the implementation of asthma management in primary care and that adherence to the Strategy Report is insufficient.

Keywords: Asthma, Primary Health Care, Family Physicians, Guidelines Adherence, Patient Education as Topic, GINA (Global Initiative for Asthma)

İntroduction

Asthma is a respiratory disease characterized by chronic inflammation of the airways, recurrent shortness of breath, wheezing attacks, and decreased lung function[1]. It affects 4.5% of the global population and caused 455,000 deaths in 2019[2]. Diagnostic methods include medical history, physical examination, spirometry, peak flowmetry, and bronchial challenge testing. Spirometry (with reversibility) is currently considered the "Gold standard" investigation of choice. However, good quality spirometry is not available in some parts of the world, time-consuming and not an easy test for patients. It may also give false-negative results in asymptomatic periods or in patients under ICS treatment. Peak flow

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recording monitor variability in airways obstruction, the diurnal variability of which is significantly increased in uncontrolled asthma. Bronchial challenge testing assesses airway hyperresponsiveness to agents like methacholine or exercise[3,4].

The latest 2025 Strategy Report from the Global Initiative for Asthma Management (GINA) recommends a stepwise treatment approach[5]. Inhaled corticosteroids (ICS) are the most effective anti-inflammatory drugs and form the cornerstone of asthma treatment. Short-acting beta-agonists (SABAs) should not be used alone at any step. The favoured first-line treatment generally involves low-dose ICS plus formoterol in a combination inhaler (known as the AIR approach), followed by maintenance ICS plus formoterol, known as the Maintenance and reliever approach (MART). If symptoms remain uncontrolled, the dose of the combination with a LABA can be increased to medium or high doses, or leukotriene receptor antagonists (LTRAs) can be added. However, caution should be exercised regarding the neuropsychiatric side effects of LTRA's. Ultimately, adjunct treatments such as biologics are considered as a final step[6]. SABA use alone or excessive use can lead to uncontrolled asthma and increased exacerbation risk. The GINA emphasizes that low-dose ICS combined with formoterol is preferred as the primary treatment over SABA alone. Despite this basic recommendation in the Strategy Report, SABA overuse remains a global problem[7,8].

Patient education is vital in managing asthma. Incorrect inhaler use is common and hampers control. The teaching and learning of proper inhaler techniques, avoiding trigger avoidances, and attending regular review follow-up appointments regularly can improve adherence and lower the risk of exacerbations[9]. The Asthma Control Test (ACT) is a simple, five-question scale that primary care physicians can easily administer. The ACT score whether asthma is controlled, partially controlled or uncontrolled in line with GINA recommendations of control assessment. Based on ACT results, treatment plans can be modified[10]. A study of 8,000 patients from eleven European countries found that nearly half of them had uncontrolled asthma[11]. The SABINA III study has shown that inadequate asthma control is a widespread problem across Europe[12]. In Türkiye the policy of reimbursing asthma medications let the family physicians prescribe only when it is reported by a pulmonologist and there are also the difficulties in reaching a pulmonologist, so this may can also affect this situation. A review of current literature shows that various countries use different methods to evaluate asthma control. In China, physicians primarily focus on symptom frequency, while in France, pulmonary function is the primary focus, and in Canada, reliever inhaler use is emphasized. Overall, ACT use remains quite low[13]. Additionally, there is a lack of data on the strategies primary care physicians in our country use for asthma control, which is a gap in the existing research.

The management of asthma requires individualized approaches planned based on evidence-based guidelines, considering patient characteristics and clinical condition. However, low awareness and low use of these guidelines can lead to incorrect diagnosis, poor asthma control and higher costs. Despite yearly updates, a study in Southern Italy found that primary care physicians rarely followed GINA recommendations for managing asthma[14]. Another study revealed that less than half of physicians knew about the updates to GINA Strategy Report[15]. Our research aimed to evaluate primary care physicians assesment in our country and the impact of GINA recommendations by evaluating their knowledge and attitudes to asthma management.

Method

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Design and Ethics

A cross-sectional analytical study was conducted to assess the knowledge levels and attitudes of family physicians working in primary care regarding asthma management. This study received approval from the Izmir City Hospital Non-Interventional Research Ethics Committee (Approval No. 2024/154), and all relevant ethical principles were followed. The data collected were anonymized, and no personally identifiable information about the physicians was gathered.

Participants

This study included general practitioners working in primary care in our country, specialized family physicians, and family medicine resident physicians. General practitioners refer to those who have completed medical school education and transitioned into family medicine. Resident physicians are doctors who perform family medicine during their specialty training. At the same time, specialists are doctors who, in addition to a medical school education, have completed an additional three-year specialization in family medicine. In Turkey, primary care is mainly delivered through Family Health Centres distributed nationwide, and each family physician is responsible for an average of 3,000–3,500 registered individuals. The primary care network provides broad geographical coverage and constitutes the first point of contact for most patients.

The regional classification was based on the proposal of the Nomenclature of Territorial Units for Statistics (NUTS). The distribution of NUTS represents the entire country. Approximately 28,000 family physicians working in Turkey's 12 NUTS regions formed the study population. The minimum sample size representing the population was calculated as 379 with a 95% confidence level and a 5% margin of error. As a result of an online invitation conducted by the Federation of Family Physicians Associations (AHEF) Education Committee nationwide, 596 participants completed the study. Informed consent was obtained from all participants before the study, and participation was voluntary.

Data collection

The research data were collected through an online survey tool developed by the research team, based on the recommendations of the GINA Asthma Strategy Report. The development of the survey was carried out in several stages: First, the researchers created draft questions reflecting the items related to asthma diagnosis, management, medication use, inhaler technique, and comorbidities as outlined in GINA. Then, the draft survey was evaluated for content appropriateness and clinical accuracy by two family medicine specialists and one pulmonologist. Based on the experts' feedback, minor adjustments were made, and the survey was pilot-tested on a small group of family physicians to assess clarity and comprehensibility. The final version of the survey includes questions about informed consent, demographic information, physicians' use of diagnostic tests, following clinic guidelines, medication knowledge, factors affecting patient compliance, inhaler technique, comorbidities, and attitudes toward asthma management in primary care. In our study, knowledge-level questions are multiple-choice, whereas attitude questions are self-assessment.

Data Analysis

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The knowledge levels of physicians and their general approaches to asthma management were analyzed using descriptive statistics such as mean, standard deviation, frequency, and percentage. Data analysis was conducted with IBM SPSS Statistics software version 25. For comparisons between independent groups, the chi-square test was employed, with a p-value <0.05 considered statistically significant. Following the chi-square independence test, differences at the cell level were assessed using Adjusted Residuals as part of post-hoc analysis. An |AR| > 1.96 was used as the cutoff for statistical significance.

RESULTS

Participants' demographic information and guide follow-up status

A total of 596 physicians from 12 different NUTS regions participated in our study, with the highest participation from the Aegean Region at 14.6% (Fig. 1). Among the participants, 52.7% were male and 47.3% were female. According to their titles, 58.7% were general practitioners, 32% were family medicine specialists, and 9.2% were resident physicians. The overall average age was 40.39 years (range, 26-67), the average duration of practicing medicine was 14.73 years (SD, 9.12), and the average time working as a family physician was 7.64 years (SD, 4.87).

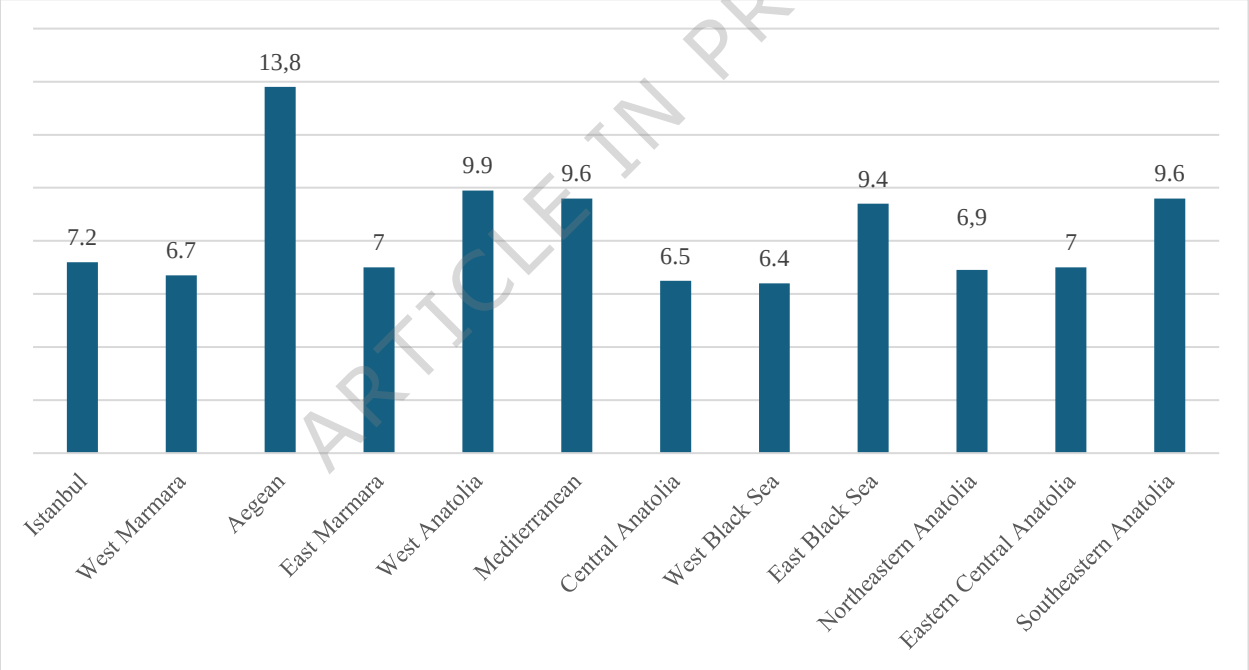


Figure 1: Percentage distribution of NUTS regions where participants performed their tasks

41.1% of the physicians participating in our study have received training related to asthma after graduation. In the past year, 25.8% have read a guideline pertaining to asthma, and 22% have attended a scientific meeting on the subject. Among the factors examined, only the level of specialization of physicians significantly affected whether they had read asthma guidelines, with family medicine specialists showing higher rates of guideline reading (Pearson Chi-square, p = 0.006).

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Participants' knowledge levels regarding asthma diagnosis, treatment, and control

In the question measuring which tests are used for the diagnosis of asthma, 96.8% of physicians were aware of the use of spirometry. Peak flowmetry was known by 73.5% of physicians, while bronchoprovocation testing was known by 66.1%. When asked which medication could be used both as a reliever and for maintenance therapy in asthma, the majority of physicians (77.2%) correctly identified the inhaled corticosteroid plus formoterol combination. The least frequently chosen option was terbutaline (5.2%) (Figure 2).

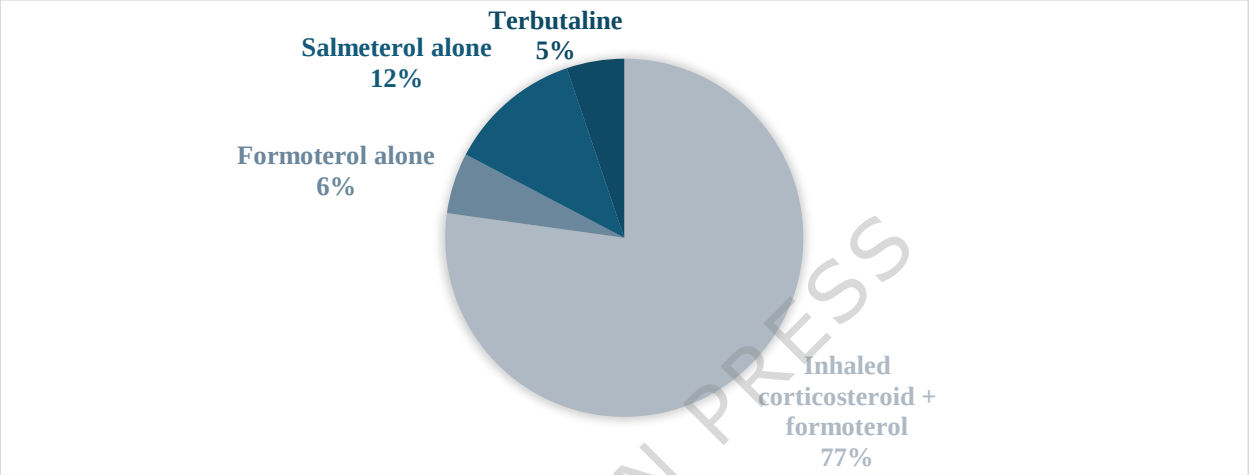


Figure 2: The percentages of participants' responses to both the reliever and maintenance medication questions

In the subgroup analysis of responses regarding the medication used both as a reliever and for maintenance, general practitioners selected the correct options (ICS + formoterol) significantly less frequently than expected, while selecting incorrect options (salmeterol alone and terbutaline) significantly more often (Table 1).

Table 1: Analysis of the responses given by doctors regarding the drug groups used reliever treatment, according to their titles

	ICS+Formeterol	Formoterol	Salmeterol	Terbutaline	Total
General Practitioner	258 (%73,7) AR: -2,4	13 (%3,7) AR: -2,3	50 (%14,3) AR: 2,0	29 (%8,3) AR: 4,0	350 (%100)
Specialist Doctor	156 (%81,7) AR: 1,8	16 (%8,4) AR: 2,1	19 (%9,9) AR: -1,1	0 (%0,0) AR: -3,9	191 (%100)
Resident Physicians	46 (%83,6) AR: 1,2	4 (%7,3) AR: 0,6	3 (%5,5) AR: -1,6	2 (%3,6) AR: -0,5	55 (%100)
Total	460 (%77,2)	33 (%5,5)	72 (%12,1)	31 (%5,2)	596 (%100)

AR: adjusted residual, row percentage has been used.

In the question investigating the knowledge of the stepwise treatment recommendations in the GINA guide, 37.4% of physicians correctly identified that regular SABA use is not part of stepwise treatment. The non-pharmacological

interventions that should be performed as the first step in asthma treatment, such as patient education, management of comorbidities, smoking cessation, exercise recommendations, weight loss, and vaccination, were known by 94.1% of physicians. The common feature of different inhaler devices, which is holding the breath for 10 seconds after inhalation, was identified as the shared response by 73.5% of physicians. In the question evaluating the factors affecting physicians' patient-device compatibility, 94.1% of physicians chouse the corrent answer about the use of correct technique, patient education, and appropriate inhaler selection were effective. In the question about incorrect information regarding inhaled corticosteroids, which are used as the primary treatment for asthma, 79.5% of physicians responded that medication should not be used when symptoms have subsided.

In response to the question of which methods physicians use to assess asthma control, 61.2% of physicians answered by looking at the number of exacerbations. The proportion of physicians using an asthma control test was found to be 11.9% (Figure 3). (Note: Sputum eosinophilia testing is not available in family health centers in Türkiye. For this evaluation, the patient must be referred to a higher-level healthcare facility)

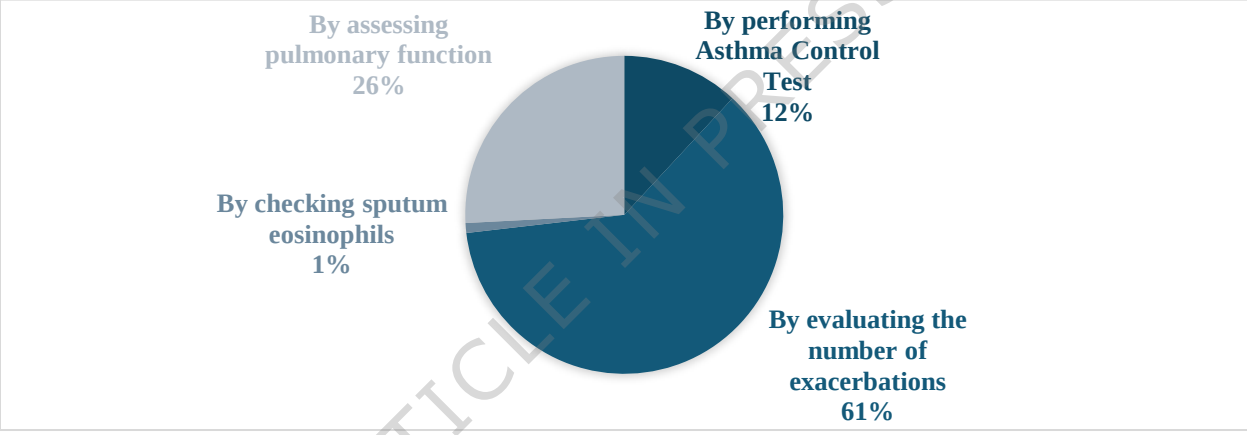


Figure 3: Methods used by physicians to assess asthma control

When physicians were evaluated based on their reading of the asthma guideline over the past year, the proportion of those who applied the asthma control test was significantly higher among those who read the guideline compared to those who did not ($p<0.001$). In subgroup analyses investigating the method used to assess asthma control, it was observed that general practitioners gave a significantly higher response based on their assessment of respiratory functions than expected. In contrast, resident and specialist physicians based their responses on the number of attacks. However, as these findings are self-reported, the possibility of bias should be acknowledged (Table 2).

Table 2: Analysis of the responses given by physicians regarding the assessment of asthma control according to their titles

	By performing the Asthma Control Test	By evaluating the number of exacerbations	Based on the eosinophil count in sputum	According to pulmonary function tests	Total

General Practitioner	39 (%11,1) AR: -0,7	196 (%56,0) AR: -3,1	6 (%1,8) AR: 2,1	109 (%31,1) AR: 3,5	350 (%100)
Specialist Doctor	29 (%15,2) AR: 1,7	128 (%67,0) AR: 2,0	0 (%0,0) AR: -1,7	34 (%17,8) AR: -3,1	191 (%100)
Resident Physicians	3 (%5,5) AR: -1,6	41 (%74,5) AR: 2,1	0 (%0,0) AR: -0,8	11 (%20,0) AR: -1,0	55 (%100)
Total	460 (%77,2)	33 (%5,5)	72 (%12,1)	31 (%5,2)	596 (%100)

AR: adjusted residual, row percentage used.

The majority of participants (90.9%) considered the need for patients to use a reliever inhaler medication / SABA as an indication that asthma is not under control. However, nearly half of the participants (49.7%) believed that high-dose SABA use would not increase the risk of exacerbation. Regarding comorbid conditions such as allergic rhinitis, gastroesophageal reflux, and obstructive sleep apnea, 82.6% of physicians provided correct answers.

Participants' attitudes towards asthma management

When evaluating attitudes related to the management of asthma, 27.7% of participants agree that they are confident in diagnosing asthma, 11.9% feel they have sufficient knowledge about the medications used in asthma treatment, 16.8% believe they are satisfied in adjusting therapy for a patient diagnosed with asthma, 6.7% actively participate in follow-up care of asthma patients, including medication changes, 52.7% think asthma should be treated primarily in primary care, 60.7% feel confident in intervening with a patient presenting with an acute asthma attack, and 19.6% would like to or currently serve as the primary physician in the diagnosis and treatment of childhood asthma patients (Table 3).

Table 3: Responses of physicians to attitude questions regarding asthma management

	Yes	No	Partly
I am confident in my ability to diagnose asthma in adults.	27,7	25	47,3
I have sufficient knowledge about the medications used in asthma treatment.	11,9	30,7	57,4
I trust myself in arranging treatment for a patient diagnosed with asthma.	16,8	33,4	49,8
I take an active role in the follow-up of asthma patients, including changing medications.	6,7	63,1	30,2
Do you think it is necessary to treat asthma in primary care?	52,7	24,5	22,8
I trust myself in managing a patient presenting with an acute asthma attack at a family health center.	60,7	13,8	25,5
Would you like to / Do you take a primary physician role in the diagnosis and treatment of childhood asthma patients?	19,6	48,2	32,2

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Regarding asthma management, 39.6% of participants responded that they inquire whether their patients' asthma is under control/test, and 59.1% answered that they remind patients about trigger prevention measures and inhaler usage techniques (Table 4).

Table 4: Other responses given by physicians to attitude questions regarding asthma management

	Yes	No	Partly
I assess whether asthma patients have their condition under control.	39,6	20,5	39,9
I remind asthma patients about preventive measures against triggers and proper inhaler techniques.	59,1	6,7	34,2

When asked about the number of asthma patients among their registered patients, 39.4% of the physicians participating in the study responded 'I don't know,' 25.5% reported between 50 and 99, 20.6% stated fewer than 50, and 14.4% reported 100 or more. The percentage of those who want to receive face-to-face training on asthma diagnosis, treatment, and follow-up is 64.9%, those who prefer online training is 32%, and those who do not want to receive training is 3%.

Discussion

In our study, among 596 participating physicians, 58.7% are general practitioners, 32% are family medicine specialists, and 9.2% are resident physicians. In our country, out of 101,233 physicians, 54.2% are general practitioners, 25.7% are family medicine specialists, and 2.7% are family medicine residents[16]. The percentage of general practitioners in our study aligns with the national average. In contrast, the differences in the percentages of family medicine specialists and residents are related to the exclusion of specialists from other branches in our study. The percentage distribution of physicians practicing family medicine in our country according to their level of specialization is not clearly known due to the recent changes in the specialization training system and the lack of sharing in official sources.

41.1% of the physicians participating in our study had received training related to asthma after graduation. In the past year, 25.8% had read an asthma guideline, and 22% had attended a scientific meeting related to asthma. A previous study conducted in our country found that approximately one-third of physicians had read an asthma guideline[17]. The lower rate in our study may be due to focusing on the past year. Having specialized training increased the guideline reading rate compared to general practitioners. It is thought that this difference may be related to the awareness created by scientific studies conducted during specialization training. Specialty students go through seminars, journal club hours, council-like activities, and processes such as writing articles and preparing theses[18]. The fact that only one in four physicians follow guidelines, the absence of a national guideline prepared by family medicine academics, insufficient integration with pulmonologists, inability to allocate enough time to patients, and similar reasons may prevent guideline recommendations from being reflected in clinical practice. Furthermore, the active role of specialists in supporting and training primary care physicians is essential but may be insufficient in current practice.

In our study, 96.8% of the physicians reported that they know spirometry is used in the diagnosis of asthma, 73.5% stated that Peak Flowmetry is used in the diagnosis of asthma, and 66.1% knew that bronchoprovocation testing is also used in asthma diagnosis. In a previous study, 66.3% of physicians reported not using spirometry or peak flow meters in their clinical practice, while 6.6% used peak flow meters and 3.7% used spirometry. The percentage of family physicians who received training in spirometry was 32.1%, and those trained in peak flowmetry was 28.4%[19]. Although the use of these tests was not investigated in our study, these similar results suggest that theoretical knowledge does not sufficiently translate into clinical practice. The reason for this gap may be the lack of accessibility, availability, and reimbursement for tests such as spirometry, FeNO, or eosinophil measurements in sputum in routine primary healthcare services. Additionally, the fact that a quarter of physicians are unaware of peak flowmeters, which are mandatory in every family health center, increases the likelihood of a knowledge gap among primary care physicians during the asthma diagnosis process. In a previous study, the most common reason for not using diagnostic tests was that physicians believed these tests were ineffective in family medicine practice, and the second most common reason was a lack of knowledge on how to use them. This situation suggests that doctors' assessment of the tests as ineffective may actually stem from a lack of proficiency in their use. This concerning result may reflect a deficiency in physicians' prescribing and reporting authority, which impacts the diagnostic process. Another possible reason, as observed in our study, is the limited habit of guideline reading among family physicians.

Regarding the medication group used both as a reliever and maintenance in asthma, the majority of physicians (77.2%) correctly identified it as the ICS + formoterol combination. The option with the lowest percentage was Terbutaline, at 5.2%. In the question investigating knowledge of the stepwise treatment recommendations in the GINA Strategy Report, only 37.4% of physicians correctly recognized that regular use of SABA is not part of the stepwise treatment. In a local field study, 77.3%[20] of family physicians stated that “SABA use alone can be continued when needed' in pediatric asthma treatment. Looking at the content of this study, data were collected in 2018. At that time, the GINA strategy reports still allowed the continuation of as-needed SABA use in children. The updated GINA recommendations discouraging SABA monotherapy were introduced later, in 2019–2020. Therefore, the physicians’ responses in that study should be interpreted within the context of the Strategy Report recommendations available during the data collection period. The use of SABA alone is no longer recommended, and the low-dose ICS+Formoterol combination is the preferred treatment[7,21]. This combination, which is the first-line recommendation in the stepwise treatment approach, is also considered a feasible treatment regimen by family physicians in the guidelines. Most of our participants also practice accordingly. However, in our study, only one in three physicians responded that regular SABA use has no place in stepwise treatment, which may be due to non-compliance with guidelines and old treatment habits. In a study involving pulmonologists, allergists, and immunologists in our country, it was observed that full adherence to the guidelines in asthma stepwise treatment was only 33.8%. The main barriers of physicians to use guidelines in this study concern the fear of worsening patient clinical conditions and patient preferences[22]. Future studies should also examine the challenges to guideline adherence among primary care physicians.

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In our study, nearly half of the participants (49.7%) believed that high-dose SABA use does not increase the risk of exacerbation. This result suggests that physicians are not hesitant to prescribe high-dose SABA and also provides insight into the increased number of SABA prescriptions. Before 2019, the Global Initiative for Asthma (GINA) Strategy Report recommended the use of short-acting β2-agonists (SABAs) as a reliever therapy when needed. In the updated GINA recommendations in 2019, due to the increased side effect potential of SABA when used as a reliever, the use of ICS+Formoterol was recommended instead of SABA[23]. The findings of our study are concerning regarding the overuse of SABA. To investigate the source of this problem, the SABA Use in Asthma (SABINA) program was conducted, examining SABA and ICS use and their clinical outcomes worldwide[12]. The first report from Europe indicated that excessive use, defined as at least three canisters of SABA per year, was 9% in Italy, 16% in Germany, 29% in Spain, 30% in Sweden, and 38% in the United Kingdom[24]. Overprescription of SABAs (≥3 canisters prescribed in the last 12 months) and inadequate combination with ICS-containing medications are among the leading causes of exacerbations. The SABINA III study also found that a quarter of patients with excessive SABA prescriptions obtained additional SABA OTC, and in these groups, asthma worsening was significantly higher. According to the SABINA study, the rate of using more than three SABA per year in our country was found to be 23.9%.[25,26]. This also suggests that this trend continues in our country.

In our study, non-pharmacological interventions, such as patient education in primary care for asthma treatment, management of comorbidities, smoking cessation, exercise recommendations, weight loss, and vaccination, were known to 94.1% of physicians. As a common feature of different inhaler devices, holding the breath for 10 seconds after inhalation was identified as the correct answer by 73.5% of physicians. Regarding patient device compliance, proper technique, patient education, and appropriate inhaler selection, 91.4% of physicians were correctly aware. For questions related to comorbid conditions such as allergic rhinitis, gastroesophageal reflux, and obstructive sleep apnea, 82.6% of physicians provided correct responses. When these results are evaluated, the management of non-pharmacological factors, device use, ensuring device adherence, and knowledge of comorbidities were found to be at a very high level in our study. This indicates the areas that need improvement in asthma management. Checking whether patients are using inhaler techniques correctly and monitoring their treatment adherence are very important for treatment success. Despite physicians having good knowledge of device use, slightly more than half still explain medication use to patients, and one of the most common issues observed in asthma control remains incorrect inhaler use[27].

In response to the question of which methods physicians use to assess asthma control, 61.2% of physicians answered by looking at the number of attacks. The proportion of physicians using the Asthma Control Test was found to be 11.9%. The Asthma Control Test consists of 5 multiple-choice questions that include a 4-week recall about symptoms, activity limitations, use of reliever inhalers, and the patient's perception of control [10,28]. The very low use of this practical tool in primary care warrants further investigation. A plausible explanation is that the increasing outpatient workload limits the time physicians can dedicate to structured assessment tools. In this context, the Royal College of Physicians (RCP) Three Questions, a validated three-item screening tool for routine asthma assessment, may represent a more feasible alternative for busy primary care settings and should be considered in future work[29].

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When evaluating attitudes related to the management of asthma, more than half of the participants believe that asthma should be treated primarily at the primary care level. However, 27.7% of them agree that they are confident in diagnosing asthma, 11.9% feel they have sufficient knowledge about the medications used in asthma treatment, 16.8% trust their ability to adjust therapy for a patient diagnosed with asthma, 6.7% actively participate in follow-up and medication changes for asthma patients, and 19.6% want to or currently take on the role of primary physician in the diagnosis and treatment of childhood asthma.

One of the most important findings in our study is the inconsistency between participants' high self-perceptions of managing asthma treatment and their low self-confidence in diagnosing or treating the disease. This contradiction likely reflects a gap between theoretical knowledge and practical competence. Self-reported knowledge generally indicates familiarity with guideline terminology rather than the ability to apply recommendations during clinical encounters with patients. Additionally, asthma management requires hands-on skills that are not routinely reinforced in primary healthcare settings. Time constraints and deficiencies in access to structured asthma management training further increase the gap between perceived competence and actual proficiency. Our findings primarily highlight the need for training programs that will contribute to clinicians' practical skills. In our study, approximately 96.9% of physicians interested in training prefer face-to-face education. This is promising for strengthening asthma management in primary care through a practice-based training program, with the involvement of pulmonology specialists.

Strengths and weaknesses of the study

The participation of physicians from different NUTS regions across Turkey provides a broad sample data set that is generalizable. The fact that our survey was prepared based on the current guideline reference demonstrates the practical application of new treatment regimens. Additionally, the results that emerged regarding issues such as SABA overuse can directly contribute to health policies. The physicians' training requests concerning asthma management have also served as a guide for specialty training and in-service education. Despite these strengths, there are some limitations to the study. Firstly, since the data are based on self-reporting, responses may be biased. Furthermore, the cross-sectional design of our study does not permit the establishment of cause-and-effect relationships. The voluntary nature of participation may have led to a higher participation rate among physicians interested in the subject. The questionnaire used was researcher-designed and not formally validated, which could limit the reliability of the measurements. Although physicians from all NUTS regions were included, uneven participation across regions may affect the generalizability of the findings. A scale that has undergone validity and reliability assessment was not used in the study. This may pose a limitation in terms of reliability. However, the fact that the questions were prepared based on GINA recommendations partially mitigates this limitation. The absence of outputs such as clinical records and prescription data prevented validation of the results. Finally, the study did not incorporate objective clinical or prescription data, nor did it explore the underlying reasons for limited guideline adherence, both of which would be valuable directions for future research.

Future research and policy recommendations

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According to the results of our study, it is necessary to increase post-graduation asthma education programs, identify barriers to guideline reading habits, and develop guidelines for primary care physicians. Awareness-raising education and patient information strategies regarding SABA overuse should be developed. The reasons for the practical non-implementation of the asthma control test, which patients can easily answer and does not require an invasive approach, should be investigated. Multidisciplinary collaboration, training, and feedback mechanisms integrated with pulmonologists that will boost the confidence of primary care physicians are also necessary. It is important that all specialties—pediatrics, geriatrics, cardiology, ENT, dermatology, gynecology, and others—expect that primary care is aware of and follows their numerous guidelines, which run into thousands of pages to digest.

Conclusion

In this study, the knowledge and attitudes of family physicians working in primary care regarding asthma management were evaluated using a questionnaire prepared based on the GINA Asthma Strategy Report. It was observed that physicians' adherence to the guidelines was inadequate and that guideline updates were not reflected in clinical practice. According to our findings, only a quarter of the physicians had read an asthma guideline in the past year. Our study was conducted with physicians from all 12 NUTS regions of our country, making it significant in revealing the current state of asthma management in primary care according to the latest GINA Strategy Report. Our findings highlight the need to increase guideline adherence and compliance in clinical practice, address clinical issues such as excessive SABA use, and identify barriers to primary care physicians' participation in the asthma treatment process. Although the results provide important insights into asthma management in primary care, the methodology used prevented the analysis of clinical outcomes, especially regarding issues like SABA overuse. In summary, this research revealed the current adherence of family physicians in our country to guidelines and their clinical approaches to asthma management. Future studies aimed at overcoming barriers to guideline adherence, identifying the needs for more active participation of family physicians in asthma management, and preventing the overuse of inappropriate medications through updated health policies will contribute to improving asthma management in primary care.

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Declarations

Ethics declarations: Ethics approval was obtained prior to the commencement of the study (Izmir City Hospital Non-Interventional Research Ethics Committee Ref No. 2024/154).

Consent for Publication: Not applicable

Competing interests: The authors declare no competing interests.

Author Contributions: Authors I.C., U.G.B. and A.Y. contributed to the study conception and design. Material preparation, data collection and analysis were performed by I.C., U.G.B. and A.Y. were a major contributor in the results interpretations and writing of the manuscript. All authors commented on previous versions of the manuscript. I.C. polished this article. Authors I.C., U.G.B. and A.Y.read and approved the final manuscript.

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