Journal of Endocrinology, Tropical Medicine, and Infectious Disease (JETROMI)
Journal homepage: https://talenta.usu.ac.id/jetromi

FACTORS INFLUENCING GENERAL PRACTITIONERS' KNOWLEDGE OF ASTHMA MANAGEMENT IN PRIMARY HEALTH FACILITIES IN MEDAN CITY

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ARTICLE INFO

Article history:
Received 15 May 2025
Revised 26 May 2025
Accepted 30 October 2025
Available online 01 November 2025

E-ISSN: 2686-0856
P-ISSN: 2686-0872

How to cite:
Vinda Sari Ermiza Nasution, Amira Permatasari Tarigan[2*], Andika Pradana[2], Rina Amelia (2025). Factors Influencing General Practitioners' Knowledge Of Asthma Management In Primary Health Facilities In Medan City. Journal of Endocrinology, Tropical Medicine, and Infectious Disease (JETROMI), 7(4), 173-181. (make in IEEE style)

ABSTRACT

Background: Asthma is a chronic respiratory disease caused by inflammation, making the airways hypersensitive to triggers and leading to recurrent symptoms. Adequate knowledge of asthma management among general practitioners is essential to improve patient care, reduce disease severity, and prevent mortality. This study aimed to identify factors influencing general practitioners' knowledge of asthma management in primary health facilities in Medan City.

Method: A cross-sectional study was conducted involving 90 general practitioners selected through consecutive sampling. Data collected included respondent characteristics such as age, length of service, number of asthma patients treated monthly, source of knowledge, history of asthma management training, and level of knowledge. A validated and reliable questionnaire was used (Guttman scale r=0.489; Cronbach's alpha=0.93). Statistical analysis using SPSS included chi-square and Fisher's exact tests to assess relationships between variables.

Result: The research showed that most general practitioners had enough knowledge (54.4%) about asthma management. Significant associations were found between age (p=0.034) and source of knowledge (p=0.048) with the level of knowledge. Other variables showed no significant relationship.

Conclusion: Age and source of knowledge significantly influence general practitioners' knowledge of asthma management in primary health facilities, highlighting the need for targeted educational interventions.

Keywords: Knowledge, GP, Asthma, Primary Health Facilities

ABSTRAK

Journal of Endocrinology, Tropical Medicine, and Infectious Disease (JETROMI) Vol.07, No.04 (2025) 173 - 181

http://doi.org/10.32734/jetromi.v7i4.20831

***Latar Belakang**: Asma adalah penyakit pernapasan kronis yang disebabkan oleh peradangan, membuat saluran udara hipersensitif terhadap pemicu dan menyebabkan gejala berulang. Pengetahuan yang memadai tentang manajemen asma di kalangan dokter umum sangat penting untuk meningkatkan perawatan pasien, mengurangi tingkat keparahan penyakit, dan mencegah kematian. Penelitian ini bertujuan untuk mengidentifikasi faktor-faktor yang mempengaruhi pengetahuan dokter umum tentang penanganan asma di fasilitas kesehatan primer di Kota Medan.*

***Metode:** Studi cross-sectional dilakukan dengan melibatkan 90 dokter umum yang dipilih melalui pengambilan sampel berturut-turut. Data yang dikumpulkan meliputi karakteristik responden seperti usia, lama kerja, jumlah pasien asma yang dirawat setiap bulan, sumber pengetahuan, riwayat pelatihan manajemen asma, dan tingkat pengetahuan. Kuesioner yang divalidasi dan dapat diandalkan digunakan (skala Guttman r=0,489; Alfa Cronbach=0,93). Analisis statistik menggunakan SPSS mencakup chi-square dan uji tepat Fisher untuk menilai hubungan antar variabel.*

***Hasil**: Penelitian menunjukkan bahwa sebagian besar dokter umum memiliki pengetahuan yang cukup (54,4%) tentang manajemen asma. Ditemukan hubungan yang signifikan antara usia (p=0,034) dan sumber pengetahuan (p=0,048) dengan tingkat pengetahuan. Variabel lain tidak menunjukkan hubungan yang signifikan.*

***Kesimpulan:** Usia dan sumber pengetahuan secara signifikan mempengaruhi pengetahuan dokter umum tentang manajemen asma di fasilitas kesehatan primer, menyoroti perlunya intervensi pendidikan*

***Kata kunci:** Pengetahuan, GP, Asma, Fasilitas Kesehatan Primer*

1. Introduction

Asthma is a chronic disease of the respiratory tract due to the inflammatory process (inflammation). Hence, the respiratory tract becomes sensitive to the entry of foreign objects that cause hypersensitive reactions. As a result, the respiratory tract becomes narrow and reduces the amount of air entering the lungs. This causes wheezing, coughing, chest tightness, and difficulty breathing, especially at night and early morning [1].

The risk factors that influence the development of asthma are interactions between host factors and environmental factors. Host factors include genetic predisposition that influences the development of asthma, allergies (atopy), bronchial hyperresponsiveness, gender, and race. Environmental factors play a role in individuals who have risk factors for asthma to develop asthma, causing exacerbations and persistent asthma symptoms. Ecological factors are allergens, exposure in the workplace, cigarette smoke, air pollution, respiratory infections, diet, and socioeconomic status [2]. Unlike earlier studies focused on hospital care or patient adherence, this study examines the knowledge of general practitioners in primary healthcare, key providers in frontline asthma management. Focusing on Medan City, it offers underexplored insights into community-level practices and highlights knowledge gaps that can inform targeted education and policy improvements.

Asthma is a chronic respiratory disease that affects 1-18% of the world's population. The increasing prevalence of asthma is also strongly correlated with the high risk of allergies, a trend observed over the past 40 years. Globally, about 300 million people suffer from asthma, with 250,000 deaths each year. Based on data, the World Health Organization (WHO) estimates that by 2025, the number of asthma sufferers will increase by 100 million people [3]. Given this alarming trend, even descriptive

research such as this study holds significant urgency and value. Understanding the current level of knowledge among general practitioners regarding asthma management, particularly in primary health facilities, is crucial for informing targeted educational strategies and health policies. This baseline data can serve as a foundation for future interventional studies and supports efforts to improve asthma care, reduce complications, and ultimately lower asthma-related morbidity and mortality.

The prevalence of asthma in Indonesia is approximately 4%, with Riskesdas 2018 reporting a national rate of 2.4%. The highest provincial prevalence was recorded in Yogyakarta (4.5%), while North Sumatra reported the lowest (1.0%) [4]. Despite the low regional prevalence, ensuring adequate asthma management remains critical. This study aims to identify factors influencing general practitioners' knowledge of asthma management in primary health facilities in Medan City, to support improvements in clinical practice and patient outcomes. This study aimed to identify factors influencing general practitioners' knowledge of asthma management in primary health facilities in Medan City.

2. Methods

This research is analytical and uses a cross-sectional approach regarding factors that influence general practitioners' knowledge of asthma management at Primary Health Facilities in Medan City. This research was conducted for 6 months, starting from the proposal being approved and receiving a letter of approval from the Health Research Ethics Commission of the Faculty of Medicine, Universitas Sumatera Utara, with research number 1127/KEPK/USU/2024.

The sample was selected using consecutive sampling. The inclusion criteria for this study were general practitioners working at primary health facilities in Medan City who had a practice permit and were willing to participate in the study by signing an informed consent. The exclusion criteria were general practitioners on leave or not actively working.

This study used a questionnaire on general practitioners' knowledge of asthma management with a total of 14 questions. The formula used to measure the percentage of answers obtained according to Arikunto (2016) is good (76%-100%), enough (56%-75%), and not enough (<56%). The questionnaire has been tested for validity and reliability, with the results of the r count of the Guttman scale questionnaire of 0.489 being valid, and the Cronbach's alpha value of 0.93 being reliable. Bivariate analysis was performed using the SPSS 22 software. Chi-square and Fisher's exact tests were used according to the sample size considered. If the p-value <0.05 is considered statistically significant.

3. Results

The total number of respondents selected in the study was 90 samples consisting of 45 respondents from health centers and 45 respondents from private clinics. Based on Table 1, regarding the number of asthma patients treated monthly, most general practitioners managed fewer than 10 patients (81.1%), while 18.9% handled 10–20 patients. The primary source of knowledge about asthma management was GINA guidelines (42.2%), followed by textbooks (30.0%) and workshops/seminars (27.8%). A majority of respondents (64.4%) had no history of asthma management training, while 35.6% had received such training. In terms of knowledge level, 54.4% had enough knowledge, 35.6% had good knowledge, and 10.0% had not enough knowledge

Journal of Endocrinology, Tropical Medicine, and Infectious Disease (JETROMI) Vol.07, No.04 (2025) 173 - 181

Table 1. Distribution of Respondents' Demographics at Primary Health Facilities

Characteristics	n	(%)
Age (Years)		
<30	28	31.1
30-40	28	31.1
40-50	22	24.4
>50	12	13.3
Number of Patients Treated		
<10	73	81.1
10-20	17	18.9
Source of Knowledge		
Textbook	27	30.0
GINA	28	42.2
Workshop/Seminar	25	27.8
Asthma Management Training		
Yes	32	35.6
No	58	64.4
GP Knowledge		
Good (>75%)	32	35.6
Enough (50-74%)	49	54.4
Not Enough (<50%)	9	10
Total	90	100.0

The analysis based on age shows that among 28 general practitioners under 30 years old, 46.4% had good knowledge, 42.9% had enough knowledge, and 10.7% had not enough knowledge. In the 30–40 year age group, only 14.3% had good knowledge, while 67.9% had enough knowledge, and 17.9% had not enough knowledge. Among those aged 40–50 years, 36.4% had good knowledge, 59.1% enough, and 4.5% not enough. In the group over 50 years old, 58.3% had good knowledge, and 41.7% had enough knowledge. A chi-square test indicated a significant association between age and the level of knowledge among general practitioners ($p = 0.034$).

Based on the length of work, among 37 general practitioners with less than 5 years of experience, 35.1% had good knowledge, 45.9% enough, and 18.9% in enough. In the 5–10 years category, 36.4% had good knowledge and 63.6% enough, with none having enough knowledge. For those with over 10 years of experience, 35.7% had good knowledge, 59.5% enough, and 4.8% not have enough. The statistical test showed no significant association between length of work and knowledge level ($p = 0.195$).

The number of patients handled per day also showed no significant effect on knowledge level ($p = 0.516$). Among 73 doctors handling fewer than 10 patients daily, 38.4% had good knowledge, 52.1% enough, and 9.6% inenough. In the group handling 10–20 patients, 23.5% had good knowledge, 64.7% enough, and 11.8% in enough.

Sources of knowledge were significantly associated with knowledge levels ($p = 0.048$). General practitioners who used the GINA guidelines had the highest proportion of good knowledge (47.4%) compared to those relying on textbooks (33.3%) or seminars/workshops (20%).

A history of asthma management training did not show a significant association with knowledge levels (p = 0.105). Among those who had received training, 43.1% had good knowledge, while among those who had not, only 21.9% had good knowledge.

The type of health facility was significantly associated with knowledge levels (p = 0.024). General practitioners working in Community Health Centers had a higher proportion of good knowledge (44.4%) compared to those working in clinics (26.7%).

Table 2. Factors Influencing General Practitioners' Knowledge of Asthma Management in Primary Health Facilities

Variables	Category	Good n (%)	Enough n (%)	Not Enough n (%)	Total n (%)	p-value
Age (year)	<30	13 (46.4)	12 (42.9)	3 (10.7)	28 (31.1)	0.034
	30–40	4 (14.3)	19 (67.9)	5 (17.9)	28 (31.1)	
	40–50	8 (36.4)	13 (59.1)	1 (4.5)	22 (24.4)	
	>50	7 (58.3)	5 (41.7)	0 (0.0)	12 (13.3)	
Number of Patients Handled	<10	28 (38.4)	38 (52.1)	7 (9.6)	73 (81.1)	0.516
	10–20	4 (23.5)	11 (64.7)	2 (11.8)	17 (18.9)	
Source of Knowledge	Textbook	9 (33.3)	13 (48.1)	5 (18.5)	27 (30.0)	0.048
	GINA	18 (47.4)	19 (50.0)	1 (2.6)	38 (42.2)	
	Workshop/ Symposium	5 (20.0)	17 (68.0)	3 (12.0)	25 (27.8)	
Training History	Yes	7 (21.9)	22 (68.8)	3 (9.4)	32 (35.6)	0.105
	No	25 (43.1)	27 (46.6)	6 (10.3)	58 (64.4)	
Type of Health Facility	Health Center	20 (44.4)	24 (53.3)	1 (2.2)	45 (50.0)	0.024
	Clinic	12 (26.7)	25 (55.6)	8 (17.8)	45 (50.0)	

4. Discussion

The age distribution in this study showed that the age group <30 years and the age group 30-40 years dominated, with a percentage of 31.1%. In this study, there was a significant influence between age and knowledge of asthma management (p=0.034). Based on research conducted by Wulandari [5], older individuals tend to have maturity in thinking and behaving, so they have better thinking than younger individuals. Research conducted by Hanifah et al. found that each age group has a different way of thinking; the older a person is, the higher the assessment given to something. The adult age group has an optimal way of thinking and decision-making, so it affects the assessment of something [6]. This is in line with research by Assiri et al. in 2021, the age characteristics of the most general practitioner respondents who took part in the study were those aged between 30 and 35 years, with 64.5%, and had better knowledge (p = 0.013) [7]. This study is also in line with research by Sirait et al. in 2023, based on the age characteristics of respondents, the majority were in the 31-40 years age range, of 34%, followed by the 41-50 years age range, with 29%, and over 60 years of age, 2% [8]. According to the researcher's observation, the age group of general practitioners who are most numerous is under 30 years old, because many general practitioners continue to work after completing an internship program to improve their knowledge and experience in practicing as general practitioners. The age range of general practitioners 30-40 is also often found in this study because it is a productive age for general practitioners who have experience in working.

Distribution of general practitioners with a length of service >10 years found as many as 42 respondents (46.7%). In this study, there was no influence of the length of service and general practitioners' knowledge of asthma management (p = 0.195). A study by Nguyen et al. in 2017 shows

the majority of general practitioners' length of service was found to be 1-10 years, amounting to 43% [9]. A research study by Lutete et al. in 2023 reported that most doctor respondents who participated in the study had a work history of 6-10 years, amounting to 37.3% [10]. This study is in line with the results of research by Bornstein et al. in 2017 and Igol et al. in 2015, where they stated that general practitioners with a shorter length of service have better medical knowledge when compared to general practitioners who have worked for a long time. This is related to the year of graduation of these general practitioners and the latest information received during lectures by younger doctors. In the meantime, general practitioners with more years of experience have seen a lot of situations that can alter their perspective on a disease [11,12]. Individual factors, such as intelligence, comprehension, memory, and motivation, can influence the level of knowledge [13].

The largest number of asthma patients treated by a general practitioner in 1 month is <10, amounting to 81.1%. In this study, there was no effect of the number of asthma patients treated by general practitioners in 1 month on the general practitioner's knowledge of asthma management (p=0.516). This study is in line with the study of Dairi in 2022, reporting that the average number of patients treated was <10 patients (36%), and there was no effect between the number of asthma patients treated and the general practitioner's knowledge of asthma management, with an OR of 1 (95% CI: 0.67-1.63) [14]. Asthma is one of the non-specialist diseases (competency level 4) that must be treated in primary health care and should not be referred. In a study conducted by Utami et al. in 2017, due to the availability of incomplete equipment and medicines, many asthma patients were referred to more complete health facilities, such as hospitals, so many asthma patients were referred and not treated at primary health facilities [15].

Most knowledge sources regarding management were obtained from the latest asthma guidelines (GINA) at 42.2%, followed by textbooks at 30%, and there was an influence between the source of knowledge and general practitioners' knowledge regarding asthma management (p = 0.048). This is in line with research conducted by Yousef et al. in 2015, where the source of knowledge most widely used by general practitioners was the GINA guidelines at 17.37% [16].

The study by Assiri et al. in 2021 also reported that the most widely used source of knowledge in the majority of general practitioners who participated in the study was the GINA guideline at 61.5%, followed by textbooks at 26% and workshops at 11.5%. There was an influence between the source of knowledge and general practitioners' knowledge of acute asthma (p = 0.066) [7]. The GINA guidelines for managing asthma suggest five treatment steps and guide the initiation of treatment and making adjustments based on the patient's current circumstances. Nonetheless, many countries' primary care systems make it extremely challenging to adhere to regulations [16,17].

In this study, it was found that the majority of general practitioners did not have a history of previous asthma management training of 64.4%, while general practitioners who had a history of prior asthma management training 35.6% and in this study, there was no effect of asthma management training history on general practitioners' knowledge of asthma management (p = 0.105). This study is not in line with the study of Assiri et al. in 2021, where 60% of general practitioner respondents had received asthma management training [7].

In a study conducted by Der Vleuten et al., it was found that there was a significant change in knowledge and skills caused by participating in training. General practitioner training can play a role in updating information and improving general practitioner skills in case management based on the latest procedures according to developments [18].

According to research conducted by Salmi et al. in 2015, the cause of the insignificant relationship between general practitioner knowledge and asthma training history may be due to errors in transferring the training. It could be because the training that was followed was still conceptual and not yet applicable, so participants who took the training could not apply it to the field of work that required these skills [19].

Guideline-focused asthma management training is needed in primary care. Well-resourced primary care is essential, as training in asthma management can improve the ability of general practitioners to manage asthma well and trigger clinical improvement in asthma patients [20].

In this study, the majority of general practitioners who participated in the study had enough knowledge of asthma management of 54.4%, followed by respondents who had good knowledge of 35.6%, and general practitioners who had insufficient knowledge of 10.0%. Another study also showed that Dairi's study on general practitioners' knowledge and asthma management practices in Saudi Arabia showed that most of the general practitioners' knowledge was in the sufficient category [14].

This study has several significant advantages, namely the age variable and the source of knowledge about asthma, where in this study, it was found that the age of general practitioners who participated in this study varied from the youngest age of 23 years to the oldest age of 63 years. Many general practitioners use the GINA guideline for asthma management because it is easier to access information about the latest management guidelines. The results of the study have practical value because they can be the basis for input for primary health facilities to evaluate and improve the knowledge of general practitioners about asthma management, such as the need to improve facilities that support asthma management, conduct training on asthma management according to the latest asthma guidelines, which are more applicable, such as regular seminars (workshops).

However, this study also has several limitations that need to be considered. In collecting research data, general practitioners did not show training certificates proving a history of previous asthma management training. If a similar study is conducted, it is necessary to consider attaching a training certificate, and this study did not specifically categorize how many times general practitioners received previous asthma management training. In addition, the cross-sectional study design only describes the relationship at a certain time, so it cannot determine the cause-and-effect relationship. The generalization of the results of this study is also limited because it only covers several health centers and private clinics.

This study's strength lies in its comprehensive analysis of factors influencing general practitioners' knowledge of asthma management, supported by a validated questionnaire and a balanced sample from both health centers and clinics. The focus on GINA guideline usage also provides practical insights into clinical practice. However, its limitations include the cross-sectional design that limits causal inference, self-reported data on training without certificate verification, a lack of detail on training frequency or quality, and limited generalizability due to the study being conducted only in Medan City.

5. Conclusion

Most of the general practitioners knew the category of 54.4%. It was found that the largest age group was <30 years, and 30-40 years old amounted to 31.1,% and there was a significant influence between age and knowledge of asthma management (p=0.034). The majority of sources of management knowledge were obtained from the latest asthma guidelines (GINA) at 42.2%, followed by textbooks

at 30%, and there was an influence between the source of knowledge and general practitioners' knowledge regarding asthma management (p=0.048).

Acknowledgements
The author would like to thank the contribution of general practitioners working in primary health facilities in Medan City for their contribution to this research.

Conflict of Interest Statement
There is no conflict of interest.

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