Pharmaceutical and Biomedical Sciences Journal
Volume 7(1), 2025, 9-13

Identification of Asthma Control Level and Its Factors Among Patients in A Tertiary Hospital in Jakarta, Indonesia: A Cross-Sectional Study

Nora Wulandari, Tuti Wiyati*, Rizqa Putri Hasanah
Clinic and Community Department, Faculty of Pharmacy and Science, Universitas Muhammadiyah Prof. DR. Hamka, Jl. Delima II/IV, Klender, East Jakarta, 13460.

**Corresponding author:* tuti.wiyati@uhamka.ac.id

Received: 24 October 2024; Accepted: 19 June 2025

Abstract: Poor asthma control levels can result in mortality and morbidity in asthma patients. Therefore, it is important to detect it early and identify related factors. This was a cross-sectional study with data collection carried out in outpatient asthma patients in a tertiary hospital in Jakarta. This study aimed to identify factors associated with asthma control. The level of asthma control was measured using the *Asthma Control Test*^{TM} (ACT^{TM}) questionnaire. SPSS version 25 was used to apply the Chi-Square Test was applied to determine risk factors potentially associated with the asthma control level. Forty-four patients met the criteria and were enrolled in this study. The results showed 43.2% of asthma patients were very uncontrolled, 27.4% of asthma patients were poorly controlled, and well-controlled asthma patients were 29.5%. Conclusion: No potential factor was found to be associated with the asthma control level of the patients.

Keywords: Asthma, Asthma Control Level, Risk factors.
DOI: 10.15408/pbsj.v7i1.42069

1. INTRODUCTION

Asthma is a chronic disease characterized by varying severity and frequency of recurrent episodes of wheezing, shortness of breath, chest tightness, and coughing (WHO, 2019). The disease is a common disease that can potentially become a serious symptom that could burden patients, their families, and the community (Global Initiative for Asthma, 2019). Epidemiologic data show the prevalence of asthma has increased over the last few decades both domestically and globally, and the minority and lower socioeconomic populations reported receiving the most significant impact on this (Loftus and Wise, 2016). WHO estimates 235 million people suffer from asthma. Asthma is not just a public health problem for high-income countries but also occurs in all countries regardless of the level of development (WHO, 2019). Based on the latest data released in 2017, there were 383,000 deaths from asthma in 2015 (WHO, 2019). Based on interviews from all provinces in Indonesia, asthma prevalence reached 4.5% among all ages. DKI Jakarta is one of the provinces with asthma prevalence reaching 5.2% (Kemenkes RI, 2015).

The strongest risk factors for developing asthma are inhaled substances and particles that could trigger allergic reactions or irritate the airways (WHO, 2019). In patients who have allergies, if traced, there is often a family history of asthma or allergies. This raises the opinion that genetic factors cause a person suffering from asthma (Djojodibroto, 2019).

Asthma is an incurable disease, but its recurrence can be controlled by avoiding the triggers of asthma itself or by using an inhaler as an anti-asthma (Basuki, 2009). If asthma is not controlled, it will cause a significant burden for patients and families. Also, uncontrolled asthma can limit the patient's activities for life (WHO, 2019). Uncontrolled asthma can increase the risk of severe asthma exacerbations that can be accompanied by upper respiratory infections and pulmonary pneumococcal infections (O'Byrne

et al., 2013). Several factors that can affect a patient's asthma control include: age, gender, number and type of asthma medication, and compliance with the use of asthma medication. Therefore, early detection of the level of asthma control and the factors that influence it is needed so that self-prevention can be done. Several factors that can affect a patient's asthma control include: age, gender, number and type osuf asthma medication, and compliance with the use of asthma medication. Therefore, this study was conducted to see the factors related to patient characteristics and the level of asthma control.

2. METHODS

This research was a non-experimental study using the Cross-Sectional method. The data used were primary data collected from patients by the *Asthma Control Test*^{TM} (ACT^{TM}) questionnaire (Nathan *et al.*, 2006; Schatz *et al.*, 2009; Lai *et al.*, 2011) and secondary data based on the medical record status of asthma patients. This study was conducted at the Jakarta Islamic Hospital (RSIJ), Cempaka Putih, Indonesia, from April to July 2019.

The study respondents were all outpatient asthma patients with the following inclusion criteria: patients with an asthma diagnosis who received asthma medication, adult asthma patients> 16 years old, and patients with mild to severe persistent. Patients using oral asthma medication, patients with infectious diseases, and patients with incomplete or illegible data at the time of the study were excluded.

SPSS version 25 was applied in this study using the *Chi-Square* Test to analyze characteristics that potentially associate with the asthma control level of the respondents. *P*-value <0.05 was considered significant. This study was approved by the ethical committee of the Faculty of Medicine, University of Indonesia, number 461/UN2.F1/ETIK/PPM.00.02/2019 with written informed consent obtained from all the respondents.

3. RESULTS AND DISCUSSION

a. Respondent Characteristics

Table 1. Baseline Characteristics of Asthma Patients

Characteristics	***n* = 44**	**%**
Age (years)		
	Mean ± SD = 53.57 ± 12.685 Min-Max = 27-88	
Gender		
Male	4	9.1
Female	40	90.9
Number of Anti-Asthma		
≤ 2	42	95.5
> 2	2	4.5
Number of Other Drugs		
≤ 2	41	93.2
> 2	3	6.8
Anti-Asthma Dosage Form		
Inhaler	22	50.0
Oral	2	4.5
Asthma Degree		
Mild persistent	6	13.6
Moderate persistent	34	77.3
Severe persistent	4	9.1

***n= number of respondents*

Forty-four patients were obtained from two hospitals during the study period with baseline characteristics shown in Table 1. The average patient was aged 53-54 years, with the lowest age of 27 years and the highest age of 88 years. Most respondents were female (71.6%) with asthma medication use ≤2 (78.9%) and non-asthma drug use <2 (90.5%). More than half of the respondents (58.9%) used a combination of inhaler and oral drugs. A study in 2015 found that asthma patients aged 50-59 in Yogyakarta had the highest percentage of 33.33% (Haryanti *et al.*, 2016). The highest number of asthma patients is dominated by women (Kemenkes RI, 2015).

b. Asthma Categorization

Based on Table 2, the level of asthma control of the respondents was dominated by 26 respondents (43.2%) who were very uncontrolled. Another study also found a similar result, which was that 81% of asthma patients had a very uncontrolled level (Haryanti *et al.*, 2016).

Table 2. Asthma Control Frequency Distribution

Asthma Control Level	***n* = 44**	**%**
Very Uncontrolled	26	59.1
Poorly Controlled	13	29.5
Well-controlled	5	11.4

**n= number of respondents*

c. Factors Associated with the Control of Asthma

Table 3. Association Factors on the Level of Asthma Control

Characteristics	**Asthma Control Level *n*(%)**			***P-value***
	Very Uncontrolled	**Poorly Controlled**	**Well-controlled**	
Age				
Mean ± SD (3.57 ± 12.685)	26 (59.09)	13(29.55)	5(11.36)	0.232
Gender				
Male	2(4.55)	1(2.27)	1(2.27)	0.666
Female	24(54.55)	12(27.27)	4(9.09)	
Number of Anti-Asthma				
≤ 2	24(54.55)	13(29.55)	5(11.36)	0.484
> 2	2(4.55)	0	0	
Number of Other Drugs				
≤ 2	23(52.27)	13(29.55)	5(11.36)	0.328
> 2	3(6.82)	0	0	
Anti-Asthma Dosage Form				
Inhaler	11(25.00)	8(18.18)	3(6.82)	0.657
Oral	2(4.55)	0	0	
Inhaler + Oral	13(29.55)	5(11.36)	2(4.55)	
Asthma Degree				
Mild persistent	3(6.82)	2(4.55)	1(2.27)	
Moderate persistent	20(45.45)	10(22.73)	4(9.09)	0.922
Severe persistent	3(6.82)	1(2.27)	0	

**n= number of respondents*
**Chi-Square Analysis tested P-value*

Table 3 shows that asthma patients with an average age of 53.57 (SD 12.685) in this study had very uncontrolled asthma, with as many as 26 people. Female asthma patients predominantly have very

uncontrolled asthma, namely 24 people. Patients who received asthma medication ≤2 and ≤2 non-asthma medication were predominantly in a condition of asthma that was very uncontrolled (24 and 23 of respondents). Based on the degree of asthma, patients with moderate persistent asthma are predominantly in a very uncontrolled condition (20 respondents). Referring to the results of the patient's asthma category, which was predominantly moderate level, so that it was in sync with the use of medication, which was not only an inhaler but also oral medication. As many as 20 patients out of a total of 34 moderate persistent asthmatics were declared to have very uncontrolled asthma. Given this condition and looking at the 2019 GINA guidelines, it is appropriate for some of these patients to receive additional oral corticosteroid therapy.

Asthma management aims to achieve controlled asthma so that asthmatics can live a normal life without obstacles in carrying out daily activities (O'Byrne *et al.*, 2013). Risk factors such as age, the amount of asthma and non-asthma drugs, the dosage form of the drug, and the type of asthma did not significantly influence asthma control. The results of this study were not in line with research conducted by Doz et al (2013), which states that there was a significant relationship between age and gender with asthma control levels (Doz *et al.*, 2013). Several other factors that influence the level of asthma control have been reported, such as bad habits that could trigger asthma, incorrect use of inhalers, and the presence of comorbid diseases (Braido, 2013).

Based on International guidelines, asthma management is done to achieve and maintain asthma control, which characterized by no symptoms during the day and night, no visit to the doctor or hospital, minimal reliever needs, no restrictions on physical activity and exercise, lung function approaching normal, and there are no drug side effects. The high population of patients who are not controlled can be caused by various factors such as ineffective drug use, inaccurate assessment and treatment, low compliance in therapy, lack of awareness of symptoms of poor asthma control by patients, as well as the possibility of resistance to treatment (GINA, 2012). Therefore, further study needs to be done to identify other related factors to the level of asthma control.

4. CONCLUSION

There were 59.1% very uncontrolled, 29.5% poorly controlled and 11.4% well-controlled asthma patients. Age, gender, number of drugs and the degree of the asthma were found not to correlate with the asthma control level with P-value > 0.05 (based on Chi Square analysis). This study is limited by the relatively small sample size and the short duration of the research period. Furthermore, researchers need to consider other factors that influence this, such as family support, psychology, or medication adherence.

5. ACKNOWLEDGMENT

We would like to express our sincere gratitude to Rumah Sakit Islam Jakarta Cempaka Putih for granting permission to conduct this research.

6. REFERENCES

Basuki, E.S. (2009) ‘Konseling Medik : Kunci Menuju Kepatuhan Pasien’, *Majalah Kedokteran Indonesia*, pp. 55–60.

Braido, F. (2013) 'Failure in Asthma Control: Reasons and Consequences', *Scientifica*, 2013, pp. 1–15. Available at: https://doi.org/10.1155/2013/549252.

Djojodibroto, R. (2019) *Respirologi*. EGC Penerbit Buku Kedokteran.

Doz, M. *et al.* (2013) 'The association between asthma control, health care costs, and quality of life in France and Spain', *BMC Pulmonary Medicine*, 13(1). Available at: https://doi.org/10.1186/1471-2466-13-15.

GINA (2012) 'Global Strategy for Asthma Management and Prevention-Updated 2012', *Global*

Initiative for Asthma, p. 32.
Global Initiative for Asthma (2019) 'Pocket Guide for Asthma Management an Precention', *Global Initiative for Asthma*, pp. 1–32.
Haryanti, S. *et al.* (2016) 'Relationship Between Compliance of Using β2-Agonist Inhaler Drug and Asthma Control on Asthma Patient', *Indonesian Journal of Clinical Pharmacy*, 5(4), pp. 238–248. Available at: https://doi.org/10.15416/ijcp.2016.5.4.238.
Kemenkes RI (2015) *Profil Kesehatan Indonesia 2014*, *Profil Kesehatan Indonesia 2014*.
Lai, C.K.W. *et al.* (2011) 'Relationship between asthma control status, the Asthma Control Test™ and urgent health-care utilization in Asia', *Respirology*, 16(4), pp. 688–697. Available at: https://doi.org/10.1111/j.1440-1843.2011.01954.x.
Loftus, P.A. and Wise, S.K. (2016) 'Epidemiology of asthma', *Current Opinion in Otolaryngology and Head and Neck Surgery*, pp. 245–249.vAvailable at: https://doi.org/10.1097/MOO.0000000000000262.
Nathan, R.A. *et al.* (2006) 'Asthma Control Test: Reliability, validity, and responsiveness in patients not previously followed by asthma specialists', *Journal of Allergy and Clinical Immunology*, 117(3), pp. 549–556. Available at: https://doi.org/10.1016/j.jaci.2006.01.011.
O'Byrne, P.M. *et al.* (2013) 'The poorly explored impact of uncontrolled asthma', *Chest*, 143(2), pp. 511–523. Available at: https://doi.org/10.1378/chest.12-0412.
Schatz, M. *et al.* (2009) 'The minimally important difference of the Asthma Control Test', *Journal of Allergy and Clinical Immunology*, 124(4), pp. 719-723.e1. Available at: https://doi.org/10.1016/j.jaci.2009.06.053.
WHO (2019) *https://www.who.int/news-room/fact-sheets/detail/asthma*, *WHO*. World Health Organization.

.