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The Relationship Between Patients' Knowledge and Medication Adherence and Asthma Control at the Pulmonary Clinic of Pasar Minggu Regional General Hospital

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Abstract: Asthma control is often suboptimal in routine care, and gaps in patient knowledge and medication adherence may contribute to poor control. **Objective**: This study aimed to examine the relationship between patients' asthma knowledge level and medication adherence with asthma control among adult patients attending the Pulmonary Clinic of Pasar Minggu Regional General Hospital. **Methodology**: A quantitative cross-sectional design was used with consecutive sampling of 191 adult asthma patients. Data were collected using validated questionnaires: ACQ-5, AGKQ, and MMAS-8. Descriptive statistics summarized distributions, and Chi-square tests examined associations between knowledge and asthma control, and between adherence and asthma control. **Findings**: Most participants had uncontrolled asthma (56.0%), low asthma knowledge (55.0%), and low medication adherence (56.5%). Knowledge level was significantly associated with asthma control ($p = 0.001$), with uncontrolled asthma more prevalent in the low-knowledge group (70.5%) than the high-knowledge group (38.4%). Medication adherence was also significantly associated with asthma control ($p = 0.001$), with uncontrolled asthma more common among low adherence (67.6%) than moderate (41.4%) or high adherence (38.5%). **Implications**: Integrating structured education and adherence-support strategies into routine outpatient care may improve asthma control and reduce exacerbation risk. **Originality**: This study integrates asthma knowledge and medication adherence within the same analytic framework of asthma control in an Indonesian pulmonary-clinic population, providing context-specific evidence for targeted clinic-based interventions.

Keywords Asthma Control; Asthma Knowledge; Medication Adherence; AGKQ; MMAS-8; ACQ-5; Pulmonary Clinic

INTRODUCTION

Asthma control remains suboptimal in many clinical settings because long-term treatment behaviors are often inconsistent, particularly when patients rely on reliever medication during symptoms and do not use inhaled corticosteroid (ICS) based maintenance therapy regularly (Global Initiative for Asthma (GINA, 2025). Qualitative evidence indicates that non-adherence is shaped by everyday factors, including patient–healthcare professional communication, limited education, medication beliefs, and behavioral barriers such as forgetting doses or stopping treatment when symptoms improve (Zhang et al., 2023). Clinical guidance therefore highlights early initiation of ICS-

containing therapy, shared decision-making in inhaler selection, and routine reassessment of inhaler technique and adherence as key elements of asthma monitoring (GINA, 2025).

Indonesia reflects similar challenges at both population and service levels. PDPI estimates asthma prevalence at approximately 5% nationally and around 10% in Jakarta and urges continuous education on correct inhaler use, reinforcement of controller therapy rather than reliever-only use, and the availability of both controller and reliever medicines in primary care facilities (Birny, 2024). Hospital-based evidence also reports a high proportion of uncontrolled asthma and low routine controller use, suggesting persistent gaps in knowledge-driven self-management and medication-taking behavior (Yasin et al., 2025).

Asthma knowledge is measurable and clinically actionable through validated questionnaires that map patients' understanding of self-management and can inform education planning (Beaurivage et al., 2018). Recent evidence continues to show knowledge deficits in routine care, while intervention studies report that structured education and pharmacist-led support can improve self-management knowledge and related outcomes (Gebresilassie et al., 2025; Kangallı Boyacıoğlu et al., 2025; Kovačević et al., 2018). Evidence from Indonesia also links knowledge and educational level with medication adherence, indicating relevance for daily treatment behavior (Cholisoh et al., 2020). Medication adherence has been consistently associated with asthma control, particularly for ICS-based therapy, and is influenced by determinants such as health literacy, socioeconomic constraints, and practical barriers to inhaled medication use (Gon et al., 2021; Jabeen et al., 2018; Nazareth et al., 2023; Zaeh et al., 2022). Inhaler technique is an important related factor because incorrect use is common and associated with poorer outcomes, while education and feedback interventions can substantially improve technique and self-management behaviors (Alnawayseh et al., 2020; Bookwalter, 2021; Kharshid, 2025; Román-Rodríguez et al., 2019). Shared decision-making in device selection may also support treatment fit and engagement, although practice may still lean toward provider-driven choices (Upton et al., 2011). Limited studies have examined knowledge and adherence together in relation to asthma control within Indonesian pulmonary-clinic populations, leaving a contextual gap for clinic-relevant evidence.

This study aims to examine the relationships between patients' asthma knowledge level and medication adherence with asthma control status among adults attending the Pulmonary Clinic of Pasar Minggu Regional General Hospital. The study also describes

the distribution of patient characteristics, knowledge levels, adherence categories, and asthma control outcomes in this clinical population.

Asthma control is hypothesized to be better among patients with higher knowledge and higher medication adherence. Higher knowledge is expected to support consistent self-management, while higher adherence is expected to sustain symptom regulation through regular use of prescribed therapy (GINA, 2024; Koesnoe, 2020; Lukitasari et al., 2023; WHO, 2024). Accordingly, patients with higher knowledge are predicted to demonstrate better asthma control than those with lower knowledge (H1), and patients with higher adherence are predicted to demonstrate better asthma control than those with lower adherence (H2).

RESEARCH METHOD

This study employed a quantitative approach with a cross-sectional design, allowing researchers to capture the relationships among knowledge level, medication adherence, and asthma control at a single point in time. The design was selected because it is practical for clinical settings where patient flow is dynamic, and it enables efficient assessment of factors influencing disease management. By using this framework, the study aimed to provide a snapshot of patient behaviors and clinical outcomes in the Pulmonary Clinic of Pasar Minggu Regional General Hospital.

The research was conducted at the Pulmonary Clinic because it serves a diverse population of asthma patients, many of whom undergo routine evaluations. This setting offered rich variability in demographic and clinical characteristics, making it suitable for identifying patterns related to asthma control. Data collection was carried out during regular clinic operational hours to ensure that all eligible patients had equal opportunity to participate without disrupting the service flow.

The study population consisted of adult patients diagnosed with asthma by a pulmonologist. Participants were recruited using consecutive sampling, a method that includes all eligible patients who meet the criteria within the data collection period. This technique was chosen to minimize selection bias and ensure that the findings represent real-world clinical conditions. Inclusion criteria required patients to be at least 18 years old, able to communicate effectively, and willing to provide informed consent.

Data were gathered using structured questionnaires that had been previously validated in clinical research. Asthma control was measured using the Asthma Control

Questionnaire–5 (ACQ-5), an instrument widely recognized for its sensitivity in detecting symptom severity. Patients' knowledge levels were assessed with the Asthma General Knowledge Questionnaire (AGKQ), which evaluates understanding of disease mechanisms, triggers, and medication use. Medication adherence was measured using the Morisky Medication Adherence Scale–8 (MMAS-8), a tool commonly applied in chronic disease studies to capture patients' consistency in following therapeutic regimens.

Before data collection began, participants received a brief explanation of the study's purpose and procedures. Researchers provided clarification when needed without influencing responses. This approach helped reduce information bias and allowed patients to answer based on their actual experiences rather than assumptions. The researchers maintained a supportive environment to encourage honest responses.

Ethical principles were upheld throughout the study. Participants were assured that their involvement was voluntary and that they could withdraw at any time without affecting their treatment. All personal information was kept confidential, and data were anonymized before analysis. Ethical approval was obtained from the appropriate institutional review board, ensuring that the study met national and international standards for research involving human subjects.

Data analysis was conducted using descriptive and inferential statistical methods. Descriptive analysis was used to summarize participant characteristics, knowledge levels, adherence patterns, and asthma control categories. Inferential analysis employed the Chi-Square test to examine associations between key variables. The Chi-Square test was selected because it is appropriate for categorical data and effectively identifies meaningful relationships within clinical populations.

To enhance the credibility of the findings, the researchers reviewed data for completeness and consistency prior to analysis. Any incomplete responses were addressed through verification with participants when possible, ensuring accuracy in representation. The systematic process of data management supported the reliability of the results and strengthened the study's contribution to understanding factors influencing asthma control.

RESULT AND DISCUSSION

Data and Characteristics of the Sample

The research subjects consisted of 191 participants, and none of the respondents dropped out. Most asthma patients in this study were in the pre-elderly age group (45–59

years), totaling 99 individuals (51.8%), followed by adults (19–44 years) with 36 individuals (29.3%), and elderly patients (>60 years) with 36 individuals (18.8%). The majority of respondents were female, with 137 individuals (71.7%), while male respondents numbered 54 individuals (28.3%).

Asthma patients with a high school education amounted to 99 individuals (51.8%), junior high school graduates totaled 61 individuals (31.9%), college graduates totaled 27 individuals (14.1%), and elementary school graduates totaled 4 individuals (2.1%). Additionally, most asthma patients at the Pulmonary Clinic of Pasar Minggu Regional General Hospital were unemployed, totaling 116 individuals (60.7%), while those who were employed totaled 75 individuals (39.3%).

ACQ Score (Asthma Control Questionnaire)

The highest ACQ score category showed that 107 individuals (56%) had uncontrolled asthma, 43 individuals (22.5%) had partially controlled asthma, and 41 individuals (21.5%) had fully controlled asthma.

AGKQ Score (Asthma General Knowledge Questionnaire)

The asthma knowledge score based on the AGKQ indicated that 105 respondents (55%) had low knowledge levels, whereas 86 respondents (45%) had high knowledge levels at the Pulmonary Clinic of Pasar Minggu Regional General Hospital.

MMAS-8 Score (Medication Morisky Adherence Scale)

The medication adherence score of asthma patients at the Pulmonary Clinic of Pasar Minggu Regional General Hospital showed that 108 individuals (56.5%) had low adherence, 70 individuals (36.6%) had moderate adherence, and 13 individuals (6.8%) had high adherence.

Relationship Between Knowledge Level and Asthma Control Level

Table 1. Relationship Between Knowledge Level and Asthma Control Level at the Pulmonary Clinic of Pasar Minggu Regional General Hospital in 2025 (n = 191)

Knowledge Level	Fully Controlled	Partially Controlled	Uncontrolled	Total	p-value
High	31 (36.0%)	22 (25.6%)	33 (38.4%)	86 (100%)	**0.001**
Low	10 (9.5%)	21 (20.0%)	74 (70.5%)	105 (100%)	

Knowledge Level	Fully Controlled	Partially Controlled	Uncontrolled	Total	p-value
Total	41 (21.5%)	43 (22.5%)	107 (56.0%)	191 (100%)	

Based on Table 1, it was found that among 86 respondents with a high level of knowledge, 31 respondents (36%) had fully controlled asthma. Meanwhile, among 105 respondents with a low level of knowledge, only 10 respondents (9.5%) had fully controlled asthma. The Chi-square test resulted in a p-value of 0.001 (< 0.05), indicating that H0 is rejected and Ha is accepted, which means there is a significant relationship between knowledge level and asthma control level at the Pulmonary Clinic of Pasar Minggu Regional General Hospital.

Relationship Between Patient Medication Adherence and Asthma Control Level

Table 2. Relationship Between Patient Medication Adherence and Asthma Control Level at the Pulmonary Clinic of Pasar Minggu Regional General Hospital Year 2025 (n = 191)

Medication Adherence	Fully Controlled	Partially Controlled	Uncontrolled	Total	p-value
Low	11 (10.2%)	24 (22.2%)	73 (67.6%)	108 (100%)	**0.001**
Moderate	26 (37.1%)	15 (21.4%)	29 (41.4%)	70 (100%)	
High	4 (30.8%)	4 (30.8%)	5 (38.5%)	13 (100%)	
Total	41 (21.5%)	43 (22.5%)	107 (56.0%)	191 (100%)	

Based on Table 2, among 108 respondents with low adherence, only 11 respondents (10.2%) achieved fully controlled asthma. Among 70 respondents with moderate adherence, 26 respondents (37.1%) had fully controlled asthma, while 4 out of 13 respondents (30.8%) with high adherence achieved full control. The Chi-square test yielded a p-value of 0.001 (< 0.05), indicating that H0 is rejected and Ha is accepted. This result confirms a significant relationship between medication adherence and asthma control among patients at the Pulmonary Clinic of Pasar Minggu Regional General Hospital.

Discussion

Asthma Knowledge Level

The level of asthma knowledge in this study was assessed using the AGKQ. Findings showed that among 191 respondents, 105 individuals (55%) had low knowledge levels. This result aligns with the study by Nadia (2021), which reported a predominance of respondents with low knowledge. The low knowledge level was attributed to limited

understanding of key aspects of asthma, including risk factors, environmental triggers, and the difference between controller and reliever inhalers. Many respondents were not aware that controller inhalers must be used daily and believed that asthma only occurs in certain age groups or conditions. These misunderstandings contributed to inadequate disease management.

Patient Medication Adherence

Medication adherence assessed using MMAS-8 revealed that 108 respondents (56.5%) had low adherence, consistent with the findings of Laila et al. (2023). Low adherence was influenced by behavioral factors, including forgetting to use inhalers, stopping medication when symptoms improved, or perceiving inhaler use as burdensome. Some respondents used inhalers only during acute shortness of breath rather than as part of daily management.

Asthma Control Level

Asthma control assessed using the ACQ showed that 107 respondents (56%) had uncontrolled asthma. This finding is consistent with previous research by Laila et al. (2023). Poor control was associated with persistent symptoms, nighttime awakenings, wheezing, limited physical activity, and frequent exacerbations, all of which reflect criteria established by GINA (2024).

Relationship Between Knowledge Level and Asthma Control

The Chi-square test showed a p-value of 0.001 (< 0.005), indicating a significant relationship between knowledge level and asthma control. This supports the findings of Nadia (2021). Asthma control is influenced by factors such as age, gender, comorbidities, environmental triggers, smoking habits, improper medication use, and inadequate understanding of self-management. Respondents with low knowledge did not fully understand that asthma is a chronic disease requiring long-term management, nor did they recognize environmental triggers or the daily use requirement of controller inhalers. As a result, they exhibited poorer asthma control. Conversely, respondents with higher knowledge were better able to identify triggers, adhere to inhaler use, and seek regular follow-up care, resulting in better asthma control.

Relationship Between Medication Adherence and Asthma Control

The Chi-square test also showed a significant relationship between medication adherence and asthma control (p = 0.001). This aligns with Laila et al. (2023). Respondents with low adherence generally demonstrated uncontrolled asthma because they did not use inhalers consistently, forgot doses, or intentionally avoided medication. Those with moderate adherence often skipped medication when they felt better or forgot to bring it during daily activities. Even among respondents with high adherence, some still exhibited uncontrolled asthma due to persistent exposure to triggers such as dust and cigarette smoke.

CONCLUSION

Asthma control in this pulmonary-clinic population remained suboptimal, with more than half of participants classified as uncontrolled, alongside a predominance of low asthma knowledge and low medication adherence. The main lesson from these findings is that asthma control in routine care is closely linked to patients' capacity to understand asthma self-management and to consistently follow prescribed therapy, as evidenced by significant associations between knowledge level and asthma control as well as between adherence and asthma control (p = 0.001). These results indicate that improving asthma outcomes requires not only prescribing appropriate therapy but also strengthening the knowledge–behavior component of long-term self-management in everyday clinical practice.

This study contributes scientifically by providing clinic-based evidence from an Indonesian pulmonary outpatient setting that positions asthma knowledge and medication adherence within the same analytic frame of asthma control. The findings offer empirical support for patient-centered asthma management strategies in respiratory nursing and outpatient pulmonary services, particularly for identifying high-risk groups characterized by low knowledge and low adherence who may benefit most from targeted education and adherence-support interventions. The study also adds a context-specific description of the distribution of asthma control categories, knowledge levels, and adherence profiles in adult asthma patients attending a regional hospital clinic.

Several limitations should be acknowledged. The cross-sectional design prevents causal inference, and adherence was assessed using a self-reported instrument, which may be influenced by recall or social desirability bias. The single-center setting may limit generalizability to other healthcare contexts, and potential confounding variables were not

examined using multivariable modeling. Future research should incorporate longitudinal designs, objective adherence measures, and broader clinical variables such as inhaler technique assessment, trigger exposure, and comorbidities to clarify pathways linking knowledge and adherence to asthma control and to inform more precise intervention models.

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