

The relationship between self-compliance and asthma control level on the quality of life of pediatric asthma patients

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Abstract. The global prevalence of asthma continues to increase, with children being the most affected group. Treatment adherence plays a crucial role in controlling symptoms, reducing recurrence, and improving patients' quality of life. This study examined the relationship between treatment adherence, asthma control, and quality of life among pediatric patients at Respira Yogyakarta Lung Hospital. A cross-sectional quantitative study was conducted in the hospital's outpatient clinic from November 2024 to February 2025. Participants were children aged 1–17 years diagnosed with asthma within the past year, those with other respiratory disorders were excluded. Data were collected using the Morisky Medication Adherence Scale-8 (MMAS-8), the Asthma Control Questionnaire (ACQ), and the Paediatric Asthma Quality of Life Questionnaire (PAQLQ). Seventy-seven pediatric patients participated, most showed poor adherence (46.8%) and uncontrolled asthma (63.6%), while 62,3% reported a moderate quality of life. Chi-square analysis revealed a significant correlation between adherence ($\chi^2=31.85$, $p<0.05$) and asthma control with quality of life ($\chi^2=48.19$, $p<0.05$). In conclusion, adherence to treatment and asthma control significantly influence the quality of life of pediatric asthma patients. These findings indicate that higher adherence to asthma treatment and better control levels are associated with an improved quality of life among pediatric patients.

1 Introduction

Asthma remains a chronic, non-communicable disease with an increasing global prevalence each year. The [1] defines asthma as a chronic inflammatory disorder of the airways characterized by recurrent wheezing, shortness of breath, and coughing that vary over time and in intensity [1]. According to the Global Initiative for Asthma, an estimated 262 million people worldwide suffer from asthma, causing approximately 455,000 deaths annually [2].

The global prevalence has risen by about 5-20% over the past decade, particularly affecting children as the most vulnerable population group. In Indonesia, data from reported that the national prevalence of asthma was 2.4% across all age groups, with the highest rate

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found in the Special Region of Yogyakarta (4.5%) [3]. This disease is known to affect children predominantly, making them the most vulnerable group to asthma [4]. This case indicates that asthma cases need serious attention.

There is no cure for asthma, but the condition can be managed and controlled effectively through proper treatment [5]. Asthma management is an important aspect that requires attention, especially in specific populations such as children and infant, who are more prone to recurrence. Therapy success depends heavily on collaboration between various parties, including the patient, parental support, and guidance from medical personnel to ensure compliance and treatment effectiveness. Good compliance will help control asthma, reduce the number of attacks, and prevent long-term complications. The better patients adhere to treatment, the more optimal asthma control and quality of life can be achieved [6]. Patient non-compliance will result in repeated exacerbations, frequent hospitalizations, and a deterioration in quality of life [7]. This can be achieved through inhalers and masks, as well as monitoring the frequency and symptoms of asthma [8]. In addition, the high cost of treatment shows that uncontrolled disease can impose a significant economic burden. This is the basis for the importance of self-compliance in asthma to maintain disease control and patient quality of life [9].

This study aims to analyze the relationship between self-compliance and the level of asthma control on the quality of life among this population. The level of control is an important indicator for determining patients' quality of life. Controlled asthma can help children engage in everyday activities and support their optimal growth and development [10]. Understanding these relationships is expected to provide insights that strengthen asthma management strategies for children.

2 Methods

2.1 Study design and participants

The study employed a quantitative cross-sectional design and was conducted in the outpatient clinic of Respira Lung Hospital, Yogyakarta, between November 2024 and February 2025. Participants were children aged 1–17 years who had been clinically diagnosed with asthma within the previous 12 months. Patients with comorbid chronic respiratory conditions, such as bronchitis, pneumonia, or tuberculosis, were excluded to minimize confounding factors. The study population consisted of 345 patients. The sample size ($n = 77$) was determined using the Solvin formula for cross-sectional studies, assuming a 10% margin of error, based on the prevalence of pediatric asthma reported in previous studies. Participant were selected through consecutive sampling until the required number was achieved. Ethical approval for this research was obtained from the Ethics Committee of Respira Hospital Yogyakarta (No. 941/C.6-II/FARM-UMY/XII/2024). All participants and their parents or guardians provided informed consent prior to data collection.

2.2 Data collection

Data collection was carried out using validated instruments. Treatment adherence was assessed with the Morisky Medication Adherence Scale-8 (MMAS-8), which evaluates behaviors related to medication use. Asthma control was measured with the Asthma Control Questionnaire (ACQ), a standardized tool for determining symptom frequency and severity. Quality of life was evaluated with the Paediatric Asthma Quality of Life Questionnaire (PAQLQ), which assesses the physical, emotional, and social impacts of asthma in children.

Data were collected through structured interviews with patients and parents and medical record reviews.

2.3 Data analysis

All collected data were coded and analyzed using IBM SPSS Statistics version 27.0. Descriptive statistics were applied to summarize demographic and clinical characteristics. The Chi-Square test was used to determine the relationship between self-compliance, asthma control, and quality of life. Statistical significance was set at $p < 0.05$.

3 Results and Discussion

3.1 Result

3.1.1 Participant demographics

Of the 77 respondents who were children with asthma at Respira Hospital in Yogyakarta, the majority, namely 36 respondents (46.8%), showed poor compliance. Compliance is the behavior of patients in understanding and carrying out the treatment management prescribed by doctors to be used during the therapy period [11]. Non-compliance can be influenced by various factors, including patients not taking or using medication as recommended, patients stopping treatment because they feel their asthma symptoms have been resolved, lack of knowledge about medication among caregivers/parents, and the perception that using medication actually worsens the condition.

In addition, other factors that contribute to low compliance are concerns about the side effects of medication, the assumption that therapy is no longer necessary when symptoms subside, the high cost of treatment, lack of education about the proper use of medication, and discomfort when inhaling medication [12]. In fact, the level of patient compliance in undergoing treatment is one of the key factors in the success of asthma therapy.

Efforts to improve compliance can be made through the support of family or close friends and by providing precise and adequate information from medical personnel. A lack of medical education and insufficient family support have been shown to have a negative impact on patient compliance in undergoing asthma therapy [13]. The results of the respondents' self-compliance measurements can be seen in Table 1.

Table 1. Results of self-compliance level measurements

Results	Frequency (n)	Percentage (%)
Poor	36	46.8
Acceptable	22	28.6
Good	19	24.7
Total	77	100

3.1.2 Measuring the asthma control level of patients

Based on the study's results, the asthma control level in 77 children at Respira Hospital in Yogyakarta showed that 49 children (63.6%) had uncontrolled asthma. These results align with a study conducted, which stated that the prevalence of uncontrolled asthma patients was 81 people (75.7%). The high number of uncontrolled respondents in these two studies may

be due to various factors, such as age, gender, education level, smoking, incorrect use of medication, poor treatment compliance, and knowledge about asthma [14].

The concept of asthma control refers to the regulation of asthma manifestations. Effective control requires attention to dosage, treatment phase, and appropriate management. The ultimate goal of asthma therapy is to maintain this control while promoting patients' quality of life and preserving daily functioning, recent developments in phenotype-based therapeutic strategies including treatment options for type-2 low asthma provide additional alternatives for individuals who do not respond adequately to conventional therapy approaches [15]. A study found that the quality of life of individuals with uncontrolled asthma was worse than that of individuals with controlled asthma [16].

The causes of asthma uncontrollability are due to low awareness, a lack of willingness to learn, and the behavior of asthma sufferers in undergoing proper treatment. The effectiveness of asthma control is influenced by several factors, including age, genetic predisposition, educational level, environmental exposure, incorrect medication use, poor treatment adherence, and psychological conditions. Inadequate consultation and patient education from healthcare providers may lead to suboptimal disease management, highlighting the importance of effective health promotion strategies in asthma care [16]. The level of control in asthma patients can be seen in Table 2.

Table 2. Results of asthma control level assessment

Results	Frequency (n)	Percentage (%)
Controlled	28	36.4
Uncontrolled	49	63.6
Total	77	100

3.1.3 Measuring the quality of life of asthma patients

The results of the quality of life assessment of 77 children with asthma at Respira Hospital, Yogyakarta, are shown in Table 3. Most respondents had a moderate quality of life, namely 48 children (62.3%). The outcome corresponds with prior studies, which reported that 20 children (26%) with asthma had a good quality of life, while preliminary studies of 10 children with asthma showed that 40% had a low quality of life, 50% had a moderate quality of life, and 10% had a high quality of life .

According to several factors affect the quality of life of asthma patients, including low education levels, lack of knowledge about asthma, age, and physiological, psychological, and immunological factors. In addition, the severity of asthma, socioeconomic status, and living environment also play an important role in determining the quality of life of asthma patients

Table 3. Results of asthma patient quality of life measurements

Results	Frequency (n)	Percentage (%)
Poor	9	11.7
Moderate	48	62.3
Good	20	26
Total	77	100

3.1.4 The relationship between self-compliance and patient quality of life

Of the 77 children who were respondents, the majority with poor self-compliance were in the moderate quality of life group, numbering 29 children (37.7%). Meanwhile, respondents with

good self-compliance were most commonly found in the good quality of life group, numbering 13 children (16.9%). These results align with prior research showing that asthma patients who adhere to treatment achieve higher quality of life scores than non-adherent patients .

The study's results in Table 3 using the chi-square test show a significant relationship between self-compliance and the quality of life of pediatric asthma patients, with a p-value < 0.05 at a 95% confidence level. This supports the Global Initiative for Asthma, statement that treatment adherence is one of the main factors affecting patients' quality of life, with non-adherent patients more likely to have a lower quality of life. In addition, psychosocial factors such as self-efficacy also play an important role in determining the quality of life of asthma sufferers.

Adherence to asthma treatment is strongly associated with quality of life, as asthma is a chronic condition requiring long-term therapy. High patient adherence to treatment has been shown to control asthma symptoms, improving quality of life. Thus, patient adherence to the doctor's prescribed treatment regimen is a key factor in the success of treatment [11].

Table 4. Relationship between self-compliance and patient quality of life

Self-Compliance	Quality of Life						Total		p value
	Poor		Moderate		Good		N	%	
	N	%	N	%	N	%			
Poor	7	9.1	29	37.7	0	0	36	46.8	0.001
Acceptable	2	2.6	13	16.9	7	9.1	22	28.6	
Good	0	0.0	6	7.8	20	16.9	19	24.7	
Total	9	11.7	48	62.3	20	26	77	100.0	

3.1.5 The relationship between control levels and the quality of life of asthma patients

Of the 77 child respondents, no patients with controlled asthma were found in the poor quality of life group, and no patients with uncontrolled asthma were found in the good quality of life group. Most respondents with uncontrolled asthma were in the moderate quality of life group, namely 40 children (51.9%). This finding aligns with the study by [11], which reported that patients with uncontrolled asthma were more prevalent than controlled patients in the good quality of life group.

The chi-square test results presented in Table 5 demonstrated a significant association between asthma control levels and quality of life among pediatric and infant patients (p < 0.05; 95% CI). Patients with severe asthma symptoms tend to experience a decline in quality of life, while poor asthma control can lead to limitations in daily activities and reduce patient satisfaction. This shows that asthma control is an important indicator in determining patients' quality of life .

Patients with poor asthma control often have low medication adherence, which contributes to a low quality of life . This condition can exacerbate asthma symptoms and increase the risk of more serious health consequences. In addition, the duration of treatment and boredom during therapy can also affect patients' quality of life. The results of this study are consistent with the previous research, which showed a significant relationship between asthma control and the quality of life of pediatric and infant asthma patients.

Table 5. Relationship between control levels and the quality of life of asthma patients

Asthma Control Level	Quality of Life						Total		p value
	Poor		Fair		Good		N	%	
	N	%	N	%	N	%			

Controlled	0	0.0	8	1.4	20	26	28	36.4	0,000
Uncontrolled	9	11.7	40	66.7	0	0	49	63.6	
Total	9	11.7	48	62.3	20	26	77	100	

3.2 Discussion

3.2.1 Interpretation of key findings

This study's results indicate that most pediatric with asthma at Respira Hospital in Yogyakarta have poor medication adherence and moderate quality of life. These findings suggest that the level of adherence is closely related to patients' quality of life, where patients who adhere to their medication tend to have a better quality of life. In addition, this study also found a significant relationship between the level of asthma control and quality of life. Similar to recent studies by [10], poor adherence has been shown to result in uncontrolled symptoms, frequent exacerbations, and decreased quality of life. Furthermore, behavioral and family-related factors significantly influence adherence behavior [10].

Overall, the results of this study confirm that medication adherence and asthma control are essential factors that affect the quality of life of children with asthma. These findings are consistent with previous studies that indicate that low adherence and poor symptom control can increase the risk of clinical deterioration and reduce patients' quality of life. Therefore, interventions focused on improving adherence and controlling asthma symptoms are essential to support the success of long-term therapy in children with asthma.

3.2.2 Strengths and limitations of the study

This study is a strength because it focuses on pediatric asthma patients, providing a more specific picture of the relationship between medication adherence, asthma control, and quality of life in this age group. The study was also conducted at Respira Hospital in Yogyakarta, a referral center for respiratory diseases adds clinical relevance and ensure that the findings reflect real world conditions.

However, this study is not without limitations. The number of respondents was limited because most patients did not attend their routine check-ups, and some patients and their caregivers refused to participate. In addition, the inclusion criteria, which only covered asthma patients without exacerbations, narrowed the sample size, given that the number of cases of asthma in children and infant each day is relatively small. These limitations may affect the generalization of the study results, so further research with a larger sample size and involving more than one health facility is needed [15].

3.2.3 Practical implications and future research

This study's results provide useful practical insights for healthcare professionals, particularly doctors and pharmacists, to improve education for patients and caregivers regarding the importance of adherence to asthma therapy and understanding symptom control to support improved quality of life for children with asthma. Family support is also an essential factor that needs to be considered in clinical practice, given that the involvement of parents or caregivers greatly influences children's adherence to long-term treatment. Hospitals and medical personnel are expected to develop ongoing education programs and provide a more persuasive approach to motivate patients and their families to follow therapy.

For further research, it is recommended to involve a larger sample size with a broader coverage of regions or hospitals so that the research results can be more generalized. Additionally, future research could include other variables such as psychosocial factors, nutritional status, and family history, which may also affect the quality of life of asthma patients.

4 Conclusion

Based on the results of a study of 77 children and infant with asthma at Respira Hospital in Yogyakarta, it can be concluded that:

- a. Paediatric asthma at Respira Hospital in Yogyakarta have poor self-compliance (46.8%).
- b. Paediatric asthma patients at Respira Hospital in Yogyakarta have uncontrolled asthma (63.6%).
- c. Paediatric asthma patients at Respira Hospital in Yogyakarta have a moderate quality of life (62.3%).
- d. There is a significant relationship between self-compliance and asthma control levels on the quality of life of pediatric asthma patients and infants at Respira Hospital in Yogyakarta. This indicates that the higher the patient's compliance with asthma treatment and management and the better the asthma control level, the better the patient's quality of life. Hospitals are encouraged to implement structured education programs, such as asthma counselling clinics, reminder systems, and family empowerment sessions, to motivate adherence.

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