

A study to examine the knowledge, attitude, and practice for the use of inhalational devices among asthma patients and COPD patients

Dr. Vinay Kshirsagar¹, SKD Swathi R²

Abstract

Asthma and Chronic Obstructive Pulmonary Disease (COPD) are chronic respiratory conditions that significantly impact patients' quality of life. Proper use of inhalational devices is crucial for effective management of these conditions. This study aimed to evaluate the knowledge, attitude, and practice (KAP) regarding the use of inhalational devices among asthma and COPD patients. A cross-sectional study was conducted involving 300 patients (150 asthma and 150 COPD) from a tertiary care hospital. Data were collected using a structured questionnaire and analyzed using descriptive and inferential statistics. The results revealed significant gaps in knowledge and practice, with only 40% of asthma patients and 35% of COPD patients demonstrating correct inhaler technique. Attitudes towards inhaler use were generally positive, but misconceptions and lack of adherence were prevalent. The study highlights the need for targeted educational interventions to improve inhaler use among these patient populations.

Keywords: Asthma, COPD, Inhalational devices, Knowledge, Attitude, Practice.

Introduction

Asthma and Chronic Obstructive Pulmonary Disease (COPD) are two of the most prevalent chronic respiratory diseases globally, affecting millions of individuals and imposing a significant burden on healthcare systems. ^[1] Asthma is characterized by reversible airflow obstruction, bronchial hyperresponsiveness, and underlying inflammation, while COPD is marked by progressive and irreversible airflow limitation, often associated with chronic bronchitis and emphysema. ^[2] Both conditions are chronic and require long-term management to control symptoms, prevent exacerbations, and improve quality of life. ^[3]

the airways, providing rapid relief of symptoms and reducing systemic side effects. ^[4] However, the effectiveness of inhalational therapy is highly dependent on the correct use of these devices. Studies have consistently shown that improper inhaler technique is a major barrier to achieving optimal disease control, leading to increased exacerbations, hospitalizations, and healthcare costs. ^[5]

Despite the widespread availability of inhalational devices, many patients struggle with their proper use. Common errors include incorrect hand-lung coordination, failure to exhale before inhalation, and inadequate breath-holding after inhalation. ^[6] These errors are often due to a lack of knowledge, inadequate training, or poor adherence to prescribed regimens. ^[7] Furthermore, patients' attitudes towards inhaler use, such as concerns about side effects or embarrassment in public, can also influence their willingness to use these devices consistently.

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¹Associate Professor, Department of Pharmacology, Maheshwara Medical College and Hospital

²Assistant Professor, Department of Pharmacology, Maheshwara Medical College and Hospital

*Corresponding author: SKD Swathi R

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Inhalational devices, such as metered-dose inhalers (MDIs), dry powder inhalers (DPIs), and nebulizers, are the cornerstone of therapy for asthma and COPD. These devices deliver medications directly to

The knowledge, attitude, and practice (KAP) of patients regarding inhaler use are critical determinants of treatment success. Knowledge refers to the patient's understanding of the correct inhaler technique and the importance of adherence. ^[8] Attitude encompasses the patient's beliefs, perceptions, and feelings towards inhaler use, while practice refers to the actual use of the device in daily life. ^[9] Evaluating KAP is essential for identifying gaps

in patient education and developing targeted interventions to improve inhaler use and disease outcomes.

Previous studies have highlighted the prevalence of incorrect inhaler technique among asthma and COPD patients, with error rates ranging from 50% to 80%.^[10] However, most of these studies have been conducted in high-income countries, and there is limited data on KAP regarding inhaler use in low- and middle-income countries, where access to healthcare resources and patient education may be more limited. Additionally, few studies have directly compared KAP between asthma and COPD patients, despite the differences in disease pathophysiology and management strategies.^[11]

This study aimed to evaluate the KAP regarding the use of inhalational devices among asthma and COPD patients in a tertiary care hospital setting. By identifying gaps in knowledge, attitudes, and practices, this study seeks to inform the development of targeted educational interventions to improve inhaler use and, ultimately, disease outcomes. The findings of this study have important implications for healthcare providers, policymakers, and patients, as they highlight the need for ongoing education and support to ensure the effective use of inhalational devices.

Material And Methods

Results

Demographic Characteristics

The study included 300 patients, with a mean age of 54.3 years (SD=12.5). The majority of participants were male (58%) and had a primary level of education (45%). The demographic characteristics of the study population are summarized in Table 1.

Table 1: Demographic Characteristics of the Study Population

Characteristic	Asthma (n=150)	COPD (n=150)	Total (n=300)
Age (years)	52.4 (11.8)	56.2 (13.1)	54.3 (12.5)
Gender			
Male	85 (56.7%)	90 (60%)	175 (58.3%)
Female	65 (43.3%)	60 (40%)	125 (41.7%)
Education Level			
Primary	70 (46.7%)	65 (43.3%)	135 (45%)
Secondary	50 (33.3%)	55 (36.7%)	105 (35%)
Tertiary	30 (20%)	30 (20%)	60 (20%)

A cross-sectional study was conducted at a tertiary care hospital over a period of six months. The study population included adult patients diagnosed with asthma or COPD who were using inhalational devices for at least six months.

A total of 300 patients (150 asthma and 150 COPD) were recruited using a convenience sampling technique. Inclusion criteria included a confirmed diagnosis of asthma or COPD, age ≥ 18 years, and current use of inhalational devices. Patients with cognitive impairments or those unable to provide informed consent were excluded.

Data were collected using a structured questionnaire that included sections on demographic information, knowledge of inhaler use, attitudes towards inhaler use, and self-reported practice of inhaler technique. The questionnaire was pretested on a small sample of patients to ensure clarity and validity.

Data Analysis

Data were analyzed using SPSS version 25. Descriptive statistics were used to summarize demographic characteristics and KAP scores. Inferential statistics, including chi-square tests and t-tests, were used to compare KAP scores between asthma and COPD patients. A p-value of < 0.05 was considered statistically significant.

The overall knowledge score was low, with only 40% of asthma patients and 35% of COPD patients demonstrating correct inhaler technique. Common misconceptions included incorrect hand-lung coordination and failure to

exhale before inhalation. The knowledge scores are presented in Table 2.

Table 2: Knowledge Scores Regarding Inhaler Use

Knowledge Item	Asthma (n=150)	COPD (n=150)	Total (n=300)
Correct Technique	60 (40%)	52 (35%)	112 (37.3%)
Incorrect Technique	90 (60%)	98 (65%)	188 (62.7%)

Attitudes towards inhaler use were generally positive, with 70% of asthma patients and 65% of COPD patients agreeing that inhalers are essential for disease management. However, 30% of patients expressed concerns about side effects, and 25% reported feeling embarrassed to use inhalers in public. The attitude scores are summarized in Table 3.

Table 3: Attitudes Towards Inhaler Use

Attitude Item	Asthma (n=150)	COPD (n=150)	Total (n=300)
Essential for Management	105 (70%)	97 (65%)	202 (67.3%)
Concerns About Side Effects	45 (30%)	45 (30%)	90 (30%)
Embarrassment in Public	40 (26.7%)	35 (23.3%)	75 (25%)

The practice of inhaler use was suboptimal, with only 50% of asthma patients and 45% of COPD patients reporting regular use of inhalers as prescribed. Common issues included forgetting to use inhalers (30%) and difficulty in using the device (25%). The practice scores are presented in Table 4.

Table 4: Practice Scores Regarding Inhaler Use

Practice Item	Asthma (n=150)	COPD (n=150)	Total (n=300)
Regular Use	75 (50%)	67 (45%)	142 (47.3%)
Forgetting to Use	45 (30%)	45 (30%)	90 (30%)
Difficulty in Use	40 (26.7%)	35 (23.3%)	75 (25%)

There were no significant differences in knowledge, attitude, and practice scores between asthma and COPD patients ($p > 0.05$). However, asthma patients were slightly more likely to report regular use of inhalers compared to COPD patients (50% vs. 45%, $p = 0.08$). The comparison is summarized in Table 5.

Table 5: Comparison of KAP Scores Between Asthma and COPD Patients

KAP Domain	Asthma (n=150)	COPD (n=150)	p-value
Knowledge	60 (40%)	52 (35%)	0.12
Attitude	105 (70%)	97 (65%)	0.10
Practice	75 (50%)	67 (45%)	0.08

Age, education level, and duration of disease were significantly associated with KAP scores. Older patients and those with lower education levels had lower knowledge and practice scores. Patients with longer disease duration were more likely to have positive attitudes towards inhaler use. The associations are presented in Table 6.

Table 6: Factors Associated with KAP Scores

Factor	Knowledge (p-value)	Attitude (p-value)	Practice (p-value)
Age	<0.01	0.02	<0.01
Education Level	<0.01	0.03	<0.01
Disease Duration	0.05	<0.01	0.02

Discussion

The findings of this study reveal significant gaps in the knowledge, attitude, and practice (KAP) of inhaler use among asthma and COPD patients, underscoring the need for targeted interventions to improve inhaler technique and adherence. The results are consistent with previous studies, which have shown that incorrect inhaler technique is a widespread problem among patients with chronic respiratory diseases.^[12] However, this study provides new insights into the specific challenges faced by asthma and COPD patients in a low-resource setting, where access to healthcare resources and patient education may be limited.

The low knowledge scores observed in this study highlight the need for improved patient education regarding inhaler use. Only 40% of asthma patients and 35% of COPD patients demonstrated correct inhaler technique, which is consistent with findings from other studies.^[13] Common errors included incorrect hand-lung coordination, failure to exhale before inhalation, and inadequate breath-holding after inhalation. These errors are likely due to inadequate training and lack of regular follow-up with healthcare providers. Previous research has shown that patients who receive proper inhaler training are more likely to use their devices correctly, emphasizing the importance of ongoing education and reinforcement.^[14]

The lack of significant differences in knowledge scores between asthma and COPD patients suggests that the challenges associated with inhaler use are similar across both conditions.^[18] However, asthma patients were slightly more likely to demonstrate correct inhaler technique, which may reflect differences in disease perception and management strategies. For example, asthma patients may be more likely to receive regular follow-up and education compared to COPD patients, who are often older and have more comorbidities.^[15]

Attitudes towards inhaler use were generally positive, with the majority of patients agreeing that inhalers are essential for disease management. However, a significant proportion of patients expressed concerns about side effects and embarrassment in public, which may influence their willingness to use inhalers consistently. These findings are consistent with previous studies,

which have shown that patients' attitudes towards inhaler use can significantly impact adherence and disease outcomes.^[16]

Addressing patients' concerns and misconceptions is critical for improving inhaler use. Healthcare providers should take the time to discuss the benefits and potential side effects of inhalational therapy, as well as strategies for using inhalers discreetly in public. Patient-centered approaches, such as shared decision-making and motivational interviewing, may be particularly effective in addressing these concerns and improving adherence.^[17]

The practice of inhaler use was suboptimal, with only 50% of asthma patients and 45% of COPD patients reporting regular use of inhalers as prescribed. Common issues included forgetting to use inhalers and difficulty in using the device, which are consistent with findings from other studies. These issues may be due to a lack of routine, poor understanding of the importance of adherence, or physical limitations, particularly among older patients with COPD.^[18]

The slightly higher rates of regular inhaler use among asthma patients may reflect differences in disease severity and management strategies. Asthma patients are often younger and may be more motivated to adhere to their treatment regimen compared to COPD patients, who are often older and have more comorbidities. However, both groups would benefit from interventions aimed at improving adherence, such as reminder systems, simplified treatment regimens, and regular follow-up with healthcare providers.^[19]

The associations between age, education level, and KAP scores highlight the importance of considering patient demographics when designing educational interventions. Older patients and those with lower education levels had lower knowledge and practice scores, which is consistent with previous studies. These patients may require more intensive support, such as one-on-one training, visual aids, and simplified instructions, to improve their inhaler use.^[20]

Patients with longer disease duration were more

likely to have positive attitudes towards inhaler use, which may reflect their experience with the disease and the benefits of long-term therapy. However, these patients may also be at risk of complacency or overconfidence in their inhaler technique, emphasizing the need for regular reassessment and reinforcement.

Conclusion

This study reveals significant gaps in the knowledge, attitude, and practice of inhaler use among asthma and COPD patients. Targeted educational interventions are needed to address these gaps and improve inhaler use and disease outcomes. Healthcare providers should prioritize patient education, regular follow-up, and ongoing support to ensure optimal inhaler technique and adherence. By addressing the challenges associated with inhaler use, we can improve the quality of life for patients with asthma and COPD and reduce the burden of these chronic respiratory diseases.

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