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Assessment of Knowledge, Attitude, and Practice of Asthma Patients on Single Maintenance and Reliever Therapy - A Literature Review

N.Kishore*[1], Prasobh.G.R[2], Nithin Manohar.R[3], Jasmy.E.S[4] Joshin Lal.E[1], Arya.S.D[1], Jasmi.S[1]

1. Fifth Year Doctor of Pharmacy Student, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.
2. Principal, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.
3. Professor & HOD, Department of Pharmacy Practice, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.
4. Assistant Professor, Department of Pharmacy Practice, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India.

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ABSTRACT

Asthma is a prevalent chronic noncommunicable disease characterized by airway inflammation, constriction, and hyperresponsiveness, currently affecting approximately 300 million individuals worldwide. The condition is categorized by severity, cause, and onset, and is clinically diagnosed through patterns of respiratory distress and airflow restriction measurements such as FEV and Peak Expiratory Flow (PEF). Effective management relies on a tiered pharmacological approach, ranging from short-acting beta_2-agonists (SABA) and systemic corticosteroids for acute exacerbations to the integrated Single Maintenance and Reliever Therapy (SMART) for long-term control.Despite advancements in treatment, poor patient outcomes are frequently linked to deficits in Knowledge, Attitude, and Practice (KAP). This study utilizes a structured KAP assessment framework to evaluate patient understanding of triggers, perceptions of severity, and adherence to medication protocols. It further highlights the pivotal role of the clinical pharmacist as an educator and interventionist. By addressing inhaler techniques and correcting misconceptions about steroid use, pharmacists serve as a vital link in the multidisciplinary effort to reduce hospitalization rates, enhance self-management, and improve the overall quality of life for asthmatic patients.

Keywords : Asthma, SMART therapy, Knowledge, Attitude, Practice

1. Overview of Asthma

➢ Definition and classification of Asthma

A significant and prevalent chronic noncommunicable disease (NCD) that affects both adults and children is asthma. Asthma symptoms, which can include any combination of cough, wheezing, shortness of breath, and tightness in the chest, are brought on by inflammation and constriction of the lungs tiny airways. Often, the symptoms worsen at night or when you wake up. They usually go away on their own or when a reliever drug is inhaled. [1]

➢ Classification of asthma

Asthma is classified into

Classification based on Severity:

- Intermittent: Symptoms occur occasionally, with normal periods in between.
- Persistent: Symptoms are present most of the time and can be mild, moderate, or severe. The patient's condition during attacks is also considered.

Classification based on Cause:

- Allergic Asthma: Triggered by allergens such as mold, pollen, and pet dander.
- Non-Allergic Asthma: Triggered by factors like exercise, stress, illness, or weather changes.

Classification based on Onset:

- Adult-Onset Asthma**:** Begins after age 18.
- Paediatric Asthma: Starts before age 5, affecting infants and toddlers. Some children may outgrow it. Doctors decide on the need for an inhaler for attacks. [1]

2.Epidemiology

Asthma affects around 300 million individuals worldwide, and studies indicate that the prevalence of the condition rises by 50% every ten years. Over the next 20 years, there will probably be a significant rise in the number of asthmatics globally due to the predicted rise in the percentage of people living in cities from 45% to 59% in 2025. By 2025, an extra 100 million people are predicted to have asthma. Prevalence rates have been shown to vary widely: research on adults and children has shown low prevalence rates (2%–4%) in Asian nations, including China and India. [2]

3.Pathophysiology

Inflammation and airway remodelling, which include goblet cell hyperplasia, subepithelial fibrosis, collagen deposition, mucosal gland hyperplasia, smooth muscle hypertrophy, and alterations in the extracellular matrix, are the primary pathophysiological features of asthma. These alterations can lead to immune system imbalance, which ultimately results in airway hyperresponsiveness. Transcription factors, inflammatory mediators, chemokines, cytokines, and proteins linked to cell apoptosis and proliferation also change throughout the course of bronchial asthma gland, smooth muscle hypertrophy, hyperplasia, and extracellular matrix alterations. These alterations may cause an imbalance in the immune system, which may ultimately result in hyperresponsiveness of the airways. Changes in transcription factors, inflammatory mediators, chemokines, cytokines, and proteins linked to cell death and proliferation also occur during the course of bronchial asthma.[3]

4.Diagnosis

Many clinicians diagnose asthma based on a trial of therapy, objective measurements are required to confirm the clinical diagnosis validated questionnaires may be an option in settings where objective testing is not available. The presence of certain key symptoms may indicate the presence of asthma, but it can also result from airway inflammation alone, from chronic rather than reversible airflow limitation, or from other respiratory and non respiratory conditions. Moreover, asthma symptoms in isolation may suggest a less severe form of the disease than is actually present. Furthermore, asthma symptoms alone may indicate a less severe version of the illness than is actually present since they have a weak correlation with abnormalities of lung function and airway inflammation. Even though many medical professionals base their diagnosis of asthma on a treatment trial, objective measurements are required to validate the clinical diagnosis. In situations when objective testing is not possible, validated questionnaires could be an option.

The chronic inflammation of asthma is associated with airway hyperresponsiveness that leads to recurrent symptoms, yet lung function may nevertheless remain normal thus, measurement of airway hyperresponsiveness has clinical significance, especially when diagnosing asthma in individuals with normal spirometry results or symptoms that are not typical of asthma. Typically, direct stimuli like methacholine or histamine are used to measure airway hyperresponsiveness. These stimuli work by activating particular receptors on the bronchial smooth muscle, which causes the airways to contract and narrow**.**

Patients with persistent respiratory symptoms, especially cough, wheezing, chest tightness, and dyspnoea, should be suspected of having asthma. Other diagnoses ought to be left out. Spirometry is an objective lung function test that can be used to verify airway obstruction and show that bronchodilator therapy can reverse the obstruction. [4]

5. Management

Severe asthma attacks are defined as acute asthma exacerbations. Following diagnosis, these patients need to have their asthma severity assessed and receive medication as away. Furthermore, careful observation and methodical assessment of treatment results are required and ought to be the foundation for hospital stay or emergency department discharge. Hospitalisations, death, and relapse rates can all be decreased with appropriate management of acute asthma exacerbations.

➢ **Inhaled short-acting β2-agonists**

Every patient experiencing an acute asthma attack should receive SABAs. After 15 to 20 minutes, there should be a reaction to this treatment, which can serve as a signal for further administration of SABA, hospitalisation, or discharge from the emergency department. The following are guidelines for SABA administration:

- SABAs, such as salbutamol (2.5–5 mg) by nebulisation or salbutamol (400–1,000 micrograms; 4–10 puffs) via MDI with a spacer, ought to be given. After treatment, a response evaluation should be carried out 15 to 20 minutes later. SABAs can be given every 20 minutes for a total of three doses during the first hour of treatment if there is no clinical improvement or only a minor improvement that does not meet the discharge criteria.

- SABAs and short-acting anticholinergics or antimuscarinics (SAMAs) should be administered together in extreme situations. This therapy may be more effective. significantly lower the chance of hospitalisation and enhance lung function compared to SABAs by alone.

➢ **Systemic Corticosteroids**

All asthma patients who have a severe acute asthma exacerbation or who have risk factors for a severe acute asthma exacerbation should receive systemic corticosteroids. The initial Corticosteroid therapy should be continued until the patient is released from the emergency room, and a dosage of an inhaled bronchodilator should be given right away. Every six to eight hours, intravenous systemic corticosteroids, such as hydrocortisone (100 mg) or dexamethasone (4-5 mg), can be given. Oral prednisolone (30–50 mg/day or 0.5–1 mg/kg/day) is justified in mild instances. Oral prednisolone should be administered to all patients receiving systemic corticosteroids at the ER for five to seven days following hospital or ER discharge.

➢ **Inhaled Corticosteroids**

Inhaled corticosteroids can be administered to patients who have not undergone previous treatment with systemic corticosteroids. A high dose of inhaled corticosteroids with in the first hour of an emergency room visit is justified and can reduce hospital admission after discharge as well as reduce the risk of severe acute asthma exacerbation. These medications can be administered in the emergency room if the patient has no history previous use. For those who have previously used inhaled corticosteroids, the dosage should be increased. [5]

➢ **Single Maintenance And Reliever Therapy**

Inhaling corticosteroids and long-acting b2 agonists (ICS/LABA) from a single inhalation device twice a day has proven to be a useful tactic for individuals whose asthma is still uncontrolled despite regular corticosteroid inhalation alone. This combo strategy lowers the chance of an exacerbation and raises the possibility of managing asthma more frequently, quickly, and at a lower dose of ICS than is seen with ICS therapy alone. Typically, combination ICS/LABA therapy has been prescribed with a separate rapid acting beta agonist inhaler used for relief of occasional breakthrough symptoms, but combination ICS/ LABA formulations employing formoterol as the LABA component allow patients to employ their usual maintenance inhaler for quick relief as well. This strategy of medication use has been recognised by regulatory authorities and in international guidelines. It has recently been argued that a strategy of using single maintenance and reliever therapy (SMART) offers more than convenience to patients; it is said to provide better improvements in several outcomes with lower ICS dosing than the traditional combination therapy approach of constant maintenance dosing with a separate reliever. [6]

6. Concept of Knowledge, Attitude and Practice Assessment

The Knowledge, Attitude, and Perception study aimed to find out more about patient's awareness of asthma risk factors and how to support those who have the condition. Enhancing patient's understanding of asthma, lowering risk factors, and preventing adverse drug reactions should be the main goals of these sessions. According to a study, the diversity of asthma self-management behaviours was significantly positively correlated with both asthma knowledge and social support. The purpose of this study was to evaluate asthmatic patient's understanding of bronchial asthma and appropriate education regarding its definition, risk factors, signs and symptoms, diagnostic procedures, management, and prevention. Patients can take an active role in their health care through an interactive learning experience that modifies their health-related knowledge and behaviours through counselling, teaching, and behaviour modification techniques.

According to most experts, asthma education enhances patient comprehension, but other health consequences differ. Hospitalisations and ER visits connected to asthma are more common when these abilities are lacking. The relationship between morbidity and illness behaviours, education, and knowledge is yet unclear. The causes, remedies, and triggers of a disease were

explained to the patients they will all tell you that the amount of information available about asthma is overwhelming. Asthma education programs typically teach participants how to either self-manage their asthma or work with a physician. [7]

7. QUESTIONNAIRE USED FOR KAP ASSESSMENT

Knowledge Questionnaire[8]

S No	Questions	Yes	No	Don't know
1.	Do you understand asthma is chronic disease of the airways?			
2.	Do you think asthma is contagious disease?			
3.	Are you aware that dust, smoke, pollen, and cold can directly cause your breathing symptoms to worsen?			
4.	Do you think asthma can be completely cured?			
5.	Do you realize that inhalers are designed to open you airways during an attack or rather than treating the underlying cause?			

SCORING SYSTEM

- Correct answer = 1
- Wrong/Don't know = 0

INTERPRETATION

- Good: >75%
- Moderate: 50 – 74%
- Poor: <50%

Attitude Questionnaire [8]

S No	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	To what extend do you feel that your asthma interferes with your ability to do your day to day activity?					
2.	How much confidence do you have that following the prescribed drug?					
3.	Do you feel comfortable using inhalers in public?					
4.	How strongly do you agree that using an inhaler is a necessary part of your daily routine rather than unwanted burden?					
5.	Do you feel motivated to learn more about your condition so that you can take a more active role in managing your own health					

SCORING SYSTEM

- Strongly Agree 5
- Agree 4
- Neutral 3
- Disagree 2
- Strongly Disagree. 1

Reverse scoring for questions:3,4,5

INTERPRETATION

- Positive Attitude:20-30(>75%)
- Neutral Attitude:10-20(50-74%)
- Negative Attitude:<10(<50%)

Practice Questionnaire [9]

S No	Questions	Yes	No
1.	How often do you use your prescribed inhaler exactly as directed by doctor?		
2.	If you experience a sudden and severe worsening of your symptoms do you seek immediate care at a hospital?		
3.	Do you keep a rescue inhaler with you at all time for use in case of an unexpected attack ?		
4.	Do you avoid any trigger?		
5.	When using an inhaler do you follow any specific inhalation technique as taught by your healthcare provider?		

SCORING SYSTEM

- Yes = 1
- No = 0

INTERPRETATION

- Good: >75%
- Moderate: 50 – 74%
- Poor: <50%

8. Role of clinical pharmacist

Asthma is one of the chronic disorders that chemists can help treat. Pharmacists are well-suited to inform asthmatic patients about their illness, describe how asthma medications work, show proper inhalation techniques, address any worries about possible side effects, and encourage adherence to recommended therapies because of their clinical expertise. This puts them in a unique position to help people with asthma get the best possible therapeutic results. A systematic, evidence-based asthma treatment service provided by a chemist greatly improved patients medication use, inhaler technique, and quality of life, according to a randomised controlled clinical trial.

The current study sought to highlight a number of aspects of managing asthma in the real world, including the roles of chemists in relation to their evidence-based, current knowledge, their attitudes toward managing asthma, and the practices of using inhaler devices correctly and caring for asthmatic patients. Furthermore, it offers interesting information about the perceived obstacles chemists face while offering asthma management counselling. [10]

9. Needs for patient education

In addition to raising treatment costs, non-adherence to asthma medication raises mortality and morbidity. Adherence rates in asthma are frequently less than 50%. When creating programs to encourage adherence, it's critical to comprehend the demands and behaviours of asthma patients as well as treatment hurdles.

According to the World Health Organization, adherence is "the extent to which a person's behaviour corresponds with agreed recommendations from a health care provider." The issue that arises when asthma management includes not taking medications as directed by a medical professional, not following a provider's instructions, using an inhaler incorrectly, etc. Adherence is therefore multifaceted, and it is crucial to avoid issues resulting from prescription non-adherence.

While a number of interventions are successful in increasing asthma patient's adherence to their medications, very few considerably increase adherence rates and clinical results for these individuals. Improving treatment adherence is a difficult undertaking that calls for asthma self-management, instructional programs combined with educational reinforcing, and the simplification of treatment plans and application forms. Improving adherence also heavily depends on clinicians having effective communication skills and educating patients. [11]

10. Conclusion

Asthma is a complex, chronic non-communicable disease characterized by airway inflammation and hyperresponsiveness, affecting approximately 300 million people globally with a rising prevalence linked to increasing urbanization. Effective management relies on a combination of objective diagnostic tools like spirometry and advanced pharmacological strategies such as Single Maintenance and Reliever Therapy (SMART), yet clinical outcomes remain heavily dependent on the patient's Knowledge, Attitude, and Practice (KAP). Bridging the gap between medical guidelines and real-world behaviour requires the active intervention of clinical pharmacists, who serve as essential educators in correcting inhalation techniques, addressing medication adherence, and mitigating the social or psychological barriers that hinder long-term respiratory health.

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