•Explore links between asthma control, inhaler use, and demographic factors.
•Identify priorities for patient education and improved disease management

The Impact of Inhaler Technique on the Health Outcomes and Cost Among Adults With Asthma and Chronic Obstructive Pulmonary Disease

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B. Balkhi 1, R. Alomari 2 and A. Alshamrani 3

1 College of Pharmacy, King Saud University, Riyadh, Saudi Arabia,
2 KING ABDULLAH MEDICAL CENTRE, jeddah, Saudi Arabia
3 EAST JEDDAH HOSPITAL, jeddah, Saudi Arabia,

INTRODUCTION

Suboptimal inhaler technique remains a hidden yet preventable cause of poor asthma and COPD control globally. Despite extensive international research, little is known about patient inhaler use and knowledge in Saudi Arabia—where asthma prevalence is rising and COPD remains underdiagnosed. Understanding local gaps in inhaler technique and education is essential for improving disease management and patient outcomes.

OBJECTIVE

•Assess inhaler technique and knowledge among patients with asthma or COPD.
•Explore links between asthma control, inhaler use, and demographic factors.
•Identify priorities for patient education and improved disease management.

METHOD

Design: Cross-sectional study
Setting: Tertiary hospital, Jeddah
Participants: 132 patients with asthma or COPD
Tool: Validated 39-item questionnaire on inhaler use, knowledge, and control
Analysis:
Descriptive statistics for demographics and practices
Chi-square tests for associations
Reliability checked using Cronbach's alpha

RESULTS

Most participants were female (60.6%) and aged between 35 and 44 years. The majority (92.4%) had asthma, while 7.6% were diagnosed with COPD. Current smokers represented 27.3% of the sample. Although metered dose inhalers were the most frequently used devices, critical gaps in technique were identified—only 48.5% shook the inhaler before use, and 17.4% exhaled fully prior to inhalation. Over 45% of participants were unaware of potential side effects, and nearly one-third did not know the correct storage method. Based on Asthma Control Test (ACT) scores, 63.9% of patients had very poor asthma control, often reporting nocturnal symptoms and activity limitations. Asthma control showed significant associations with gender, age, education, occupation, and smoking status ($p < 0.05$).

Table 1: Demographic of Participants (N=132)

Total Number of Cases	100
Gender	
Male	39.4
Female	60.6
Age	
18-24	6.1
25-34	22.7
35-44	37.1
45-54	15.2
55-64	5.3
65 and more	13.6
Education	
Preliminary	1.5
Middle	5.3
Secondary	22.0
Bachelor	50.8
Higher Education	11.4
Illiterate	9.1
Occupation	
Employee	62.9
Retired	6.1
Unemployed	31.1
Smoking	
Smoker	27.3
Previous	13.6
Non-smoker	59.1
Respiratory Status	
Asthma	92.4
COPD	7.6

Figure 1: Proper use of inhalers (Total score analysis)

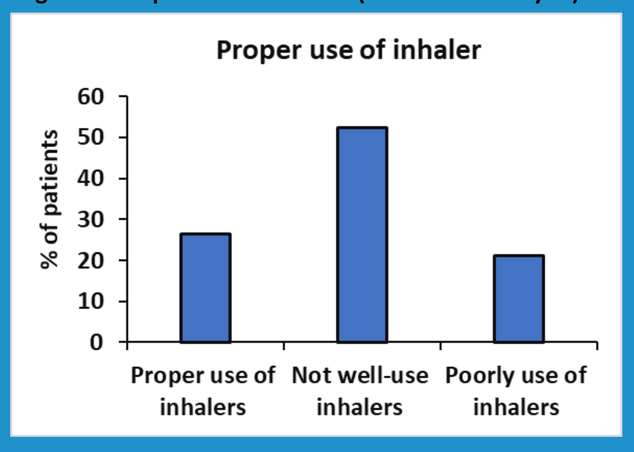


Figure 2: Asthmatic Score according to ACT system

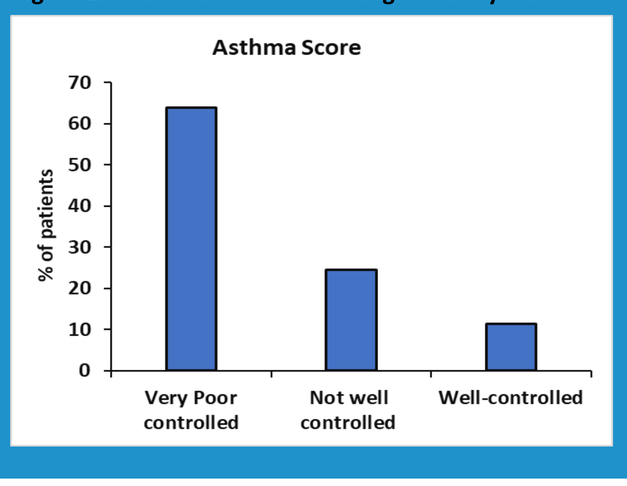


Figure 3. Knowledgeable about Storage

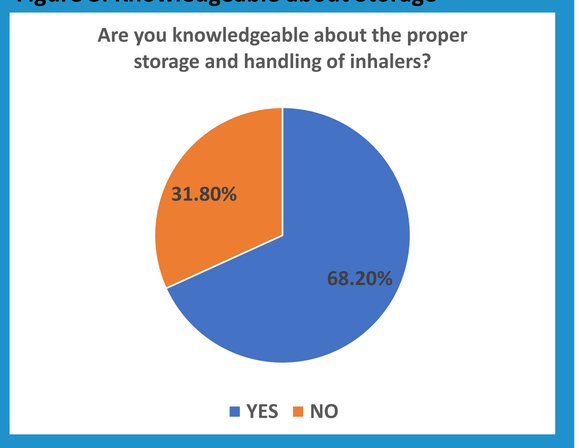
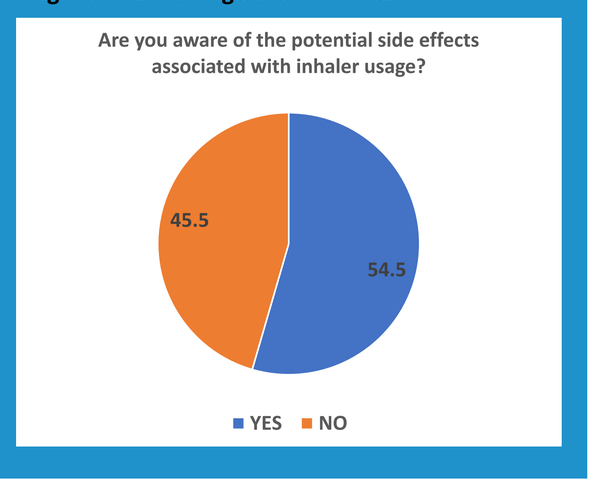


Figure 4: Knowledgeable about SE



CONCLUSIONS

- This study highlights suboptimal inhaler use among asthma and COPD patients, with clear associations to poorer disease control and potential economic consequences. Proper inhaler technique is crucial for effective symptom management, minimizing exacerbations, and optimizing healthcare expenditures.
- Targeted educational interventions, incorporating demographic and disease-specific factors, are essential to improve inhaler technique. Healthcare providers should integrate routine assessment and corrective training into clinical practice. Furthermore, standardized evaluation methodologies are necessary for reliable research and benchmarking. Addressing these gaps will enhance patient outcomes, reduce unnecessary healthcare costs, and contribute to improved quality of life for patients with asthma and COPD. Future research should explore longitudinal impacts of inhaler training interventions and the cost-effectiveness of structured inhaler education programs.

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CONTACT INFORMATION

bbalkhi@ksu.edu.sa