



Original Research Article

A Study on Patient Preference Among Various Inhaler Devices for COPD in a Tertiary Care Hospital

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Abstract: **Introduction:** Chronic Obstructive Pulmonary Disease (COPD) is a long-term respiratory condition requiring consistent inhaler use. Selecting the right inhaler device based on patient preference and usability is crucial for improving treatment adherence and outcomes. **Objective:** To assess inhaler device preferences among newly diagnosed COPD patients, identify the factors influencing their choices, and evaluate adherence to inhaler therapy. **Methods:** A Prospective Observational study was conducted on 128 newly diagnosed COPD patients initiating inhaler therapy. Data on demographic details, clinical symptoms, comorbidities, inhaler preferences, and ease of use were collected. A structured questionnaire evaluated the influence of factors such as affordability, portability, and emergency suitability. Adherence levels were assessed using a 10-item scoring tool and categorized into low, moderate, and high adherence. **Results:** The study population had a mean age of 65.37 years, with 50.8% males and 49.2% females. The most common presenting symptom was breathing difficulty (85.9%), and the leading comorbidities were hypertension (53.9%) and diabetes mellitus (46.1%). The Metered Dose Inhaler (MDI) was the most preferred device (35.9%), rated easiest to use by 35.2% of patients. The Diskus inhaler was the least preferred (5.5%) and most difficult to use (53.1%). Among all factors, ease of cleaning and Suitability of the device for quick use in emergency situation had statistically significant impact on inhaler preference. Overall, 75.8% of patients exhibited high adherence to inhaler use. **Conclusion:** The study highlights that selecting suitable inhaler devices based on patient preferences and educating patients on inhaler techniques can significantly improve adherence, disease control and quality of life. The study also emphasizes the importance of considering patient comfort and device usability to improve adherence and therapeutic outcomes in COPD management. Patient centered prescribing leads to better treatment outcomes and treatment satisfaction.

Keywords: COPD, MDI, Inhaler, Patient Preference.

INTRODUCTION

According to the Global Initiative of Chronic Obstructive Lung Disease (GOLD), COPD is defined as “A preventable and treatable disease with some significant extra-pulmonary effects that may contribute to the severity in individual patient. One feature of its pulmonary component is airflow limitation that is not completely reversible. The restriction of airflow is typically progressive and linked to an aberrant inflammatory reaction of the lungs to harmful particles or gases.[1]

An essential part of managing and treating individuals with these conditions is the inhalation of medication. Better clinical control and a higher quality of life are

largely dependent on using inhalation devices correctly and following treatment instructions.[2,13] Drug formulation (e.g., solution, dry powder, or mist), whether the inhaler contains medication in a single- or multi- dose, whether the device is disposable or refillable, and how the inhaler dispenses the medication are some of the differences between inhaler devices.[3,11] Patient preference with inhaler devices have attracted increasing attention, because of the potential impact that patients’ usage with inhalers might have on adherence to therapy and outcome in long term manner.[4] More than 250 inhaler devices are available on the market; they are commonly referred to as pressurized metered dose inhalers (MDIs) and dry powder inhalers (DPIs).[5] The main

factors influencing patient preference were the form of the inhaler, the dose counter, and its reusability after a month of therapy.[6,12]

METHODOLOGY

Study design

Prospective observational study was conducted in the Department of Respiratory Medicine at a tertiary care hospital offering a complete range of health care services

Study population

All patients with COPD in the respiratory medicine department and those who satisfied the inclusion and exclusion criteria were selected for the study.

Sample size

Minimum sample size required for the current study is 128, calculated using the formula $n = Z\alpha^2PQ$

where $Z\alpha$ = Z value of α error at 5%, P = Proportion of COPD patients preferring pMDI, $Q = 1 - P$, d = absolute precision

Inclusion criteria

The study included patients who were OP patients, both male and female patients, patients who are willing to give consent to join the study, patients with COPD as respiratory condition, patient above 18 years of age, patient who are newly using inhalers.

Exclusion criteria

Paediatric patients, Patients with cognitive impairment as well as psychiatric illness, Patients who are not willing to give consent to join the study
Data collection

It was a 6 month study conducted from a period of October 2024 to March 2025 after getting approval from Institutional Ethics Committee. Patient demographic details were collected using standardised patient data collection form. Inhaler preference was assessed through Inhaler Preference Table which contain the validated checklist of Inhalers. Factors influencing Inhaler choices were assessed through Inhaler Preference Questionnaire. Adherence to Inhaler were assessed through Inhaler Adherence Questionnaire

Statistical analysis

Data was properly coded and entered in Microsoft Excel and analyzed using SPSS software, version 2. Qualitative variables such as age group, occupation status, and economic status were expressed as frequencies and percentages. Quantitative variables were summarised as mean(SD) / median(IQR). Associations between inhaler type and categorical variables were assessed using Fisher's exact test.

To evaluate the factors influencing inhaler preference,

beneficiary responses to a structured 10-item questionnaire were compared across different inhaler types using the Kruskal-Wallis test.

Statistical significance was determined at a p-value of <0.05.

RESULTS

1. Distribution based on gender

Out of 128 patients, from Figure 1, the gender distribution was nearly equal with males comprising 50.8% and females 49.2%.

2. Distribution based on age

Out of 128 patients, from Figure 2, the highest number of patients were aged either 60-69 years or above 70 years (both 33.6%), followed closely by those aged 50-59 years (32.8%), indicating an even distribution among older adults. The mean age was 65.37 years.

3. Patient Ratings of Ease of Use for Different Inhaler Types

From Figure 3, the Metered Dose Inhaler (MDI) was rated as the easiest to use by 35.2% of patients. The Diskus inhaler was found to be the most difficult, with 53.1% rating it as hard

4. Distribution based on inhaler preference

Out of 128 patients, from Figure 4, the MDI with Spacer was the most preferred inhaler (35.9%) and the Diskus inhaler was the least preferred at 5.5%.

5. Comparison of Factors Influencing Inhaler Preference Among the Study Population

Based on Table 1, Ease of cleaning showed a statistically significant difference ($p = 0.002$), with Synchrobreathe rated highest and Suitability in emergencies approached significance ($p = 0.050$).

6. Distribution of study population based on inhaler type and gender

From Figure 5, the study examined inhaler preference across genders. Among males, the MDI with Spacer (41.5%) was the most preferred inhaler. Among females, while the MDI with Spacer (30.2%) remained the most chosen

7. Distribution based on inhaler type and age

From Figure 6, In the 50-59 years group, Synchrobreathe (28.6%) was most preferred. Among the 60-69 years group, MDI with Spacer (44.2%) had the highest preference. For those aged >70 years, MDI with Spacer (39.5%) again dominated preferences.

8. Distribution of study population based on adherence to inhaler use

From the Figure 7, adherence to inhaler use was generally high: High adherence was reported by 75.8% These findings indicate a strong overall

adherence to prescribed inhaler use among the study population.

9. Distribution of study population based on inhaler type and adherence to inhaler use

From Figure 8, the analysis of adherence by inhaler type showed variations in adherence rates, but these were not statistically significant. High adherence was most common among Diskus (85.7. Synchrobreathe had the highest low adherence rate (16.7%).

Figure 1: Distribution based on gender

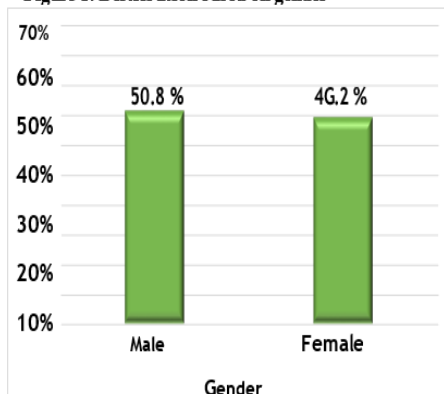


Figure 2: Distribution based on age

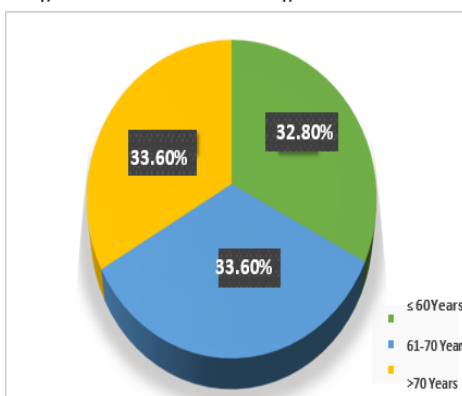


Figure 3: Patient Ratings of Ease of Use for Different Inhaler Types

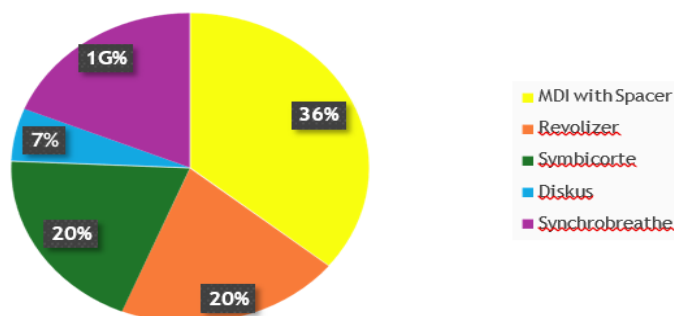
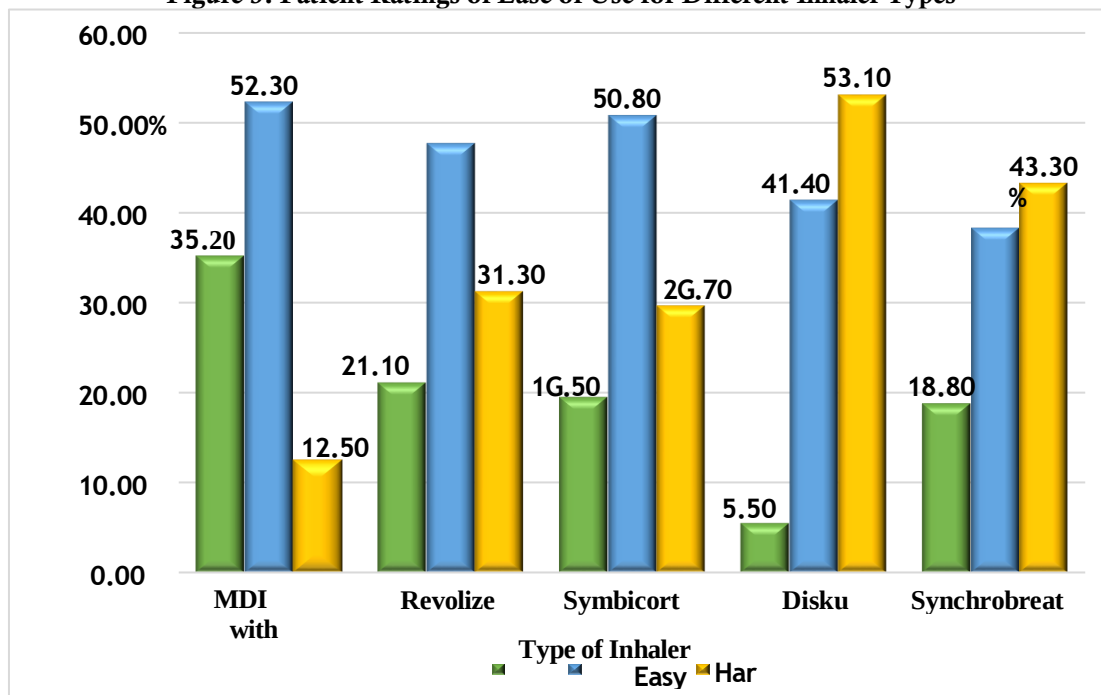


Figure 4: Distribution based on inhaler preference

Table 1 : Comparison of Factors Influencing Inhaler Preference Among the Study Population

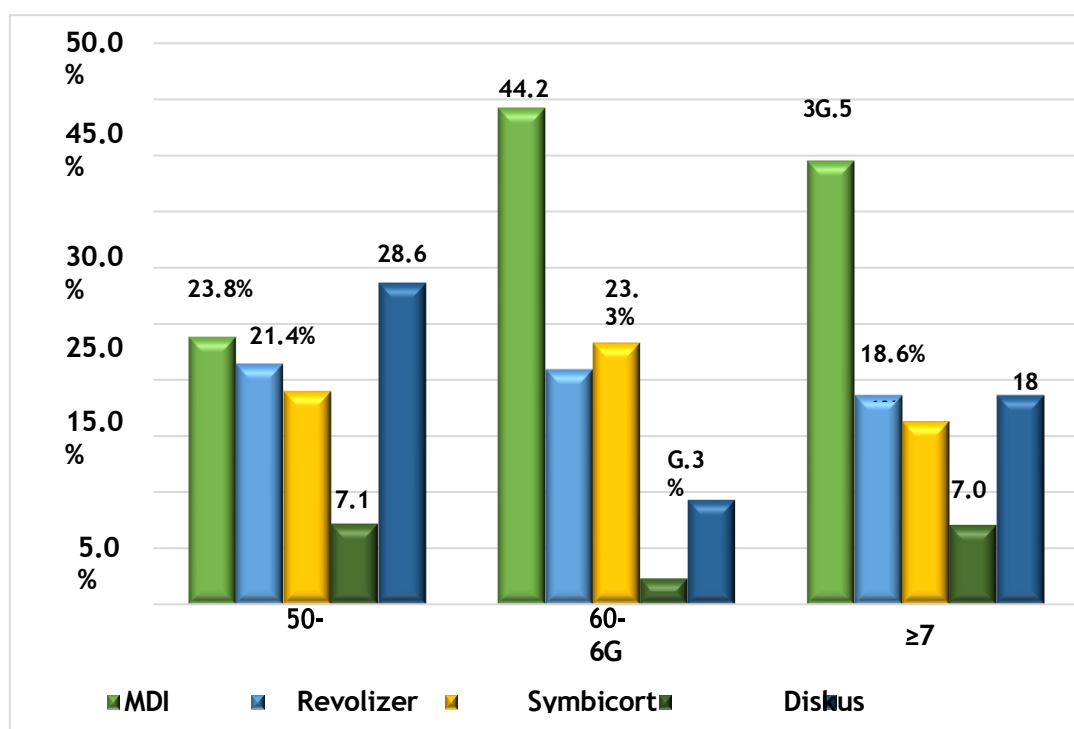
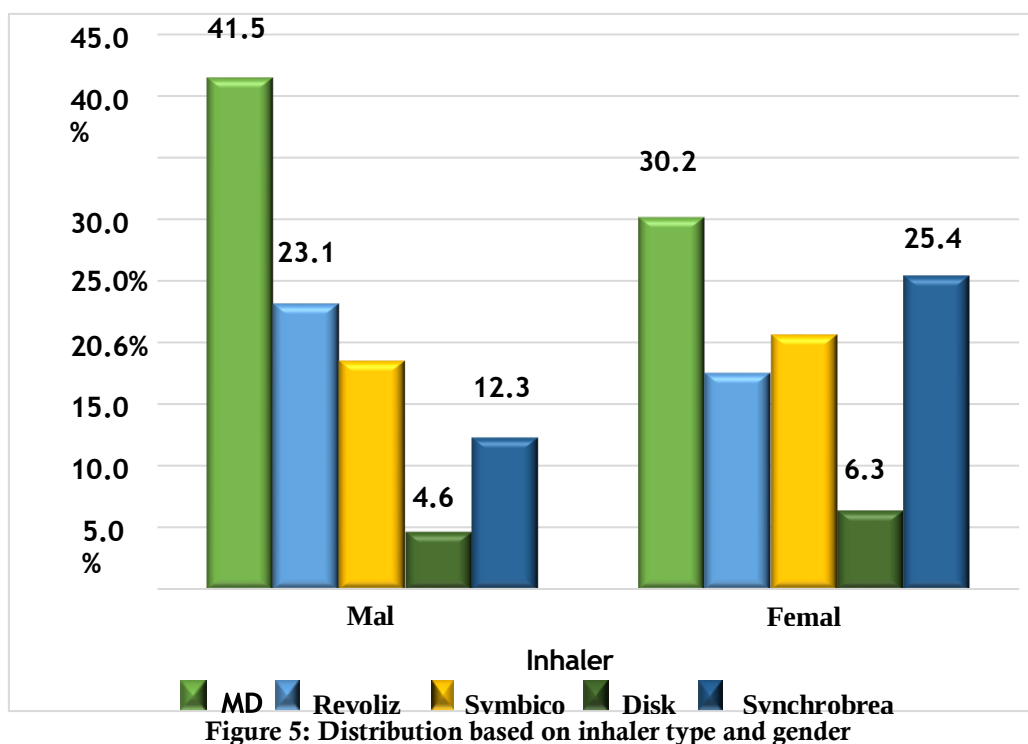
Factor considered	Inhaler preferred – Median Score (IQR)					Test statistic * & p value
	MDI	Revolizer	Symbicort	Diskus	Synchrobreathe	
Liking for the device.	4(1)	4(2)	4(1)	4(1)	4(1)	H = 0.374, p = 0.985
Appeal of the device's shape and colour.	3(1)	4(1)	4(1)	4(1)	3(1)	H = 1.398, p = 0.844
Confidence in using the device.	3.5(1)	3.5(1)	4(1)	4(1)	4(1)	H = 3.102, p = 0.541
Ease of handling the device.	3(1)	3(1)	4(1)	3(1)	3(1)	H = 5.126, p = 0.275
Affordability of the inhaler.	3(1)	3(0)	3(0)	3(3)	3(0)	H = 2.627, p = 0.622
Simplicity in remembering the inhaler usage.	3(1)	3(1)	3(1)	3(1)	4(1)	H = 6.926, p = 0.140
Comfort in carrying the device.	3(1)	4(1)	4(1)	4(1)	4(1)	H = 7.160, p = 0.128
Ease of cleaning the inhaler.	3(1)	3(1)	3(1)	3(1)	4(1)	H = 17.33, p = 0.002*
Suitability of the device for quick use in emergencies.	3(2)	3(1)	3(0)	4(1)	3(1)	H = 9.477, p = 0.050
Presence of fear while using the device.	2(2)	2(1)	2(1)	3(2)	2(2)	H = 5.828, p = 0.212

Ease of cleaning the inhaler:

Scores for ease of cleaning varied, with the Synchrobreathe receiving slightly higher ratings. A significant difference was observed (H = 17.33, p = 0.002), suggesting that ease of cleaning played an important role in influencing inhaler preference, with some inhalers perceived as easier to maintain than others.

Suitability of the device for quick use in emergencies:

Ratings for emergency usability ranged from 3 to 4, indicating moderate satisfaction with the inhalers' readiness for urgent use. The comparison approached (H = 9.477, p = 0.050) suggesting that the perceived suitability of the inhaler for emergencies may have influenced some patients' choices.



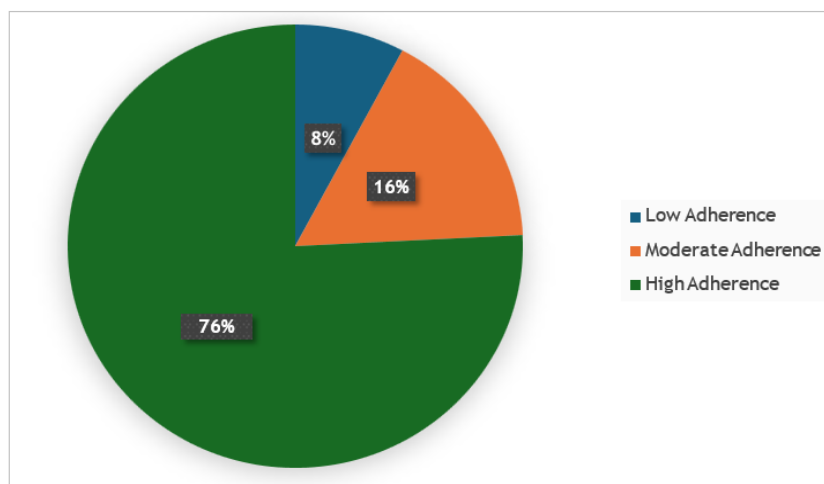


Figure 7: Distribution of study population based on adherence to inhaler use

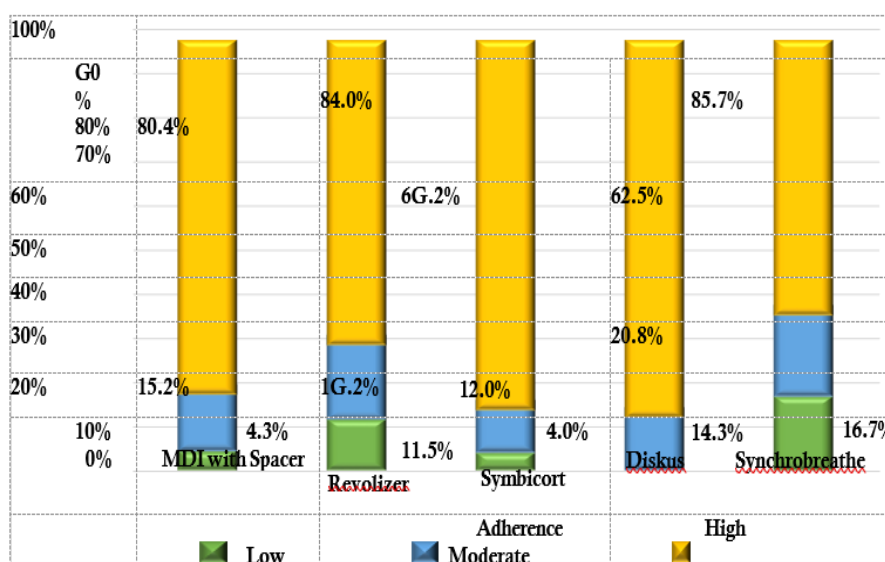


Figure 8: Distribution of study population based on inhaler type and adherence to inhaler use

DISCUSSION

This study explored the relationship between inhaler device preference, usability, and medication adherence among COPD patients. The results indicate that while the study population had a nearly equal gender distribution, a large proportion were unemployed (77.3%) and belonged to the Above Poverty Line group (70.3%). The high prevalence of obesity (60.9%) and symptoms such as breathing difficulty (85.9%). Hypertension (53.9%) and diabetes mellitus (46.1%) were the most frequently reported comorbid conditions. Among the inhaler types evaluated, the Metered Dose Inhaler with Spacer (MDI) emerged as the most preferred (35.9%) and easiest to use (35.2%), while the Diskus was the least favored (5.5%) and perceived as the hardest to use (53.1%). Despite the lack of statistically significant association between device type and adherence, the high adherence rate (75.8%) across devices, especially with Diskus (85.7%), Symbicort (84%), and MDI with Spacer (80.4%), underscores the importance of

matching patient preferences with usability. Conversely, Synchrobreath had the lowest high-adherence rate (62.5%) and highest low-adherence rate (16.7%), suggesting that patient familiarity and comfort with the device substantially affect consistent use. These observations align with prior studies by Schreiber et al[7], Price D et al[8], Usmani et al[9], Cakmakli et al.,[10] Plaza V et al., [14] and Chouaid C et al., [15]

CONCLUSION

Choosing the right inhaler devices based on patient preferences, particularly ease of use and maintenance can significantly improve treatment adherence in COPD patients. Patient comfort and device usability leads to improved therapeutic outcomes in COPD management. Educating patients about inhaler techniques leads to better disease control, reduce hospitalizations and improves overall quality of life. Patient-centered Prescribing in future leads to treatment satisfaction and better health outcomes.

Future studies may consider longer time frames, diverse populations, physician prescribing preferences, multiple follow – ups to assess long term effects and explore alternative therapy.

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Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Ethical consideration

Institutional Ethics/Human Ethics Committee approval was obtained.

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