

**EVALUATION OF INHALATION TECHNIQUE AND QUALITY OF LIFE IN  
RESPIRATORY DISEASES**Joycy George\*<sup>1</sup>, Rosmin Jacob<sup>2</sup> and Dr. K. Krishnakumar<sup>3</sup><sup>1</sup>M. Pharm, Department of Pharmacy Practice, St. James College of Pharmaceutical Sciences, Chalakudy, Kerala.<sup>2</sup>Assistant Professor, Department of Pharmacy Practice, St. James College of Pharmaceutical Sciences, Chalakudy, Kerala.<sup>3</sup>Principal, St. James College of Pharmaceutical Sciences, Chalakudy, Kerala.**\*Corresponding Author: Joycy George**

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**ABSTRACT**

The correct use of inhalers can reduce the occurrence of Asthma and COPD to an extent. The Aim is to assess steps in use of inhaler devices in respiratory diseases & to evaluate the relationship of inhaler usage with quality of life. Main objectives of the study were to assess the inhalation technique & quality of life in patients who have respiratory diseases mainly Asthma & COPD, To educate patients on proper usage of inhalers and To evaluate association of inhaler use with respiratory disease control, hospital visits. A prospective observational study was conducted among 110 patients diagnosed with respiratory diseases like Asthma & COPD and are using inhalers in the pulmonology and general medicine department of a 450 bedded tertiary care hospital, for a period of 10 months to assess the steps of inhaler use and its relationship with quality of life in the given population. Both male & female patients with age greater than 18 who diagnosed with Asthma & COPD & are using inhalers. Patients who are not using inhalers and Patients in emergency departments and out patients and also Patients with age less Than 18 were excluded from the study. Clinical pharmacist played an important role to improve quality of life through patient education. Hence by effective drug therapy, correct use of inhaler, and adequate pharmacist intervention Quality of life of Asthma and COPD patients can be improved and thus their recurrent visits to hospitals also reduced.

**KEYWORDS:** Asthma, inhaler, usage, errors.**INTRODUCTION**

Asthma and Chronic obstructive pulmonary disease population are growing faster now a days. Both are characterized by airway inflammation & airway obstruction and also leads to recurrent hospital admissions. Asthma and COPD are two respiratory diseases which uses inhalers mostly. Asthma is a chronic disease characterized by recurrent attacks of breathlessness and wheezing. Asthma is more prevalent in children and elderly now a days. Inhaler therapy for these conditions have lot of advantages over systemic therapy which includes less number of side effects, quicker onset of action etc. The patients should be given proper training regarding inhaler usage to ensure optimum therapy. Asthma and other chronic airway diseases can be effectively treated by inhaler therapy. Inhaler devices are of different types such as metered dose inhalers (MDI) or dry powder inhalers (DPI). The outcome of inhaler therapy largely depends on appropriate use of inhaler not the type of inhaler device used. Appropriate use of inhaler means correct usage of inhalation technique. A poor inhalation technique may reduce lung drug deposition; and more the mistakes in

the inhalation technique the lower the benefits on lung function. But sometimes children faces difficulties in inhaler usage.<sup>[1]</sup>

**Bronchial Asthma**

Bronchial Asthma is a chronic inflammatory condition of the lungs characterized by widespread narrowing of the airways due to spasm of the smooth muscle, edema of the mucosa, and the presence of mucus in the lumen of the bronchi and bronchioles. It is a reversible condition.<sup>[2]</sup>

**Epidemiology**

According to WHO, India has 15-20 million asthmatics prevalence of asthma in last 6 decades has increased from 2%-25% among rural residents and from 2%-15% among urban residents in India. Peoples in the low and middle income countries have higher Asthma population than higher income countries and its prevalence is estimated to be increasing faster in those countries.<sup>[3]</sup>

**Chronic Obstructive Pulmonary Disease (COPD)**

Chronic obstructive pulmonary disease is a disease state characterized by airflow limitation. COPD, or chronic obstructive pulmonary disease, is a chronic, ongoing, progressive disease of the lower respiratory tract in the lungs. It is treatable and can be prevented, but airflow persistently remains decreased. The hallmark of the disease is difficulty with breathing that slowly gets worse over time.

**Etiology:** The major reasons for COPD includes

1. Tobacco smoking
2. Occupational exposure to chemical fumes, dust and gases.
3. Natural ageing process of lungs
4. Genetic factors
5. Air pollution
6. Socio-economic status.<sup>[4]</sup>

Appropriate inhaler use can be determined by comparing actual use with the advised regimen by the prescriber. Several studies have shown that, children should have proper compliance with inhalation corticosteroids for its effectiveness. Overuse of bronchodilators has also been increased and some parents are confused about the corticosteroid inhaler that is used for maintenance therapy and bronchodilator inhaler which is used for relieving symptoms. The parents were asked about how they assessed the number of remaining doses and how they cleaned the device after use. Questionnaires can also be necessary to determine the level of knowledge of children and their parents associated with the correct use of inhaler and also to identify inconsistencies between uses of inhalers with prescriber's advice.<sup>[5]</sup>

QOL score card and respiratory disease questionnaire are tools to measure health related quality of life in asthma patients, the questionnaire is a disease specific questionnaire. Respiratory disease questionnaire was developed to measure health problem of patients and QOL score card was used to assess their improvement in quality of life.<sup>[6]</sup>

**OBJECTIVES**

- ✓ To assess the inhalation technique in patients who have respiratory diseases mainly Asthma & COPD.
- ✓ To educate patients on proper usage of inhalers.

**Table 1: Distribution based on smoking habit.**

Smoking habit	Number of patients (n)	Percentage %
Non smoker	62	57
Ex smoker	36	32
Current smoker	12	11

The pattern of distribution for smoking habit among study population is shown in the table (1). among the study population 57.27% were non- smokers (n=63), 31.81% were ex-smokers(n=35), 10.90% were current smokers(n=12).

- ✓ To evaluate association of inhaler use with respiratory disease control, hospital visits & quality of life of patients.

**MATERIALS AND METHODS**

A prospective observational study was conducted among Asthma and COPD patients to assess the steps of inhaler use and its relationship with quality of life in the given population. The study was carried out in the pulmonology and general medicine department of a 450 bedded tertiary care hospital attached with a drug information Centre (DIC). A total of 110 patients diagnosed with respiratory diseases like Asthma & COPD and are using inhalers were enrolled in the study. The study was carried out for a period of 10 months.

**Study criteria****Inclusion Criteria**

- Both male & female patients diagnosed with respiratory diseases like Asthma & COPD, who are using inhalers.
- Patients with age greater than 18 diagnosed with Asthma & COPD & are using inhalers.
- Patients admitted in general medicine & pulmonology wards, who are using inhalers.

**Exclusion Criteria**

- Patients who are not using inhalers
- Patients in emergency departments and out patients.
- Patients with age less than 18.

**Data collection and analysis**

The Patient details were collected from the medical records. The further information were collected by direct patient interview. Patient awareness to inhalational technique will be assessed using self-designed respiratory disease control questionnaire. Documented data was analyzed. The data was fed into Microsoft excel and Effectiveness of counseling on quality of life of patients with respiratory disease was analyzed using paired t test. Chi-square test was applied to analyze the association of inhaler use and quality of life.

**RESULTS AND DISCUSSION****1. Smoking habit**

Distribution of patients based on smoking habit N=110

**2. Type of inhaler used**

Distribution of patients based on type of inhaler used.

**Table 2: Distribution based on type of inhaler used.**

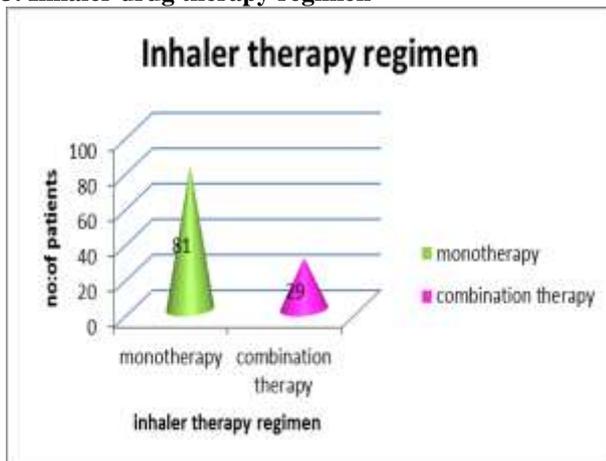
Type Of Inhaler Used	Number of patients (N)	Percentage %
PMDI	71	64.54
DPI	22	20
PMDI With Spacer	19	17.27

N=110

The study population is distributed based on type of inhaler used as shown in table (2). Most of the patients 64.54% (n=71) uses PMDI type of inhaler. About 20% that is n=22 were using DPI type inhalers. And only 17.27% (n=19) were using PMDI with spacer type.

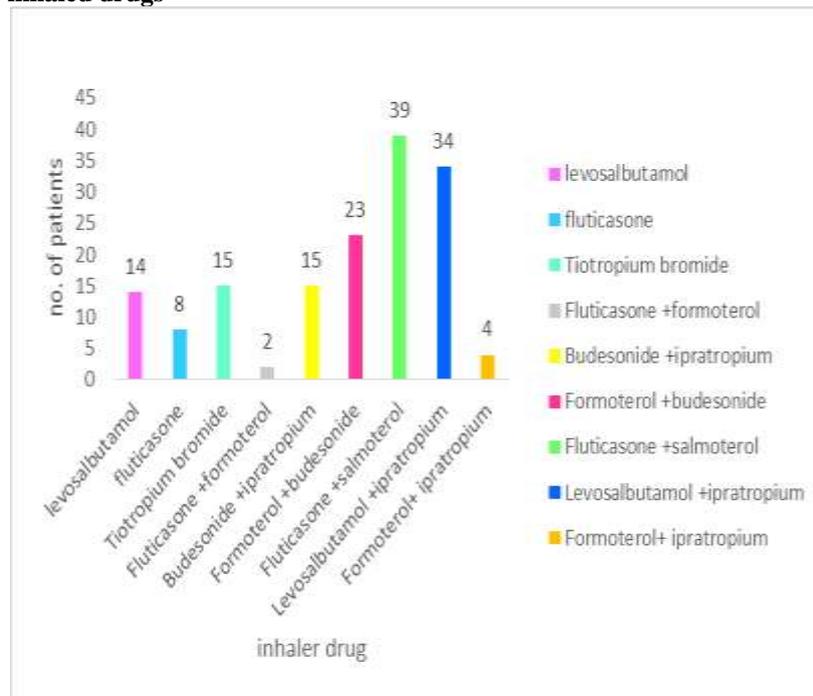
The study population undergone Distribution of patients based on number of inhalers. Most of the patients 73.6% i.e n=81 are using only one inhaler. But about 26.36% (n=29) were using more than one inhalers.

### 3. Inhaler drug therapy regimen



**Fig. 1: Distribution based on number of inhalers used.**

### 4. Categorization of inhaled drugs



**Fig. 2: Categorization of inhaled drug.**

Figure (2) reveals that majority 35.45% (n=39) were having Fluticasone +Salmeterol and also Levosalbutamol

+ipratropium 30.90% were also frequently prescribed in n=34patients. Budesonide+ipratropium. 13.63% (n=15),

Formetrol+ budesonide 20.90% (n=23), levosalbutamol 12.72% (n=14), 7.27% Fluticasone (n=8), Tiotropium bromide 13.63% (n=15) were also prescribed. Fluticasone +Formetrol 1.8% and Formetrol+ ipratropium 3.63% were the least prescribed drugs.

### 5. Category of co-prescribed drugs

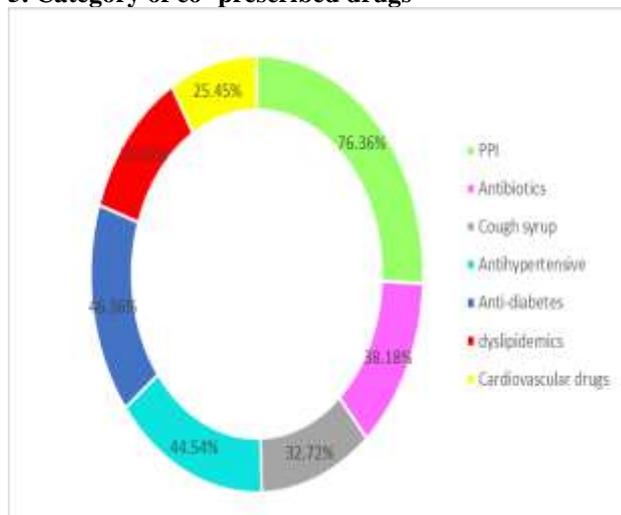


Fig. 3: Distribution of co-prescribed drugs.

Percentage of co-prescribed drugs used is shown in figure (3). Proton pump inhibitors 76.36% (n=84) was the most commonly used drugs with inhalers. Antibiotics are used by 38.18% (n=42), 46.36% (n=51) are using anti diabetics, 32.72% cough syrups (n=36), 44.54% (n=49) are using antihypertensive 33.63% (n=37), was prescribed with dyslipidemics, 25.45% of asthma population are using CVD (n=28).

### 6. Distribution of patients on correct steps of inhaler usage

Distribution of patients who done the inhaler usage steps correctly.

Table 3: Mean, Mean difference and 't' value on pre-test and post-test quality of life scores.

Parameter	Mean	Standard deviation	Mean difference	't' value	p value
Pre-test	10.96	1.75	10.37	58.596*	<0.001
Post-test	21.34	1.74			

N=110

$t_{109} = 1.659$ ,  $p < 0.05$  \*Significant

The data in the table 7 shows that the mean post-test quality of life score ( $10.96 \pm 1.75$ ) was greater than the pre-test quality of life score ( $21.34 \pm 1.74$ ). The calculated 't' value 58.596 was greater than the table value ( $t_{109} = 1.659$ ) at 0.05 level of significance. The p value obtained is <0.001. Hence the null hypothesis was rejected and the research hypothesis was accepted. Therefore the counseling was effective since there was a significant increase in the mean quality of life score before and after counseling.

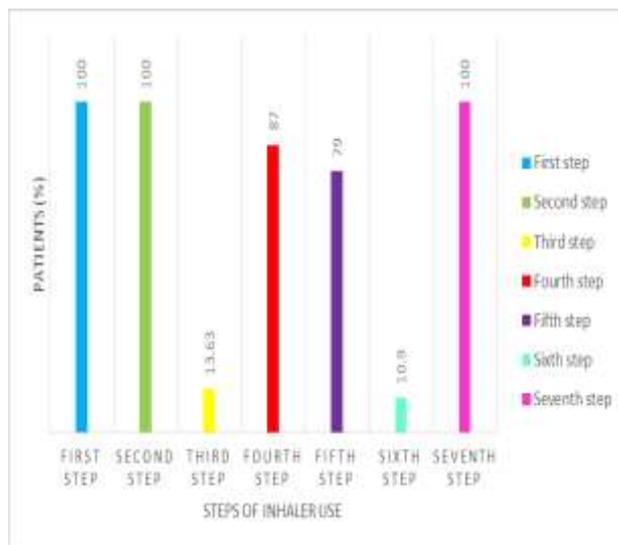


Fig. 4: Distribution based on inhaler usage steps.

All (100%) of the patients were done first two steps and seventh step correctly. Fourth (87%), n=96 and fifth (79%), n= 87 steps were done by most of the patients. Very few patients were done (n=15) third step (13.63%) and sixth step n=12 (10.9%) correctly.

### Effectiveness of counseling on quality of life of patients with respiratory disease

To find the significant difference between the mean pre-test and post-test. Quality of life score, paired 't' test was used. The following null hypothesis was stated.  $H_{03}$ : The mean posttest quality of life score will be significantly less than the mean pretest quality of life score.

### Association of inhaler use score with quality of life score

To find the association of inhaler use score with quality of life score, Chi square test was used. The following null hypothesis was stated.

$H_{08}$ : There will not be any significant association of inhaler use score with quality of life score.

**Table 4: Association of inhaler use score with quality of life score.**

Parameter	$\chi^2$ value	df	Table value of $\chi^2$	p value	Inference
QOL Score	14.456	3	7.815	0.002	*S

$\chi^2$  at 0.05 level of significance NS- Not Significant, S\*- Significant.

Data in the table 8 shows that the  $\chi^2$  value obtained for quality of life score and inhaler use score is 14.456 which was greater than the table value at 0.05 level of significance. The p value obtained (0.002) was less than 0.05. Hence the null hypothesis is rejected and the research hypothesis is accepted for these variables. Therefore there was a significant association of quality of life score with inhaler use score. That means patients recurrent hospital visits reduced due to correct use of inhaler devices.

### CONCLUSION

Study indicate that inhalers can be used to deliver medications to the lungs effectively. Giving one or more doses of a short acting bronchodilator via inhaler with a spacer and face mask is better than giving the same medication by nebulizer in most patients. The pre-study scores was lesser, shows very few patients were having appropriate information about the way of handling the inhalation devices, and that is increased by giving adequate counselling with patient information leaflet. From the pre study and post study score values we can conclude that patient awareness about both the drug, disease and quality of life has improved by effective patient counselling. Clinical pharmacist played an important role to improve quality of life through patient education. Hence by effective drug therapy, correct use of inhaler, and adequate pharmacist intervention QOL of Asthma and COPD patients can be improved and thus their recurrent visits to hospitals also reduced.

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