

Knowledge and Adherence to MDI Usage among COPD and Asthma Patients

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ABSTRACT

Introduction: Increasing prevalence of respiratory diseases is a matter of concern. Three hundred million people were affected worldwide and caused more than 2 lakhs death globally. Proper practice and training of the correct steps of using metered dose inhaler can minimise the drawbacks and therefore it is necessary to observe and analyse the existing knowledge and adherence on the use of metered dose inhaler.

Objective: This study aims to investigate the level of knowledge regarding Metered Dose Inhaler (MDI) usage and adherence to correct inhalation techniques among COPD and asthma patients attending a respiratory outpatient department in a multispecialty hospital in Trivandrum, Kerala.

Methods: Descriptive research design is used for the study. 30 patients who met the inclusion criteria were selected conveniently for the study. Participants were selected based on inclusion criteria, and demographic data were collected to understand the characteristics of the sample. Knowledge regarding MDI usage was assessed, and adherence to correct inhalation techniques was observed.

Results: The majority of participants were above 50 years old, with a higher representation of females. Primary education completion was prevalent among participants, and most reported a duration of outpatient visits of less than 5 years. Knowledge assessment revealed a significant lack of education on MDI usage, with 77% reporting below-average knowledge. Adherence to correct inhalation techniques varied, with notable gaps in certain steps. Associations between socio-demographic factors and knowledge demonstrated a significant relationship with the number of outpatient visits, but no significant associations were found with age or education level.

Discussion: The findings underscore the critical need for tailored patient education and regular follow-up visits to improve knowledge and adherence to MDI usage among COPD and asthma patients. Healthcare providers should prioritize comprehensive education sessions and consider interventions tailored to address the specific needs of patients with lower levels of formal education.

Conclusion: This study highlights the importance of addressing knowledge gaps and improving adherence to correct MDI usage among COPD and asthma patients.

Keywords: COPD, Asthma, Metered Dose Inhaler, Inhalation Techniques, Patient Education, Adherence, Outpatient Department, Trivandrum.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) and asthma pose significant challenges to healthcare systems globally,

with effective management often reliant on inhalation therapy, particularly Metered Dose Inhalers (MDIs). However, optimal treatment outcomes hinge not only on the

prescribed medication but also on patients' knowledge of correct MDI usage and their adherence to these techniques. Understanding the extent of patients' knowledge regarding MDI usage is crucial for tailoring effective educational interventions. By assessing knowledge gaps, healthcare providers can identify areas for targeted education to empower patients in managing their respiratory conditions more effectively. Furthermore, evaluating patients' adherence to correct inhalation techniques during clinic visits provides valuable insights into the practical application of MDI therapy in real-world settings, ensuring optimal treatment outcomes and disease control. Despite the widespread use of MDIs in COPD and asthma management, studies have highlighted persistent challenges related to patient education and adherence. Many patients may struggle with understanding proper inhalation techniques, leading to suboptimal medication delivery and treatment efficacy. Moreover, factors such as socioeconomic status, language barriers, and access to healthcare resources can further complicate patients' ability to adhere to prescribed regimens. This study aims to assess the level of knowledge regarding MDI usage and adherence to correct inhalation techniques among COPD and asthma patients attending the respiratory outpatient department of a selected hospital in Trivandrum.

Objectives

- 1.To assess the knowledge regarding use of metered dose inhaler among patients with COPD and Asthma.
- 2.To determine the extent to which patients adhere to correct inhalation techniques while using MDIs for the management of COPD and asthma in the specified outpatient setting.
- 3.To find out the association between Age, Educational level, Duration of OPD visit and with patients' knowledge regarding MDI usage among COPD and Asthma patients attending respiratory outpatients department of selected hospital

MATERIALS AND METHODS

Descriptive research design was adopted for the study. The study was conducted in Multispecialty hospital at Trivandrum district after getting permission from the hospital authority. A total of 30 COPD and Asthma patients who is using MDI and attending the respiratory OPD were selected for the study. Criteria for

Inclusion criteria were 1) Who is having pulmonary disease like Asthma, COPD and are using metered dose inhaler. 2) Who can read and understand English or Malayalam.

Exclusion criteria were 1) Who were very ill. 2)Who were mentally incompetent.3) Who did not consent to take part in the study.

A written consent was obtained from each participant after the aim and objectives of the study were fully explained to them. Information on knowledge regarding the use of MDIs was collected from the participants self- reporting. The participants were given the option of either the English or Malayalam version of the questionnaire to answer. Thereafter each participant was asked to demonstrate the steps of MDIs and observed the steps using a standardized checklist. The research tool used consists of 3 sections. Section I consist of demographic variables. Section II consists of knowledge questionnaire to assess the knowledge on the use of MDI. Section III consists of checklist used to assess patients adhere to correct inhalation techniques while using MDIs. The researcher selected COPD and asthma patients based on inclusion criteria from respiratory OPD's. Informed consent was obtained from the participants. Each participant took 15 minutes to complete data. The data was obtained from 30 samples regarding their knowledge and adhere to correct inhalation techniques. Data collection was tabulated and analysed by using descriptive and inferential statistics.

RESULTS

Section I: Socio demographic data of COPD and Asthma patient using MDI.

Section II: To assess the knowledge regarding use of metered dose inhaler among patients with COPD and Asthma.

Section III: Association between age, level of education, and duration of OPD visit with patients' knowledge regarding MDI usage among COPD and Asthma patients

Section I: Socio-Demographic data of COPD and Asthma patient using Metered Dose Inhaler.

Table 1: Frequency and percentage distribution of samples according to age

Age range (years)	Frequency	Percentage (%)
18-20	0	0
21-29	5	17
30-39	6	20
40-49	3	10
50-69	16	53
Total	30	100

Data presented in table 1 reveals that majority of participants in the study were older adults, with 16 out of 30 participants (53%) falling within the age range of 50-69 years. The next most represented age group was 30-39 years, comprising 20% of the sample, followed by the 21-29 years age group with 17%. Participants aged 40-49 years constituted 10% of the sample, while there were no participants in the youngest age range of 18-20 years, The results indicate that the study sample predominantly consisted of older individuals, with relatively fewer participants in younger age group

Table 2 Frequency and percentage distribution of samples according to the gender

Gender	Frequency	Percentage
Male	12	40
Female	18	60
Total	30	100

The data in table 2 shows that, In terms of gender, there were 12 males (40%) and 18 females (60%) making the ratio of males to females 2:3.

Table 3 Frequency and percentage Distribution of samples according to the education level

Education	Frequency	Percentage
none	7	24
Primary	15	50
Secondary	3	10
Tertiary	5	16
Total	30	100

Table 3 reveals almost half of the participants (50%) completed primary school as the highest level of education followed by (24%) not attended any form of schooling. Only 16% completed tertiary education, while 10% completed secondary level of education.

Table 4 Distribution of the sample according to the duration of OPD visit

Duration	frequency	percentage
<5 years	16	53
>5 years	14	47

The data in Table 4 shows that 16 individuals (53%) having a duration of less than 5 years for their OPD visits and 14 individuals (47%) having a duration of more than 5 years.

Section II: To assess the knowledge regarding use of Metered Dose Inhaler

Table 5 Assessment of the knowledge regarding use of metered dose inhaler

knowledge	frequency	percentage
Above average	7	23
Below average	23	77

Table 5 indicates that the majority of patients, 77% have below average knowledge regarding the use of metered dose inhalers. This suggests that there may be a significant portion of patients who require additional education or support in understanding how to properly use these inhalers. Only 23% of the patients have knowledge rated above average.

Section III: patients' adherence to correct inhalation techniques while using Metered Dose Inhaler

Table 6: Extent to which patients adhere to correct inhalation techniques while using MDIs

Steps on usage of MDI	Yes	No
1. Removes the mouthpiece cover, and check the mouthpiece thoroughly to see that it is clean.	30 (100%)	0 (90%)
2. Shakes the inhaler vigorously	23 (77%)	7 (23%)
3. Hold the inhaler upright between index finger and thumb.	18(60%)	12(40%)
4. Breathes out gently through your mouth and immediately place the mouthpiece in your teeth (Do not bite it)	16 (53%)	14(47%)
5. Grips the mouthpiece firmly with your lips.	29 (97%)	1 (3%)
6. Tilt your head slightly backwards.	11 (37%)	19 (63%)
7. Starts breathing in slowly through your mouth. (At the same time press the canister, to release one dose while continuing to breathe)	23 (77%)	7 (23%)
8. Remove the inhaler from your mouth and holds breathe for at least 10 seconds or as long as is comfortable	15 (50%)	15(50%)
9. Breathes out slowly.	26 (87%)	4 (13%)
10. If another dose is required, wait for at least one minute, repeat steps 1 -4	19(63%)	11(37%)
11. After use, replace the mouthpiece cover.	27(90%)	3(10%)

Table 6 reveals that Steps 1 (removing the mouthpiece cover and checking its cleanliness) and 5 (gripping the mouthpiece firmly with lips) show very high adherence rates, with 100% and 97% respectively. Steps 2 (shaking the inhaler vigorously), 3 (holding the inhaler upright), 7 (starting breathing in slowly while pressing the canister), and 11 (replacing the mouthpiece cover after use) show moderate adherence rates, ranging from 60% to 77%. Steps 4 (breathing out gently and placing the mouthpiece in teeth), 6 (tilting head slightly backwards), 8 (removing inhaler from mouth and holding breath), 9 (breathing out slowly), and 10 (waiting for another dose if required) exhibit lower adherence rates, ranging from 37% to 53%.

Steps 4, 6, 8, 9, and 10 indicate areas where patients may require additional education or support to improve adherence to correct inhalation techniques

Section IV: Association between Age, Educational level and Duration of OPD visit with patients' knowledge regarding Metered Dose Inhaler usage

Table 7: Association between the age and knowledge

Socio demographic variable	Chi square (x2)	df	significance
Age	3.84	1	NS

df (1) t = 3.84 (p >0.05)

The above table shows that there is no association between knowledge and age

Table 8: Association between knowledge and level of education

Socio demographic variable	Chisquare (x2)	Df	significance
Level of education	1.38	1	NS

df (1) t= 6.31 (p >0.05)

The above table shows that there is no association between level of education and knowledge.

Table 9: Association between knowledge and no of OPD visit regarding the use of MDI among COPD and Asthma patient.

Socio demographic variable	Chisquare (x2)	df	significance
No of OPD visit	10.38	1	*

df (1) t= 36.84 (P < 0.05)

The above table shows that there is an association between knowledge and no of OPD visit regarding the use of MDI among COPD and Asthmatic patients.

DISCUSSION

The present study aimed to assess the socio-demographic characteristics, knowledge regarding the use of Metered Dose Inhalers (MDI), and adherence to correct inhalation techniques among patients with Chronic Obstructive Pulmonary Disease (COPD) and Asthma.

The socio-demographic profile of the participants revealed interesting insights. The majority of participants were above 50 years of age, with a significant proportion falling within the age range of 50-69 years. This finding aligns with the typical age range of individuals affected by COPD and Asthma, which tend to manifest and worsen with age. Additionally, there was a slightly

higher representation of females compared to males in the sample, indicating a possible gender predisposition or higher healthcare-seeking behavior among females.

Regarding education level, a considerable proportion of participants had only completed primary education or had not attended any formal schooling. This highlights a potential gap in educational attainment among the studied population, which could impact their understanding and adherence to medical instructions, including the proper use of MDIs.

The duration of outpatient department (OPD) visits varied among participants, with a slight majority reporting a duration of less than 5 years. This could indicate the chronic nature of COPD and Asthma, requiring ongoing management and monitoring.

The assessment of knowledge regarding MDI usage revealed concerning findings. A significant majority of participants reported below-average knowledge regarding MDI usage, with only a small percentage indicating above-average knowledge. This suggests a widespread lack of education or awareness regarding the correct use of MDIs among COPD and Asthma patients, which could lead to suboptimal treatment outcomes and exacerbations of their conditions.

The evaluation of adherence to correct inhalation techniques while using MDIs unveiled mixed results. While the majority of participants demonstrated proper technique in some steps, such as removing the mouthpiece cover and gripping the mouthpiece firmly with lips, there were notable deficits in other steps, such as shaking the inhaler vigorously and tilting the head backward.

The analysis of associations between socio-demographic factors and knowledge regarding MDI usage yielded interesting insights. There was a significant association between knowledge and the number of OPD visits, suggesting that patients who visited the OPD more frequently had better knowledge regarding MDI usage. However, no significant associations were found

between knowledge and age or education level.

Implications and Recommendations

The findings of this study underscore the importance of comprehensive patient education and regular follow-up visits in improving knowledge and adherence to proper MDI usage among COPD and Asthma patients. Healthcare providers should prioritize patient education sessions focusing on correct inhalation techniques and reinforce these instructions during every clinical encounter. Additionally, interventions tailored to address the specific educational needs of patients with lower levels of formal education should be developed and implemented.

Future research could explore the effectiveness of different educational interventions, such as personalized counselling sessions or multimedia educational materials, in improving knowledge and adherence to MDI usage among COPD and Asthma patients. Longitudinal studies tracking patient outcomes following educational interventions could provide valuable insights into the impact of improved knowledge on disease management and quality of life.

CONCLUSION

The findings show the importance of ongoing patient education and personalized interventions to enhance knowledge and adherence to MDI usage. Healthcare providers should prioritize comprehensive education sessions and consider tailoring interventions to address the specific needs of patients with lower levels of formal education.

Declaration by Authors

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