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## Assessment in Improving Knowledge, Attitude, and Practice Towards Inhalers Used in Asthma and COPD Patients



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**Keywords:** Asthma, COPD, KAP Study, risk factor analysis, validation of KAP

### ABSTRACT

WHO describes Asthma as a chronic inflammatory disorder that affects airways whereas, COPD causes obstructed airflow from the lungs. So, this study deals with usage of inhalers in asthma and COPD patients. Main objective is to evaluate the knowledge, attitude and practice of patients on asthma and COPD regarding inhaler use with validated KAP questionnaire. It is a prospective and interventional study which is carried out in pulmonology department for Six months. Patients of adult age group (18-80 years) around 67 subjects were included. In validation of KAP questionnaire, the overall I-CVI was found to be 91.43%. The overall S-CVI were found to be 91.59% and 99% for relevance, clarity, simplicity, and ambiguity. The results of the validated KAP questionnaire reveal that the majority of the study population is having good knowledge (n=57, 85.07%), moderate attitude (n=57, 85.07%), good practice (n=48, 71.64 %) on usage of inhalers and 82.3% of study population (n= 56) were having poor overall KAP scores. While analyzing the total KAP study, the p value was <0.00001. In our study the proportion of Asthma, COPD & unclear diagnosis was found to be 31.34%, 34.32% & 34.32% respectively. It reveals majority of patients that developed asthma and COPD belonged to age group 20-30 years. Considering the gender-wise distribution male predominance was found. These finding highlights the ignorance of precise inhaler techniques in disease management. Hence medical practitioners should focus on patient education regarding inhaler techniques in order to achieve better disease control and reduce morbidity and mortality.



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## INTRODUCTION

Asthma and COPD are chronic obstructive lung diseases that affect many patients and add an enormous burden to health care systems worldwide. Based on current treatment guidelines, both diseases are treated with maintenance medications delivered daily by inhaler devices (usually a mixture of bronchodilators and inhaled corticosteroids) <sup>[1]</sup>. However, it's common for patients under prolonged treatment to possess poor medication adherence. A wide variety of inhaler devices with different drug combinations exist that provide excellent therapeutic results when used efficiently <sup>[2]</sup>. However, there's still space for improvement regarding device-related attributes that are considered important to the patients, like simple use, size, and portability. However, upto 94% of patients with asthma don't use their inhalers correctly and they require multiple education sessions to maintain their technique <sup>[7]</sup>. The purpose of our study is to determine the level of Knowledge, attitude and practice towards inhaler used in asthma and COPD patients along with misconceptions on inhalers among the study group. This study aims to enhance patient knowledge about inhaler techniques. The study reveal that patient population has a piece of good knowledge, fair attitude towards inhalers used in the treatment of disease and better practice knowledge about the inhaler technique used to treat the disease condition.

## MATERIALS AND METHOD:

### Study design, study setting, and source of data:

In December 2019 we conducted a prospective interventional case study on the pulmonology outpatient department in The Oxford Medical College and Research Centre to evaluate usage of inhalers in asthma and COPD patients.

### Sampling Size and Technique:

We have done the study on a sample size of 67 patients pulmonology OPD in the hospital for 6 months through a collection of data from the medical records & questionnaire for KAP on inhalers.

The sample size of 67 was calculated using the following sample size equations:

$$X = Z^2 P(1-P) / e^2$$

$$n = NX / X + N - 1$$

Patients of all age groups and both gender that receive the inhalers therapy in the treatment plan and patients show good response in medication therapy were included.

**Collection of Data and Methods of Data Analysis:**

1: All the documents which were used in the study were translated to the local language (Kannada) & Ethical approval was obtained from the Institutional Ethics Committee of The Oxford Medical College, Attibele, and Bangalore. IEC/TOMCHRC/124/2019-20).

2: Consent was obtained from the patient through an informed consent form in English and Kannada language.

3: Collected data regarding the demographics of the patient (Name, Age, Sex, OP.NO, Height, Weight) and the details regarding complaints, diagnosis, prescribed drugs, past medication history, side effects and drug interactions with antibiotics through data entry form.

4: Assessment of data, Knowledge, attitude and practice towards inhaler use in asthmatic patients employing a validated questionnaire.

5: Assessment of interventions made after patient counseling in improving the knowledge level of patients.

6: The obtained data are going to be evaluated using the acceptable statistical procedure.

Methodology for validation of Knowledge, attitude and practice questionnaire associated with inhalers utilized in asthma and COPD patients. The development of the questionnaire and validation study had happened in two phases. Phase 1 consisted of the questionnaire development stage, and phase 2 comprised validation studies. Both these phases were completed within 1 month of the study.

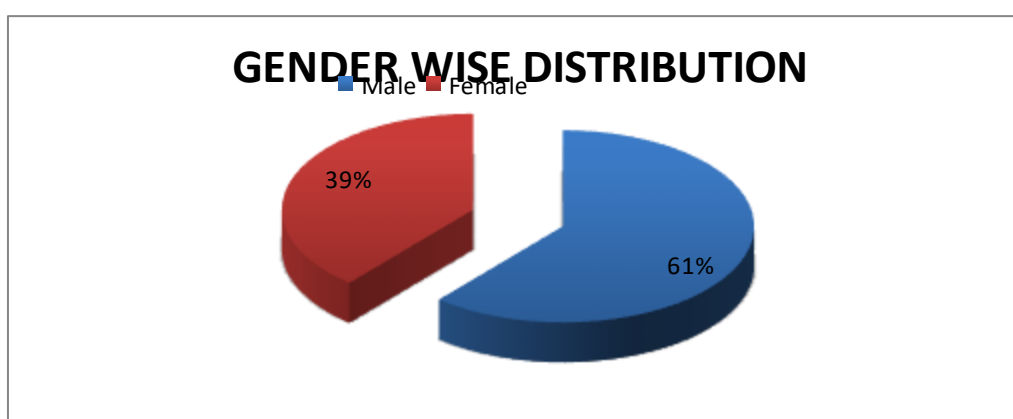
## RESULTS AND DISCUSSION

### RESULTS

#### 1. GENDER WISE DISTRIBUTION

*Table No. 1: Gender wise distribution*

GENDER	No. of patients (N=67)	Percentage
Male	41	61.19%
Female	26	38.80%



*Figure No. 1: Gender wise distribution*

The results show that gender-wise distribution of 67 patients of asthma and COPD patients in pulmonology department which the usage of prescribed inhalers is higher in men than the women.

#### 2. AGE WISE DISTRIBUTION

*Table No. 2: Age wise distribution*

AGE (in years)	No. of patients (N=67)	Percentage
20-30	15	22.38%
31-40	12	17.91%
41-50	14	20.89%
51-60	10	14.92%
61-70	9	13.43%
71-80	5	7.46%
81-90	2	2.98%

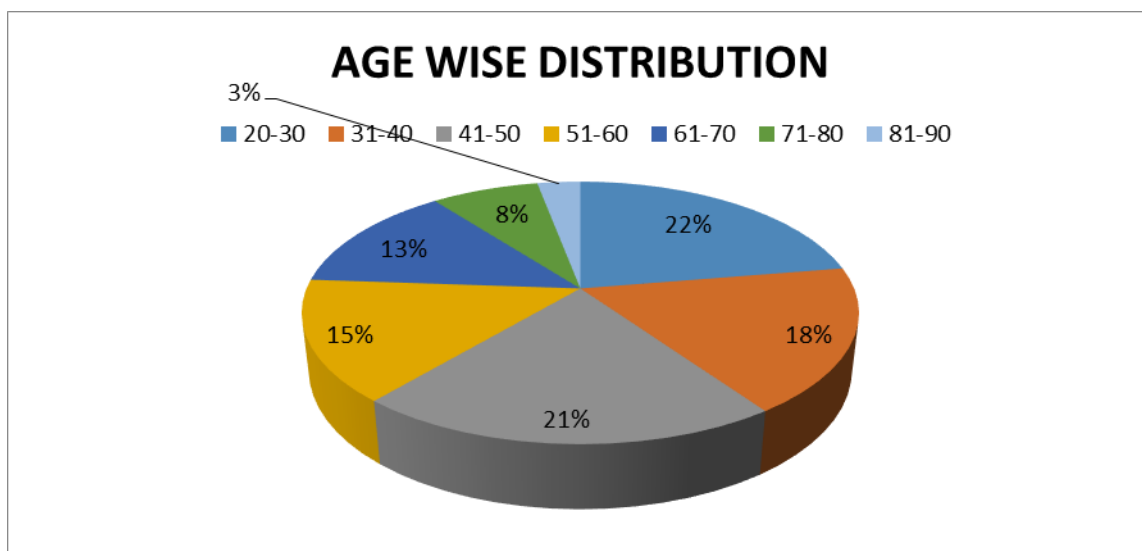


Figure No. 2: Age wise distribution

The results showed that out of 67 patients of the outpatient department in pulmonology department with the age group of 20-30 patients (22%) were most affected.

### 3. VALIDATION-ICVI (INTERNAL CONTENT VALIDATION INDEX)

Table No. 3: Internal content validation index

Question Number	Relevance score	Clarity score	Simplicity score	Ambiguity score	I-CVI%
1.	3.73	3.73	3.86	3.8	94.5
2.	3.73	3.66	3.46	3.66	90.68
3.	3.8	3.86	3.8	3.93	96.18
4.	3.53	3.66	3.66	3.66	90.68
5.	3.73	3.46	3.73	3.73	91.56
6.	3.73	3.46	3.66	3.73	91.12
7	3.4	3.46	3.66	3.8	89.5
8	3.73	3.53	3.66	3.53	90.31
9	3.6	3.66	3.66	3.66	91.12
10	3.4	3.66	3.86	3.8	92
11	3.46	3.73	3.73	3.66	91.12
12	3.53	3.53	3.73	3.53	89.5
13	3.86	3.8	3.8	3.66	94.5
14	3.55	3.66	3.66	3.86	92.06
15	3.55	3.6	3.66	3.66	90.43
16	3.8	3.53	3.4	3.8	90.81
17	3.6	3.73	3.53	3.73	91.18
18	3.6	3.6	3.53	3.93	91.62

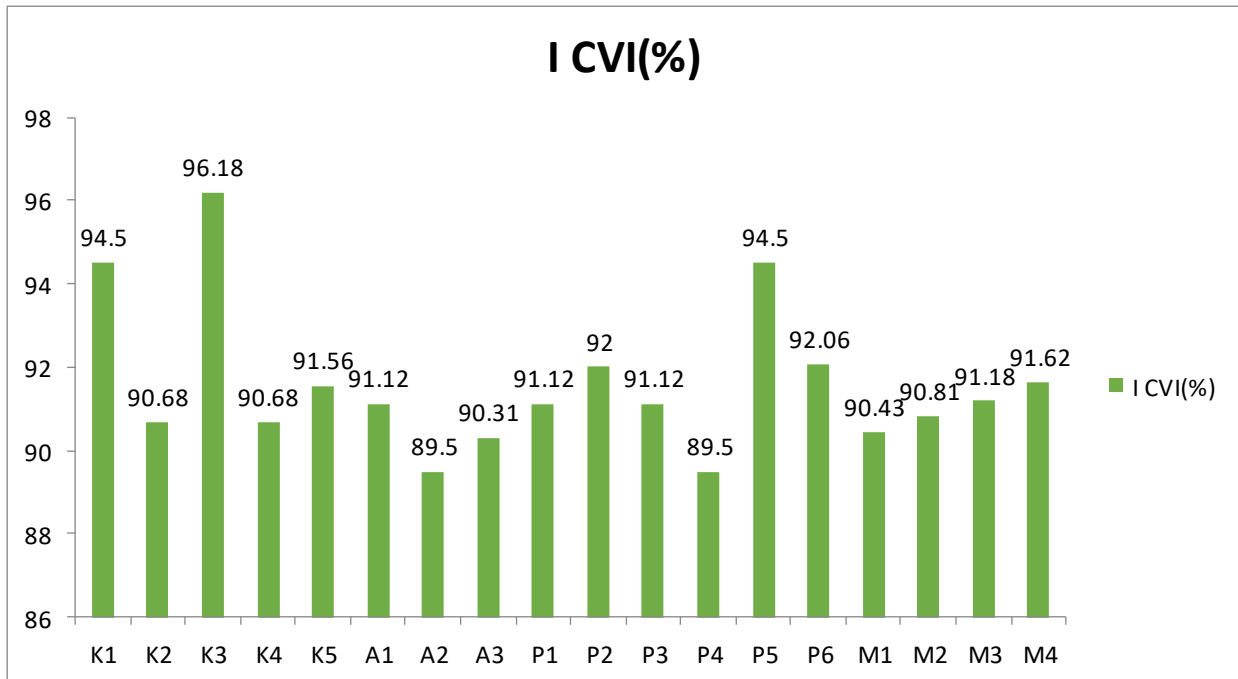


Figure No. 3: Internal content validation index

From above graph represents internal content validation index of questionnaires were accurate.

#### 4. SCALE CONTENT VALIDATION INDEX

Table No. 4: Scale content validation index

PARAMETER	S-CVI	AVERAGE	PARAMETER	S-CVI
RELEVANCE		3.629444		90.73
CLARITY		3.628889		90.7
SIMPLICITY		3.669444		91.72
AMBIGUITY		3.729444		93.23

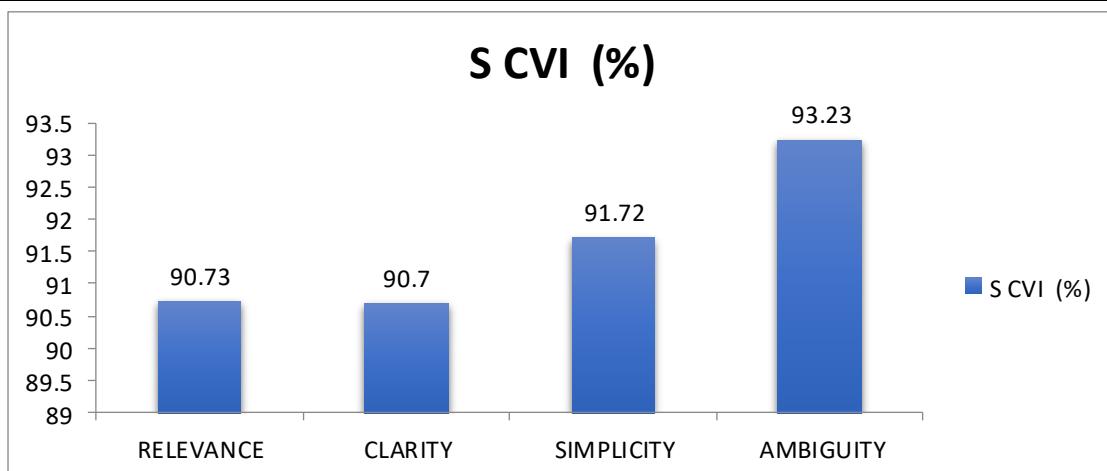


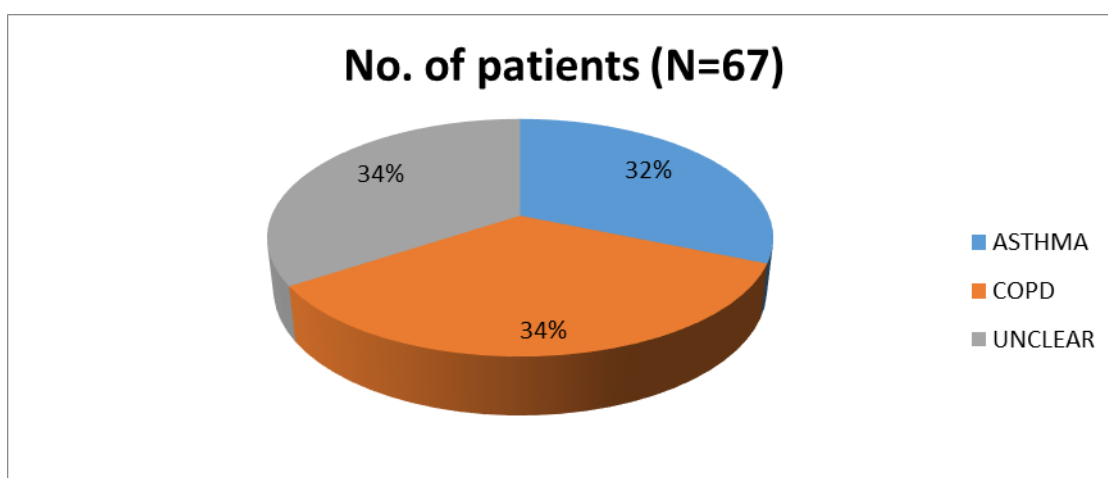
Figure No. 4: Scale content validation index

From above, graph represents scale content validation index shows accurate results.

## 5. DIAGNOSIS

*Table No. 5: Disease wise distribution*

DISEASES	No. of patients (N=67)	PERCENTAGE
ASTHMA	21	31.34%
COPD	23	34.32%
UNCLEAR	23	34.32%



*Figure No. 5: Disease wise distribution*

The result shows that patients with asthma were found to be (31.34%) and COPD (34.32%) and unclear state is seen as (34.32%). Most of the outpatient department diagnoses were unclear.

## 6. QUESTIONNAIRES SCORE INDEX

### a) KNOWLEDGE

*Table No. 6(a): Knowledge of patients*

KNOWLEDGE	No. of patients (N=67)	Percentage
POOR (0-5)	0	0
FAIR (6-10)	4	5.97%
GOOD (11-15)	57	85.07%
VERY GOOD (16-20)	6	8.95%

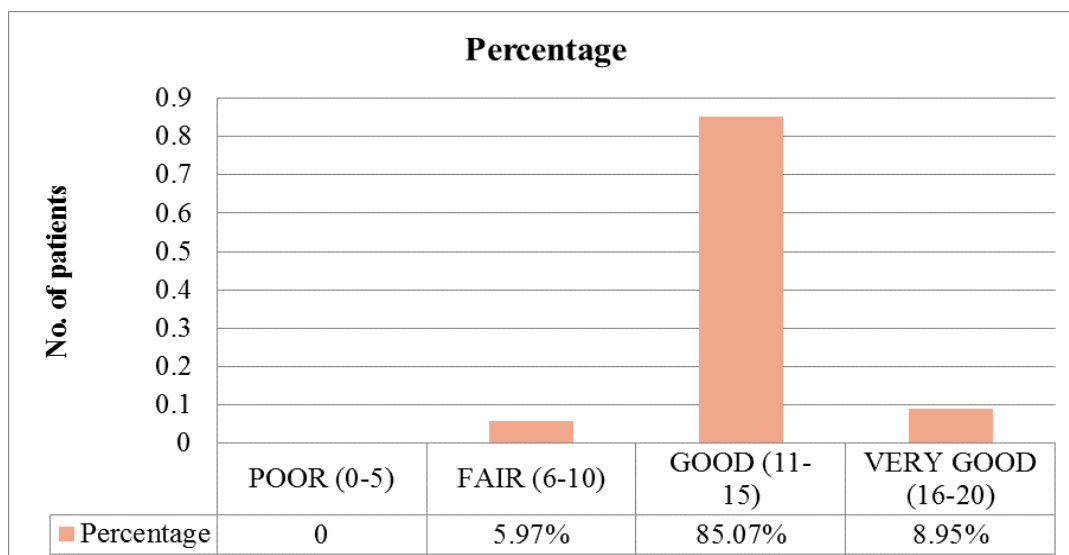


Figure No. 6(a): Knowledge of patients

The results shows patients of the asthma and COPD have good knowledge (n=57, 85.07%).

b) ATTITUDE

Table No. 6(b): Attitude of patients

ATTITUDE	No. of patients (N=67)	Percentage
POOR (0-3)	0	0
FAIR (4-6)	7	10.44%
GOOD (7-9)	57	85.07%
VERY GOOD (10-12)	3	4.47%

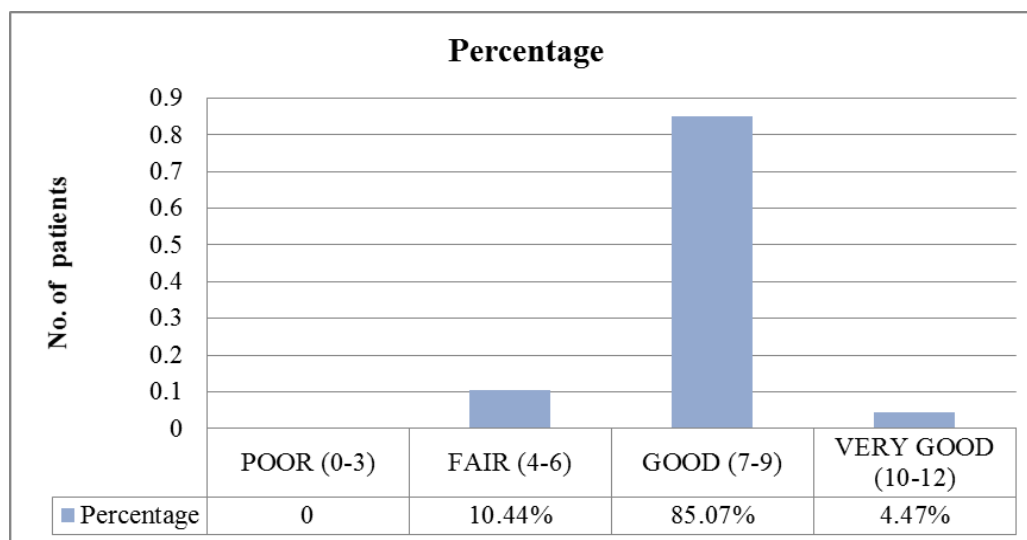


Figure No. 6(b): Attitude of patients

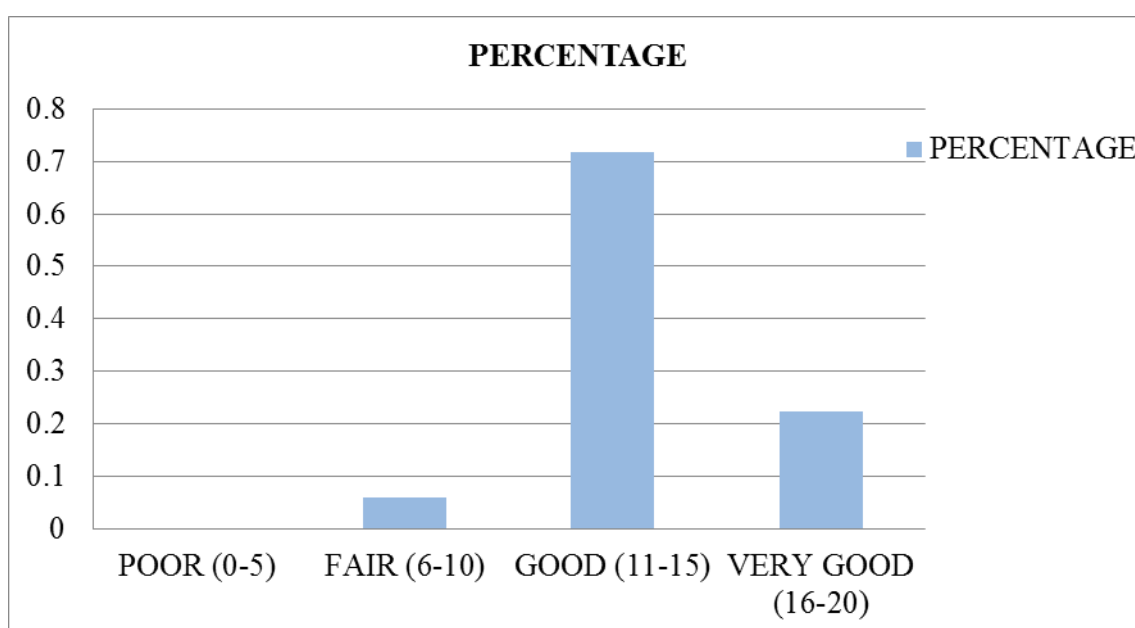


The results shows that patients have good attitude (n=57, 85.07%).

**c) PRACTICE**

*Table No. 6(c): Practice of patients*

PRACTICE	No. of patients (N=67)	PERCENTAGE
POOR (0-5)	0	0
FAIR (6-10)	4	5.97%
GOOD (11-15)	48	71.64%
VERY GOOD (16-20)	15	22.38%



*Figure No. 6(c): Practice of patients*

The shows that patients have a good practice (n=48 71.64%).

a) Who has shown you how to use inhalers?

Table No. 6(d): Persons who showed how to use inhaler

Who has shown you how to use inhalers?	No. of Patients (N=67)	PERCENTAGE
FAMILY MEMBER	2	2.98%
INTERNS	30	44.77%
NURSE	9	13.43%
PFT TECHNICIAN	22	32.83%
RELATION	3	4.47%
STUDENT	1	1.49%

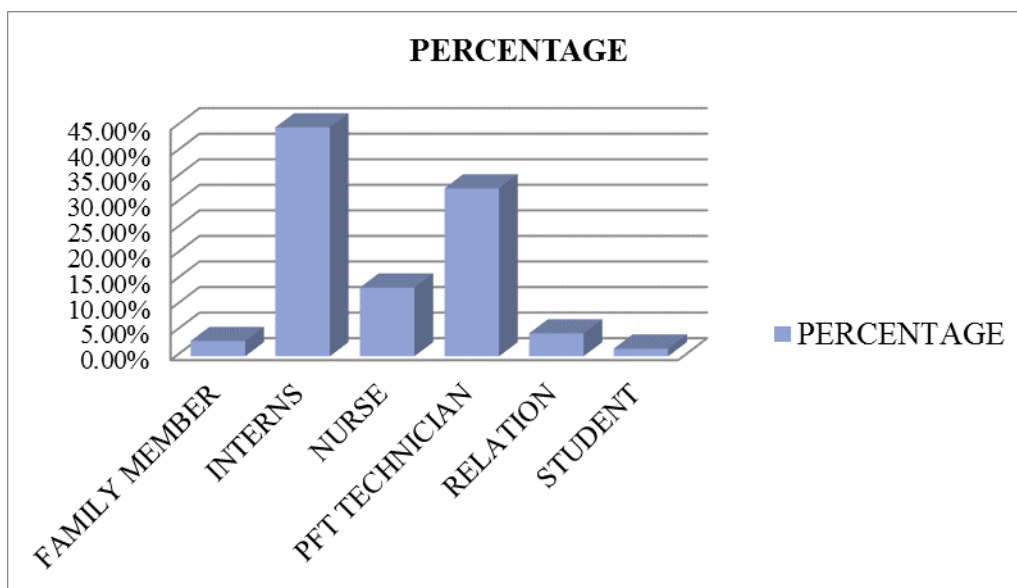


Figure No. 6(d): Persons who showed how to use inhaler

The results shows clearly that interns have educated patients regarding inhaler use (n=30 44.77%).

b) Myths Related To Use of Inhalers

Table No. 6(e): Myths related to use of inhalers

MYTHS RELATED TO USE OF INHALERS	No. of patients (N=67)	PERCENTAGE
VERY GOOD (0-4)	0	0
GOOD (5-8)	0	0
BAD (9-12)	61	91.04%
VERY BAD (12-16)	6	8.9%

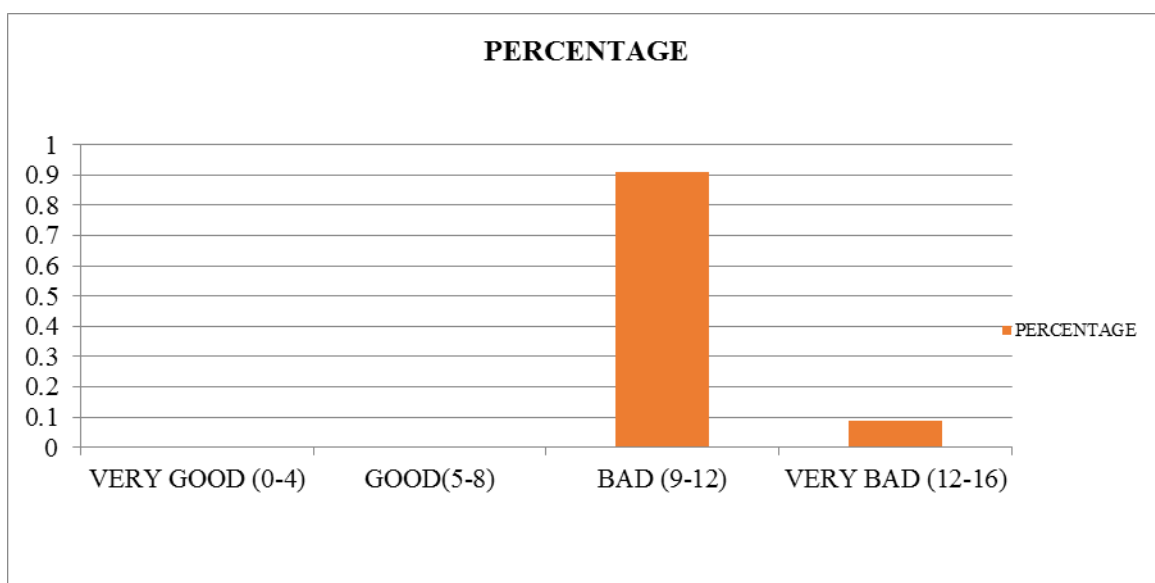


Figure No. 6(e): Myths related to the use of inhalers

The results indicates the patients have increased misconceptions regarding inhaler use (n=61 91.04%).

### 7. Overall KAP Score

Table No. 7: Overall KAP score

KAP SCORE	No. of Patients (N=67)	Percentage
POOR (40-50)	56	82.3%
GOOD(50-68)	11	16.1%

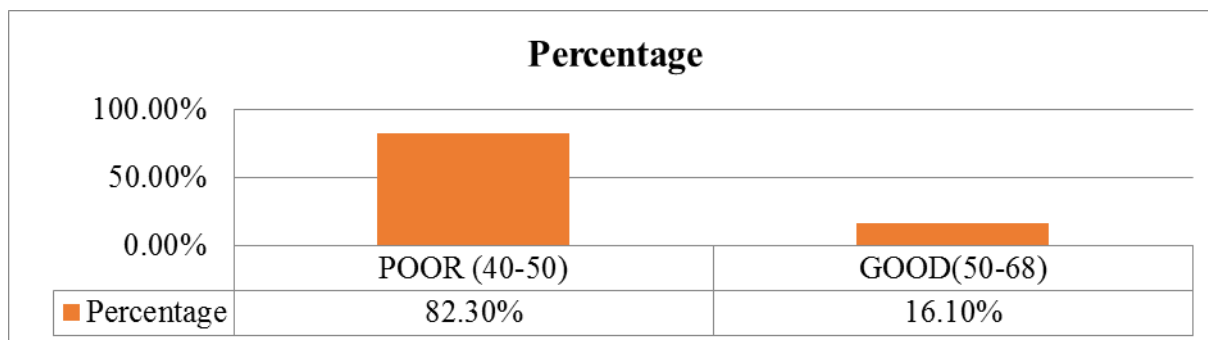


Figure No.7: Overall KAP score

The results show that patients have poor KAP scores (82.30%).

### 8. INHALERS

Table No. 8: Type of Inhalers

INHALERS	No. of patients (N=67)	PERCENTAGE
METERED DOSE INHALER	30	44.77%
POWDER DOSE INHALER	37	55.22%

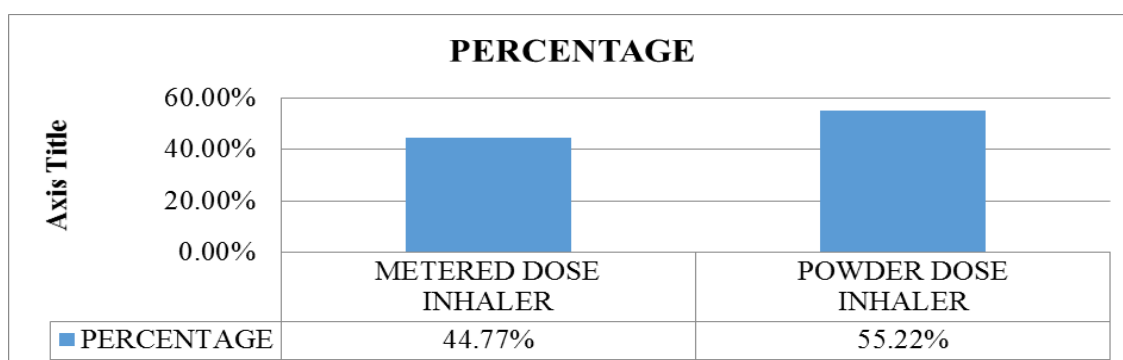


Figure No. 8: Type of Inhalers

The results showed that majority of the patients used powdered dose inhalers compare to metered dose inhalers.

9. METERED-DOSE INHALERS

Table No. 9: MDI Usage before & after patient counseling

METERED-DOSE INHALERS			
BEFORE (N=11)	PERCENTAGE	AFTER (N=11)	PERCENTAGE
3	27.27%	10	90.90%
5	45.45%	9	81.81%
4	36.36%	10	90.90%
3	27.27%	9	81.81%
5	45.45%	10	90.90%
3	27.27%	9	81.81%
4	36.36%	9	81.81%
6	54.54%	11	100%
2	18.18%	6	54.54%
3	27.27%	11	100%
6	54.54%	11	100%
3	27.27%	8	72.72%
3	27.27%	11	100%
7	63.63%	11	100%
6	54.54%	10	90.90%
7	63.63%	10	90.90%
6	54.54%	9	81.81%
7	63.63%	9	81.81%
4	36.36%	9	81.81%
4	36.36%	9	81.81%
3	27.27%	9	81.81%
5	45.45%	8	72.72%
6	54.54%	10	90.90%
2	18.18%	10	90.90%
3	27.27%	8	72.72%
4	36.36%	8	72.72%
9	81.81%	11	100%
4	36.36%	9	81.81%
6	54.54%	8	72.72%
7	63.63%	8	72.72%

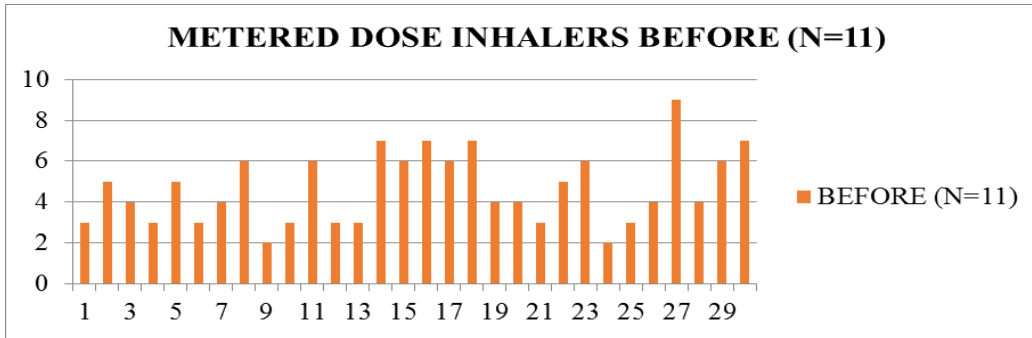


Figure No. 9(a): MDI Usage before patient counseling

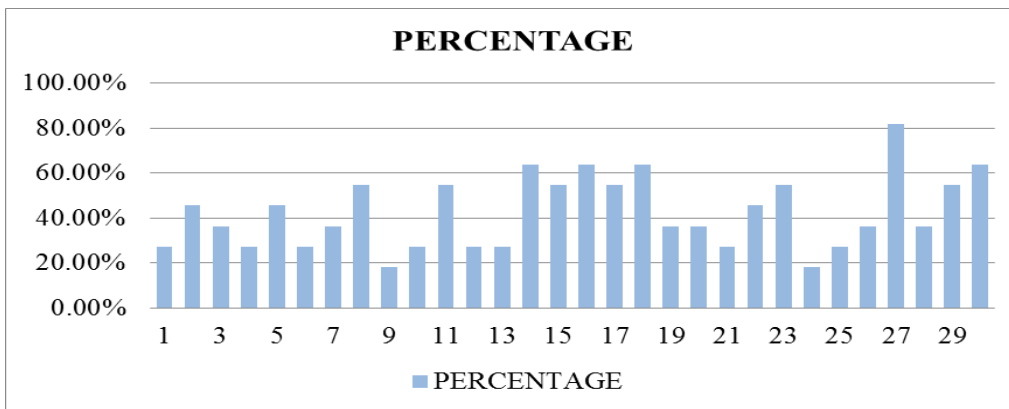


Figure No. 9(b): MDI Usagepercentage before patient counseling

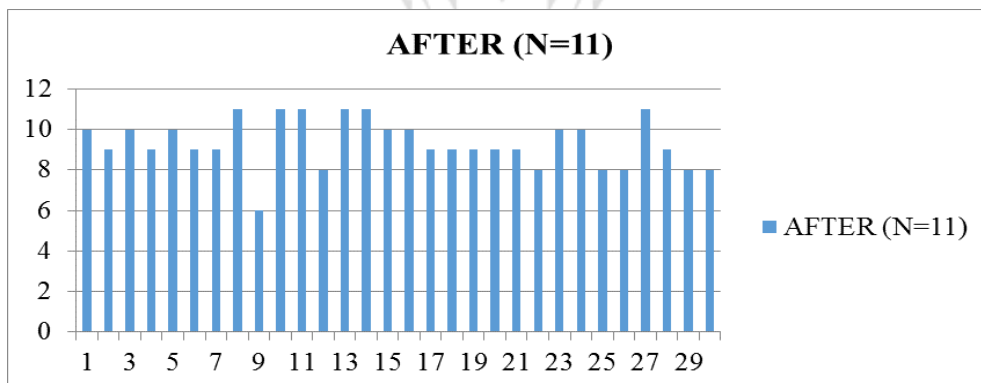


Figure No. 9 (c): MDI after patient counselling

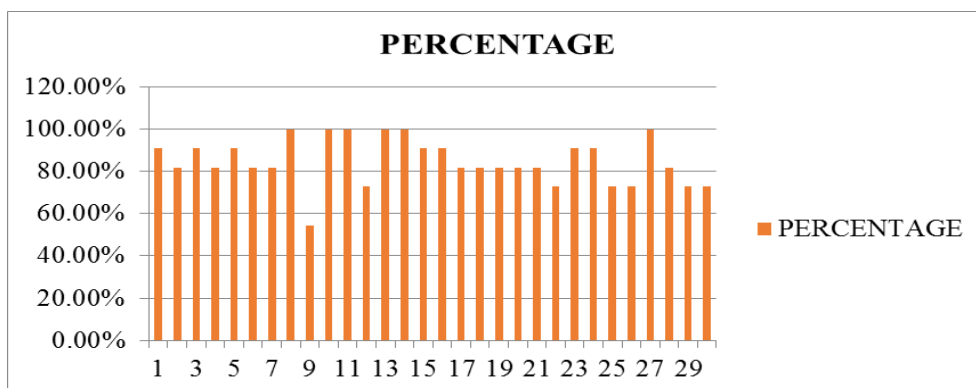


Figure No. 9(d): MDI percentage after patient counselling

The results show clearly indicates, that graph was low before patient counselling and improved after patient counselling.

### 10. DRY POWDER INHALERS

*Table No. 10: DPI score before & after patient counselling*

DRY POWDER INHALERS			
BEFORE (N=6)	PERCENTAGE	AFTER (N=6)	PERCENTAGE
3	50%	6	100%
2	33.33%	6	100%
3	50%	5	83.33%
3	50%	4	66.66%
3	50%	5	83.33%
4	66.66%	5	83.33%
4	66.66%	5	83.33%
4	66.66%	5	83.33%
3	50%	6	100%
2	50%	6	100%
2	33.33%	6	100%
3	50%	5	83.33%
3	50%	4	66.66%
2	33.33%	5	83.33%
3	50%	5	83.33%
4	66.66%	6	100%
3	50%	6	100%
4	66.66%	6	100%
5	83.33%	6	100%
5	83.33%	6	100%
4	66.66%	6	100%
4	66.66%	5	83.33%
1	16.66%	5	83.33%
3	50%	5	83.33%
3	50%	5	83.33%
2	33.33%	4	66.66%
4	66.66%	6	100%
3	50%	6	100%
3	50%	6	100%
3	50%	4	66.66%
4	66.66%	6	100%
4	66.66%	6	100%
4	66.66%	6	100%
4	66.66%	6	100%
2	33.33%	6	100%
4	66.66%	6	100%
3	50%	5	83.33%

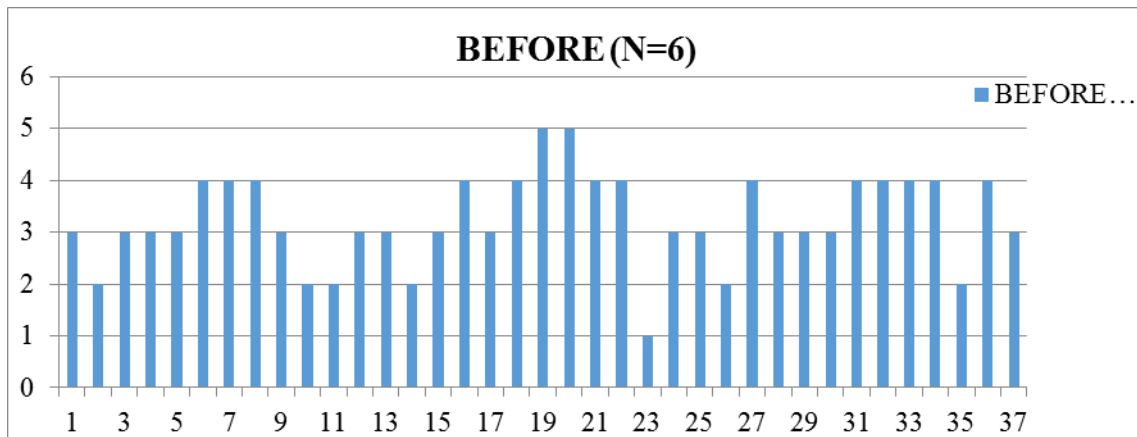


Figure No. 10 (a): DPI score before patient counseling

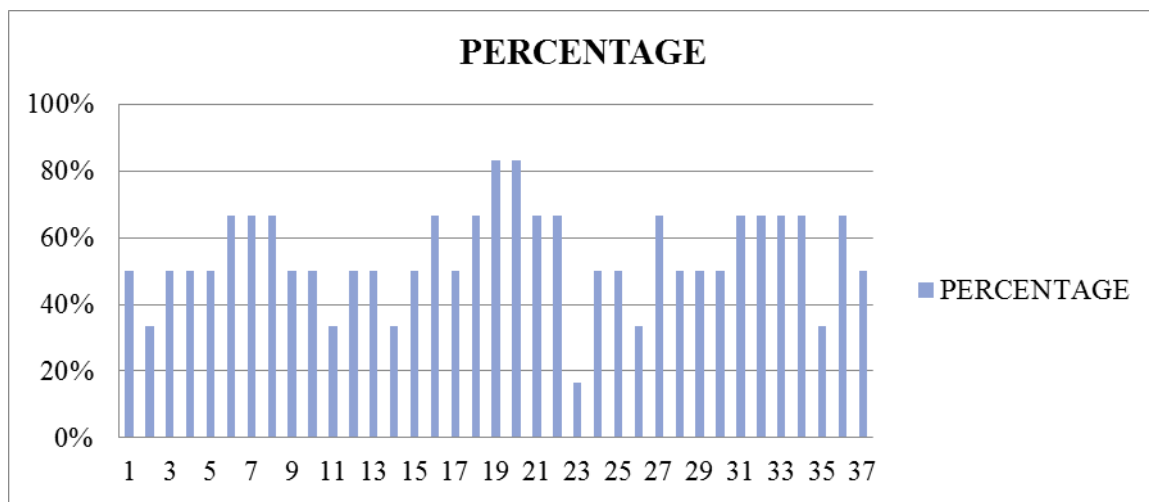


Figure No. 10(b): DPI percentage before patient counseling

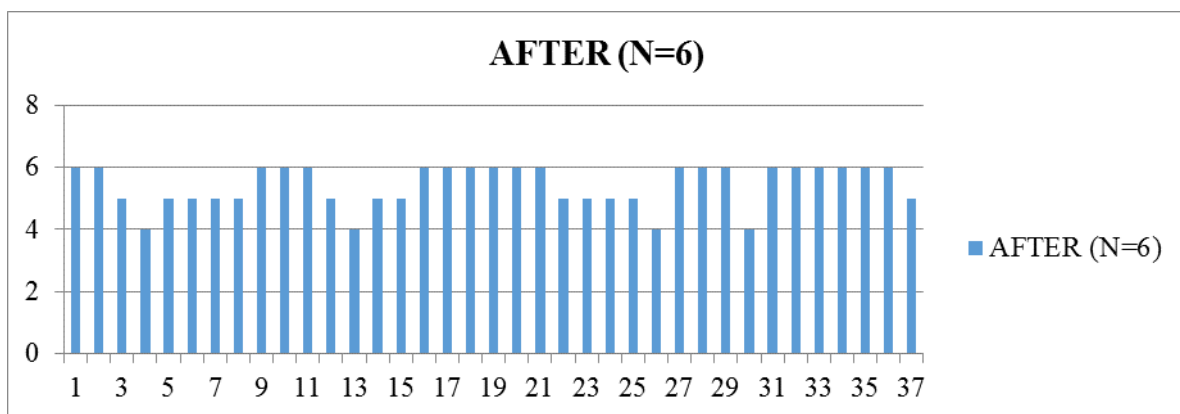


Figure No. 10(c): DPI score after patient counseling



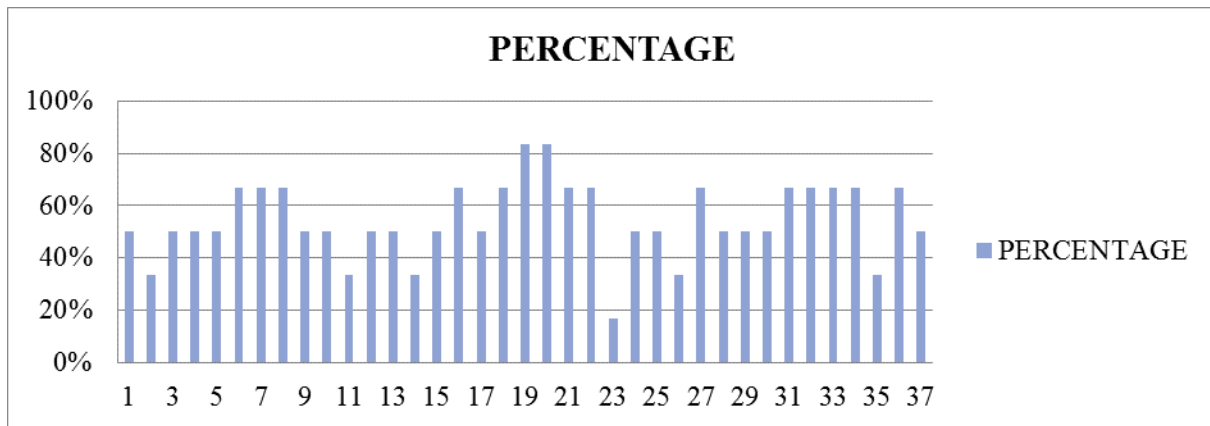


Figure No. 10(d): DPI percentage after patient counselling

The result clearly indicates that graph was low before patient counselling and improved after patient counselling.

### 11. P – VALUE

Z Score Calculator for 2 Population Proportions

Success!

You'll find the values for  $z$  and  $p$  below. Blue means your result is significant, red means it's not.

Sample 1 Proportion (or total number)

Sample 1 Size ( $N_1$ )

Sample 2 Proportion (or total number)

Sample 2 Size ( $N_2$ )

Significance Level:

0.01

0.05

0.10

One-tailed or two-tailed hypothesis?:

One-tailed

Two-tailed

The value of  $z$  is NaN. The value of  $p$  is < .00001. The result is significant at  $p < .05$ .

Figure No. 11: P – VALUE

The value of  $p$  is < 0.00001. Hence, the results are significant at  $p < 0.05$ .

### DISCUSSION

The main mark of the study is to assess the knowledge, posture and practices towards inhalers use in asthma and COPD cases and to bring out the misconception regarding inhalers use.

The study showed validated KAP questionnaire for asthma and COPD has optimum internal viscosity and stable trustworthiness to our knowledge there were no prior studies conducted regarding the validation of KAP questionnaire specific for asthma and COPD. A study was started by Dr Harjinder singh *et al*, which assessed knowledge and station of asthmatic cases towards the inhalers use, the study showed refined number of women (58 58) than males (42 42). A study was started by Dr Surinder Pal Singh which showed more males were affected than women with a rate of 6 males to 4 women.

There's a global problem with asthma superintendency, either under treatment due to ignorance or shapeless information/ knowledge of cases about their trouble. By 2025, another of 100 million people will suffer from asthma due to growing urbanization and pollution. It's estimated that asthma accounts for about one in every 250 deaths worldwide. The frequentness of asthma in India shows wide expatriate variations with the tiniest frequentness in the southern region (0.9). Socioeconomic conditions, habits, and artistic beliefs greatly touch the Knowledge, Station and Practices (KAP KAP) towards asthma.

The study was started by Padmavathy R, which an assessed Knowledge, Station and Practice of asthma cases using a modified form of validated KAP questionnaire which is true and culture fair to their geographic area. The study shows that cases with asthma still want satisfactory knowledge about infirmity and have multitudinous misconceptions regarding the illness and its treatment. As for the success of habitual airways infirmity treatment, only 10 accounts for physic and 90 is the result of education in inhaler device play. This is a prospective study design rested on assessment of KAP by validated questionnaire which concluded that patient kindliness is one the important purpose in treatment of respiratory infirmity. The resemblant study was plant by Aleksandra Dudvarski Ilic which concludes significant enhancement in inhalation system after patient kindliness. Adherence to inhalation remedy is one of the vital factors of successful respiratory infirmity treatment.

In the testimony of KAP questionnaire on asthma and copd, the overall item standing content validity pointer or internal content validity pointer (I I-CVI) for all the points of the questionnaire was planted to be 91.43% and the overall scale standing content validity pointer or face content validity pointer (S S-CVI) for all validating parameters like pertinence, simplicity, clarity and obliquity was plant to be 91.59%.

## CONCLUSION

The study findings reveal that metered-dose inhalers and dry powdered inhalers were given to the different age groups of 67 patients which is considered for clinical studies for assessing inhalers devices. In the validation of knowledge attitude practice and myth-related questionnaire, the I-CVI % and S- CVI% was found to be under the acceptable internal consistency of Cronbach's alpha coefficient acceptability criteria and hence the questionnaire was fit for the study. The study reveal that patient population has good knowledge, fair attitude towards inhalers used in the treatment of disease and better practice knowledge about the inhaler technique used to treat the disease condition. The dry powdered inhalers were effective and quiet convenient for patients compared to metered-dose inhalers. Hence medical practitioners should focus on proper education of patients regarding inhaler techniques in order to achieve better adherence and clinical outcomes of the patients.

## ACKNOWLEDGMENT

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