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Research Article

## The Role of Clinical Pharmacist in Enhancement of Medication Adherence and Quality of Life in Bronchial Asthma and Chronic Obstructive Pulmonary Disease

Aswathi Gangadharan<sup>1</sup>, Diya Sheela Thomas<sup>1</sup>, Harshida<sup>1</sup>, Cyril Tom<sup>1\*</sup>, Prabhakar Adake<sup>2</sup>

<sup>1</sup> Department of Pharmacy Practice, Shree Devi College of Pharmacy, Mangalore, Karnataka, India

<sup>2</sup> Department of Pharmacology, Yenepoya Medical College Hospital, Derlakatte, Mangalore, Karnataka, India

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### \*Address for Correspondence:

Cyril Tom, Department of Pharmacy Practice, Shree Devi College of Pharmacy, Mangalore, Karnataka, India

### Abstract

Asthma and Chronic Obstructive Pulmonary Disease (COPD) are two of the leading causes of morbidity, mortality and economic burden worldwide. The burden of chronic respiratory disease has major adverse effects on the quality of life and ability of affected individuals. A variety of effective treatment options exist for patients with Asthma and COPD but long-term adherence to medications is required for treatment success. Aim of the study was to assess the adherence to medication and quality of life in Asthma and COPD patients using questionnaires, and to enhance adherence and quality of life using the strategies of counselling and education. The observational study was conducted for a period of 6 months, assessed medication adherence by Morisky self-reported questionnaires and quality of life by St. George's Respiratory questionnaire (SGRQ) and 36 item short form health survey (SF-36). The study shows there was statistically significant improvement in medication adherence score ( $p < 0.05$ ) and quality of life ( $p < 0.05$ ) after pharmacist's counselling regarding disease, medication and lifestyle. Comparison between various demographic factors like age, gender, co-morbidities, smoking index showed equal impact of pharmacist's counselling on improvement of overall medication adherence and quality of life in Asthma and COPD patients. Overall medication adherence and quality of life improvement was found to be statistically significant in Asthma and COPD patients after counselling by clinical pharmacists. Clinical pharmacists must be considered as an integral element of healthcare system. Patient counselling is effective to resolve the problems associated with medication non-adherence and quality of life.

**Keywords:** Asthma, COPD, Medication adherence, Quality of life

## INTRODUCTION

Medication adherence is one of the most important factors that determine therapeutic outcome especially in patients suffering from chronic illness. Low medication adherence will undermine the benefits of the medical care.

Patient adherence can be defined as an extent to which patient behaviour coincides with health-related advice and ability of patient to take medications as prescribed. Adherence to the medication has reported to be low among patients with COPD and Asthma. The major reasons for medication non-compliance were felt better and stopped, high cost of medications, forgetfulness, fear of side effects, non-beneficial treatment. Poor compliance with prescribed therapy leads to increased morbidity and mortality.<sup>1</sup>

Quality of life is defined by World Health Organization (WHO) as a broad and complex concept of individual about their physical health, mental health and social relationship. Chronic illness of COPD and Asthma are frequent in general population. These diseases are characterised by a narrowing of bronchi associated with chronic inflammation. However, there are some differences between Asthma and COPD in

terms of onset age, casual factors, clinical aspects and impact on daily life. However, the relationship between pulmonary obstruction, dyspnoea and impact of the disease on the daily life of the patient is not necessarily linear.

Questionnaires do exist and have been used for decades as they can gather data in a standardised form, about the patient's perception of the status of disease and treatment. This information reported directly by the patient without other people's interpretation about his/her well-being, behaviour and feelings in regard to state of health.<sup>2</sup>

## MATERIAL AND METHODS

The study was approved by the Yenepoya University Ethics Committee, Derlakatte, Mangalore. In this study, 69 cases were collected in which the role of clinical pharmacist in enhancement of medication adherence and quality of life in COPD and Asthma patients were studied. This Prospective Observational study was conducted in the In-patient departments of General Medicine and Pulmonary medicine of Yenepoya Medical College Hospital. Considering the inclusion and exclusion criteria, patients were enrolled after

taking written consent from each patient for the study. The study was carried out by considering the following criteria:

#### Inclusion Criteria:

Patients of either sex, aged 18 years and above from the In-Patient departments of General Medicine and Pulmonary medicine. Can understand oral and written information. Diagnosed with COPD or Asthma. Patients diagnosed with COPD based on GOLD guidelines

#### Exclusion criteria:

Patients admitted in Intensive Care Unit, other departments and out-patients. Patients with mental or psychiatric diseases, cognitive dysfunction. Patients on cancer chemotherapy and dialysis. Pregnant and lactating females.

#### Source of Data:

Patients' medical record, Patient interview, Data collection tools, Patient data collection form, Medication adherence scale (Morisky-8) <sup>3</sup>, 36 item short form health survey (SF-36 Questionnaire) <sup>4</sup>, St. George's Respiratory Questionnaire (SGRQ) <sup>5</sup>, Modified Medical Research Council (mMRC) Dyspnoea Scale, Patient Counselling documentation form

#### Statistical Analysis:

The collected data were tabulated and analyzed using Microsoft Excel version 13 and SPSS Version 22. The

statistical analysis was done with McNemar's test for assessing adherence using MMAS-8 and Wilcoxon sign test was used for the assessment of quality of life using St. George's Respiratory Questionnaire and 36- Short Form Survey.

**Ethical Clearance:** The study was approved by the Yenepoya University Ethics Committee, Deralakatte, Mangalore and issued ethical clearance certificate.

## RESULTS AND DISCUSSION

#### Details of patients enrolled into the study:

During the 6 months study period, total of 69 (Asthma & COPD) patients were enrolled as per our inclusion and exclusion criteria. In this study, 7 (58.3%) were males and 5 (41.7%) were females with Asthma and 53 (93.0%) males, 4 (7.0%) were females with COPD and most of the patients were above 45 years old. About 10 (83.3%) patients were with Asthma and 52 (91.2%) were with COPD in this age group.

#### Smoking status:

Out of 69 subjects, 2 (16.7%) were ex-smokers in Asthma, 8 (66.7%) were non-smokers and 2 (16.7%) were current smokers, whereas in COPD, 32 (56.1%) were ex-smokers, 6 (10.5%) were non-smokers and 19 (33.3%) were current smokers.

**Table 1: Demographic characteristics of enrolled Asthma & COPD patients**

Basic Variable	Asthma		COPD	
	Male	Female	Male	Female
<b>No. of patients enrolled in the study</b>	7 (58.3%)	5 (41.7%)	53 (93.0%)	4 (7%)
<b>Age in years</b>				
18-25	1 (8.3%)		0 (0.0%)	
26-33	1 (8.3%)		1 (1.8%)	
34-45	0 (0.0%)		4 (7.0%)	
> 45	10 (83.3%)		52 (91.2%)	
<b>Smoking index</b>				
Ex- smokers	2 (16.7%)		32 (56.1%)	
Non- smokers	8 (66.7%)		6 (10.5%)	
Current smokers	2 (16.7%)		19 (33.3%)	

**Assessment of Medication Adherence:**

Medication adherence was assessed using Morisky Medication Adherence Scale (MMAS-8). All the subjects of the study were provided with the questionnaire at the time of enrolment and subsequent follow-up was done after patient counselling for the assessment of medication adherence. The baseline data was compared with before and after counselling scores using Mc-Nemar’s test.

Among all the enrolled patients in Asthma, 9 (75%) were low adherent and 3 (25%) showed medium adherence to the

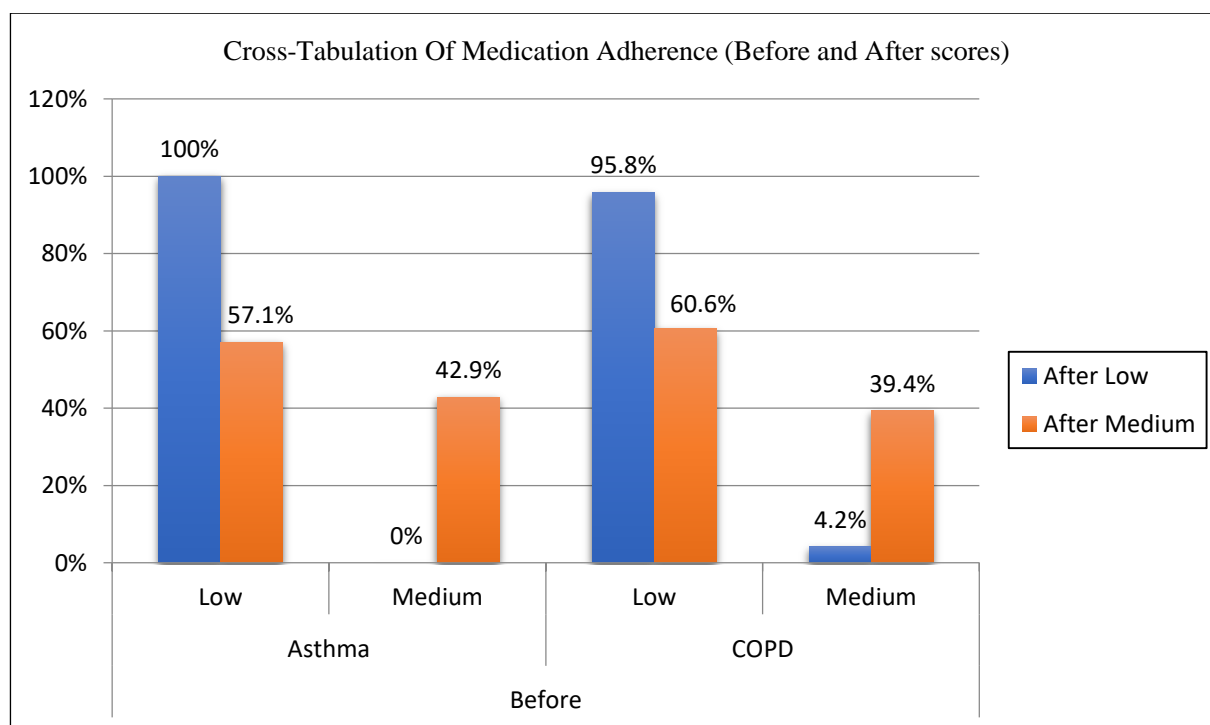
medication before counselling. After counselling, 4 (57.1%) showed improvement from low to medium adherence and 3 (42.9%) remained in the medium adherence category but this was not found to be statistically significant (p value=0.125).

In COPD, 43 (75.4%) were low adherent to the medication and 14 (24.6%) were medium adherent to the medication before counselling. After counselling, 20 (60.6%) showed significant improvement from low to medium and 13 (39.4%) remained medium adherent (P value= 0.00).

**Table 2: Assessment of Medication Adherence in Asthma and COPD patients before and after counselling**

	DIAGNOSIS			Scores-After		Total	p value
				Low	Medium		
Scores- Before	Asthma	Low	Count	5	4	9	0.125
			Percent	100.0%	57.1%	75.0%	
		Medium	Count	0	3	3	
			Percent	0.0%	42.9%	25.0%	
		Total	Count	5	7	12	
			Percent	100.0%	100.0%	100.0%	
	COPD	Low	Count	23	20	43	0.00*
			Percent	95.8%	60.6%	75.4%	
		Medium	Count	1	13	14	
			Percent	4.2%	39.4%	24.6%	
Total		Count	24	33	57		
		Percent	100.0%	100.0%	100.0%		

\*statistically significant



**Figure 1: Cross-Tabulation of Medication Adherence (Before and after scores)**

**Assessment of Quality of Life:**

Among the 69 subjects, 43% were known cases of COPD and 39% were known cases of Asthma. Newly diagnosed Asthma and COPD cases were of 9% each and more than 40% had one or more comorbidities and only 10% of patients were without any co- morbidities. Quality of life was assessed using St. George’s Respiratory Questionnaire (SGRQ) and 36-Short Form Survey Questionnaire (SF-36). All the subjects were provided with the above questionnaires at the time of enrolment, the follow up was done after patient counselling and the scores were compared using Wilcoxon sign test.

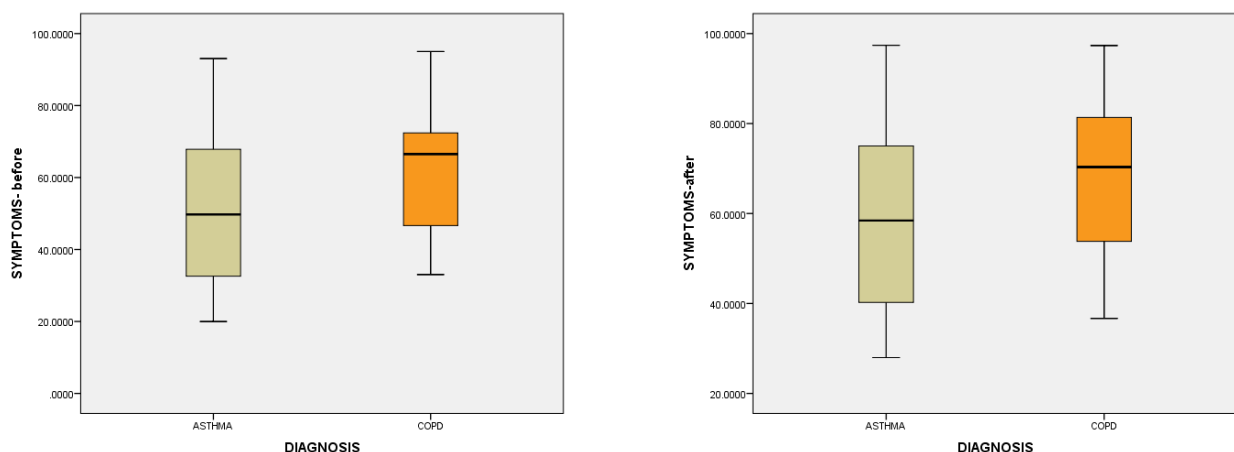
**St. George’s Respiratory Questionnaire (SGRQ)**

In Asthmatic patients, the total SGRQ scores for the domain of symptom improved significantly after counselling ( $49.73 \pm 39.55$  vs  $58.44 \pm 39.81$ ,  $p < 0.05$ ). Similarly, in COPD too, a significant improvement was observed in the total SGRQ scores for the domain of symptoms ( $66.51 \pm 28.31$  vs  $70.34 \pm 28.10$ ,  $p < 0.05$ ). Scores for Activities remained same in both Asthma ( $93.7 \pm 10.87$  vs  $93.7 \pm 11.5$ ,  $p > 0.05$ ) and COPD ( $93.3 \pm 14.13$  vs  $93.3 \pm 14.13$ ,  $p < 0.05$ ) before and after counselling. Impact too showed significant improvement in the total SGRQ scores after counselling for both Asthma ( $56.83 \pm 28.63$  vs  $63.83 \pm 33.41$ ,  $p < 0.05$ ) and COPD ( $56.8 \pm 28.58$  vs  $60.56 \pm 26.94$ ,  $p < 0.05$ ).

**Table 3: Assessment of Quality of Life using St. George’s Respiratory Questionnaire**

Comparison of Symptoms							
		Subjects	Minimum	Maximum	Median	IQR	p value
<b>Asthma</b>	Before	12	19.97	93.04	49.73	39.55	0.002*
	After	12	27.97	97.4	58.44	39.81	
<b>COPD</b>	Before	57	33.04	95.03	66.51	28.31	0.00*
	After	57	36.68	97.33	70.34	28.10	
Comparison of Activities							
<b>Asthma</b>	Before	12	42.52	100	93.7	10.87	0.317
	After	12	42.52	100	93.7	11.5	
<b>COPD</b>	Before	57	54.43	100	93.3	14.13	0.022*
	After	57	54.43	100	92.51	14.13	
Comparison of Impacts							
<b>Asthma</b>	Before	12	32.46	85.45	56.83	28.63	0.007*
	After	12	33.46	95.45	63.83	33.41	
<b>COPD</b>	Before	57	35.84	87.4	56.8	28.58	0.00*
	After	57	36.23	88.11	60.56	26.94	

\*statistically significant



**Figure 2(a): Comparison of symptoms before and after counselling**

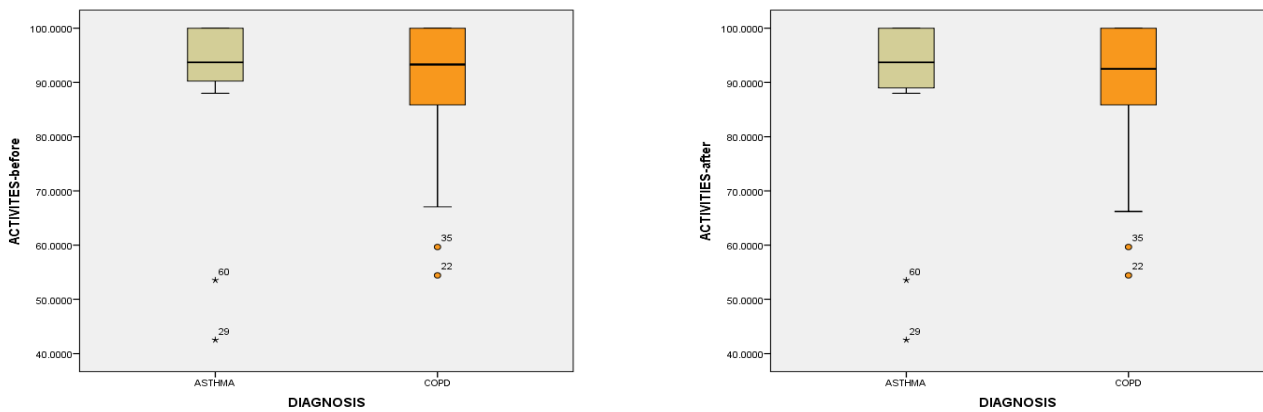


Figure 2(b): Comparison of activities before and after counselling

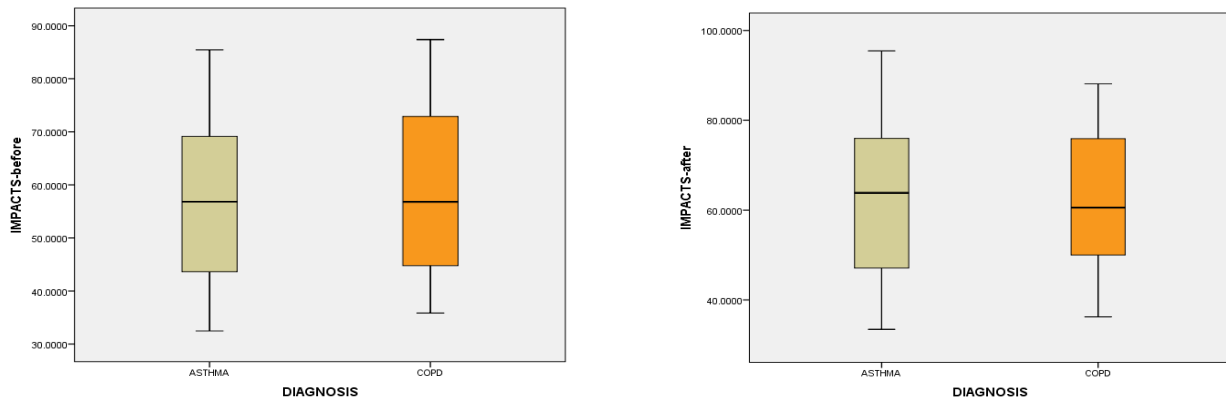


Figure 2(c): Comparison of impacts before and after counselling

**36-Short Form Survey (SF-36):**

For Asthma and COPD patients, SF-36 was used to assess quality of life before and after counselling and an average score was taken for assessment of significance value. Asthma

patients showed significant improvement in quality of life from a median of 318.05 to a median of 674 ( $p < 0.05$ ). Similarly, in COPD too there was a significant improvement in the quality of life from a median of 377.5 to a median of 754 ( $p < 0.05$ ).

Table 4: Assessment of Quality of Life using 36- Short Form Survey (SF-36)							
		Subjects	Minimum	Maximum	Median	IQR	p value
Asthma	Before	12	184.5	481	318.05	223.1	0.002*
	After	12	364	948	674	448.87	
COPD	Before	57	145.5	595	377.5	199.9	0.00*
	After	57	300	1163	754	385.45	

\*statistically significant

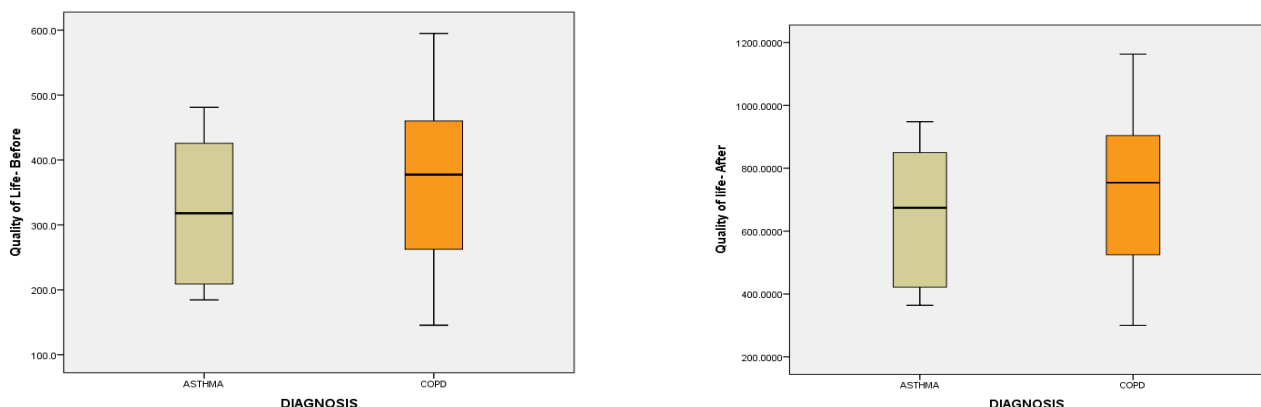


Figure 3: Comparison of Quality of Life before and after patient counselling using SF-36

## DISCUSSION

Asthma and COPD pose a large health burden across health systems and consistently rank among the most fatal diseases across developed countries. The study was designed to assess the role of clinical pharmacist in enhancement of medication adherence and quality of life in Asthma and COPD patients.

The study was conducted using various questionnaires to assess the medication adherence and quality of life. Individualized patient counselling was carried out regarding the disease, medications and lifestyle.<sup>6-8</sup>

Significant improvement in compliances to the medications was observed by patient counselling. This result shows the role of clinical pharmacist in the enhancement of medication adherence in Asthma and COPD patients. The major self-reported reasons for non-adherence to medication are symptomatic improvement, forgetfulness, expense, illiteracy, fear of side effects, feel non-beneficial. The same reasons were reported in the previous studies, hence this study focused on these reasons to minimize by clinical pharmacist-mediated patient counselling.<sup>9</sup>

The current study also addressed the improvement of quality of life by clinical pharmacist-mediated patient counselling. SGRQ shows improvement in the domains of symptoms and impacts and SF-36 showed significant improvement in all the domains. The participating clinical pharmacists acquired new communication skills in their dealings with patients. Good communication reflects patient education and tailoring therapy for patients' better health related outcome.<sup>10-11</sup>

## CONCLUSION

The study revealed that the enhancement of medication adherence and quality of life was statistically significant in Asthma and COPD patients after clinical pharmacist mediated patient- counselling. The self-reporting questionnaire method was found to be effective for the assessment of medication adherence and quality of life. The reasons for non-adherence to the medication were resolved by patient counselling and hence, quality of life was improved which resulted in better patient health-related outcome. Clinical pharmacists must be considered as an integral element of healthcare system.

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