A Study on Medication Adherence & Quality of Life in Asthma & Chronic Obstructive Pulmonary Diseases(COPD) of Rural Population in a Tertiary care Hospital

K V Ramanath[*], Nagakishore CH, Mahesh Kumar S, Balaji D B S S, Bhanuprakash M

S A C College of Pharmacy, B G Nagara, Nagamangala(T), Mandya Dist-571448, Karnataka, India

Address for Correspondance: kattavenkateshramanath@gmail.com

ABSTRACT: Chronic diseases are the diseases of longer duration and generally slow progressive in nature. Chronic diseases need a treatment throughout life. Medication Adherence is one of the important factor to determine the therapeutic outcome and how that influences on Quality of life. The main objective of this study was to assess the impact of clinical pharmacist involvement in the medication adherence and quality of life of Asthma and COPD patients.

A Prospective, Randomized and interventional study was carried out in the medicine department for a period of 8 months in Adichuchanagiri hospital and research center after taking the Ethical Clearance. The patient data was collected by using a well designed patient data collection form after taking their consent. The questionnaires were used to know the medication adherence behaviour and quality of life.

A total of 150 prescriptions were screened, out of which 78 prescriptions were containing Asthma and COPD. In which 5 patients were dropped out from the study. The Morisky medication adherence Scale and Medication adherence report scale results showed P value 0.153, 0.282 for asthma, <0.001, <0.001in COPD. The SF-12 quality of life questionnaire showed the P value- 0.350 for physical component summary and 0.628 for mental component summary in asthma patients, where as in COPD patients 0.015* in PCS and <0.001** in MCS respectively.

This study concluded that continuous education program/counselling is important for chronic respiratory diseases to emphasize and re-emphasize on the disease management and positive results in the medication adherence behaviour and disease management (QOL). © 2011 IGJPS. All rights reserved.

KEYWORDS: Medication Adherence; Asthma; COPD; Quality of Life.

INTRODUCTION

Asthma is defined as a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role. In susceptible individual, inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness and coughing. Throughout the world approximately 300 million people are suffering from asthma. In each decade prevalence is increased by 50%. Since 1980s,

the mortality rate of asthma has declined, approximately 1.80.000 deaths annually attributed to asthma worldwide. In India, it is estimated that more than 15 million populations are affected by asthma and the overall prevalence of diagnosis of asthma was at 2.38%. Asthma accounts for 0.5% of national burden of disease with 0.2% of death.[1,2,3,4]

Chronic obstructive pulmonary disease (COPD) is a progressive disease characterized by airflow limitation that is not fully reversible and is associated with an abnormal inflammatory response of the lungs to noxious particles or gases. Chronic Obstructive Pulmonary Disease is historically described as either chronic bronchitis or Emphysema. Chronic bronchitis is defined in clinical terms, where as emphysema is defined in terms of anatomic pathology. Chronic obstructive pulmonary disease is the fourth leading cause of mortality in the United States, accounting for 126,000 deaths in 2003. Prevalence estimates range from a few million to 12 million in the United States alone, with some data suggesting that half of all cases remain undiagnosed. In India a median prevalence of 5 per cent in men and 2.7 per cent in women was calculated which accounted for a total burden of 8.15 million male and 4.21 million female patients in a population of 944.5 million in 1996.[1,5]

Medication nonadherence is a multifaceted problem, especially for people with chronic diseases. Nonadherence to medication for chronic diseases leads to worsened therapeutic outcomes, higher hospitalization rates, and increased health care costs. Patients with chronic conditions often must take more than one medication indefinitely for maintenance, and their adherence to their therapeutic regimen tends to decrease over time.[6]

Medication adherence is one of the important factors that can determine the therapeutic outcome. This therapeutic outcome is quite important especially in patients suffering from chronic illnesses. It is a known fact that whatever may be the efficacy of the drug, it cannot show its efficacy unless the patients take the drug. Therefore adherence is considered as vital link between the treatment and the therapeutic outcomes in medical care.[7,8]

Quality of life (QOL) is a broad multidimensional concept that usually includes subjective evaluations of both positive and negative aspects of life. Health is one of the important domains of overall quality of life, there are other domains as well—for instance, jobs, housing, schools, the neighbourhood. The concept of health-related quality of life (HRQOL) and its determinants have evolved since the 1980s to encompass those aspects of overall quality of life that can be clearly shown to affect health-either physical or mental.[9-21]

The study was carried out in Adichunchanagiri hospital and research centre (AH&RC) B.G.Nagara of General Medicine Department, located in Karnataka which is in southern part of India. AH&RC is a 750 bedded tertiary care teaching rural hospital. This type of study is not conducted in our hospital, Hence for the first time the present study is taken to assess the impact of clinical pharmacist on medication adherence and factors influencing the medication adherence of asthma and chronic obstructive pulmonary disease patients and how that is influencing on Quality of life

Objectives of the study:

To assess the impact of clinical pharmacist involvement/intervention in the medication adherence and quality of life in Asthma and COPD patients.

MATERIALS & METHODS

This was a prospective randomized and interventional study was conducted in the Medicine department of Adichunchanagiri Hospital and Research Center; B G Nagara, for a period of 8 months. Ethical committee clearance was obtained from Adichunchanagiri Hospital and Research Centre.

Study criteria:

Inclusion criteria:

- Inpatients and outpatients of General Medicine Department who were diagnosed and on medication for Asthma and COPD since six months.
- 18 years and above patients of either sex.
- Patients who are willing to participate in the study and sign the consent form.

Exclusion criteria:

- Patients having more than 4 diseases
- Pregnant/lactating women.

Source of data

Patient data relevant to the study was obtained from the following sources

Inpatients: Patient case records, medication charts and lab reports

Outpatients: Prescriptions

Material used Informed consent form, Patient data collection form, Questionnaires (Morisky Medication Adherence Scale (MMAS), Medication Adherence Report Scale (MARS), SF-12v2 Quality Of Life (QOL) Scale).

Study procedure

Around 150 patients were approached during the study period and were informed about the study and study procedure briefly, but out of which only 78 patients agreed to participate in the study, in which 30 are Asthma and 48 are COPD patients respectively. The total withdrawals of patients from the study are 5 out of which 2 are Asthma and 3 are COPD patients respectively due to various reasons. The total number of patients who had completed the study is 73, out of which 28(C-14, I-14) are Asthma and 45 (C-22, I-23) are COPD patients respectively. The total control and intervention group patients are 36 and 37 patients respectively.

After obtaining the patient consent, the Patients were randomized into intervention and control group by simple randomisation technique (i.e. odd and even numbers) in order to prevent the bias. The odds number patients are enrolled into control group and even numbers are enrolled into interventional group. The required data collection details was obtained from Out Patient cards (OP card), case records of inpatients and by direct interview. The patient was also informed to come for the 1st follow-up after one month from the base line or from the date of enrolment and thereafter 30 days for the 2nd follow-ups.

The **control and intervention group** patients were interviewed and their sociodemographic details were entered in the patient data collection forms along with baseline signs & symptoms of Asthma, COPD and body mass index (BMI) were recorded. In order know the MAB (medication adherence behaviour) of both control and intervention groups provided with the dairy cards and told to give it at the end of the study. The control group did not receive any counselling and PILS (patient information leaf lets) at the baseline and in the first follow up. But they were provided oral instruction, and PIL were providing at the end of the follow up. The intervention group patients were counselled on various aspects like disease, drugs and their management at baseline and during each follow-ups and mediation adherence and QOL was assessed by using standard questionnaires i.e. Morisky Medication Adherence

(scale-4 item), Medication Adherence Rating Scale (MARS) (scale-5 item) and SF-12v2 quality of life (QOL) were used to assess / to know their medication adherence and quality of life respectively. The answers given by them were recorded. The same method was carried out in the 1st and 2nd follow-ups. In each follow-up and baseline the patient's were asked to check with the doctors for their disease state, afterwards the respective questionnaire was administered by pharmacist. During the end of 2nd follow-up diary cards was collected back from patients.

The Patient **satisfaction questionnaire** was prepared by selecting the suitable questions from the validated osteoporosis patient satisfaction questionnaire. The expert's opinion were taken and administered for the intervention group patients to know the impact of clinical pharmacy services and types of counselling service done by the clinical pharmacist. The obtained data were subjected for statistical analysis.

Statistical Methods: Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance

RESULTS & DISCUSSION

Out of which 73 patients completed the study (i.e. two follow ups of one month interval from baseline in each group). Out of which 28(C-14, I-14) were asthma, 45(C-22, I-23) were COPD patients respectively. 5 patients were dropped (not completed the follow up) out, in which 2 were asthma and 3 were COPD patients respectively. The 5 drop out reasons are because of negligence, left the place, illiteracy, dependent on others, age factor, economic status and duration of disease.

Table 1 The basic demographic details of 28 Asthma patients in which 14 were in intervention group, in which males were 7 (50%) and females 7 (50%) and in control group, out of 14 patients males were 5 (35.70%) and females 9 (64.3%). Out of 45 COPD patients 23 were in intervention group, and 22 were in control, all these patients were found to be males (100%). This study showed that males are more in COPD diseases when compare to females. Another interesting of our study showed that female patients are more asthmatic than male patients. This may be because of life style modification, working environment and social habits etc. This results also clearly highlights /showed that in rural areas also chronic diseases like Asthma &COPD diseases existence was more and there is a need of pharmaceutical care services.

Basic variables	Asthma Control		Asthma Intervention		COPD Control		COPD Intervention	
	N	%	N	%	N	%	N	%
Age in years								
20-30	1	7.1	1	7.1	1	4.5	0	0.0
31-40	0	0.0	0	0.0	2	9.1	1	4.3
41-50	3	21.4	3	21.4	3	13.6	3	13.0
51-60	3	21.4	4	28.5	8	36.4	14	60.9
61-70	7	50.0	3	21.4	8	36.4	5	21.7
>70	-	-	3	21.4	1	4.5	0	0.0
Gender								
Male	5	35.7	7	50.0	22	100.0	23	100.0
Female	9	64.3	7	50.0	-	-	-	-
BMI (kg/m^2)								

<18.5	4	28.6	0	0	4	18.2	7	30.4
18.5-25.0	8	57.1	11	78.5	17	77.3	14	60.9
25.0-30.0	-	-	1	7.1	0	0.0	2	8.7
>30.0	1	7.1	2	14.2	1	4.5	0	0.0
Education								
Illiterate	9	64.3	8	57.1	10	45.5	14	60.9
Primary	3	21.4	5	35.7	9	40.9	8	34.8
High school	1	7.1	0	0	3	13.6	1	4.3
Pre-university	1	7.1	1	7.1	-	-	-	-
Degree+			-		-	-	-	-
Occupation								
Farmer	4	28.6	5	35.7	21	95.5	21	91.3
House wife	8	57.1	6	42.8	-	-	-	-
Employed	-	-	-	-	0	0.0	1	4.3
Business	1	7.1	3	21.4	1	4.5	0	0.0
Retired	1	7.1	0	0	0	0.0	1	4.3
Income (in Rs)								
<25000	10	71.4	12	85.7	14	63.6	20	87.0
25001-50000	3	21.4	2	14.2	8	36.4	3	13.0
5001-100000	1	7.1	-	-	-	-	-	-
1-1.5 lakhs	-	-	-	-	-	-	-	-
>1.5 lakhs	-	-	-	-	-	-	-	-
Total	**14**	**100.0**	**14**	**100.0**	**22**	**100.0**	**23**	**100.0**

Table 1 Distribution of Demographic details of Asthma and COPD groups

In asthma age group between 51-60 (28.5%) years found to be major in intervention and 61-70(50%) of age groups found more in control group, In COPD age group between 51-60 (60.9%) years found to be more in intervention group, and the age groups between 51-70 (72.8%) years are found to be major in control group. This suggests that after the age of 50 to 70 years, there is an chances of diseases due to change in the anatomical and physical functions. The chances of chronic diseases like Asthma and COPD were high because of the above said reasons which are also associated with the life style pattern. >70 years of age group patients are also prone to chronic conditions but there was a less patients in our study the reasons may be difficult to come to the hospital for regular checkups, financial supports, lack of care takers and lack of awareness etc. 20 to 40 years of age group patients are less prone to these chronic diseases because of their good physical and more work/eager to earn. This increases the physical activity in maintaining of health.

In asthma intervention group 8 (57.1%) were found illiterates in intervention group. In control group 9 (64.3%) were found illiterates. In COPD out of 23 patients in intervention group 14 (60.9%) are illiterates. Out of 22 patients in control group10 (45.5%) were illiterates. This educational details study suggested that there are less educated people. The reasons may be due to living in rural area or with low economic conditions. This point clearly suggests that there is a need of education to maintain / manage their disease. This can be achieved by involving of the clinical pharmacist in providing the pharmaceutical care services.

In asthma, intervention group house wives were found to be more 6 (42.8%) followed by business man 3 (21.4%) were found less in and in control group house wives were found to be more 8(57.1%), retired & business man (7.1%) were found to be less in control group. In COPD farmers 21 (91.3%) were found to be more in control and interventional group. Employed and retired one each (4.3%) were less in intervention group.. In control group businessman 1 (4.5%) was found to be less. These occupation findings

may directly influence in their disease management.. So the education about the disease management will influence to stick to the disease management strategies (eg: Stick to the medication even though busy schedule, minimisation of forgetfulness etc).

 In Asthma <25,000/year, were 12 (85.7%) and 2(14.2%) were in intervention group and 10(71.4%) were and 1 (7.1%) less in control group. In COPD <25,000 20(87%), 14(63.6%) were more, in intervention and control groups and less in 25001- 50000 3(13%), 8(36.4%) intervention and control groups. Majority in both groups of two diseases were found in economic range of < 25,000 rupees/year. Which is one of the factors that affect the patient's medication adherence behaviour, maintaining the disease states like buying the medicines and regular checkups? This in turn affects QOL of the patient. After education intervention about the disease management improved their management pattern.

 Table-2 showed that the basic clinical variables of the diseases the body mass index was found to be normal range. Some of the patients in 4 patients in Asthma, and 13 patients in COPD were below the normal range and More body mass index was found 2 in Asthma and 1 in COPD were in above the normal range in both the groups. The study population showed more number of smokers i.e. 51 patients were active smokers. Family history of the diseases is also one of the factors to cause the diseases like Asthma and COPD. Asthma was found to be 1(c) and 1(I) respectively, COPD was found to be 7(C) and 4(I) respectively. Our study created awareness among such families about these diseases.

Clinical variables	Asthma Control		Asthma Intervention		COPD Control		COPD Intervention	
	N	%	N	%	N	%	N	%
Alcohol								
No	12	85.7	12	85.7	7	31.8	6	26.1
• Yes	2	14.3	2	14.3	15	68.2	17	73.9
Smoking								
• No	11	78.6	11	78.6	0	0.0	0	0.0
• Yes	3	21.4	3	21.4	22	100.0	23	100.0
Co-morbid condition								
• HTN	6	42.9	6	42.9	4	18.2	2	8.7
• DM	0	0	0	0	1	4.5	1	4.3
• IHD	0	0	0	0	1	4.5	0	0.0
• TB	0	0	0	0	1	4.5	0	0.0
Family history of disease								
• No	13	92.9	13	92.9	15	68.2	19	82.6
• Yes	1	7.1	1	7.1	7	31.8	4	17.4
Total	**14**	**100.0**	**14**	**100.0**	**22**	**100.0**	**23**	**100.0**

Table 2 Distribution of various Clinical variables of Asthma and COPD groups

Assessment of medication adherence scores:

In Table 3 Asthma the P values at the baseline medication adherence was 0.292, followed by first follow up was 0.668, followed by second follow up was 0.153. In COPD the baseline medication adherence was 0.089, followed by first follow up was <0.001**, followed by second follow up was <0.001**. This clearly showed that there was an good improvement in medication adherence behaviour of diseased patients both in control and intervention. But there was a very good improvement in intervention when compare to control because the intervention group patients were provided with counselling materials. But there was slight a

improvement even in the control group, this may be because of repeated visiting to the hospital and information of the doctors and clinical pharmacist may influence them to think about their disease management.

MMAS	Asthma Control	Asthma Intervention	P value	COPD Control	COPD Intervention	P value
Baseline	2.00±0.68	1.71±0.73	0.292	2.50±0.67	2.09±0.90	0.089
1st follow up	2.93±0.62	3.00±0.00	0.668	2.55±0.60	3.30±0.70	<0.001**
2nd follow up	3.14±0.36	3.00±0.00	0.153	2.86±0.35	3.91±0.29	<0.001**

Table 3 Distribution of MORISKY MEDICATION ADHERENCE SCALE SCORES (MMAS) of Asthma & COPD groups
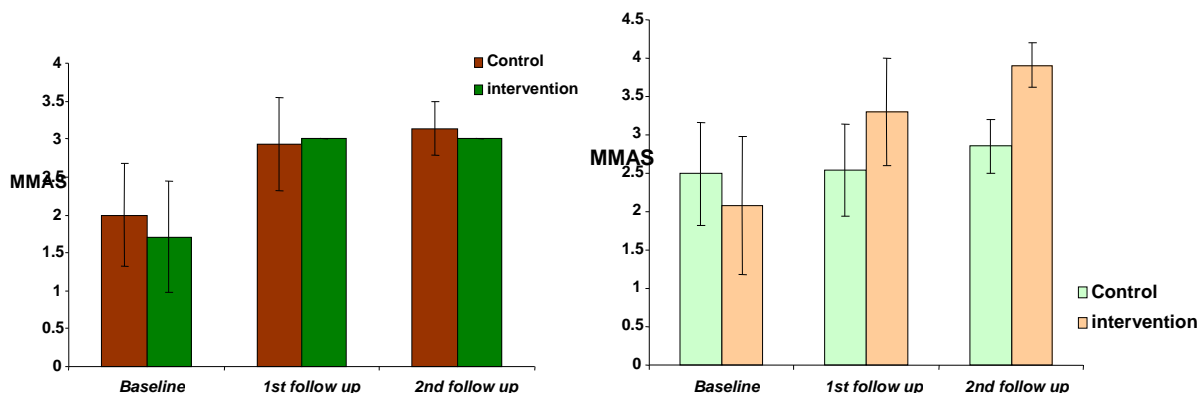

Medication adherence report scale:

Table 4 At base line P values of each disease i.e in Asthma was 0.07, in COPD 0.119. At first follow up scores was in Asthma 0.616, in COPD <0.001 respectively. At second follow up score was in Asthma 0.282, in COPD <0.001. The results showed that in the baseline there was a need of education/repeated monitoring of chronic disease conditions and its management. The first & second follow up results showed that there was an very good improvement/positive impact on the pharmacist provided education about medication adherence behaviour. This was positively influence on their QOL.

MARS	Asthma Control	Asthma Intervention	P value	COPD Control	COPD Intervention	P value
1Q.I forget to take the medicine						
Baseline	4.43±0.94	4.29±0.99	0.699	4.36±1.09	3.87±1.46	0.206
1st follow up	4.93±0.27	5.00±0.00	0.327	4.45±1.06	4.96±0.21	0.031*
2nd follow up	4.93±0.27	5.00±0.00	0.327	4.95±0.21	5.00±0.00	0.312
2Q.I alter the dose of medicine						
Baseline	4.86±0.53	4.86±0.53	1.000	3.36±1.33	3.17±1.30	0.631
1st follow up	5.00±0.00	5.00±0.00	1.000	3.55±1.47	4.48±0.85	0.012*
2nd follow up	5.00±0.00	5.00±0.00	1.000	4.27±1.32	5.00±0.00	0.011*
3Q.I stop taking medicine for a while						

Baseline	3.21±0.8	3.07±0.62	0.601	4.05±1.17	3.70±1.22	0.333
1st follow up	4.21±0.8	4.00±0.96	0.406	3.82±1.37	4.61±0.78	0.021*
2nd follow up	4.36±0.74	4.43±0.65	1.000	3.32±1.36	4.91±0.29	<0.001**
4Q.I decided to miss out a dose						
Baseline	4.00±1.04	2.79±1.25	0.010*	4.68±0.78	4.39±1.03	0.295
1st follow up	4.14±0.95	4.21±0.58	0.626	4.32±1.25	4.87±0.34	0.048**
2nd follow up	4.21±0.89	4.29±0.47	0.591	3.64±1.43	5.00±0.00	<0.001**
5Q.I take less than Instructed						
Baseline	4.36±1.08	4.71±0.73	0.315	3.14±1.21	3.43±1.16	0.403
1st follow up	4.71±0.83	5.00±0.00	0.207	3.18±1.44	4.26±0.92	0.004**
2nd follow up	4.93±0.27	5.00±0.00	0.327	4.09±1.48	4.83±0.39	0.026*
Total						
Baseline	20.86±1.66	19.71±1.54	0.070+	19.59±1.68	18.57±2.54	0.119
1st follow up	23.00±1.36	23.21±0.80	0.616	19.32±2.03	23.17±1.64	<0.001**
2nd follow up	23.43±0.76	23.71±0.61	0.282	20.27±2.00	24.74±0.45	<0.001**

Table 4 Comparative Distribution of MEDICATION ADHERENCE REPORT SCALE (MARS) SCORES of Asthma and COPD groups
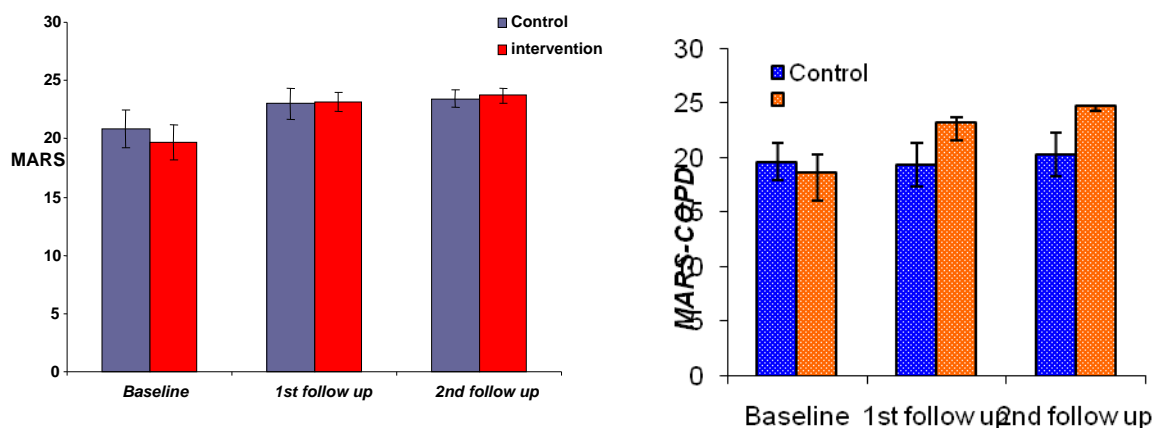
Quality of life:

In Table-5 QoL domain score in two groups of Asthma patients showed the p values of the physical functioning at baseline p value =1.000 and at second follow-up (p value =1.000) respectively. Where role physical at the baseline p value =0.541 and in the 1 and 2 follow-ups p value =0.720 and 0.863 respectively. Similarly for bodily pain at the baseline p value =0.377 and in the 1 and 2 follow-ups p value =0.542 and 0.452 respectively. In general health at the baseline p value =0.422 and in the 1 and 2 follow-up p value =0.422 and 0.422 respectively. In vitality score at the baseline p value =1.000 and in the 1 and 2 follow-ups p value =1.000 and 0.553 respectively. In social functioning score at the base line p value =0.253 and in the 1 and 2 follow-ups p value =0.364 and 0.784 respectively. The role emotional score at the baseline p value =0.720 and in the 1 and 2 follow-ups p value =0.207 and 0.220 respectively. Where in mental health score at the baseline p value =0.236 and in the 1 and 2 follow-ups p value =0.136 and 0.074+ respectively. In Asthma patients there was an improvement in mental health and other factors were not improved.

QOL Domains	Asthma Control	Asthma Intervention	P value	COPD Control	COPD Intervention	P value
Physical Functioning (PF)						
Baseline	39.29±34.96	39.29±28.95	1.000	40.91±14.53	40.22±19.57	0.894
1st follow up	39.29±34.96	39.29±28.95	1.000	46.59±11.69	52.17±10.43	0.098+
2nd follow up	39.29±34.96	39.29±28.95	1.000	54.55±9.87	55.43±12.96	0.798
Role-Physical (RP)						
Baseline	61.61±19.28	57.14±18.81	0.541	36.36±15.39	40.22±18.45	0.452
1st follow up	59.82±21.47	57.14±17.48	0.720	38.07±8.16	53.80±12.74	<0.001**
2nd follow up	64.29±14.59	63.39±12.47	0.863	39.20±5.84	64.67±15.38	<0.001**
Bodily Pain (BP)						
Baseline	50.00±16.98	44.64±14.47	0.377	40.91±12.31	33.70±20.79	0.166
1st follow up	50.00±16.98	46.43±13.36	0.542	43.18±11.4	45.65±17.92	0.586
2nd follow up	44.64±22.31	50.00±13.87	0.452	52.27±10.66	59.78±19.57	0.120
General Health (GH)						
Baseline	32.50±14.90	37.50±17.40	0.422	30.91±15.86	20.65±9.69	0.012
1st follow up	32.50±14.90	37.50±17.40	0.422	30.23±15.31	26.96±11.65	0.423
2nd follow up	32.50±14.90	37.50±17.40	0.422	37.73±17.23	43.26±21.35	0.345
Vitality (VT)						
Baseline	41.07±18.62	41.07±18.62	1.000	36.36±12.74	33.70±14.32	0.513
1st follow up	41.07±18.62	41.07±18.62	1.000	36.36±14.9	45.65±14.41	0.039
2nd follow up	39.29±16.16	42.86±15.28	0.553	38.64±18.46	52.17±22.50	0.033*
Social Functioning (SF)						
Baseline	57.14±15.28	50.00±16.98	0.253	45.45±9.87	42.39±19.12	0.506
1st follow up	57.14±15.28	51.79±15.39	0.364	46.59±11.68	58.69±17.85	0.010*
2nd follow up	58.93±15.83	57.14±18.16	0.784	50.00±7.72	63.04±14.83	0.001**
Role-Emotional (RE)						
Baseline	53.57±12.43	55.36±13.62	0.720	44.32±6.37	41.85±15.82	0.499
1st follow up	52.68±12.19	58.93±13.36	0.207	39.77±8.31	56.52±9.88	<0.001**
2nd follow up	55.36±11.72	60.71±10.81	0.220	49.43±4.69	65.22±13.57	<0.001**
Mental Health (MH)						
Baseline	50.89±10.36	46.43±9.08	0.236	40.34±9.40	42.39±14.95	0.587
1st follow up	50.89±10.36	45.54±7.92	0.136	39.20±8.00	53.26±9.40	<0.001**
2nd follow up	51.79±10.81	44.64±9.45	0.074+	52.27±7.36	61.41±11.87	0.004**

Table 5 Comparative distribution of QUALITY OF LIFE (SF-12v2 QOL) Domains Scores of Asthma and COPD groups

COPD comparison of QoL score in two groups of COPD patients showed the p values of the physical function at baseline p value =0.894 and at second follow-up p value =0.798 respectively. In control group the physical functioning score from baseline 40.91 ± 14.53 to the second follow-up 54.55 ± 9.87 and with the intervention group from baseline 40.22 ± 19.57 to the second follow-up 55.43 ± 12.96. Where role physical at the baseline p value =0.452 and in the 1 and 2 follow-ups. p value =<0.001** and <0.001**

respectively. Similarly for bodily pain at the baseline p value =0.166 and in the 1 and 2 follow-ups. p value =0.586 and 0.120 respectively. In general health at the baseline p value =0.012 and in the 1 and 2 follow-ups p value =0.423 and 0.345 respectively. In vitality score at the baseline p value =0.513 and in the 1 and 2 follow-ups p value =0.039 and 0.033* respectively. In social functioning score at the base line p value =0.506 and in the 1 and 2 follow-ups p value =0.010* and 0.001** respectively. The role emotional score at the baseline p value =0.499 and in the 1 and 2 follow-ups p value =<0.001**and <0.001** respectively. Where in mental health score at the baseline p value =0.587 and in the 1 and 2 follow-ups p value = <0.001** and 0.004** respectively. . In COPD patients there was an improvement in physical function, Role physical, Social function and mental health
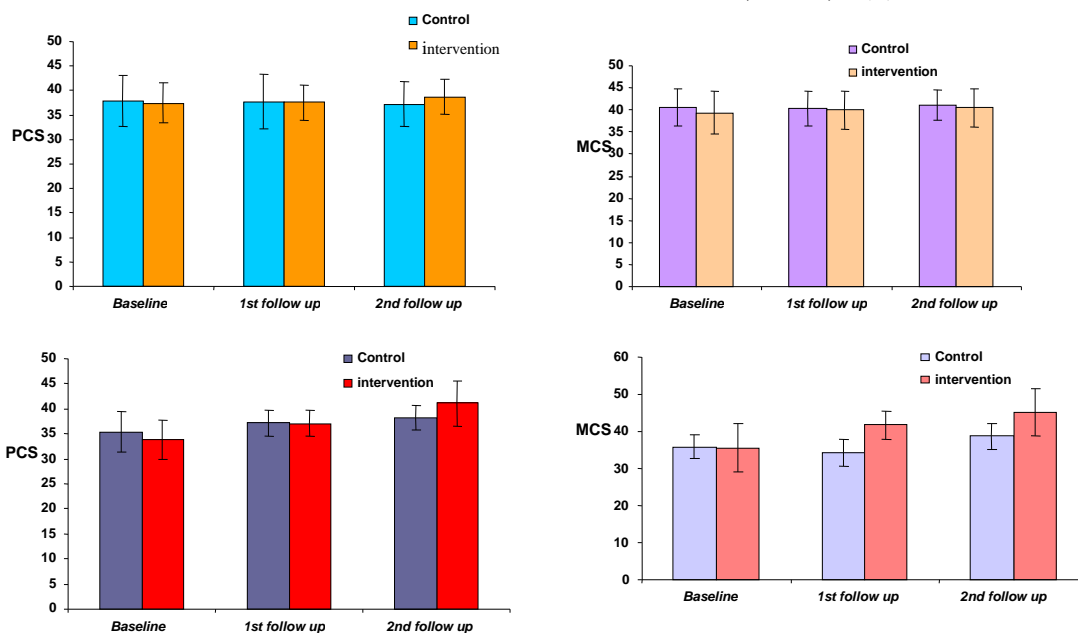
The final result showed that the overall quality of life was improved, When compare to baseline to first follow up and first follow up to second follow up, and baseline to second follow up. But still there is a need of continues monitoring /work to be carried out to reduce / to manage their disease/ quality of life in a constant manner.

Table 6 represents the overall physical and mental health component summary. The stress is the one of the factor which will influence on the QOL (i.e. physical and mental health). Comparison of quality of life PCS and MCS scores of Asthma **p** value is 0.831 and 0.521 at the baseline and in the second follow-up **p** value 0.350 and 0.628 respectively. COPD **p** value are 0.167 and 0.823 at the baseline and in the second follow-up **p** value <0.015* and <0.001** respectively. After intervention, patients demonstrated larger improvement in physical component summary (PCS) and mental component summary (MCS) than control from baseline. This clearly states that there was an improvement in the scores of intervention group by managing of their chronic diseases. Even patients in control group stated/felt that there is a need of more information other than asthma & COPD drugs.

QOL	Asthma Control	Asthma Intervention	P value	COPD Control	COPD Intervention	P value
PHYSICAL COMPONENT SUMMARY (PCS)						
Baseline	37.87±5.28	37.49±4.05	0.831	35.41±4.05	33.74±3.92	0.167
1st follow up	37.72±5.56	37.51±3.68	0.905	37.19±2.59	37.13±2.59	0.935
2nd follow up	37.25±4.53	38.73±3.58	0.350	38.26±2.52	41.06±4.48	0.015*
MENTAL COMPONENT SUMMARY (MCS)						
Baseline	40.49±4.17	39.38±4.79	0.521	35.87±3.17	35.52±6.47	0.823
1st follow up	40.39±3.98	39.99±4.33	0.798	34.23±3.61	41.77±3.75	<0.001**
2nd follow up	41.16±3.39	40.45±4.26	0.628	38.69±3.56	45.06±6.34	<0.001**

Table 6 Comparative distribution of QUALITY OF LIFE (SF-12v2 QOL) PCS and MCS Scores of Asthma and COPD groups.

The comparison of overall quality of life domains shows that there was significance in COPD. In Asthma some domains scores states that there was a significance (vitality role emotional , mental health) and some scores showing need to be improved.. The one of the probable reasons for this may be age, non availability of separate patient counselling area.

PSQ	Question	Asthma	COPD
Questions on Clinical Pharmacy Services			
Q1	How would you rate your understanding of ASTHMA/COPD since your participation in this study	3.64±0.50	4.22±0.42
Q2	Were the follow up session with the pharmacist kept on time	3.50±0.52	4.17±0.39
Q3	During the appointment, was there adequate time to discuss your problem with the pharmacist	3.64±0.50	4.09±0.51
Q4	If you have questions about your ASTHMA/COPD medicines, would you trust an answer from the pharmacist	3.36±0.50	4.13±0.46
Q5	Since your participation in this study, how would you rate your understanding of your ASTHMA/COPD medication	3.64±0.50	4.17±0.58
Q6	Since your participation in this study, go you have more or less problems when it comes to taking your ASTHMA/COPD medications	3.29±0.47	4.09±0.60
Q7	How useful was the service provided by the pharmacist in this study	3.79±0.43	4.04±0.47
Q8	Has the advice given by the pharmacist affected your life in general	3.50±0.65	4.09±0.60
Q9	Do you agree that the pharmacist should continue his services in the clinic to help patients with their chronic disease medications	4.00±0.00	4.30±0.47
	Total	**32.36±1.34**	**37.30±1.29**
Questions on types of counseling Indicate how useful you found each of the following information which the pharmacist may have provided during your last visit.			
Q10	Explanation of ASTHMA/COPD	3.64±0.50	4.26±0.45
Q11	Explanation on the purpose of the medicine(s)	3.71±0.47	4.65±0.49
Q12	Advice on how best to take medicine(s)	3.50±0.52	4.30±0.47
Q13	Explanation on possible side effects	3.14±0.66	3.22±0.42
Q14	Disease/Drug pils and Diary card	3.93±0.27	4.43±0.51
	Total	**17.93±1.14**	**20.87±0.81**

Table 7 Distribution of Patients Satisfaction questionnaire (PSQ) in the intervention groups of Asthma & COPD

Dairy cards

A dairy card was provided to control and interventional group patients as a reminder to their medications. A total of 55 dairy cards was returned by the patients, out of 25(C-12, I-13) in Asthma group, 30(C-12, I-18) in COPD group. Remaining patients may not returned the dairy cards due to forgetfulness, lack of education and negligence.

Patient satisfaction questionnaire

Table 7 Patient satisfaction about the pharmacist provided Clinical pharmacy service and types of counselling in the management of asthma and COPD scores showed that, 32.36±1.34 for asthma, 37.30±1.29 for COPD respectively and the counselling type results were 17.93±1.14 for Asthma & 20.87±0.81 for COPD respectively.

CONCLUSION

The present study showed that the clinical pharmacist involvement in disease management has positive impact in creating awareness about the disease, and its usage and in improving the QOL.This study concluded that continuous education programs and counselling should be conducted for chronic diseases to emphasize and re-emphasize the importance of medication adherence and Quality of Life, to prevent recurrences, reduce progression of disease and ultimately minimize hospitalization and there is a need of continuous pharmaceutical care services/monitoring to minimise the cost and to improve the better quality of life.Further a similar type of educational and monitoring services and providing disease PILs to other chronic diseases that can improve the clinical and humanistic outcomes.

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