

Evaluation of the Clinical Pharmacist Role in a Health Care Team; a Comparative Approach

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ABSTRACT

Background: Clinical pharmacy services were started in 1997 in India, in contrast to developed countries where the services were started in early 1960s. However 15 years have been passed out after the introduction of clinical pharmacy in India, but still the involvement of clinical pharmacist in the health care team is negligible.

Objective: To elevate the clinical pharmacist role in the health care team, to justify the liaison between health care professionals and to promote better quality of life in chronic disease patients a prospective observational and interventional study was carried out. **Setting:** Rajiv Gandhi Institute of Medical Sciences, an 800 bedded tertiary care teaching hospital, Kadapa, India. **Main Outcome:** Progression of Quality of Life in chronic disease patients. **Results:** 200 patients were recruited belonging to age ≥ 40 years; they were divided in to Observational Group (100) and Interventional Group (100). Each group consist of 25 patients for Hypertension (25), Stroke (25), Diabetes Mellitus (25) and Asthma (25). Major risk factors identified as age, obesity, cigarette smoking, hypercholesterolemia, alcohol, diet, hereditary, allergens, seasons. Laboratory levels were compared between groups with $p = 0.0049$ (Observational Group), $p=0.0081$ (Interventional Group). Significant results obtained for medication adherence in Interventional Group ($p=0.0003$), Knowledge, Aptitude and Practice assessment between groups yielded significant results in Interventional Group as follows in Hypertension ($p < 0.0001$), Diabetes Mellitus ($p < 0.0001$), Stroke ($p < 0.0001$) and Asthma ($p < 0.0001$). significant results were observed for Quality of Life in Interventional Group as follows Hypertension (Physical Components- $p=0.0036$; Mental Components - $p < 0.0001$), Diabetes Mellitus (Physical Components- $p=0.0221$; Mental Components - $p=0.0014$), Stroke (Physical Components- $p=0.0015$; Mental Components- $p=0.0038$) and Asthma (Physical Components- $p=0.0117$; Mental Components- $p=0.0043$). **Conclusion:** Clinical pharmacist role will be elevated in health care team by promoting intrinsic services to doctors, by maintaining the diplomatic liaison between health care professionals and a decent patient-pharmacist relation improves the patient's knowledge on disease and which makes their better Quality of Life.

Key Words: Pharm. D, Clinical Pharmacist, Quality of Life, Chronic Diseases, Health Care Team, KAP.

INTRODUCTION

“Clinical pharmacy is defined as that area of pharmacy concerned with the science and practice of rational medication use”.¹ Clinical pharmacy should be considered as an integral element of a health care system. Physicians can get assistance in optimizing patients' pharmacotherapy with the presence of clinical pharmacists in medical rounds. Furthermore, clinical pharmacists could condense medication errors and adverse effects insofar as they contribute meaningfully in the detection than management of drug related problems.² The practice of clinical pharmacy embraces the

concepts of both pharmaceutical care and management of medicines.³ It has been more than 75 years since the establishment of India's first degree in pharmacy.⁴ Clinical pharmacy services were started in 1997 in India,⁵ in contrast to United States where the services were started in early 1960s. However 15 years have been passed out after the introduction of clinical pharmacy in India, but still the involvement of clinical pharmacist in the health care team is negligible compared to the developed countries like United States, Australia etc. where the role of clinical pharmacist is being actively performed

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and accepted by all the health care professionals. Clinical pharmacy practice in the hospital settings, as seen in other countries, can improve the drug use process by promoting the quality and safe use of medicines thereby improving overall health care of the patients in India. Involvement of clinical pharmacists in patient care in the inpatient hospital settings results in safer and more effective medication use.⁴ As the chronic disease makes the patient to prone for more morbid and sometimes mortal conditions, the patients should be always empowered with the updated knowledge of his/her disease condition, medication and the proper life style modifications required to optimize their diseased condition and thereby improve their Quality of life, here comes the role of clinical pharmacist after the physician to educate the patients regarding their disease, medication and lifestyle modifications as a part of patient counseling. Hence there is a need to evaluate and elevate the role of clinical pharmacist services in the health care team. In the present study we are dealing with the provision of knowledge and improvement of quality of life of patients suffering with Hypertension, Stroke, Diabetes Mellitus (type II) and Asthma/COPD with the following objectives (1) to elevate the clinical pharmacist role in the health care team (2) to minimize Drug related problems (3) to justify the liaison between health care professionals (4) to provide the better knowledge to the chronic disease patients regarding their disease and medication (5) to promote better quality of life in chronic disease patients.

AIM of the Study

To Evaluate the Clinical Pharmacist Role in a Health Care Team by providing precise services to physicians, patients, nurses and other health care professionals in a tertiary care teaching hospital.

Ethical Approval

The study was approved by the Human Research Ethical committee, RIMS, Kadapa with approval number Rc. No. 3349/Acad./ 2013-14.

METHOD

Study design: Prospective Observational and Interventional Study

Study period: December 2013 to June 2014 (6 months)

Study population: 200 Patients belonging to HTN, DM, Stroke & Asthma/COPD.

Study place: RIMS, an 800 bedded tertiary care teaching hospital, Kadapa.

Department: Department of General Medicine, male and female units (Inpatient)

Study Materials: Specially designed Patient data collection proforma (Apex-1), Clinical Pharmacist intervention forms, Patient information leaflets, KAP questionnaire (Apex-2, 3, 4, 5), SF-36 QOL questionnaire (Apex-6).

Inclusion criteria: Patients suffering from HTN, DM, Stroke & Asthma/COPD without any comorbid conditions/diseases with past history of 1 year belonging to age ≥ 40 years.

Exclusion criteria: Acute diseased patients, immunosuppressive patients, chronic kidney diseases, other cardiovascular diseases, pediatrics, pregnancy.

Method of study

Selection of patients based on the inclusion criteria followed by the collection of all the baseline parameters of the patients'. Then patients were divided into two groups' namely observational and Interventional. Patients of intervention group received the clinical pharmacist's services along with the physician advices to the patients, whereas the patients in the observational group did not get intervened by the clinical pharmacist. The patients included in the interventional group were reviewed for every 3 months i.e. at 3rd month and 6th month during the study period, so that twice they can be counselled and educated. In contrast to this, patients in the observational group were asked to come at the 6th month of study period after taking all the baseline parameters in the first month. Finally all the patients from both the groups were assessed for their quality of life and compared the same between the groups.

RESULTS

A total of 200 subjects were recruited in to the study based on the inclusion criteria, they were divided in to two groups namely observational group and interventional group. Out of 100 subjects, each disease (i.e. HTN, Stroke, DM II and Asthma/COPD) consists of 50 subjects of which 25 belong to observational and 25 to interventional groups. (Table 1)

Table 2 furnishes the details of subjects' distribution based on the gender. More number of male patients were observed in the HTN (60%) whereas female patients were seen more in the Asthma/COPD (56%).

Table 3 furnishes the details of subjects' distribution based on the age group. In HTN patients' highest number (28%) was seen in the 51-60 years of age group. In Stroke patients' highest number (30%) was seen in the 61-70 years of age group. In DM patients' highest number (30%) was seen in the 61-70 years of age group. In Asthma/COPD patients' least number (16%) was seen in the 71-80 years of age group and all other age groups consists of equal population (28%).

Table 4 furnishes the details of subjects' distribution based on the duration of disease. In HTN patients' highest number (48%) was seen in the 2-3 years of duration. In Stroke patients' highest number (40%) was seen in the 2-3 years of duration. In DM patients' highest number (40%) was seen in the 2-3 years of duration. In Asthma/COPD patients' highest number (44%) was seen in the 1-2 years of duration.

Table 5 describes the details of the risk factors contributing to the respective diseases. Age, hypercholesterolemia, obesity were recorded as the major risk factors for HTN. Age, hypercholesterolemia, obesity, alcohol were recorded as the major risk factors for Stroke. Age, hypercholesterolemia, obesity, diet, lifestyle were recorded as the major risk factors for DM, cigarette smoking, occupation, allergens, season were recorded as the major risk factors for Asthma/COPD.

Table 6 describes the details of effect of clinical pharmacist interventions, all the parameters mentioned in the table were affected by the clinical pharmacist counseling to the respective patients, general increase in HDL, FVC, FEV1 levels and decrease in all other parameters in the interventional group was observed. Contrasting results were seen in the observational group. All the results shown in the table are the standard deviation values of the laboratory parameters belonging to the respective patients. Significant result ($P=0.0081^{**}$) was obtained for the interventional group.

Table 7 describes the details of subjects' distribution based on the adherence towards the medication. The values in the table represent the number of patients adhered towards medication in both the observational and interventional groups. Significance (p) values were calculated for the yes answers that were adhered to medication. Significant result ($P=0.0003$) was obtained for the interventional group.

Assessment of KAP for HTN, STROKE, DM II & ASTHMA/COPD Patients

KAP questionnaire scores for the HTN, DM II, STROKE & ASTHMA/COPD patients were taken as yes (Y) and no (N) answers for the questions mentioned in the respective questionnaire. Significance (p) value was calculated for the yes answers.

Table 1: Distribution of subjects into observational and interventional groups

Disease	Observation Group (n-100)	Intervention Group (n-100)	Total N = 200
HTN	25	25	50
STROKE	25	25	50
DM (II)	25	25	50
ASTHMA/ COPD	25	25	50

Table 2: Distribution of subjects based on the gender

Disease	Gender	Observation Group	Intervention Group	Weighted Total (50)	
				(n)	{%}
HTN	Male	15	15	30	60
	Female	10	10	20	40
STROKE	Male	17	10	27	54
	Female	8	15	23	46
DM (II)	Male	11	12	23	46
	Female	14	13	27	54
ASTHMA/ COPD	Male	12	10	22	44
	Female	13	15	28	56

Note: KAP questionnaire and patient's answers are given in the Appendix 1

Assessment of KAP for HTN Patients

KAP questionnaire scores for the HTN patients in the observational group which were taken as yes (Y) and no (N) answers for 26 questions mentioned in the questionnaire.

Assessment of KAP for Stroke Patients

KAP questionnaire scores for the Stroke patients in the observational group which were taken as yes (Y) and no (N) answers for 23 questions mentioned in the questionnaire.

Assessment of KAP for DM Patients

KAP questionnaire scores for the DM patients in the observational group which were taken as yes (Y) and no (N) answers for 24 questions mentioned in the questionnaire.

Assessment of KAP for Asthma/COPD Patients

KAP questionnaire scores for the Asthma/COPD patients in the observational group which were taken as yes (Y) and no (N) answers for 21 questions mentioned in the questionnaire.

Assessment of QOL for HTN, Stroke, DM and Asthma/COPD Patients

Table 3: Distribution of subjects based on the Age Group

Disease	Age Group (Years)	Observation Group	Intervention Group	Weighted Total (50)	
		M/F	M/F	M/F	(n) (%)
HTN	40-50	3/3	3/4	6/7	13 26
	51-60	3/3	4/4	7/7	14 28
	61-70	3/3	3/4	6/7	13 26
	71-80	2/3	2/3	4/5	10 20
STROKE	40-50	3/4	3/3	6/7	13 26
	51-60	3/3	3/4	6/7	13 26
	61-70	6/2	5/2	11/4	15 30
	71-80	3/2	2/2	5/4	9 18
DM (II)	40-50	3/2	3/3	6/5	11 22
	51-60	3/3	4/3	7/6	13 26
	61-70	5/2	5/3	10/5	15 30
	71-80	3/2	3/3	6/5	11 22
ASTHMA/ COPD	40-50	3/3	4/4	7/7	14 28
	51-60	3/3	4/4	7/7	14 28
	61-70	3/3	4/4	7/7	14 28
	71-80	2/2	2/2	4/4	8 16

Table 4: Distribution of subjects based on the Duration of Disease

Disease	Duration (Years)	Observation Group	Intervention Group	Weighted Total (50)	
		n	n	n	{%}
HTN	1-2	6	6	12	24
	2-3	12	12	24	48
	≥3	7	7	14	28
STROKE	1-2	9	9	18	36
	2-3	10	10	20	40
	≥3	6	6	12	24
DM (II)	1-2	9	7	17	34
	2-3	10	10	20	40
	≥3	7	6	13	26
ASTHMA/COPD	1-2	11	11	22	44
	2-3	8	8	16	32
	≥3	6	6	12	24

Table 5: Risk Factors

Disease	HTN	Stroke	DM (II)	Asthma/ COPD
Risk Factors	Age Obesity Cigarette smoking Hypercholesterolemia Alcohol Diet Hereditary Life style	Age ≥60 Obesity Cigarette smoking Hypercholesterolemia Alcohol Diet Uncontrolled HTN Trauma Life style	Age Obesity Hypercholesterolemia Hereditary Diet Life style	Age Smoke/fog Cigarette smoking Occupation Diet Hereditary Allergens Seasons Viral

Table 6: Effect of Clinical Pharmacist Intervention

Disease	Parameter	Observational			Interventional			
		Base-line	End	p	Base-line	3 M	6 M	p
HTN	BP(mmHg)	160±9	162±11	0.0049	168±7	160±4	158±3	0.0081
	BP (mmHg)	170±7	182±8		181±4	174±5	162±7	
STROKE	HDL(mg/dl)	37±2	36±2		35±2	38±1	39±3	
	LDL (mg/dl)	95±5	105±6		97±5	82±3	79±2	
	TC(mg/dl)	145 ± 7	152 ± 9		148 ± 9	140 ± 5	136 ± 2	
	RBS (mg/dl)	224 ± 8	231 ± 5		235 ± 6	198 ± 8	164 ± 2	
	FBS(mg/dl)	146 ± 6	151 ± 4		153 ± 4	146 ± 4	140 ± 2	
DM (II)	HDL(mg/dl)	35 ± 2	36 ± 2		35 ± 1	38 ± 3	42 ± 2	
	LDL(mg/dl)	105 ± 4	108 ± 4		104 ± 7	98 ± 5	82 ± 2	
	TC(mg/dl)	135 ± 7	142 ± 5		152 ± 4	144 ± 2	131 ± 2	
ASTHMA/ COPD	RR (c/m)	24 ± 2	24 ± 4		25 ± 4	22 ± 2	20 ± 2	
	FVC (L)	2.6 ± 1.2	2.4 ± 1.1		2.1 ± 1.4	2.9 ± 1.0	3.5 ± 1.3	
	FEV1 (L)	2.2 ± 0.3	2 ± 1.1		2 ± 1.3	2.6 ± 2.1	2.9 ± 1.9	
	TLC (L)	6.9 ± 1.7	7.2 ± 1.1		6.9 ± 1.5	6.9 ± 0.4	6.5 ± 1.0	
	VC (L)	1.8 ± 1.1	2.1 ± 1.4	1.9 ± 1.2	1.8 ± 0.5	1.7 ± 0.6		

Observational Group Significance - Student paired t-test; p = 0.0049 (s)
 Interventional Group Significance - one way ANOVA; p = 0.0081** (s)

Table 7: Distribution of subjects based on the Medication Adherence

Disease	Observational Adherence				P-Value	Interventional Adherence						P-Value
	Baseline		End			Baseline		3M		6M		
	Yes	No	Yes	No		Y	N	Y	N	Y	N	
HTN	12	13	11	14	0.4444	12	13	14	11	19	6	0.0003
STROKE	13	12	13	12		11	14	11	14	15	10	
DM (II)	14	11	11	14		11	14	11	14	19	6	
ASTHMA/COPD	13	12	14	11		13	12	15	10	20	5	

Observational Group Significance - Student paired t-test; p=0.4444 (ns)
 Interventional Group Significance - one way ANOVA; p=0.0003*** (s)

QOL questionnaire (SF-36) consists of 35 questions for each disease divided in to physical and mental components. Each component is divided into different questions hence an average score was taken for all the patients and compared the same for significance.

DISCUSSION

A prior ethical clearance was obtained from Institutional Ethical Committee (IEC) of RIMS and with the permission of head of the Department of General Medicine, RIMS; the study was begun conferring to the methodology. All the statistical analysis were calculated by using

the student paired t-Test and one way ANOVA with graph pad prism software taking P=<0.05 as significant value.

Highest number of male population was found in HTN which coincide with the results of Biradar S S. *et al.*⁶ In the interventional group in HTN patients, BP (mmHg) decreased from 168 ± 7 to 158 ± 3, in Stroke patients BP decreased from 181 ± 4 to 162 ± 7, in Stroke patients HDL (mg/dl) levels increased from 35 ± 2 to 39 ± 3, LDL (mg/dl) levels decreased from 97 ± 5 to 79 ± 2, TC (mg/dl) levels decreased from 148 ± 9 to 136 ± 2. These results coincide with the results of Autumn Bagwell,

Pharm D *et al.*⁷In DM patients RBS levels decreased from 235 ± 6 to 164 ± 2 , FBS levels decreased from 153 ± 4 to 140 ± 2 , HDL levels increased from 35 ± 1 to 38 ± 3 , LDL levels decreased from 104 ± 7 to 82 ± 2 , TC levels decreased from 152 ± 4 to 131 ± 2 . These results coincide with the results of Taha O. Mahwiet *et al.*⁸

Significant results were obtained in the medication adherence behaviour of the patients in the interventional group with significance value $p = 0.0001^{***}$ compared to the observational group $p = 0.4444$.

KAP questionnaires were used to assess the patient's knowledge regarding their disease, medication and life style adaptations they have to follow to control their morbid conditions and to improve their QOL. Separate questionnaires were prepared for HTN, Stroke, DM and Asthma/COPD patients. Results were compared between the observational and interventional groups. Both groups were assessed separately taking scores at the baseline and at the end of the study and significance were calculated.

For HTN patients KAP questionnaire consists of 26 questions for these questions answers were taken from the patients and significance was calculated, scores as follows (Figure 1 and 2). In the observational group $p = 0.0010^{***}$ (s), in the interventional group $p < 0.0001^{***}$ (s). These results coincide with the Line Aubert *et al.*⁹

For Stroke patients KAP questionnaire consists of 23 questions for these questions answers were taken from the patients and significance was calculated, scores as follows (Figure 3 and 4). In the observational group $p = 0.0007^{***}$ (s). In the interventional group $p < 0.0001^{***}$ (s), Greater significant difference was observed, results coincides with the Sujata Das *et al.*¹⁰

For DM patients KAP questionnaire consists of 24 questions for these questions answers were taken from the patients and significance was calculated, scores as follows (Figure 5 and 6). In the observational group $p = 0.0006^{***}$ (s), in the interventional group $p < 0.0001^{***}$ (s). These results coincide with the Al-Maskar *et al.*¹¹

For Asthma/COPD patients KAP questionnaire consists of 21 questions for these questions answers were taken from the patients and significance was calculated, scores as follows (Figure 7 and 8). In the observational group $p = 0.0126^*$ (ns), in the interventional group $p < 0.0001^{***}$ (s) and these results coincides with the Rathan Shyam M, Jyothi D.¹²

QOL questionnaires were used to assess the patient's quality of life before and after the interventions by the clinical pharmacist. Same questionnaire was used for HTN, Stroke, DM and Asthma/COPD patients which consists of 35 questions relating to the physical and mental health components. As the each question was related to all the diseased patients and the patients from each disease may or may not have the same answer for the same question and sometimes single question may get more yes answers from different patients, hence an average score was taken for the assessment of significance value. Results were compared between the observational and interventional groups.

For HTN patients QOL was assessed and the scores as follows (Figure 9-12). In the observational group for the Physical Components $p = 0.1573$ (ns), for the Mental Components $p = 0.0835$ (ns). In the interventional group for the Physical Components $p = 0.0036^{**}$ (s), for the Mental Components $p < 0.0001^{***}$ (s). Greater significant difference was observed. These coincide with the Gusmao JL *et al.*¹³

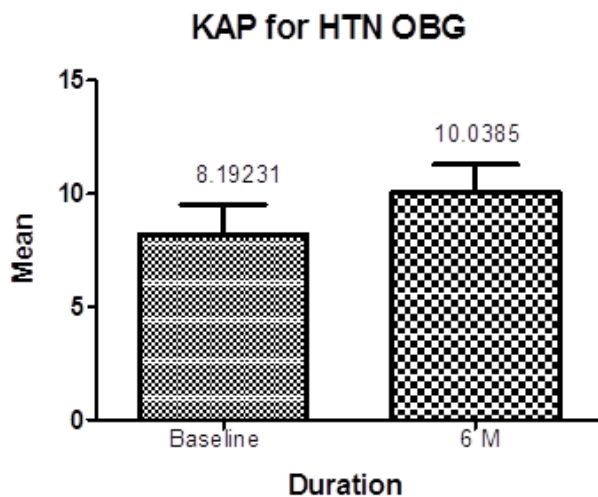


Figure 1: Assessment of KAP for HTN Patients (Observational group) Significance – Student paired t-test; $p = 0.0024^{**}$ (s).

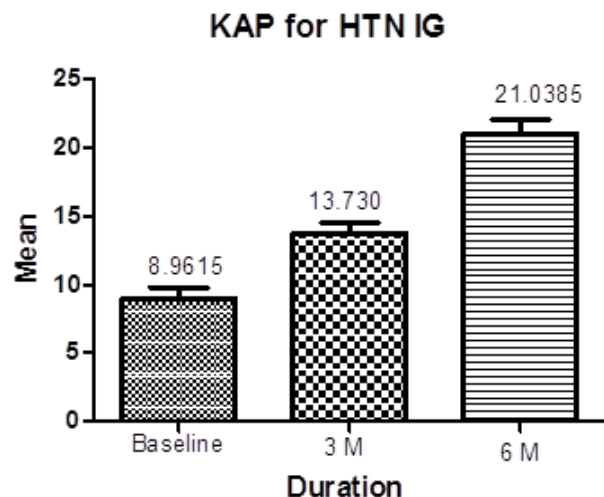


Figure 2: Assessment of KAP for HTN Patients (Interventional group) Significance – one way ANOVA; $p < 0.0001^{***}$ (s).

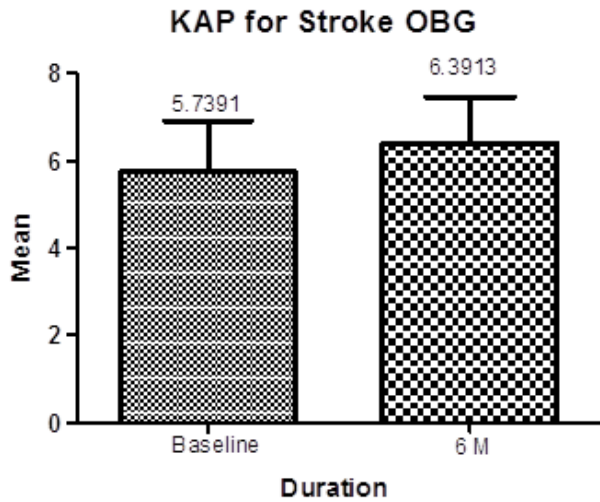


Figure 3: Assessment of KAP for Stroke Patients (Observational group) Significance – Student paired t-test; $p = 0.0873$ (ns).

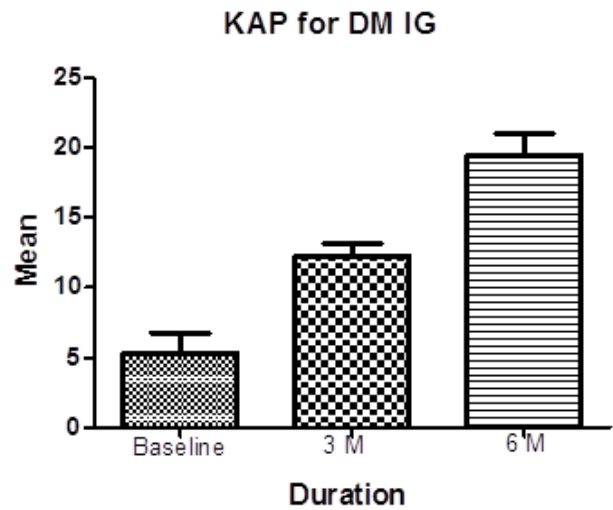


Figure 6: Assessment of KAP for DM Patients (Interventional group) Significance – one way ANOVA; $p < 0.0001^{***}$ (s).

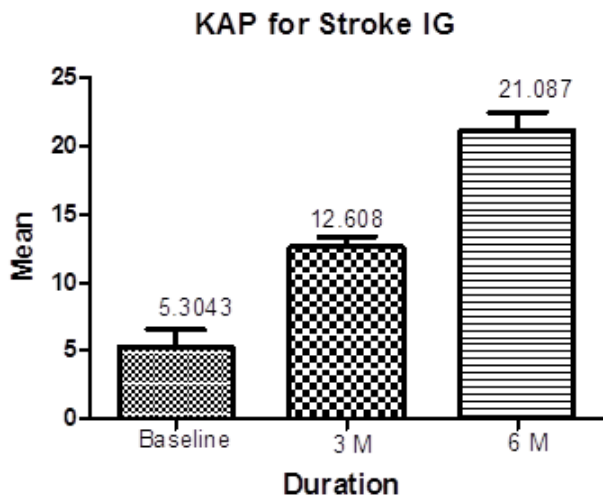


Figure 4: Assessment of KAP for Stroke Patients (Interventional group) Significance – one way ANOVA; $p < 0.0001^{***}$ (s).

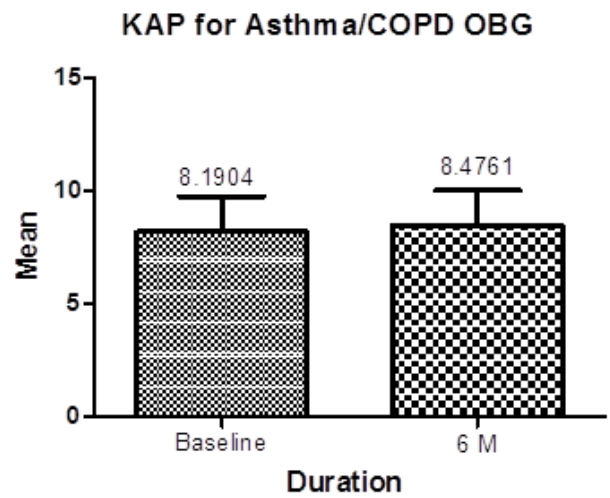


Figure 7: Assessment of KAP for COPD Patients (Observational group) Significance – Student paired t-test; $p = 0.1623$ (ns)..

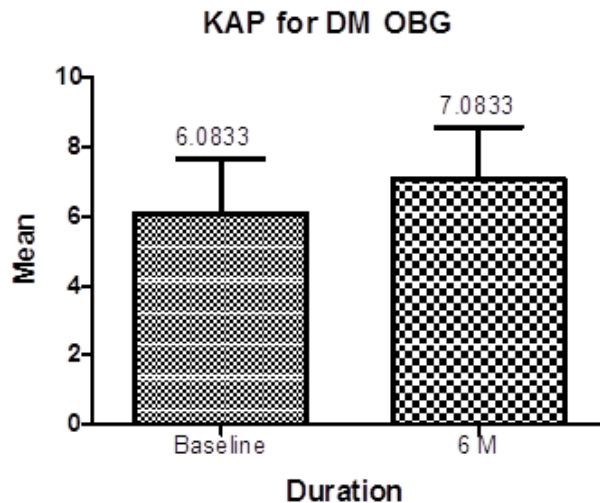


Figure 5: Assessment of KAP for DM Patients (Observational group) Significance – Student paired t-test; $p = 0.0025^{**}$ (s)

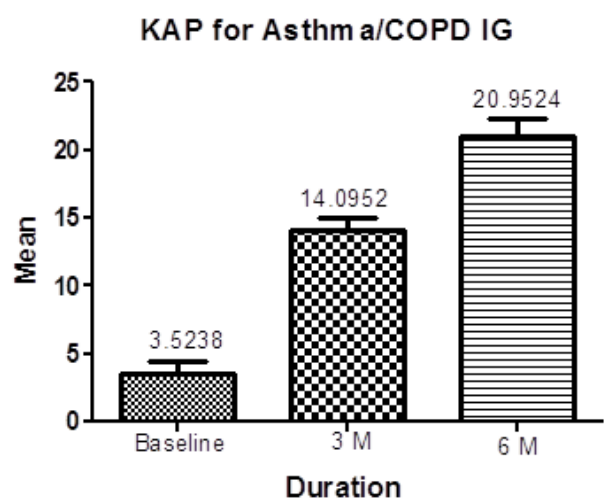


Figure 8: Assessment of KAP for COPD Patients (Interventional group) Significance – one way ANOVA; $p < 0.0001^{***}$ (s).

For Stroke patients in the observational group, for the Physical Components $p=0.0798$ (ns), for the Mental Components $p=0.5017$ (ns). In the interventional group for the Physical Components $p=0.0015^{**}$ (s), for the Mental Components $p=0.0038^{**}$ (s) (Figure 13-16). These results coincide with the Kehchung Lin *et al.*¹⁴

For DM patients in the observational group for the Physical Components $p=0.1761$ (ns), for the Men-

tal Components $p=0.1161$ (ns). In the interventional group for the Physical Components $p=0.0221^*$ (s), for the Mental Components $p=0.0014^{**}$ (s) (Figure 17-20). These results coincide with the Harvey Thomson *et al.*¹⁵ For Asthma/COPD patients in the observational group for the Physical Components $p=0.0328^*$ (s), for the Mental Components Significance $p=0.1672$ (ns). In the interventional group for the Physical Components

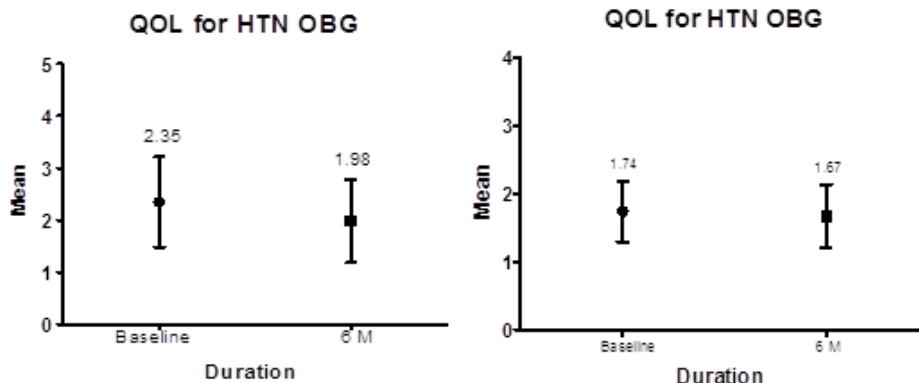


Figure 9,10: Assessment of QOL for HTN Patients (Observational group). (Figure 9) Physical Components Significance – Student paired t-test; $p = 0.1573$ (ns). (Figure 10) Mental Components Significance – Student paired t-test; $p = 0.0835$ (ns).

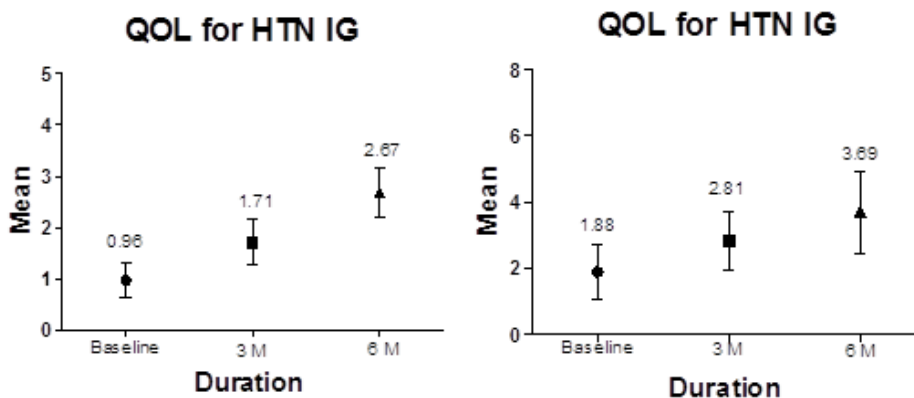


Figure 11,12: Assessment of QOL for HTN Patients (Interventional group). (Figure 11) Physical Components Significance – one way ANOVA; $p = 0.0036^{**}$ (s). (Figure 12) Mental Components Significance – one way ANOVA; $p < 0.0001^{***}$ (s)

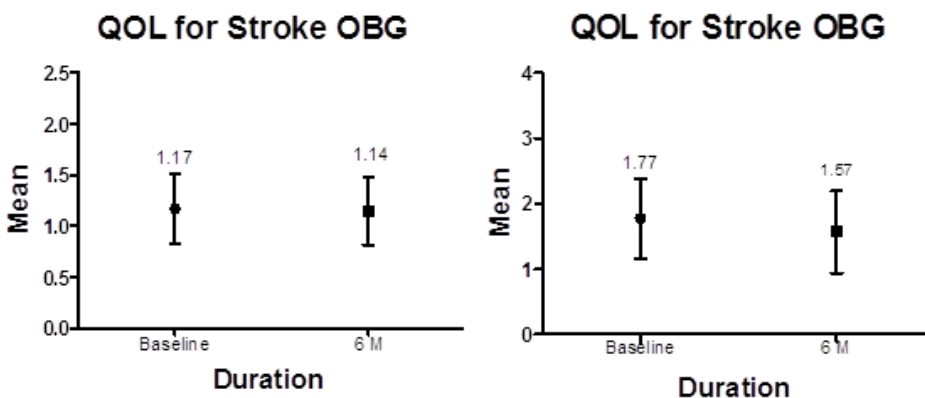


Figure 13,14: Assessment of QOL for HTN Patients (Observational group). (Figure 13) Physical Components Significance – Student paired t-test; $p = 0.0798$ (ns). (Figure 14) Mental Components Significance – Student paired t-test; $p = 0.5017$ (ns).

$p=0.0117^*$ (s), for the Mental Components $p=0.0043^{**}$ (s) (Figure 21-24). These results coincide with the Eanes Delgado Barros Pereira *et al.*¹⁶

Our study revealed that the intrinsic services provided by the clinical pharmacist in the hospital settings are the mediums for a clinical pharmacist to take part in the health care team and it can be achieved with the diplomatic relation maintained with all the other health care professionals in fact sometimes clinical pharmacist may

CONCLUSION

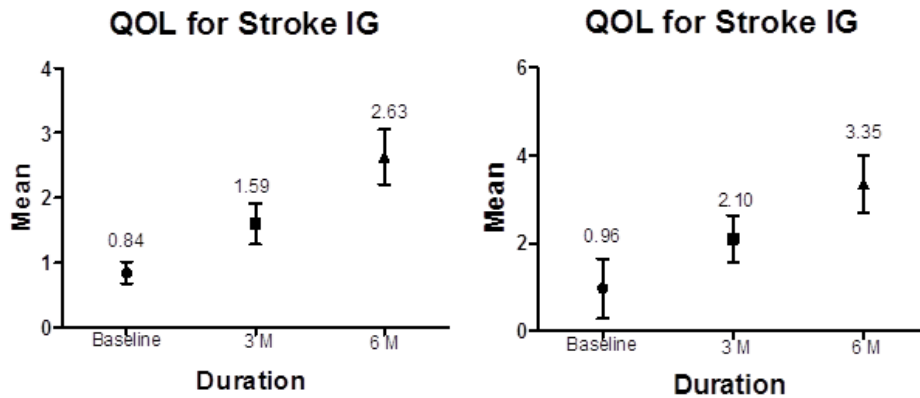


Figure 15,16: Assessment of QOL for Stroke Patients (Interventional group). (Figure 15) Physical Components Significance – one way ANOVA; $p = 0.0015^{**}$ (s). (Figure 16) Mental Components Significance – one way ANOVA; $p = 0.0038^{**}$ (s).

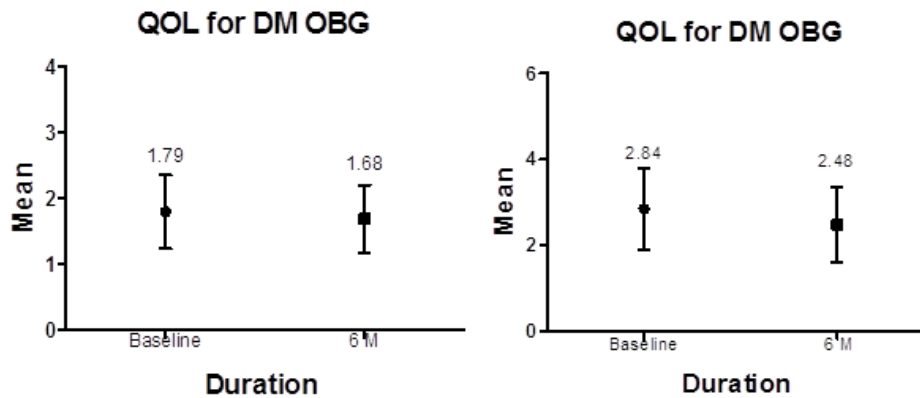


Figure 17,18: Assessment of QOL for DM Patients (Observational group). (Figure 17) Physical Components Significance – Student paired t-test; $p = 0.1761$ (ns). (Figure 18) Mental Components Significance – Student paired t-test; $p = 0.1161$ (ns).

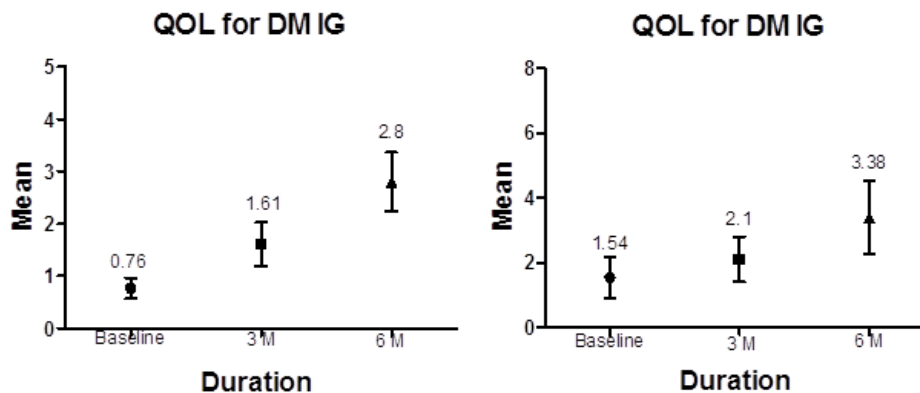


Figure 19, 20: Assessment of QOL for DM Patients (Interventional group). (Figure 19) Physical Components Significance – one way ANOVA; $p = 0.0221^*$ (s). (Figure 20) Mental Components Significance – one way ANOVA; $p = 0.0014^{**}$ (s).

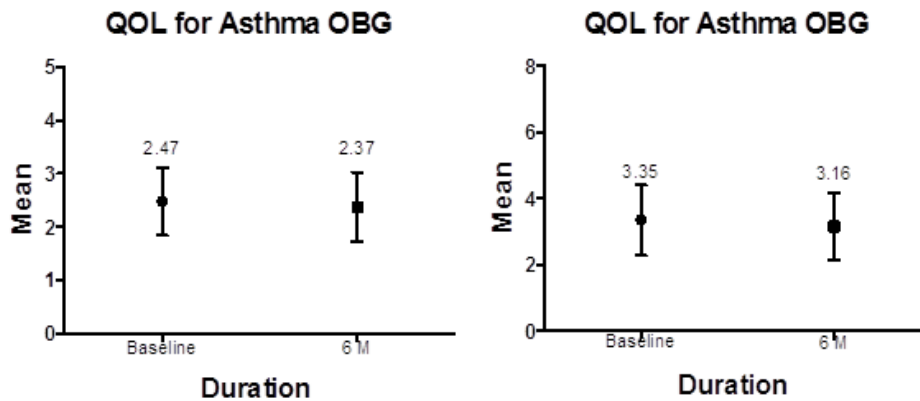


Figure 21, 22: Assessment of QOL for Asthma/COPD Patients (Observational group). (Figure 21) Physical Components Significance – Student paired t-test; $p = 0.0328^*$ (s). (Figure 22) Mental Components Significance – Student paired t-test; $p = 0.1672$ (ns).

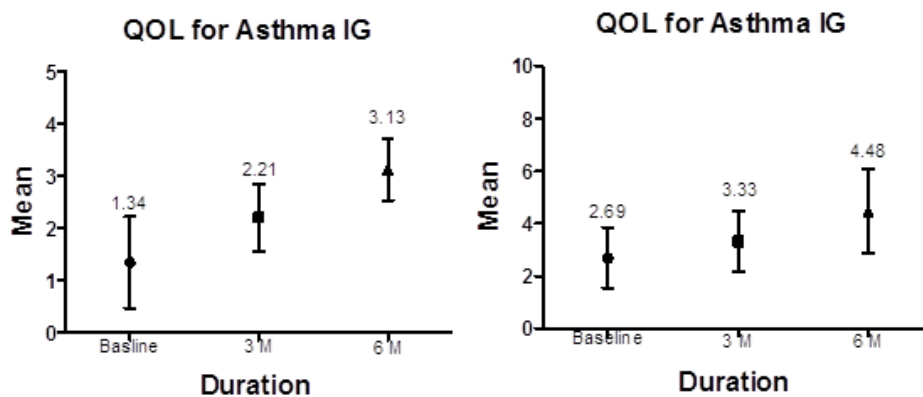


Figure 23, 24: Assessment of QOL for Asthma/COPD Patients (Interventional group). (Figure 23) Physical Components Significance – one way ANOVA; $p = 0.0117^*$ (s). (Figure 24) Mental Components Significance – one way ANOVA; $p = 0.0043^{**}$ (s).

go beyond it and can achieve decent outcomes thereby better liaison will be ascertained between the clinical pharmacist and all other health care professionals. Study mentions the importance of clinical pharmacists in improving the adherence to medication in the chronic disease patients thereby achieving the noble therapeutic levels of the medicines which lead to the well improvement of patient. Study also stresses the role of the clinical pharmacist in improving the patients' Quality of Life by providing the healthier patient counselling and empowering patients with the worthy knowledge regarding their ailments. These kinds of studies should be carried out in the future in all types of morbid conditions so that quality of life of the patients can be improved, better relations will be established between health care professionals including the clinical pharmacist which will be constructive for the upcoming of evolving Clinical Pharmacists.

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CONFLICT OF INTEREST

No conflict of interest are declared.

ABBREVIATION USED

RIMS: Rajiv Gandhi Institute of Medical Sciences; **IEC:** Institutional Ethical Committee; **HTN:** Hypertension; **DM:** Diabetes Mellitus; **COPD:** Chronic Obstructive Pulmonary Disease; **FVC:** Forced expiratory Volume; **FEV1:** Forced expiratory Volume at one second; **TLC:** Total Lung Capacity; **VC:** Vital Capacity; **HDL:** High Density lipo-protein; **LDL:** Low Density Lipo-protein; **TC:** Total Cholesterol; **RBS:** Random Blood Sugar; **FBS:** Fasting Blood Sugar; **BP:** Blood Pressure; **IG:** Interventional Group; **OBG:** Observational Group; **KAP:** Knowledge aptitude and Practice; **QOL:** Quality of Life; **N:** No; **Y:** Yes; **M:** Month; **ANOVA:** Analysis of variance.

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