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Role Of Clinical Pharmacist In Identifying The Factors That Influence Medication Non- Adherence And Improvement On Hospitalised Geriatric Non-Adherent Patients

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ABSTRACT

Background- Poor adherence is one of the major factors which alters therapeutic outcome of medication in geriatric patients with chronological diseases. Medication non-adherence is one of the drug related barrier for hospitalization of elderly patients. So, there is a need to assess the factors responsible for hospitalization of elderly patients due to medication non-adherence.

Aim- To identify the factors responsible for hospitalization of elderly patients due to medication non-adherence and importance of clinical pharmacist role in the improvement of medication adherence

Materials & Methods- Morisky 8-item Medication Adherence Questionnaire- to identify medication non adherence, patient information leaf lets. A prospective interventional study was conducted in tertiary care teaching hospital,

Results- A total of 423 patients were interviewed. Out of these 182 patients were included in the study. Among these 42 patients were affected by polypharmacy, 38 patients were affected by lack of knowledge, 34 patients were affected for being asymptomatic, 30 patients were affected by cost of medication. After patient counseling, 18 patients had overcome from non-adherence due to polypharmacy, 33 patients had overcome non-adherence due to lack of knowledge, 28 patients had overcome non-adherence by being asymptomatic.

Conclusion- The present study showed that the clinical pharmacist involvement in disease management has positive impact in creating awareness about the disease, which improves medication adherence along with quality of life.

KEYWORDS: Geriatrics, Adherence, Chronic Diseases, Factors Influencing Adherence, Patient Counseling.

INTRODUCTION

Defining "elderly" is difficult. The geriatric population is often arbitrarily defined as patients who are older than 65 years as per American society & older than 60 years as per Indian society[1]. Currently there are 90 million people in India aged over 60 years, and as this number grows it will become increasingly important for pharmacists to contribute to rational and safe medication use in the elderly[2]. One of the most complicated reason which results in altered therapeutic outcome is medication non adherence. It was noted that the elderly are particularly vulnerable to the medication non adherence. Because, elderly patients may have several different pathophysiologic conditions, which puts the person at risk for multiple chronic illnesses that require multiple drug therapy. Thus medication non-adherence is mostly observed in elder patients[3]. According to the World Health Organization, adherence is the extent to which a person's behavior (e.g., taking medications, following a diet and/or executing lifestyle changes) corresponds with agreed-upon recommendations from a health care provider[4]. Non-compliance may lead to Medication-related hospital admissions, unnecessary disease progression and complications, Additional medical costs, increased use of expensive, specialized medical resources. So, there is a need to identify factors influencing medication non-adherence[5]. There is a five sets of factors affecting the non-adherence, these are

SOCIO/ECONOMIC FACTOR- lack of family/friends support and financial recourses,

PROVIDER-PATIENT/HEALTH CARE SYSTEM FACTOR- lack of good relationship between the patient and health care provider, which features encouragement and reinforcement from the provider, has a negative impact on adherence especially in older adults with memory problems.

CONDITION-RELATED FACTOR- adherence to long term treatment regimens often declines significantly over time.

THERAPY-RELATED FACTOR- The complexity of the medication regimen, which includes the number of medications (polypharmacy) and number of daily doses required; duration of therapy; therapies that are inconvenient or interfere with a person's

lifestyle and side effects have been associated with decreased adherence[6].

Patient-related factors- Lack of knowledge about disease and medication.

Physical Barriers- weakness, arthritis, tremors, wheel chair or bedridden patients may have difficulty getting up several times a day to take their medication.

FUNCTIONAL BARRIERS- Memory loss, confusion due to complex regimens, insufficient income, multiple pharmacies, solitude, So, there is a need to identify the factors influence non-adherence, overcome of these factors is important for improving the medication adherence. There is a large number of interventions to improve patient adherence have been studied. Most of these have been patient-oriented and educational. Oral instructions are the most frequently studied interventions, followed by written instructions and educational leaflets[2].

MATERIALS AND METHODS

This was a prospective interventional study, conducted in the Rajiv Gandhi Institute of Medical Sciences (RIMS), kadapa, for a period of 6 months. Study criteria: The study was approved by the institutional review board of P.R.R.M College Of Pharmacy and the ethical committee of RIMS, kadapa.(R.C No-3349).

INCLUSION CRITERIA

1. Elder patients with chronic illness such as hypertension, Diabetes mellitus, Primary stages of pulmonary Tuberculosis, COPD& their comorbidities.
2. Age group-above 60 yrs.
3. Inpatients with duration of stay for more than four days.

EXCLUSION CRITERIA

1. Patients with less than 2yrs of past medical history of chronic illness except pulmonary Tuberculosis (<1yr) Patients with acute illness.
2. Co-morbid conditions other than Hypertension, Diabetes mellitus, Pulmonary Tuberculosis, COPD

SOURCE
MATERIALS USED

Patient informed consent form, Patient data collection form, Patient interview: Morisky -item Medication Adherence Questionnaire, to identify medication non adherence, patient information leaf let.

ETHICAL APPROVAL
STUDY PROCEDURE

Around 423 patients were approached during the study period and were informed briefly about the study and study procedure. Out of which only 182 patients were prospectively selected for our study from inpatient general medicine department and Tuberculosis department. Then patients were categorized according to their disease condition. Patient was interviewed and various factors of non-compliance were sorted out. By using Morisky 8-item Medication Adherence Questionnaire the adherence of treatment was measured before counseling. Then the patients were counseled

regarding the disease & importance of medication adherence and the follow-up's are made once in 2 months for two times by either direct or phone contact .Morisky 8-item Medication Adherence Questionnaire was used to calculate the rate of adherence in each follow-up.

STATISTICAL ANALYSIS

Data was analysed by using graph pad prism-student T-test. Significance was assessed at 95% confidence interval, Mean ± SEM also assessed.

RESULTS AND DISCUSSION

Total interviewed patients were 423 patients. Out of these, 182 patients were included in the study. The remaining 241 patients were excluded as they didn't fulfill the inclusion criteria. Among these 182 medication non-compliant patients, Males were 97(53%); females were 85(47%).

Table 1: Proportion of patients interviewed and recruited.

TOTAL PATIENTS INTERVIEWED	PATIENTS EXCLUDED	PATIENTS INCLUDED (NON-COMPLIANT)
423	241(57%)	182 MALES- 97(53%) FEMALES- 85(47%)

FACTORS INFLUENCED THE MEDICATION COMPLIANCE

Factors affecting the compliance of patients in study were classified into 5 major categories, namely Socio/Economic factors (53 patients), Provider-patient/health care system factor (27), condition-related (46), therapy-related (68), patient-related (80). Among these 53 patients affected with Socio/Economic factors, 3 were Hypertension patients, 6 were Diabetes mellitus, 4 were COPD patients, 17 were Tuberculosis patients, 23 were with co-morbidities. Among these 27 patients affected with Provider-patient/health care system factor, 32were Hypertension patients, 9 were Diabetes

mellitus, 3 were COPD patients, 6 were Tuberculosis patients, 7 were with co-morbidities. Among these 46 patients affected with condition- related 15 were Hypertension patients, 7 were Diabetes mellitus, 8 were COPD patients, 4 were Tuberculosis patients, 12 were with co-morbidities. Among these 68 patients affected with therapy-related, 5 were Hypertension patients, 9 were Diabetes mellitus, 6 were COPD patients, 14 were Tuberculosis patients, and 34 were with co-morbidities. Among these 80 patients affected with patient-related, 18 were Hypertension patients, 12 were Diabetes mellitus, 1 6 were COPD patients, 15 were Tuberculosis patients, 19 were with co-morbidities.

Table 2: Factors influenced the medication compliance

	HTN	DM	COPD	TB	CO-MORBIDITIES	TOTAL
Socio/Economic	3	6	4	17	23	53
Provider-Patient/Health Care System	2	9	3	6	7	27

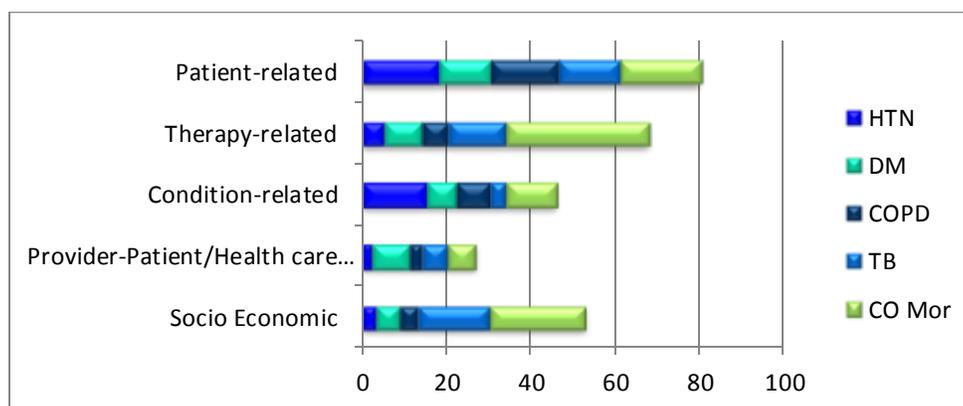|						
Condition Related	15	7	8	4	12	46
Therapy-Related	5	9	6	14	34	68
Patient- Related	18	12	16	15	19	80

Fig 1: Factors influenced the medication compliance

VARIOUS INDIVIDUAL FACTORS AMONG THE CLASSIFICATION INFLUENCED THE PATIENTS
SOCIO-ECONOMIC FACTORS

Among 182 patients, 53 were influenced with Socio/Economic factors, In which 30 were influenced with Cost of medication, 9 were influenced with Occupational burden, 14 were influenced by Lack of family support.

Table 3: Socio-Economic Factors

SOCIO-ECONOMIC FACTORS	NUMBER OF PATIENTS
Cost of medication	30(56.60)
Occupational burden	9(16.98)
Lack of family support	14(26.42)
TOTAL	**53**

PROVIDER-PATIENT/HEALTH CARE SYSTEM FACTOR

Among 182 patients, 27 were influenced with provider-patient/health care system factor, in which

21 were influenced with lack of instructions, 5 were influenced with prescribing habits, 1 patient was influenced by Dispensing habits.

Table 4: Provider-Patient/Health Care System Factor

PROVIDER-PATIENT/HEALTH CARE SYSTEM FACTOR	NUMBER OF PATIENTS
Lack of Instructions(about medication use and side-effects)	21(77.78)
Prescribing habits	5(18.52)
Dispensing habits	1(3.70)
TOTAL	**27**

CONDITION RELATED FACTOR

Among 182 patients, 46 were influenced with condition-related factor, In which 34 were influenced with asymptomatic factor, 12 were influenced with co-morbidities.

Table 5: Condition Related Factor

CONDITION RELATED	NUMBER OF PATIENTS (46)
Asymptomatic	34(73.91)
Co-morbidities	12(26.09)
TOTAL	**46**

THERAPY –RELATED FACTORS

Among 182 patients, 68 were influenced with Therapy-related factor, In which 42 were influenced with polypharmacy, 15 were influenced with Duration of therapy,8 were influenced by ADR'S and Side-effects,3 patients were influenced by interference with personal life.

Table 6: Therapy –Related Factors

THERAPY RELATED	NUMBER OF PATIENTS
Polypharmacy	42(61.76)
Duration of therapy	15(22.06)
ADR's and Side-effects	8(11.76)
Interference with personal life	3(4.42)
TOTAL	**68**

PATIENT-RELATED FACTOR

Among 182 patients, 80 were influenced with patient-related factor, In which 38 were influenced with lack of knowledge, 28 were influenced with forgetfulness, 14 patient was influenced by lack of motivation.

Table 7: Patient-Related Factor

PATIENT-RELATED	NUMBER OF PATIENTS(80)
Lack of Knowledge	38(47.5)
Forgetfulness	28(35)
Lack of Motivation	14(17.5)
TOTAL	**80**

MOST INFLUENCED FACTORS

The factors mostly influenced the patients in the study are Polypharmacy, Lack of knowledge, Being-asymptomatic, Cost of medication, Forgetfulness, Lack of instructions. Patients influenced with polypharmacy were 42, Patients influenced with Being-Asymptomatic were 38, Patients influenced with Cost of medication were 30, Patients influenced with Lack of knowledge were 28, and Patients influenced with Lack of instruction were 21.

Table 8: Most Influenced Factors

MOST INFLUENCED FACTORS	NO.OF PATIENTS
Polypharmacy	42
Lack of knowledge	38

Asymptomatic	34
Cost of medication	30
Forgetfulness	28
Lack of instructions	21

CATEGORIZATION OF PATIENTS BASED ON ADHERENCE RATE

Out of 182 patients before the counseling, 45 patients were identified as Medium adherence, 137 patients were identified as low adherence. 159 patients were done first follow-up. Among these, 70 were identified as Medium adherence, 50 patients were identified as Low adherence, and 39 were identified as Adherent. Out of 159 patients of the first follow-up, only 146 patients were undergone second follow-up. Among these 142 patients, 13 patients were medium adherence, 16 patients were low adherence, 117 patients were adherent.

Table 9: Categorization of Patients Based On Adherence Rate

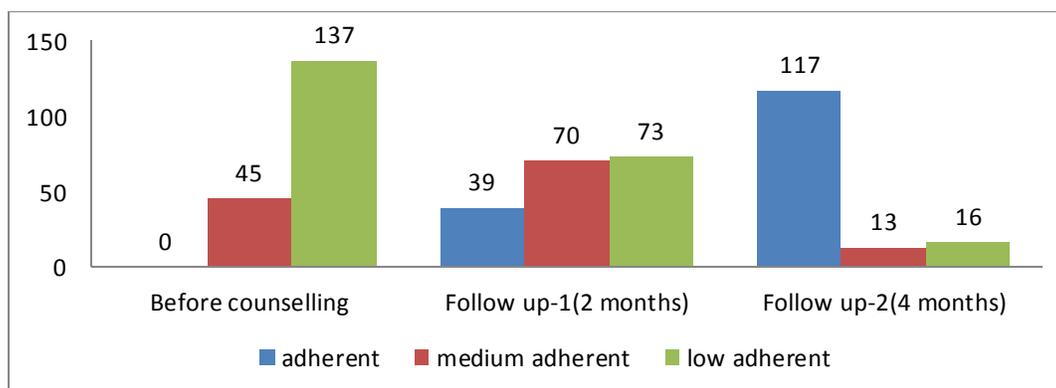| ADHERENCE RATE	NUMBER OF PATIENTS BEFORE COUNSELLING	FOLLOW UP-1	FOLLOW UP-2
Adherent		39	117
medium adherent	45	70	13
Low adherent	137	50	16
TOTAL	**182**	**159**	**146**

Fig 2: Categorization of Patients Based On Adherence Rate

DISEASE WISE CATEGORIZATION IN FOLLOW UP-2 ACCORDING TO THE MEDICATION ADHERENCE RATE OF PATIENTS

Among 24 hypertension patients, 21 were adherent, 1 patient was medium adherent, 2 patients were low adherent. Among 17 Diabetes mellitus patients, 12 were highly adherent, 3 patients were medium adherent, and 2 patients were low adherent. Among 24 COPD patients, 17 were highly adherent, 7 patients were low adherent. Among 22 Tuberculosis patients, 22 patients were highly adherent, 4 patients were medium adherent, 1 patient was low adherent. Among 45 co-morbidities patients, 45 were highly adherent, 5 patients were medium adherent, 4 patients were low adherent.

Table 10: Disease Wise Categorization in Follow Up-2

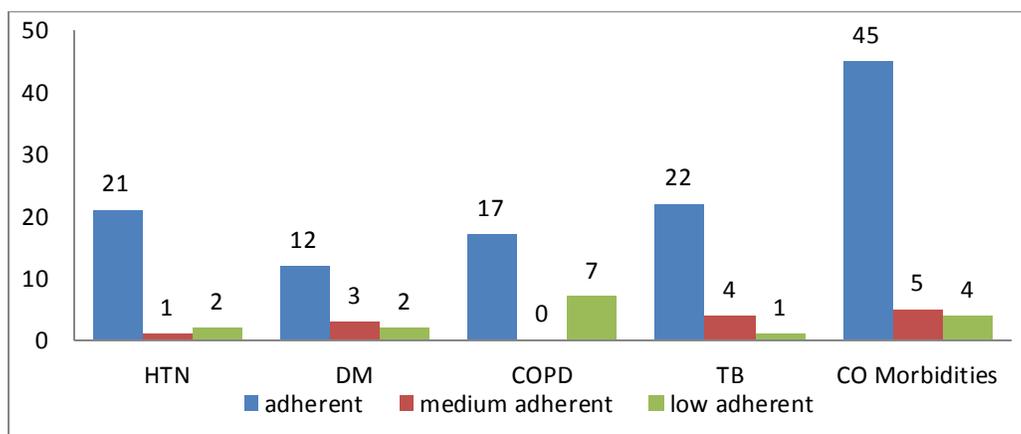| ADHERENCE RATE	HTN (24)	DM(17)	COPD(24)	TB (27)	CO-morbidities (54)	TOTAL
Adherence	21	12	17	22	45	117
Medium adherence	1	3	0	4	5	13
Low adherence	2	2	7	1	4	16

Fig 3: Disease Wise Categorization in Follow Up-2

PATIENTS REDEEMED FROM MOSTLY INFLUENCED FACTORS

The factors mostly influenced the patients in the study were Poly pharmacy (42) out of which 18 patients had overcome it, Lack of knowledge (38) out of which 33 patients had overcome it, Being-asymptomatic (34) out of which 28 patients had overcome it, Cost of medication (30) out of which 24 had overcome it, Forget fullness(28)out of which 10 patients had overcome it, Lack of instructions(21)out of which 17 had overcome it.

Table 11: Patients redeemed from mostly influenced factors

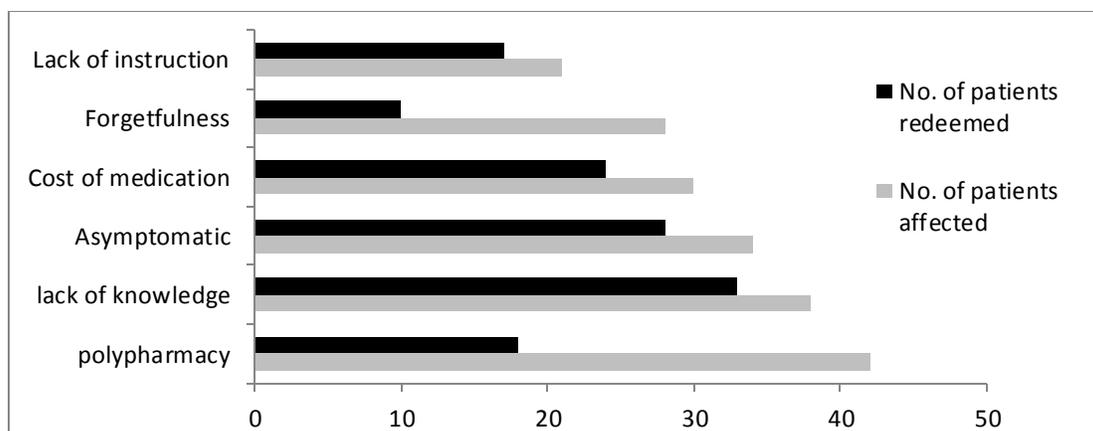| MOSTLY INFLUENCED FACTORS	NUMBER OF PATIENTS AFFECTED	NUMBER OF PATIENTS REDEEMED
Polypharmacy	42	18
Lack of knowledge	38	33
Asymptomatic	34	28
Cost of medication	30	24
Forgetfulness	28	10
Lack of instruction	21	17

Fig 4: Patients redeemed from mostly influenced factors by patient counselling

DISCUSSION

Total numbers of patients we have recruited in our study are 182 patients, of which males were 97(53%) and females were 85(47%). Medication Non-adherence in our study was explained with several factors like: Socio/economic factor, provider-patient/health care system factors, Condition-related factors, Therapy-related factors, Patient-related factors In our study, we found major reason for medication non-adherence is polypharmacy (Therapy-related factor) constitutes 23.07%of all the factors. Because elderly patients may have different pathophysiological conditions, which puts them at risk for multiple chronic illnesses, that require multiple drug therapy (polypharmacy). Our study has been supported by shalini md and mc joshi md, "Study of polypharmacy and associated problems among elderly patients"[7].Totally they have recruited 310 elderly patients of which 25.20% (78) were being influenced by polypharmacy and that being the major reason for medication non-adherence. Lack of patient counseling which constitutes 20.88% is also one of the reasons for medication non-adherence. Elder people have to be given proper patient counseling apart from verbal instructions, non-verbal instructions and sign-boards should also be given for elderly people. This is supported by study of S Malhotra, R S Karan, et al , on "drug related medical emergencies in the elderly: role of adverse drug reactions and non-adherence"[8],who totally recruited 578 members of which 25.4% of people affected by lack of knowledge and instruction. Patients perception of equating feeling well or better with being cured, may affect their medication adherence.

Being asymptomatic is the next reason for medication non-adherence in elderly which constituted 18.69%. In case of chronic diseases such as HTN, COPD the patients have been mostly assymptomatic. This is in contrast with kabir M, iliyasu Z et al, adherence to medication among hypertensive patients in murtala mohammed specialist hospital, Kano, Nigeria"[9].Totally they have recruited 360 members of which 56 members i.e; 34% are being affected by asymptomatic factor Cost of medicines is also one of the reasons for medication non-adherence which constituted 16.49% in our study. But this is in contrast with anshu gupta, dinesh mehta, et al,"Adherence in chronic obstructive pulmonary disease patients attending pulmonary medicine opd in a tertiary care hospital: prospective study"[10], totally they have recruited 578 elderly patients out of which 51.6% of people are affected by cost. The other reason for medication non-adherence in our study is forgetfulness, which constituted 15.38%. As age goes by the attention and memory are affected, So elder people are having the difficulty in recalling and also certain vasomotor functions like (motor skills involving vision such as eye-hand co-ordination) will be slower. Our study has been in contrast with "Shuvankar mukherjee, biswanath sharma sarkar et al, "adherence to anti-diabetic drugs"[11]. Totally they have recruited 470 patients out of which 89(44.7%) are affected by forgetfulness, that being the next major reason for medication non-adherence. There is no true 'gold standard' for measuring adherence. We used in-depth interviews in our evaluation. The interviews were conducted by a pharmacist not directly involved in the treatment of the patients or

the prescription of medication, in order to reduce possible bias on the part of the patient. This method has been found more accurate than pill counts for evaluating adherence. Interviews are relatively specific in confirming non-adherence but are not sensitive enough to rule it out. Adherence in our study may, therefore be overestimated.

Table 12: Estimation of means based on the Morisky 8-item Medication Adherence Questionnaire score

	MEAN ± SEM
Baseline	3.313± 0.09097
1st follow up	1.837 ± 0.1130
2nd follow up	0.493 ± 0.0918

In accordance with Morisky 8-item Medication Adherence Questionnaire the MEAN ± SEM of Baseline, first follow- up and second follow- up are respectively 3.313± 0.09097,1.837 ± 0.1130 and 0.493 ± 0.0918. This shows most of the people in baseline are low adherent, first follow- up are medium adherent and second follow- up are adherent.

Table 13: Mean differences and P values at 95% confidence interval

		95% confidence interval	Mean differences	P value
Baseline	1st follow up	1.346 to 1.606	1.476	< 0.0001
Baseline	2nd follow up	2.561 to 3.069	2.815 ± 0.1296	< 0.0001
2nd follow up	1st follow up	1.049 to 1.622	1.336 ± 0.1460	< 0.0001

The **P value** of the first follow up in comparison with baseline was, < 0.0001.
The **P value** of the first follow up in comparison with second follow up was, < 0.0001.
The **P value** of the second follow up in comparison with baseline was, < 0.0001.

This clearly showed that there was a good improvement in medication adherence behavior of diseased patients after counseled the patients. According to Morisky 8-item Medication Adherence scale, there was significant (p value), before counseling and after counseling i.e.; first follow-up and second follow-up to include all the p values. So the elder patients need to be properly counseled apart from verbal counseling, non-verbal counseling Should also be done and proper instructions need to be given. So clinical pharmacist especially trained from geriatric patients can make major impact in the therapy on elder patients and re-admissions may not occur. Since the patients will be more adherent to the treatment.

CONCLUSION

The present study showed that the clinical pharmacist involvement in disease management has positive impact in creating awareness about the disease and medication, which improves medication compliance along with quality of life .This study concluded that continuous education programs and counseling 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 minimize the cost and to improve the better quality of life. Further a similar type of educational and monitoring services and providing disease PILLs to other chronic diseases that can improve the clinical and humanistic outcomes.

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