A Study On Assessing Factors Associated With Medication Non-Adherence And Evaluating Medication Adherence In Elderly

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Abstract:
Medication compliance refers to the degree or extent of conformity to the recommendations about day-to-day treatment by the provider with respect to the timing, dosage, and frequency[1]. Patient medication compliance is an important parameter in management of chronic diseases in elderly patients. The present study aimed to evaluate medication non-compliance barriers and the effectiveness clinical pharmacist intervention in promoting medication adherence in geriatric patients with chronic diseases.an prospective observation study was conducted in total of 275 patients aged above 60 years with chronic illness were (178 women and 97 men). The patients' mean age (SD) was 55 (±23.934) years. Approximately 38.9% were illiterate, primary education (23.2%), secondary education 17.09% high school, 12.4% Bachelor's degree education, 5.8% Master's degree) and 2.5% PhD holders were documented in the study. The MMAS scores were categorised previously into the following 3 levels of adherence: high adherence (score, 8), medium adherence (score 6 to 8), and low adherence (score < 6). The study population had 53.84%% with low adherence, 31.63% medium adherence, and 14.5% high adherence. All the values are found to be significant as $p \leq 0.05$. The common barriers of medication non-compliance founded during the study are polypharmacy 97patients, forgetfulness in 158 patients, duration of therapy 146 patients, lack of hope in 95 patients, psychological attitude in 102 patients & 133 patients reported as on subside symptoms. Pharmacist involment in improving medication adherence is very much needed to improve therapeutic outcome. This study suggests that it is importance of targeting social support in screening and intervention approaches in order to improve adherence among diverse patients.

Keywords: Medication Compliance, Elderly, Geriatric, Pharmacist, Screening

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Introduction

Medication compliance refers to the degree or extent of conformity to the recommendations about day-to-day treatment by the provider with respect to the timing, dosage, and frequency[1]. Patient medication compliance is an important parameter in management of chronic diseases in elderly patients. Patient compliance with physician's medication instructions has been a growing concern for nearly two decades. Elderly patients are thought to have more difficulty following prescription instructions because they generally have more medications prescribed, often suffer from cognitive decline, and frequently have physical limitations such as failing eyesight and hearing[17]. Exhibiting a genuine concern to patients for the importance of drug therapy and adherence to directions is the first step to improve compliance. Providing adequate verbal and written medication instruction, and implementing routine assessment of medication compliance should greatly improve response to drug therapy and decrease adverse effects[18].

Adherence to medication is an important predictor of illness course and outcome in disease. Medication adherence behaviour lies on a continuum from complete adherence to prescribed medication, through partial adherence, to complete non-adherence. There are a number of approaches for evaluating medication-taking behaviour. The main methods are patient and clinician report, pill counts, and biological methods (such as blood or urine drug concentrations), each of which confers different advantages and disadvantages[2].

Nonadherence may be particularly devastating for older adults, as recent data indicate that approximately 15% of nonelective hospital admissions in the elderly are due to nonadherence to medications. Physical limitations are a barrier to adherence that may present a greater challenge in the geriatric population than in other population[3]. Many strategies for improving pharmacological adherence among older adults have been developed in recent years. These approaches have focused primarily on addressing one or two of the aforementioned risk factors for nonadherence in isolation[3]. One approach has been increasing patient knowledge about disease and treatment which may include disseminating drug information via audio-visual information, individual or group instruction, warnings about side effects, and written information in the form of leaflets, articles, or books. Another strategy is influencing the treatment experience, which includes the doctor–patient relationship, and the way of providing care (Becker, 1985). In general, the literature indicates that the patient– provider relationship, which may include the development of a cooperative, active relationship between doctor and patient, and answering all of a patient's questions, is an important predictor of patient satisfaction and consequently, of adherence1[3,4].

There is a lack of information concerning adherence to chronic drug treatment. To the best of our knowledge, there is no adequate tool for measuring adherence to chronic medication therapy in the rural population while taking into consideration socio-economic and cultural factors[1,7,8].

The real issue of noncompliant behaviour is how it influences health outcome. Every clinician has several examples of how noncompliant behaviour by patients has resulted in failed treatment or drug toxicity[3].

Adherence to a prescribed drug therapy has a major influence on the therapeutic outcomes and the efficiency of the healthcare system. Adherence to a drug therapy requires that a patient has the intention to be adherent and follow through the medication regimen[7,10]. The patient might have limitations in the ability to manage the medication schedule independently or take the right drug in the right dose at the right time via the right route of administration that will lead to unintended non-adherence, which can be corrected by adherence intervention in contrast to the intended non-adherence, which is a consent and self-determined decision of a patient to alter or not make use of the proposed therapy[11,12,15].

The present study aimed to evaluate medication non-compliance barriers and the effectiveness clinical pharmacist intervention

in promoting medication adherence in geriatric patients with chronic diseases[17,18].

Method

The study was designed as a prospective cross-section study conducted in largest public **hospital** in Rayalaseema region of Andhra Pradesh i.e., SVRR government general hospital, Tirupati, Andhra Pradesh, India, between June 2022 and December 2022. The patients who aged above 60 years and with chronic diseases were included in the study. The patients who are not willing to participate in the study and having immunocompromised disease are not included in the study. Participants were randomly recruited during regular outpatient visits at general medicine department. All patients were informed of the objective of the study and gave written consent before inclusion in the study, which was approved by the institutional ethical Committee.

Patients were asked to complete a self-designed proforma that contained three parts: history information form (socio-demographic, age, education, medical history, medication data), the MMAS-8 scale, and list of non-compliance barriers.

Measures:

MMAS-8 First, the scale was used to measure the medication adherence among study population. The scale is composed of eight items.15 Seven items (item 1 to item 7) are yes/ no questions, in which a ‘‘no’’ answer received a score of 1, and a ‘‘yes’’ answer received a score of 0, except for item 5, which was reverse scored. Item 8 is measured on a five-Responses of ‘‘never,’’ ‘‘once in a while,’’ ‘‘sometimes,’’ ‘‘usually,’’ and ‘‘all the time’’ were scored 1, 0.75, 0.50, 0.25, and 0, respectively, whereas for item were scored ‘‘1’’ for ‘‘never’’ and ‘‘0’’ for other responses. The total scores ranged from 0 to 8. Scores of 8, 6-8, and < 6 indicate high, medium, and low adherence, respectively. Patients with scores of 8 and 6-8 were considered adherent, and a score < 6 was considered as non-adherent in our study.

The common barriers affecting medication non-compliance among chronic disease patients was recorded. The terms used to evaluate medication non adherence was polypharmacy, forgetfulness, duration of therapy, lack of hope, psychological attitude and on symptoms subsided. The subjects who enrolled in the study were followed up after one month during their review visits to the hospital. Again, the MMAS-8 questioner was used to record the adherence responses details[6,17].

Data was analysed using Stata 13.0 software. Descriptive analysis was reported as frequency, percentage and mean scores. T-test was done used to evaluate the relationship between the dependent (medication adherence and literacy), and independent variables (demographic characteristics of the participants). Pearson correlation was used to assess the relationship between mean baseline and follow up visit scores. All the differences of estimated variables were considered statistically significant if $P<0.05$.

Results

A total of 275 patients aged above 60 years with chronic illness were recruited for our study (178 women and 97 men). The patients’ mean age (SD) was 55 (±23.934) years. Approximately 38.9% were illiterate, primary education (23.2%), secondary education 17.09% high school, 12.4% Bachelor’s degree education, 5.8% Master’s degree) and 2.5% PhD holders were documented in the study. The mean time (SD) regarding disease distribution among the patients was hypertension was 105 (52.5 ±35.341) followed by diabetes mellitus 97 (48.5 ±29.797) and cardiovascular diseases 73 (36.5 ±9.009). over all socio-demographics and disease characteristics are summarized in Table 1.

Table 1

SAMPLE CHARECTERSTICS	NO OF SUBJECTS (n=275) MEAN (SD)	LOW ADHERANCE (n=275) MEAN (SD)	MEDIUM ADHERANCE (n=275) MEAN (SD)	HIGH ADHERANCE (n=275) MEAN (SD)	p value
Age	55 ±23.934				
GENDER n(%)					

Male	178 (64.72%)	95 (34.54%)	56 (20.36%)	27 (9.8%)	0.039
Female	97 (35.2%)	53 (19.3%)	31 (11.27%)	13 (4.7%)	
EDUCATION LEVEL					
Illiterate	107 (53.5 ±24.254)	68 (34 ±18.017)	27 (13.5 ±4.851)	12 (6 ±2.772)	0.438
Primary Education	64 (32 ±2.772)	33 (16.5 ±9.009)	24 (12 ±6.93)	7 (3.5 ±0.693)	
Secondary Education	47 (23.5 ±3.465)	22 (11 ±1.386)	17 (8.5 ±0.693)	8 (4 ±2.772)	
Bachelor's Degree Education	34 (17 ±4.158)	13 (611 ±1.386)	12 (6 ±2.772)	9 (4.5 ±2.079)	
Master Level Education	16 (8 ±1.386)	7 (3.5 ±0.693)	6 (3 ±1.386)	3 (1.5) ±0.693	
Ph.D.	7 (3.5 ±0.693)	5 (2.5 ±0.693)	1 (0.5 ±0.693)	1 (0.5 ±0.693)	
DISEASES					
Hypertension	105 (52.5 ±35.341)	59 (29.5 ±14.552)	29 (29.5 ±14.552)	17 (8.5 ±10.394)	0.047
Diabetes mellitus (I&II)	97 (48.5 ±29.797)	53 (26.5 ±18.71)	27 (13.5 ±9.009)	17 (8.5 ±2.079)	
Cardiovascular	73 (36.5 ±9.009)	36 (18 ±2.772)	31 (15.5 ±9.009)	6 (3 ±2.772)	

Responses of the items of the MMAS-8 were recorded. A total score of all items was calculated with a sum score ranging from 0 to 8 for adherence. Frequencies, mean, median and standard deviation were calculated for the sum scores. MMAS-8 score was calculated if the respondent answered at least 6 of 8 items. The MMAS scores were categorised previously into the following 3 levels of adherence: high adherence (score, 8), medium adherence (score 6 to 8), and low adherence (score < 6). The study population had 53.84%% with low adherence, 31.63% medium adherence, and 14.5% high adherence table1.

Table 2

MMAS Items	baseline (yes) n=275 (%)	baseline (no) n=275 (%)	follow up (yes) n=275 (%)	follow up (no) n=275 (%)	Association with MMAS yes scores (baseline vs follow-up) p scores
Item1	198 (72%)	77 (28%)	69 (25.09%)	206 (74.90)	0.04
Item2	177 (64.36%)	98 (35.63%)	83 (30.18%)	192 (69.81%)	0.069
Item3	156 (56.72%)	119 (43.2%)	77 (28%)	198 (72%)	0.005
Item4	142 (51.63%)	133 (48.36%)	86 (31.27%)	189 (68.72%)	0.059
Item5	146 (53.09%)	129 (46.9%)	123 (44.71%)	152 (55.27%)	0.001
Item6	184 (66.9%)	91 (33.09%)	167 (60.72%)	108 (39.27%)	0.037
Item7	186 (67.63%)	89 (32.26%)	92 (33.45%)	183 (66.54%)	0.039
Item8	176 (64%)	97 (36%)	157 (57.09%)	118 (42.90%)	0.001

N= No of patients; p≤ 0.05 = significant

The individual scores were calculated for each item (n=8) presented in moriskey medication adherence scale. The scores were recorded both in two visits i.e., baseline & follow up (patients next visit after their baseline visit). Majority of the subjects were responded yes which indicates non-compliance at baseline visit. The data obtained was corelated baseline with follow up were indicates statistically significant (p≤0.05) all items except item 2(p=0.069) and item 4(p=0.059) Table2.

Common Barriers Noted	Low	Moderate	High	P Values
Poly Pharmacy (N=205)	97 (3 ±2.772)	63 (31.5 ±2.079)	45 (22.5 ±0.693)	0.039
Forgetful Ness (N=158)	79 (39.5 ±20.096)	43 (21.5 ±2.079)	36 (18 ±2.772)	0.056
Duration Of Therapy (146)	62 (31 ±1.386)	49 (24.5 ±6.237)	35 (17.5 ±2.079)	0.098
Lack Of Hope (95)	39 (19.5 ±0.693)	27 (13.5 ±2.079)	29 (14.5 ±3.465)	0.07
Psychological Attitude (102)	46 (23 ±9.702)	29 (14.5 ±0.693)	27 (13.5 ±4.851)	0.007
On Symptoms Subside (133)	67 (33.5 ±9.009)	45 (22.5 ±3.46)	21 (10.5 ±0.693)	0.01

Values are expressed as N, Mean ± SD, P value <0.05, significant. SD: Standard Deviation, N=no of patients

The common barriers of medication non-compliance founded during the study are polypharmacy 97patients, forgetfulness in 158 patients, duration of therapy 146 patients, lack of hope in 95 patients, psychological attitude in 102 patients & 133 patients reported as on subside symptoms (Table 3).

Despite the significance of our findings, our study has substantial drawbacks, including the fact that it is a cross-sectional study rather than a randomised clinical trial. As a result, it can only provide the adherence rate for a specific time period, which is problematic because adherence rates have been shown to alter over time.

Discussion

The medication adherence assessment in clinical practice is very essential but also challenging. The most simple and economical method to receive information was from routine practice setting. however, their accuracy and agreement with other data sources remain questionable, leading to a need for validity investigation[6]. The original MMAS-8 was originally tested by Moriskey et al, and it was found that the scale was reliable with good concurrent and predictive validity in primarily low-income patients with hypertension patients where it is also easily applicable to evaluate medication adherence in patients with chronic illness[1,2,6].

The demographic findings in our study reveals the majority of patients were male and illiterates are more than other groups of education. These results were due to as our study site is government general hospital were majority of patients visited from below poverty class. These findings were similar to MacLaughlin EJ[3] et al study.

The hypertension is most common illness founded in study population was hypertension as it shows increasing prevalence of hypertension in elderly people where these findings are similar to Eric J. MacLaughlin et al[3] & Parker K et al[20] study where they documented majority of hypertension patients in their study than other illness.

The results in table 2 reveals that health care team (physician, nurse, pharmacist) involment in improving awareness in medication adherence can gives positive results. These findings are similar to this study conducted by witry et al[9] on Pilot and Feasibility of Combining a Medication Adherence Intervention and Group Diabetes Education for Patients with Type-2 Diabetes.

The overall medication adherence documented in the baseline group was 38.7%, which climbed to 75.7% in the follow-up research. In the follow-up study, medication adherence increased by 37% compared to the baseline research.

Four themes were identified as impediments to drug adherence: lifestyle problems, patient incompatibility, medication forgetfulness, and nonexpert counsel. These ideas are constantly present in the illness process and decrease the patients' efforts to live normally and take their medicine. The common barriers for medication non-compliance founded in our study was poly-pharmacy and forgetfulness. As our study was on elderly people where they have higher comorbidities and reduced mental ability leads to polypharmacy and forgetfulness. These results were similar to study conducted by Agh T et al[15] on factors associated with non-adherence to medication in patients with chronic diseases.

Conclusion

In comparison to the baseline study, a substantial 37% improvement in medication adherence was seen among the study population in the follow-up research. The medication adherence is most common in elderly patients. Patients who have risk factors for poor adherence should be constantly evaluated in order to optimise their drug-taking behaviour. Pharmacist involment in improving medication adherence is very much needed to improve therapeutic outcome. This study suggests that it is importance of targeting social support in screening and intervention approaches in order to improve adherence among diverse patients.

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