Effect of Clinical Pharmacists' Intervention on Attitude towards Medication in Geriatrics

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ABSTRACT: Geriatric population require special care due to polypharmacy and complex medication regimens leading to non- adherence, compromising the outcome and effective control of the disease. Management of non-adherence will improve attitude towards medication, minimize the risk of harm and improve the outcome and quality of life, reduce unnecessary healthcare costs. Objectives: The main goal of the study was to assess the effect of clinical pharmacists' intervention on attitude towards medication in geriatrics and assess risk of non-adherence. Materials and Methods: This was an interventional study. The subject's demographic details and responses were collected with the help of a standardized questionnaire (DAI-30). The collected data were entered in Microsoft Excel and Wilcoxon signed rank test was performed. Results: It was found that majority of the subjects were found to have negative attitude towards medications (56.5%), affecting adherence. Adherence was improved through interventions (p value <0.05, p=0.001), reducing negative attitude to 1%. Adherence was affected by lack of knowledge (65.69%), experiencing side effects (67.05%) and cost of medication (35.30%). Conclusion: The attitude towards medication was improved through interventions (such as pillbox) and proper education. The risks for non-adherence were related to lack of knowledge, side effects and cost of medications, which were rectified by necessary interventions.

Key words: Geriatric, Adherence, Non-adherence, Attitude, Risks, Intervention.

INTRODUCTION

The geriatric population is expanding at a greater rate than the general population. Aging is an unavoidable and irreversible reality of the world involving changes to the body, increase in vulnerability and frequency of illness and frailty.¹Alterations in the pharmacodynamics and pharmacokinetics comes with aging and old age. These alterations along with polypharmacy and complex medication regimens put them at a greater risk for adverse drug reactions due to metabolic changes and reduced drug clearance related to aging.

Lack of adherence may lead to a negative impact on the quality of life and decreased therapeutic benefits, frequent hospitalization and increased visits to the physician, increasing the expenditure for health care and even overtreatment of a diseased condition.²

According to a WHO report from 2013, there are more than 600 million elderly people worldwide. By 2025, the senior population will have doubled, and by 2050, it will be two billion. In 1990, 9.2% of the world's population was elderly; by 2021, that number is expected to rise to 21.1 percent.³

With the ever-growing geriatric population, there is more risk for non-adherence as non-adherence can be caused by a variety of factors. The ability and willingness of a patient to adhere to a prescribed regimen has a direct impact on the therapy's success. Various explanations for pharmaceutical non-adherence have been identified, including:

- **Reluctance to start therapy**: The older population is sometimes hesitant to see a doctor and begin a new medication regimen.
- Missed doses: The elderly may miss doses due to hassles such as prescription timing, among other things.
- **Medication discontinuation**: Some older people are unaware of how long it takes for a drug to take effect or the importance of finishing a course of treatment. They stop taking drugs after the symptoms go away, because they don't understand what's going on.
- **Dose self-adjustment**: To save money or avoid unwanted effects, the elderly may alter their doses themselves.
- Noncompliance: If symptoms persist or worsen, the elderly may take more drugs than suggested.
- **Improper drug administration**: When patients disregard particular instructions or rules and abuse their prescribed prescriptions, this is known as inappropriate drug administration.⁴

Non-adherence can occur due to forgetfulness, fear and worry of taking new medications, misunderstanding the prescription, adverse side effects of drugs, complex medication regimens, suffering with mental illness making it difficult to take their prescription on time and as prescribed, absence of symptoms.⁵

Adherence can be improved by emphasizing the need of taking drugs as recommended and the consequences of failing to do so. Tools can also be used to support medication adherence

- Pill boxes
- Reminder charts
- Pill cards
- Organizers for pills
- Digital dispensers
- Timers
- Mobile apps.⁶

For easy and cost-effective use, a simple pill box may be utilized as a reminder for taking medication. The pill box is used to help

the patient to remember on which days the medication is to be taken, at what time of the day it is to be taken. It will also make sorting of medications much easier as they can be kept in their individual compartments, helping to avoid missing doses of their medication. Pill boxes will help to improve attitude towards medication and also improve medication adherence.

MATERIALS AND METHODS

Subjects for the study were identified by the investigators during community visits based on the inclusion and exclusion criteria. The purpose of the study was explained to the subjects and the informed consent was obtained. Relevant data (demographic details) was recorded, and the subjects were administered with other study tools to obtain relevant information. The data obtained was entered in a Microsoft Excel sheet and appropriate analysis was performed.

Study Site: The study was conducted in Soldevanahalli, Bengaluru for 6 months.

Study Design: This was an educational-interventional study.

Study Criteria: A total of 85 subjects fulfilling the inclusion criteria were included in the study.

Inclusion Criteria

- a. Subjects of 65 years of age and above.
- b. Subjects who are willing to participate in the study and give consent.
- c. Subjects who have been taking 4 or more medications and having comorbidities.
- Exclusion Criteria
- a. Subjects who are less than 65 years of age.
- b. Subjects with cognitive impairment.
- c. Subjects taking less than 4 medications.
- d. Subjects without comorbidities.

Ethical Approval: The study was approved by Institutional Ethics Committee of Acharya and BM Reddy College of Pharmacy, Bengaluru-560090, Karnataka, India.

Data collection tools

- 1. Data Collection Form A self-designed data collection form was used to collect data of subjects.
- 2. Drug Attitude Inventory-30 (DAI-30) It contains 30 items to assess medication adherence, having positive and negative scores.
- 3. Risk Assessment Questionnaire It has 12 items used to assess the risk for non-adherence.
- 4. Pill Box A pill box was given to each subject as an intervention to act as an aid in taking medication.

Statistical Analysis

Statistical analysis was performed using Wilcoxon Signed Rank Test to assess the effect of clinical pharmacists' intervention by comparing the pre-test and post-test scores of the subjects. Statistical analysis was performed for both DAI-30 and Risk Assessment Questionnaire. The p value was found to be 0.001 for both DAI-30 and Risk Assessment Questionnaire. As the p value is <0.05, it is found to be statistically significant. This shows that there was improvement in the attitude towards medication, thereby improving the adherence to medications.

RESULTS

The study was conducted in the subjects drawn from the population within Soldevanahalli, Bengaluru who were fulfilling the inclusion criteria and had provided the informed consent to participate in the study.

Distribution of subjects by Age

Out of 85 subjects in the study, 62 were in the age group 65-75 years (72.94%), 20 were 76-85 years (23.53%) and 3 were >85 years old (27.78%) as shown in Figure 1.



Figure 1: Distribution of subjects in the study population by age

The mean age of the study population was found to be 71.34 ± 6.1 years. Majority of the subjects belonged to the age group 65-75 years (72.94%).

Distribution of subjects by Gender

The subjects in the study population included 48 females (56.47%) and 37 males (43.53%).

There were more female subjects who were willing to participate in the study as shown in Figure 2.



Figure 2: Distribution of subjects by gender

Distribution of Gender within Different Age Groups

Figure 3 shows the gender distribution within different age groups. The numbers of female subjects were more than the males in all the age groups.



Figure 3: Distribution of gender within different age groups







The most common co-morbidities were Hypertension (82.35%), followed by Diabetes Mellitus (76.25%), Cholesterol (58.75%) and Cardiovascular Disease (0.12%). Other co-morbidities included Arthritis (2.50%), Hypothyroidism (2.50%), COPD (2.50%), Varicose Veins (1.25%), etc.

Distribution of subjects based on Polypharmacy

In the study population, Majority of the subjects took at least four (56.47%) medicines concurrently, followed by five (20.00%), six (8.24%), and nine (7.06%) as in Figure 5.



Figure 5: Number of medications taken

DAI-30 QUESTIONNAIRE

In this study, the subjects were assessed using Drug Attitude Inventory-30 questionnaire (DAI-30). The responses are assessed by use of a scoring system that categorises the study subjects as adherent (positive attitude) and non-adherent (negative attitude). Pre-test questionnaires were administered during data collection and the same questionnaire was administered for post-test assessment after 5 weeks. Each subject was provided with a pill box as an intervention along with patient information leaflets and patient education.

PRE – TEST

Out of the 85 subjects included in the study, 48 subjects (56.5%) had a negative total score while 37 subjects (43.5%) had a positive total score. Majority of the subjects were shown to be non-adherent due to their negative attitude towards their medication as depicted in Figure 6.



POST – TEST

After a 5-week follow up through communication by phone calls, the same questionnaire was administered to the subjects to assess the attitude of the subjects. After providing pill box, proper education and counselling, majority (98.8%) of the subjects improved

their attitude towards their prescribed medicines. The improvement in attitude resulted in the improvement of the adherence of the subjects (shown in Figure 7).



Figure 7: DAI-30 post-test

RISK ASSESSMENT QUESTIONNAIRE

The risk for non-adherence is assessed by using Risk Assessment Questionnaire. The responses of the subjects are recorded and scored based on the scoring system. The subjects are then categorised as 'at risk' for non-adherence and 'not at risk' for non-adherence.

PRE – TEST

The subjects were administered the questionnaire to assess the risk of non-adherence.

Out of 85 subjects, 80 subjects (94.1%) were found to be at risk for non-adherence as shown in Figure 8.



Figure 8: Risk Assessment pre-test

The responses of the subjects were analysed to assess the reasons for risk of non-adherence. Identification of risk for non-adherence will help to provide education to the subject to prevent non-adherence and its negative effects.

Majority of the subjects were shown to have a negative response to R1 (60%), R3 (82.35%) and R4 (64.70%) which are related to knowledge, R6 (67.05%) related to side effects and R12 (35.29%) related to cost (shown in Figure 9).

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Figure 9: Response to Risk Assessment Questionnaire pre-test The responses for assessment of risk are put into five categories as shown in Figure 10.



Figure 10: Categorization of risk

The main reasons for risk of non-adherence were found to be lack of knowledge (65.69%), experiencing side effects (67.05%) and cost (35.30%).

POST – TEST

The same Risk Assessment Questionnaire was administered after a 5-week follow-up to the subjects. After providing the necessary interventions, the number of subjects at risk for non-adherence decreased significantly to 37 subjects (43.5%) as shown in Figure 11.



Figure 11: Risk Assessment post-test

The responses to the questionnaire were analysed to identify changes in adherence (Figure 12).



Figure 12: Response to Risk Assessment Questionnaire post-test

There was a significant decrease in negative responses to the questionnaire related to lack of knowledge and side effects. **DISCUSSION**

A three-month-long, interventional study was conducted in the village of Soldevanahalli in Bengaluru. The study included 85 subjects identified based on the inclusion and exclusion criteria, out of which 56.47% were females and 43.53% were males. The age of participants included were 65 years and above and the mean age was 71.34 ± 6.1 which is similar to a study conducted by *Abdelmoneim Awad et al.*, where the mean age was 70 (8) years. The study subjects were categorized based upon their age groups and the majority belonged to the age category 65-75 years (72.94%).⁷

The most common co-morbidities observed were Hypertension, followed by Diabetes Mellitus, Cholesterol and Cardiovascular

Disease, which is similar to a study conducted by *Shruthi R et al.*, where the most common co-morbidities were Hypertension, Diabetes Mellitus, Coronary Artery Disease and Chronic Obstructive Pulmonary Disease.⁴

The present study showed that a total of 430 drugs were prescribed to 85 subjects. On average, each subject was given 5 ± 2 drugs daily. In a study conducted by *Juliana Martins Ribeiro Valassi et.al.*, in São Paulo on 159 elderly patients in an outpatient clinic where the subjects were taking an average of 6.5 medications daily.⁸

Medication adherence is one of the major factors that influences treatment outcomes. Medication non-adherence may result in treatment failure, worsening of diseased condition, loss of money and time, and will affect the quality of life. Interventions may help to improve medication adherence. Various studies were conducted on medication adherence and in one systemic review performed by *Verloo Henk et al.*, 995 patients in intervention group showed that adherence was higher in groups where interventions were implemented than compared to those in which interventions were not given. ⁹

The study utilises both the provision of a pill box and patient information leaflet providing behavioural and educational intervention. The use of these tools act as a reminder and help to improve medication adherence. This is compared with the evidence-based review by *Zachary A Marcum et al.*, who found that behavioural/educational intervention researches improved in both adherence and health related outcomes.¹⁰

The subjects involved in the study were given standardised questionnaires with a 5-week follow-up. Pre-test and post-test were done for both DAI-30 Questionnaire and Risk Assessment Questionnaire. The subjects were scored based on their responses. The subjects were categorised according to their total score, before and after the use of a pill box.

It was found that majority of the subjects were non-adherent to their prescribed medication before the implementation of the intervention i.e., use of a pill box. Out of 85 subjects, 48 (56.5%) of the subjects were found to be non-adherent while 37 (43.5%) subjects were shown to be adherent to their prescribed medications.

After the implementation of the intervention (pill box), medication adherence improved significantly showing that out of 85 subjects, 84 subjects (98.8%) were adherent to their prescribed medicines while only 1 subject (1.2%) showed non-adherence.

In our study, the attitude of the subjects towards medications improved showing an average score of 18.97 (\pm 6.90 SD) which is similar to a study by *Di Lorenzo R. et al.*, which stated that the attitude towards drug therapy was moderately positive with an average score of 14.24 (\pm 10.46 SD) and was positively associated with reduction in relapse with hospitalization.¹¹

The Risk Assessment Questionnaire was conducted as pre-intervention test and post-intervention test to understand what factors could contribute to risk for non-adherence. The pre-intervention results showed that out of the 85 subjects, 80 subjects (94.1%) showed risk for non-adherence with lack of knowledge, experiencing side-effects and cost of medications being the most common reasons for non-adherence which is contrary to the study conducted by *Lam A Y* where forgetfulness to take medications and cost of medications were the most common reasons for nonadherence. while only 5 subjects (5.9%) were more likely to be adherent to their prescribed medications.¹²

In this study, the post-intervention test was done at the end of a 5-week follow-up upon which the results indicated that the subjects at risk for non-adherence decreased to 37 subjects (43.5%) and the remaining 48 subjects (56.5%) were more likely to be adherent to their medication.

Polypharmacy is one of the main reasons for non-adherence. Taking a large number of medications may be difficult to remember for geriatric patients. Geriatric patients can be given certain tools to help them remember which medications to take and when to take them on a daily basis. In this study, patients at the age of 65 and over were included, excluding those with cognitive impairment, similar to the study conducted by *Gomes Daniel et al.*, (2019), where a questionnaire was given to assess daily administration of prescribed medications. It showed that management of medication on a daily basis helped to promote health literacy and improve management of poly-medicated geriatric patients.¹³

CONCLUSION

In the elderly population, medication adherence is a very underrated but important factor that can influence the health outcome of the patient. Geriatric patients usually take more than 6 medications per day due to old age, comorbidities, complex prescriptions consisting of many drugs and other factors. Non-adherence can lead to deterioration of health, frequent hospitalization and increased expenditure.

The study aimed to evaluate the effect of clinical pharmacists' intervention on attitude towards medication in geriatrics. DAI-30 and Risk Assessment questionnaire were used. Pill box was given as an intervention.

Initially, the majority of the subjects had a negative attitude towards their medications. Lack of knowledge, experiencing side effects and cost of medications had also affected the adherence of the subjects.

After the necessary interventions were given to the subjects, the attitude towards medications became more positive. Pill box helped the subjects to remember when and which drugs are to be taken. Counselling helped them to better understand the importance of adherence. With the development of a more positive attitude, it resulted in better medication adherence.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

DAI-30: Drug Attitude Inventory-30; **COPD:** Chronic Obstructive Pulmonary Disease; **WHO:** World Health Organization. **SUMMARY**

As the geriatric population require special care due to a number of factors including polypharmacy and complex medication regimens, adherence and attitude towards medication needs to be assessed. The study aimed to assess the effect of clinical pharmacists' intervention on attitude towards medication in geriatrics and assess risk of non-adherence. By using DAI-30 Questionnaire and Risk Assessment Questionnaire, It was found that majority of the subjects were found to have negative attitude towards medications (56.5%), affecting adherence. Adherence was improved through interventions (p value <0.05, p=0.001), reducing negative attitude to 1%. Adherence was affected by lack of knowledge (65.69%), experiencing side effects (67.05%) and cost of medication (35.30%). Attitude towards medication was improved through interventions (Pill Box). The risks for nonadherence were related to lack of knowledge, side effects and cost of medications, which were rectified by necessary interventions.

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