

A Study to Assess the Prevalence of Medication Related Problems in Elderly Patients

Abhishek Pradhan¹, Jayakumar Sudha Sanjay², A.R Shabaraya³

¹Asst. Professor, Department of Pharmacy Practice, Srinivas College of Pharmacy, Mangalore, Karnataka, India – 574143

²Student, Department of Pharmacy Practice, Srinivas College of Pharmacy, Mangalore, Karnataka, India – 574143

³Professor & Head, Department of Pharmacy Practice, Srinivas College of Pharmacy, Mangalore, Karnataka, India – 574143

Corresponding Author: Jayakumar Sudha Sanjay

DOI: <https://doi.org/10.52403/ijrr.20221204>

ABSTRACT

Medication-related problems are referred to drug therapy that interferes with or can intervene with the preferred health outcomes for a patient. The geriatric populace that almost represents 21% of the whole populace, devours a remarkable deal of drug treatments due to the age-associated physiological changes, pharmacokinetic and pharmacodynamics alterations, consequently developing into medication related problems. The high prevalence of multiple drug use with age-related changes in pharmacokinetics and pharmacodynamics makes elderly patients vulnerable to medication-related problems.

A community-based observational study was conducted among the residents who met the inclusion and exclusion criteria belonging to different regions of Dakshina Kannada district. The duration of the study was 6 months and enrolled 150 elderly patients aged 60 years and above of either sex and diagnosed to have any disease except cancer and being bedridden, to assess the prevalence of medication-related problems in elderly patients.

Out of 150 elderly patients enrolled in the study, 107 were identified to have Medication Related Problems (MRPs). A total of 196 MRPs were identified amongst those 107 patients. The prevalence of patients with MRPs was found to be 72% in this study. The prevalence of MRPs was found to be varying among males (68.29%) and females (75%), across different age groups & others.

So, the study concluded that the number of elderly patients and multiple co-morbidities are increasing consequently with the increase in the number of medications and thus leading to increase in MRPs. So, it's vital to ensure optimum care for positive outcomes in the elderly.

Keywords: Medication-related problems, MRPs, elderly patients, geriatric populace

INTRODUCTION

Medication-related problems (MRP) are defined by the Pharmaceutical Care Network of Europe as an incident or scenario involving drug therapy that genuinely or potentially interferes with planned health outcomes. [1]

Medication-related problems (MRPs) are the third or fourth greatest cause of death in the elderly, and they can also lead to disability, depression, and falls. [2]

Medication use improves the quantity and quality of life but, the shadow side of multiple drug use is the frequent occurrence of medication-related problems such as adverse drug reactions, drug-drug interactions, comorbidities, and underutilization. Elderly patients are more prone to such MRPs. The prevalence of prescribing multiple medications to patients is increasing globally due to the rise in life expectancy and the incidence of multiple non-communicable chronic diseases. [3,4]

Medication-related problems can lead to ineffective pharmacotherapy and may become responsible for medication-related morbidity and mortality. Several variables have raised the risk of MRP in elderly patients, including the use of the wrong medicines/incorrect drug selection, the occurrence of adverse drug reaction/s, and the occurrence of drug interactions. [5]

MRP can be classified into eight categories based on the Hepler-Strand classification that are untreated indication, improper drug selection, sub-therapeutic dosage, failure to receive drugs, overdose, adverse drug reaction, drug interaction/s, and drug use without indication. [6]

The high prevalence of medication-related problems in geriatric patients is increasing due to polypharmacy, age-related physiological changes, pharmacokinetic and pharmacodynamic alterations. [7]

In community settings, patients with comorbidities and chronic diseases often take medications, such patients are prone to have an increased risk of experiencing MRPs in their prescriptions. [8]

MATERIALS AND METHOD

A community-based observational study was conducted to assess medication-related problems in elderly patients in various communities of Dakshina Kannada district in Karnataka. From January 2021 to June 2021, a six-month study was conducted among geriatrics over the age of 60. A total of 150 patients were included in the study. The Institutional Ethics Committee (IEC) of Srinivas Institute of Medical Science and

Research Centre (SIMS & RC), Mukka, Mangalore approved the protocol of the study

Patients of both sexes over 60 years of age, with any illness, on several drugs, and who were willing to participate in the study met the study's inclusion and exclusion criteria. Patients under the age of 60, inflicted with cancer, bedridden, and unwilling to participate in the study were excluded.

A standardized data collecting form was used to collect data for the study. Patient demographics, personal history, medical & medication history, current diagnosis & drug therapy details, and any issues experienced/observed by the patient during treatment were conjured. The data analysis was done using Microsoft Excel

RESULTS

Demographic Details

The study included 150 elderly patients, all of whom were over the age of 60. Patient interview form and the MRP risk assessment tool were used to gather each patient's information and their medical history were gathered. There were 82 males and 68 females among the 150 patients. 9 among the 150 patients in the study were alcoholics, 12 were smokers, 5 were both alcoholics and smokers, and 3 were using tobacco products. In this study, 61 patients had more than 3 co-morbidities, while 74 patients were prescribed more than 5 medications. Table 1 lists the demographic characteristics of the patients who participated in this study.

Table 1. Demographic features and clinical characterization of the patient

VARIABLE	CATEGORY	FREQUENCY N=150	PERCENTAGE
AGE	60 ≤ X < 70	76	51%
	70 ≤ X < 80	56	37%
	≥ 80	18	12%
GENDER	Male	82	54%
	Female	68	46%
SOCIAL HABITS	Alcoholic	9	6%
	Smoking	12	8%
	Both Alcoholic and Smoking	5	3.33%
	Tobacco	3	2%
NUMBER OF DRUGS PRESCRIBED	1-4	89	59.33%
	≥ 5	61	40.66%
NUMBER OF MEDICINE DOSES TAKEN DAILY	1-9	107	71.33%
	≥ 10	43	28.66%
NUMBER OF DISEASES	Single illness	30	20%
	2 co-morbidities	32	21.33%
	≥ 3 complications	88	58.66%

PREVALENCE OF MRP

MRPs were identified in 107 of the 150 patients who participated in this study. From 107 patients, 196 MRPs were identified and classified using the Hepler-Strand classification.

In this study, the prevalence of MRPs among elderly patients were found to be 72%. The number of patients that were found to have MRPs is shown in Figure 1.

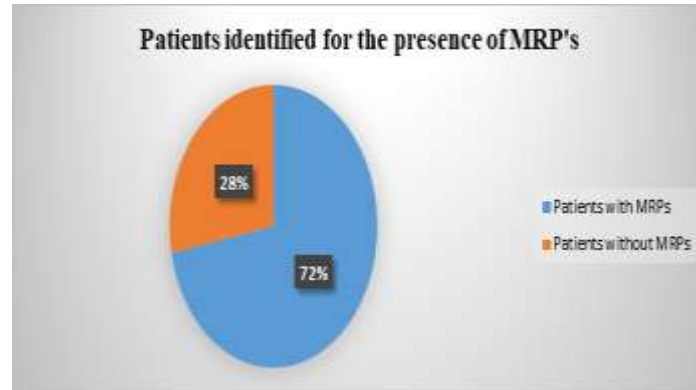


Figure 1. Patients identified with the presence of MRPs

MRPs were found in 56 male (68.29%) and 51 female (75%) out of 107 patients, indicating that female patients had a higher prevalence of MRPs than male patients. The prevalence of MRPs in the male and female populations is depicted in Figure 2.

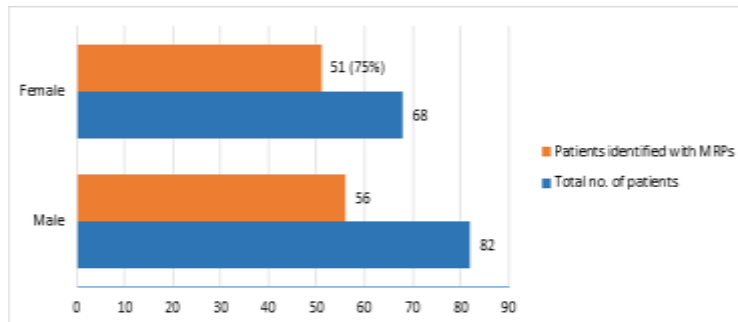


Figure 2. Prevalence of MRPs among male and female patients.

Considering age groups, it was observed that the prevalence of MRPs among elderly patients increased as they became older. MRPs were found in 50 out of 76 patients (65.78%) between the ages of 60 and 70, 41

out of 56 patients (73.21%) between the ages of 70 and 80, and 16 out of 18 patients (88.88%) over the age of 80. Figure 3 depicts the presence of MRPs as the age group increased.

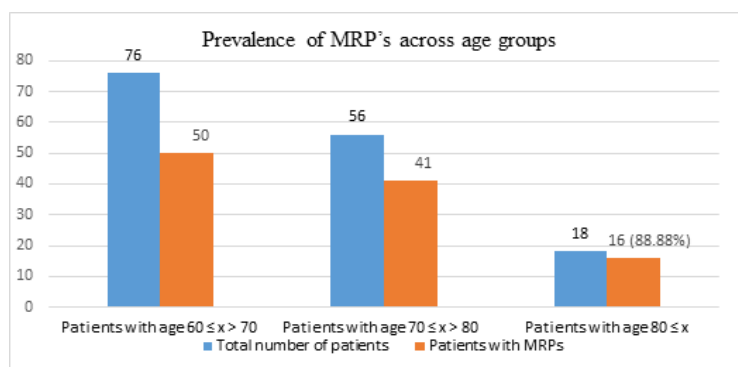


Figure 3. Prevalence of MRPs across age groups

According to the findings of this study, the prevalence of MRPs increased as the number of diseases increased. MRPs were observed in 17 out of 30 patients (56 %) with a single illness, 22 out of 32 patients

(68.75 %) with two complications, and 68 out of 88 patients (77.25 %) with more than three complications. Figure 4 depicts the prevalence of MRPs as the number of co-morbidities increases.

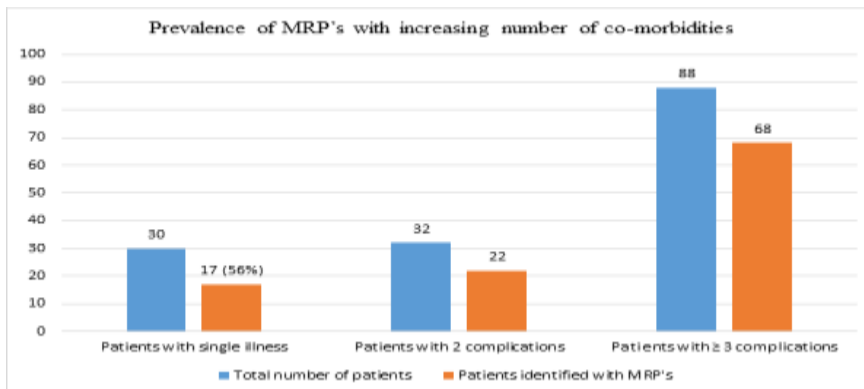


Figure 4. Prevalence of MRPs with increasing number of co-morbidities

When the number of drugs prescribed was considered, MRPs were found in 54 out of 89 patients (60.67%) who were prescribed 1-4 drugs and 53 out of 61 patients (87%) who were prescribed more than 4 drugs.

This demonstrated that polypharmacy raised the possibility of drug interactions and MRPs. Figure 5 depicts the prevalence of MRPs as the number of medications prescribed rises.

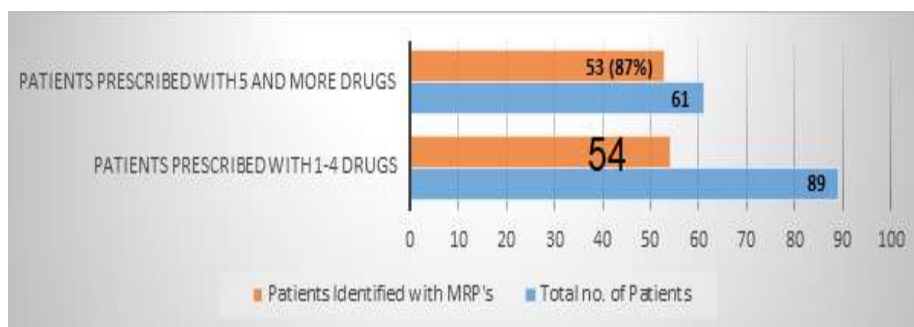


Figure 5. Prevalence of MRPs against number of drugs prescribed.

DISCUSSION

The elderly people were at increased risk of medication-related problems as a result of age related physiological changes, presence of multiple chronic diseases and conditions, types and numbers of prescription and non-prescription medications consumed.

The present study included 150 elderly patients of either sex aged above 60, diagnosed with one or more diseases. 107 patients among 150 were found to have MRPs. A total of 196 MRPs were identified from 107 geriatric patients.

In this study, prevalence of MRPs among geriatric patients were high (72%). The

study conducted by Chee-Tao Chang, Ju-Ying Ang *et al.*, among the Malaysian elderly population was also high, warranting for measures and evidence-based guidelines to ensure the safe medication use. [9]

Among the elderly patients identified with MRPs (107), female patients were more prone to MRPs (75%). The study conducted by Rademaker M *et al* also suggested that females were more prone to MRPs as women generally have a lower lean body mass, reduced hepatic clearance, have differences in activities of cytochrome enzymes and metabolize drugs at different rates compared to men. [10]

Comparison of prevalence of MRP's with the age group (60-70yrs, 70-80yrs, 80 and above) among the elderly, it was found that MRP's increase with increasing age. Increasing age leads to increased comorbidities, which further leads to increase in the risk of medication related problems and decreased ability to eliminate medications from the body due to reductions in kidney and liver function. Similar observations were observed from the study conducted by A O Baldoni *et al.*^[11]

From this study, it was found that the prevalence of MRPs was increasing with increased number of diseases. Increased number of diseases leads to increased number of drug consumption, which further leads to increased MRP's in elderly patients. While considering the number of drugs prescribed, it was observed that polypharmacy increases the risk of drug interactions and other MRPs. The study conducted by M Saljoughian *et al* also suggested the presence of MRPs increased with the number of drugs used. Patients consuming 5-9 medications had a 50% chance of an ADR, increasing to 100% when they consumed 20 or more medications.^[12]

Different initiatives have been developed in an attempt to reduce the likelihood of MRPs in elderly patients. Pharmacist could play an important role in identifying and preventing negative health outcomes and medication related problems in geriatric patients.

CONCLUSION

The findings of the study conclude that pharmacists could help promote better medication use by ensuring that elderly patients received appropriate medications for their conditions, considering physiologic factors, co-morbidities, polypharmacy, and other factors, and thus reducing the risk of medication-related problems. Geriatric prescription patterns divulged unsuitable medicines, rendering these patients more prone to adverse drug reactions and drug interactions. To decrease the risk of medication-related disorders, prudent drug

prescription and thorough and regular monitoring of drug therapy are mandatory.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCE

1. Starner CI, Gray SL, et al. Pharmacotherapy a Pathophysiologic Approach. 7th ed. New York: McGraw-Hill Medical; 2008. pp. 57–66.
2. Gavilán Moral E, Suarez-Varela MTM, Esteban JAH, Suanes AMP. Inappropriate multiple medication and prescribing of drugs immobile elderly patients living in the community. *Atencion Primaria*. 2006; 38(9): 476-80.
3. Vinks T H, De Koning F H, De Lange T M, Egberts T C. Identification of potential drug related problems in the elderly: the role of community pharmacist. *Pharmacy world and science*. 2006; 28(1):33-8.
4. Awad A, Alhadab A, Albassam A. Medication-related burden and medication adherence among geriatric patients in Kuwait: A cross-sectional study. *Frontiers in pharmacology*. 2020; 11:1296.
5. Howard M, Dolovich L, Kaczorowski J, Sellors C, Sellors J. Prescribing of potentially inappropriate medications to elderly people. *Fam Pract*. 2004; 21(3): 244-7
6. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *American journal of hospital pharmacy*. 1990; 47(3): 533-43.
7. Hailu BY, Berhe DF, Gudina EK, Gidey K, Getachew M. Drug related problems in admitted geriatric patients: the impact of clinical pharmacist interventions. *BMC geriatrics*. 2020; 20(1): 1-8.
8. Adepu R, Adusumili PK. Assessment of drug related problems in patients with chronic diseases through health status survey in a south Indian rural community setting. *Indian Journal of Pharmaceutical Sciences*. 2016; 78(4): 537-41.
9. Chang C T, Ang J Y, Islam M A, Chan H K et al. Prevalence of drug related problems and complementary and alternative

- medicine use in Malaysia: A systematic review and meta-analysis of 37,249 older adults. *Pharmaceuticals*. 2021; 14(3): 187.
10. Rademaker M. Do women have more adverse drug reactions?. *American journal of clinical dermatology*. 2001; 2(6): 349-51.
 11. Baldoni AD, Chequer FM, Ferraz ER, Oliveira DP, Pereira LR, Dorta DJ. Elderly and drugs: risks and necessity of rational use. *Brazilian Journal of Pharmaceutical Sciences*. 2010; 46(4): 617-32.
 12. Saljoughian M. Polypharmacy and drug adherence in elderly patients. *US Pharm*. 2019; 44(7): 33-6.

How to cite this article: Abhishek Pradhan, Jayakumar Sudha Sanjay, A.R Shabaraya. A study to assess the prevalence of medication related problems in elderly patients. *International Journal of Research and Review*. 2022; 9(12): 30-35.
DOI: <https://doi.org/10.52403/ijrr.20221204>
