



## Drug-related Problems in Elderly Patients - A Review

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### KEYWORDS

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### ABSTRACT:

**Background and aims:** Drug inefficiency, undesirable medication effects, overdosing, underdosing, and drug interactions are all common among the elderly. The main goal of this review is to identify, classify, and evaluate drug-related problems among geriatric patients.

**Methods:** Earlier studies examined drug-related problems in elderly patients to gain a better understanding of the identification, classification, and evaluation of drug-related problems among elderly patients

**Results:** According to the study, elderly patients generally have more than one chronic disease and usually they are prescribed as polypharmacy (more than five drugs) which may cause a huge number of drug-related problems in elderly patients such as drug-drug interaction, drug-food interaction, drug-disease interactions, adverse drug reactions, side effects, ineffectiveness, drug-disease interactions, etc.

**Conclusion:** Elderly patients are at high risk of Drug Related Problems (DRPs) due to morbidity-associated polypharmacy, age-related physiologic changes, and pharmacokinetic and pharmacodynamics alterations.

### 1. INTRODUCTION:

Drug issues in elderly people are prevalent with drug inefficiency, adverse drug effects, overdosage, underdose, and drug interactions <sup>(1)</sup>. Drug issues are also prevalent. In older adults, drugs may not be effective, due to under-dose clinic (e.g., enhanced concerns over negative impacts) or bad adherence (e.g., economic, or behavioral constraints). Drug users are not administered properly <sup>(2)</sup>. Unwanted, uncomfortable, or harmful effects of a drug are adverse effects. Sedation, confusion, hallucinations, falls, and bleeding are common examples. For outpatients aged more than sixty, adverse events happen at the rate of 5%. In elderly patients (about 17%) the levels of hospitalization from negative drug impacts are four times greater than in younger patients (4%). <sup>(3-5)</sup>

### 2. METHODS:

#### 2.1 Search terms and strategies:

##### 2.1.1 Review of literature:

We examined earlier studied research papers on drug-related problems in elderly patients to gain a better understanding of

the identification, classification, and evaluation of drug-related problems among elderly patients.

### 3 RESULTS:

The incidence of drug-related issues in geriatric patients has been growing globally over the last few years and is achieving epidemic proportions in both advanced and developing nations. Age-related modifications influencing and comorbidity in the pharmacodynamic and pharmacokinetics field pose excellent difficulties of ideal medication treatment and place the danger of ADEs, hospitalization, and death of frail and sensitive patients on a higher footing. This section deals with all the drug-related problems in geriatric patients and the studies done to identify, classify, and evaluate drug-related problems among geriatric patients. The maximum number of articles was explored, and a literature review was done accordingly.

#### 3.1 Reasons for drug-related problems:

Any patient may experience adverse drug effects; however, certain features of older adults make them more vulnerable. Older adults, for instance, frequently take many medications, and modifications in drugs associated with age, reduce the



risk of adverse effects. Instead, the risk of drugs is increased<sup>(6-9)</sup>.

Geriatric patients are at high risk of Drug Related Problems (DRPs) due to morbidity-associated polypharmacy, age-related physiologic changes, and pharmacokinetic and pharmacodynamics alterations. These patients are often excluded from premarketing trials which can further increase the occurrence of DRPs. This study aimed to identify drug-related problems and determinants in geriatric patients.<sup>(23)</sup>

### 3.2 Preventable cause of drug-related problems:

In older adults, several prevalent factors are avoidable for adverse drug effects, inefficacy, or both. Some of those factors include insufficient communication with patients or between healthcare specialists<sup>(10,11)</sup>. Many drug-related issues could be avoided by paying more attention to reconciliation when patients are admitted or discharged from or during other transitions from hospital care<sup>(12-15)</sup>.

### 3.3 Drug illness interaction:

A drug that is administered to treat a disease may give rise to another disease. It is hard to distinguish subtle negative medicinal impacts from illness impacts and can lead to a prescription cascade<sup>(16)</sup>.

### 3.4 Drug-drug interactions:

As older adults frequently take many medicines, they are especially susceptible to interactions between drugs. Older adults also often use drugs of plant origin and other food supplements and will not reveal it to healthcare professionals. They can interact and contribute to ADEs with prescribed drug products.<sup>(17)</sup>

### 3.5 Inefficient monitoring:

Monitoring is very important for the prevention of any drug-related problems. Lack of New drug indication documentation, maintaining a present list of medicines that patients use in medical records, monitoring therapeutic target achievements and other new drug reactions, monitoring of laboratory trials needed to assess efficacy / adverse impacts, etc. are the main reasons for causing drug-related problems.

### 3.6 Inappropriate drug choice:

In older adults, some drug classes are particularly important. As medicines are so problematic, they can be not prescribed

for older adults and certainly used with increased caution. The benefit or risk of therapy for each patient must be weighed by clinicians<sup>(18)</sup>. The criteria do not apply to end-of-life patients when choices on drug treatment are very distinct.

### 3.7 Lack of patient adherence:

The medical efficacy of the outpatient elderly adults is often affected by a lack of compliance. Up to half of older adults do not take medicines according to their directions, typically taking less than their recommended use.<sup>(19)</sup>

### 3.8 Overdosage:

Overdosing may also happen when medicine interactions raise the number of medications available or when separate doctors prescribe a drug and do not know that another doctor who prescribes the same medicinal product (therapeutic duplication)<sup>(20)</sup>

### 3.9 Poor communication:

Conversely, failure to communicate when admitted to a health care facility could lead to the deliberate omission of a maintenance drug needed. Drug reconciliation relates to a formal examination of each care transition for all prescribed medicines and may assist in eliminating mistakes and failures. Poor communication of medical data from one healthcare institution to another at transitional points leads up to 50% of all medication mistakes and up to 20% of hospital-negative medication impacts. When patients get discharged from the hospital, a different prescriber who refuses to interact with the prior prescriber may unnecessarily continue with drug schemes that have begun and are required in a hospital setting (e.g., sedative-hypnotic products, laxatives, proton pump inhibitors).

### 3.10 Prescribing errors:

It is necessary to establish the primary causal elements that contribute to prescription mistakes in older persons before developing efforts to eliminate them. Prescribing mistakes were shown to be most significantly connected with features of the prescriber and the medicine, according to a Dutch study. Administering errors to elderly patients is also linked to several other issues.

When an older person becomes seriously unwell, they may be seen by general practitioners who are available for consultation or admitted to the hospital by medical



professionals who are unaware of their specific medical history outside regular business hours. In addition, there may be inadequate access to primary care, hospital, and community pharmacist data for elderly patients. As a result, there is a higher chance that prescription errors may happen. These mistakes might not be discovered and corrected until after hospital admission, by which point a negative clinical outcome might have happened.

Frank et al. found that 5% of patients do not take prescriptions that are recorded on their primary care prescription record and that over 40% of elderly patients use pharmaceuticals that their GP is unaware of.<sup>23</sup> Prescription mistakes are not unexpected to occur most often during the transition of care, especially upon hospital admission, when elderly patients have their drugs prescribed by a physician who is typically unfamiliar to them.<sup>(22)</sup>

### 3.11 Underprescribing:

Appropriate medicines, i.e., for maximum effectiveness, cannot be taken under-prescribed. Under-prescription may boost morbidity and death and decrease living standards<sup>(21)</sup>. Adequate drug dose and multidrug regimen should be used by the clinicians if stated.

### 3.12 Prescribing pattern:

Fita, R., Dewa, P., and Pramantara., 2009 presented research on Polypharmacological treatment and unwanted medicine in older patients hospitalized who were admitted. This research was conducted on unwanted drugs, on cost high for unnecessary medicines, and whether polypharmaceuticals were an adequate indicator for unnecessary drug therapy occurring in a hospital setup. The avoidance of unnecessary pharmaceutical treatment problems is possible by reducing drug use (all drugs without therapeutic advantage, purpose or indication should be eliminated). Unnecessary medical therapy prevention will also help to save the cost of elderly patients.

This research is carried out to solve medicinal product-associated issues in the geriatrics industry and to decrease the risk of life-threatening issues. Drug-related problems are adverse drug events, drug interactions, higher dosing, lower dosing, and inappropriate drug selection. All these problems can lead to ineffective treatment outcomes or harmful effects on the patients. Geriatric patients are among the vulnerable groups where drug-related problems can bring morbidity and mortality. It is estimated that drug-related problem is the third or fourth leading cause of death among geriatric patients because of polypharmacy prescription, which can cause disability, giddiness, depression, gait differences, and falls.

These problems can increase medical expenditure and suffering too. However, many of the drug's related problems are preventable. The clinical pharmacist can extend their role in minimizing drug-related problems and thereby improve the quality of life of geriatric patients.<sup>(24)</sup>

## 4. CONCLUSION:

A number of variables combine to make elderly individuals more vulnerable to Drug Related Problems (DRPs). The concurrent use of many medications, known as morbidity-associated polypharmacy, becomes a significant factor that may result in unfavorable drug interactions or unwanted side effects. The situation is further complicated by age-related physiologic changes, which can affect how medications are absorbed, transported, metabolized, and eliminated due to changes in the body's systems. Elderly people are particularly vulnerable due to the complex interactions between pharmacokinetics and pharmacodynamics because they may respond differently to drugs than younger people do. This complex network of variables emphasizes how important it is to provide the elderly population with individualized and attentive medication management.

## REFERENCES:

1. Ruifeng liu, Mohamed. (2017).data driven prediction of adverse drug reactions induced by drug-drug interactions. BMC pharmacology and toxicology: 18-24
2. Amanda H Lavan,Paul F .(2016).Methods to reduce prescribing errors in elderly patients with multimorbidity; clinical interventions in aging;11: 857-866
3. Bollu, M., Koushik, NK. et al(2015). Inpatient drug related problems and pharmacist intervention at a tertiary care teaching hospital in South India-A retrospective study. European Journal of Biomedical and Pharmaceutical Sciences;2:688-705
4. George, R, J., James, E. Vijayalakshmi, S. (2015). Clinical pharmacist's interventions on drug related problems in a tertiary care hospital. Int J Pharm Pharm Sci, 4; 7:401-404
5. Hanlon JT, Semla TP, Schmadre KE, et al: Alternative medications for medications in the use of high-risk medications in the elderly and potentially harmful drug-disease interactions in the elderly quality measures. J Am Geriatr Soc 63(12): e8-e18, 2015. doi: 10.1111/jgs.13807.
6. Hege Kersten, Lara .T. (2015).Clinical impact of potentially inappropriate medications during hospitalization of acutely ill older patients with multimorbidity. Scandinavian journal of primary health care; 33(4):243-251.



7. Mary, R. James, E. et al (2015).Clinical pharmacist's interventions on drug1.related problems in a tertiary care hospital. *Int J pharm sci.*7:401-404.
8. Maheshwari, A., Shah, P, Upadhyay, V.etal (2015).Assessment of medication related problems in a general medicine ward of a teaching hospital. *World Journal of Pharmacy and Pharmaceutical Sciences*, 4:1709-1719.
9. The American Geriatrics Society 2015 Beers Criteria Update Expert Panel: American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. 63(11):2227-46, 2015. doi: 10.1111/jgs.13702.
10. Shareef, J., Sandeep, B.et al. (2014). Assessment of drug related problems in Patients with cardiovascular diseases in a tertiary care teaching hospital. *J Pharm Care*, 2:70-76.
11. Carla .F, Justiniano. (2013).Comorbidity-polypharmacy score: A novel adjunct post emergency department Trauma Triage.*J Surg Res* May 1; 181(1):16-19.
12. Grace, M., Daniel, R. etal. (2013). Drug Errors and Related Interventions Reported by United States Clinical Pharmacists Pharmacotherapy. *The Journal of Human Pharmacology and Drug Therapy*, 33(3): 253-65.
13. Mahabaleshwarkar RK,Yang Y(2013) Risk of adverse cardiovascular outcomes and all-ccause mortality associated with concomitant use of clopidogrel and proton pump inhibitors in elderly patients. *Current medical research opinion*; 2993):315-323.
14. Reema,R.(2013).Drug related problems and reactive pharmacists interventions for inpatients receiving cardiovascular drugs. *Int J of basic science and Pharm.*3:42-48.
15. Satishkumar, B,P., Dahal ,P. Venkataraman, R.(2013) Assessment of clinical pharmacist intervention in tertiary care teaching hospital of southern India. *Asian J Pharm Clin Res*; 6:258-61.
16. Miranda, TMM. Petriccione, S. etal (2012). Interventions performed by the clinical pharmacist in the emergency department. *Einstein*, 10:74-78.
17. Ganachari, M., Kumar, M., et al (2010) Assessment of drug therapy intervention by a clinical pharmacist in a tertiary care hospital. *Ind J PharmPract*, 3:22-28.
18. Wong JD, Bajcar JM, Wong GG, et al: Medication reconciliation at hospital discharge: evaluating discrepancies. *Ann Pharmacother* 42(10):1373-9, 2008. doi: 10.1345/aph.1L190.
19. Pierre I, Karakiewicz. (2006).Outcomes research: A Methodologic review. *European urology* (50):218-224.
20. Tam VC, Knowles SR, Cornish PL, et al: Frequency, type and clinical importance of medication history errors at admission to hospital: a systematic review. *CMAJ* 173(5):510-5, 2005. doi: 10.1503/cmaj.045311.
21. Smolinski, MS., Hamburg, MA. (2003) Microbial threats to health- emergence, detection, and response. Washington, DC: Institute of Medicine. 20(24):262-293.
22. Lavan, A. H., Gallagher, P. F., & O'Mahony, D. (2016). Methods to reduce prescribing errors in elderly patients with multimorbidity. *Clinical interventions in aging*, 11, 857–866. <https://doi.org/10.2147/CIA.S80280>.
23. Hailu, B. Y., Berhe, D. F., Gudina, E. K., Gidey, K., & Getachew, M. (2020). Drug related problems in admitted geriatric patients: the impact of clinical pharmacist interventions. *BMC geriatrics*, 20(1), 13. <https://doi.org/10.1186/s12877-020-1413-7>.
24. Rahmawati, Fita & Dewa, I & Pramantara, Putu & Rohmah, Wasilah & Azhar, Syed & Sulaiman, Syed. (2009). Polypharmacy and unnecessary drug therapy on geriatric hospitalized patients in Yogyakarta Hospitals, Indonesia.