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## **"Polypharmacy in Geriatric Family Medicine: A Comprehensive Review"**

**Primary author**

**Name:1. Dr.Faisal sad mohamed Katib,**

**Primary health care corporation , Doha , Qatar**

**E-mail: faisalkatib@yahoo.com**

2. Dr.Abeer Shafeek mahmoud, Primary Health Care Corporation, Doha,Qatar

3. Dr.Omar Bassam Ahmad Saleh, Primary Health Care Corporation, Doha , Qatar

### **Abstract**

Comorbidities and polypharmacy are more likely to affect older adults. Inappropriate prescribing and a higher risk of harmful consequences are both linked to polypharmacy. The impact of polypharmacy in older adults in Family Medicine was the focus of this investigation. The effects of polypharmacy on Family Medicine were also investigated, with a focus on neuropsychiatric, antihypertensive, and antidiabetic drugs. In India, as everywhere throughout the world, an ageing population is an increasing cause for concern. Taking many medications at once, regardless of whether or not they are clinically necessary, is known as polypharmacy. The elderly are overrepresented in the polypharmacy population. Studies have shown this as well. Negative outcomes associated with polypharmacy in the elderly population include increased adverse medication responses, falls, frailty, and mortality. Additionally, it causes a rise in personal expenditures. In the elderly population, polypharmacy increases the likelihood of poor medication adherence and missing doses. Increased medical practitioner awareness, better drug administration and adherence, less reliance on self-medication, and corrected application of cross-pathology are all potential solutions. Ageing and the diseases that come with it are symptoms of getting older. Nutritional issues, vision and hearing loss, urinary incontinence management, balance and fall prevention, osteoporosis, and polypharmacy are just few of the many aspects of older patients' health that must be taken into account when conducting a comprehensive physical examination.



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Improper treatment, adverse medication reactions, and issues related to the dynamic nature of pharmacokinetics and pharmacodynamics are only some of the consequences polypharmacy can have on the elderly. Ageing in the elderly with some ailment may lead to getting higher number of drugs, leading to incorrect prescribing patterns, contributing to hazardous drug responses, and hospitalization. The impact of polypharmacy on elderly individuals will be discussed in this review.

**Keywords:** Polypharmacy, Family Medicine sector, Geriatric, ageing.

## **Introduction**

Older adults may face the health issue of polypharmacy, which is the use of many medications or more medications than are clinically necessary. The term "polypharmacy" can be defined as the usage of four or more medications, while there is no universally accepted cut-off number.

Overmedication can also be defined as the use of more drugs than are necessary for a patient's condition. According to this definition, polypharmacy includes the use of many therapeutically unnecessary medications. Nearly 42 million people, or 13.3% of the global population, are 65 or older and use one or more of the many medications that are recommended to the elderly (Alshanberi, 2022).

Multiple chronic illnesses, such as diabetes mellitus, hypertension, chronic obstructive pulmonary disease, and heart failure, require multiple medications to treat. In these circumstances, it is common and often necessary to use many medications.

As people get older, they begin to experience the negative effects of ageing on organs and systems such the heart, kidneys, liver, and stomach, as well as on the metabolism of drugs.



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Many medications' pharmacokinetic and pharmacodynamics properties alter with treatment, raising the possibility of side effects. Alterations in medication response are seen in the elderly because to alterations in absorption, distribution, metabolism, excretion, and receptor level. According to various definitions, the prevalence of polypharmacy in the published literature varies from five percent to seventy-eight percent. Polypharmacy is common because of socioeconomic status, health status, and availability of medical care.

High healthcare costs, the likelihood of prescription errors, drug interactions, side effects, poor medication adherence, and geriatric syndromes are just some of the unintended consequences of polypharmacy (Sinha, 2021).

Adverse drug events are defined by the World Health Organization as "unintended and undesired effects of a medication at a normal dose" and are categorized into five groups: adverse drug reaction, medication error, therapeutic failure, drug withdrawal, and overdose.

The purpose of this research was to look at how polypharmacy correlates with typical geriatric symptoms such as frailty, inability to perform daily tasks, bowel and bladder dysfunction, disturbed sleep, and malnutrition.

Improvements in health are the ultimate goal of health development, which aims to raise people's knowledge, motivation, and capacity for leading healthy lifestyles. Rising life expectancy, falling death rates, and the importance of birth mothers are all results of successful health improvement (Ie, 2017).

The best evidence should inform the prescription pattern for a patient with multiple disorders. An increase in inappropriate therapy, adverse drug events (ADES), and some of



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the difficulties caused by changes in pharmacokinetics, pharmacodynamics, and comorbidities are some of the effects that polypharmacy can have on the elderly. At least one of the drug administrations in polypharmacy is unwarranted. There must have been an evaluation of the drug and drug compliance in order to arrive at this definition. Polypharmacy is caused by prescribing drugs for the wrong conditions, or duplicating medications. Proton-pump inhibitors, for instance, are given to hospitalised patients routinely as a preventative measure against stress ulcers. It would be inappropriate to continue administering this medication after the patient has been released from the hospital. Consequences of polypharmacy include increased risk of adverse events, noncompliance with prescription use, and drug interactions (DIs), as well as geriatric syndromes. Polypharmacy is associated with medication buildup in the elderly, which can have devastating consequences. Evidence from a number of research points to polypharmacy as a root cause of PIM. Therefore, the purpose of this review is to assess the effects of PIMs and polypharmacy in the elderly (Alsuwaidan, 2019).

### **Populatoin of elderly**

The elderly are defined in the United States as those between the ages of 65 and 74 who have health issues, diseases, dependency on others, and problems with the function and dysfunction of organs; those beyond the age of 85 are considered to be among the oldest old (the "oldest old" >85). Statistical data show that the elderly and geriatric populations will continue to grow, and by a substantial margin. There were 36,2 million people in the



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country in 2004, but by 2014 that number had risen to 46,2 million, an increase of 28. The population is expected to reach 98.2 million by 2060. Meanwhile, the number of persons aged 85 and up reached 6.2 million in 2014, is expected to steadily rise, and will reach 14.6 million by 2040. The elderly and very old population in Germany has reached 4.5 million, with 5.4% being 80 or older. Over the past decade, this population has grown steadily. The number of Italians who are really elderly (85 and up) is rising quickly. Success in preventing age-related diseases is measured by a country's life expectancy rate and the general health of its elderly population. The proportion of the elderly who are 60 years old or older is rising quickly. The percentage of the global population that is 60 or older increased from 11% in 2010 to 16% in 2030. The percentage of the European population over the age of 60 is projected to rise to 29% by the year 2030. Due to their advanced age, they face unique challenges. Alterations in physiological processes, as well as some diseases more common in the elderly, might bring on a host of health issues. The outcome is an increase in drug use or polypharmacy among the elderly, which carries its own set of dangers and difficulties (Rohrer, 2013).

### **Change of aging**

The process of ageing is multifaceted. Ageing normally and developing age-related disorders go hand in hand. Diseases associated with old age, but does not occur in all people (ageing probabilistic) are dementia, hypothyroidism, stroke, and congestive heart failure (CHF). Ageing typically reduces physiological functions, such as decreased bone density,



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osteoarthritis, and suffering cataract lens. DNA damage, oxidative materials, free radicals, catastrophic errors, the ageing process, apoptosis, the immunological system, and the neuroendocrine system are just some of the mechanisms of ageing that have been proven by current molecular and cellular biology. Abnormalities in homeostasis result from a shortage of specialised integrative cells in the glands that regulate hormone production and secretion (the pituitary, thyroid, adrenal, pancreas, and gonads). Because of their weakened immune systems, the elderly often take multiple drugs at once (a condition known as polypharmacy) (Kamau, 2023).

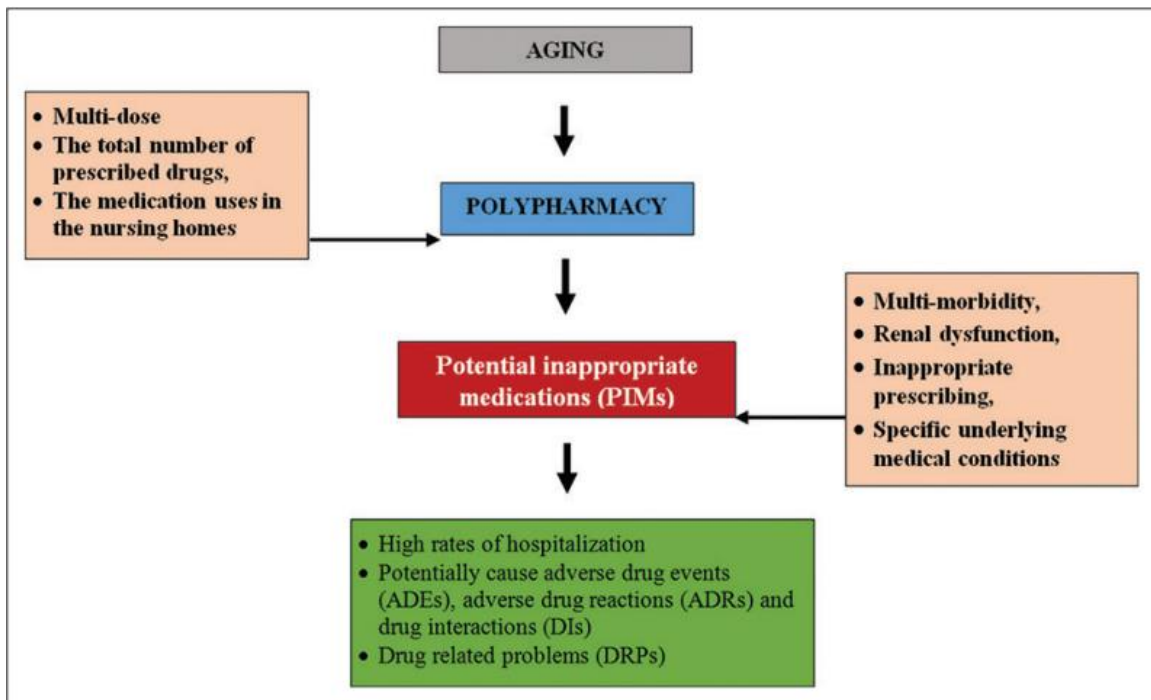
Hormones like androgens and anabolic growth hormones play a role in building muscle and strength; however, their production naturally declines with age, leading to a loss of muscle mass, strength, and power. Clinically, ageing is characterised by muscle weakness, increased fracture risk, and a drop in body mass index, which increases the risk of falls, trauma, infection, delirium, unstable blood pressure, and other physical problems. The results of a sample physical examination for the elderly are shown in Table 1.

It is impossible to avoid becoming elderly. It involves a transformation in one's body, mind, and community. The future quantity and quality of life and health of the elderly will be determined by the effectiveness of health development and the life cycle approach beginning with the mother preparing for pregnancy and continuing through the infant years, school-aged children and adolescents, adults, and the pre-elderly. The quality of life for the elderly can be guaranteed by providing high-quality healthcare throughout the lifespan. Because a drug's effects can vary depending on the patient, it's important to tailor treatment



strategies to each individual by analysing the drug's pharmacokinetics and pharmacodynamics. Some of the following may be applicable to this profile (Akyon, 2023):

- The drug's pharmacokinetics and pharmacodynamics characteristics will be



revealed in select patients.

**Fig. 1: The impact caused by polypharmacy**

**Muscle alterations as a function of age are summarised in Table 1.**

a loss of muscular mass of 30–40%.

Synthesis of myosin heavy chain has been reduced.



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Lessen the pressure.

Fat cells invade muscular tissue

Enhanced fatigue.

Baseline metabolic rate declines (by as much as 4 percent every decade beyond age 50).

Lower levels of nerve endings.

The number of myofibril in each motor unit has increased.

Disappearance or slowing of satellite cell growth.

Turn to Type I fibres.

- 
- Those patients who may be at risk for DIs.
  - Possible unwanted effects of medication on some patients.
  - The problem of patients not following their prescribed medication regimen.

### **Multi diseases**

An interdisciplinary team of medical experts should evaluate the pathophysiology of the elderly. In order to determine the state of an elderly person's health, a geriatric assessment must look at the patient's medical history (both before and after treatment), their social and family background, and their demographic information. Nutrition issues, vision, hearing, urinary incontinence, balance and fall prevention, osteoporosis, and polypharmacy should





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all be taken into consideration when treating the elderly. When evaluating the health of the elderly, medical personnel should keep in mind the heightened severity of age-related diseases (Nitya, 2021).

### **The impact caused by polypharmacy**

Because of the prevalence of chronic illnesses in the elderly population, their pharmacological treatment needs to be more nuanced than those of younger age groups. Due to age-related changes in pharmacokinetics and pharmacodynamics, medication metabolism and adverse effects may be different for the elderly compared to younger adults. Problems with health, such as the occurrence of side effects and ADRs, have been linked to the use of incorrect medications in the elderly. Comorbidities, complex treatment regimens, functional and cognitive state, therapy goals, and quality of life should all be considered in drug evaluations for the elderly. Prescription errors, prescribing the wrong prescription without an indication, and prescribing an indication without drugs are only some of the issues that need to be addressed in a full examination of drug usage in the elderly (Lee, 2020).

- The clinical effects, including drug or disease interactions, incorrect dosage, treatment duration, and method of use, and incorrect prescription indication all contribute to the risk of reaction/event associated with an unneeded drug.



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- Drugs used for purposes other than treating or preventing the disease for which they were prescribed are known as "drugs without indication," and include both over-the-counter and prescription pharmaceuticals.
- An undiagnosed medical condition for which a medicine is needed in a clinical setting but is not prescribed. Figure 1 depicts the consequences of polypharmacy for elderly people.

### **Polypharmacy and the Risk of Adverse Drug Events**

ADR is more likely to occur in patients with multiple conditions and polypharmacy. When treating patients, it will be important to keep in mind the possibility of incorrect prescribing and the increased risk of ADRs in the elderly population. Another reason why the dose may need to be altered in the elderly is that pharmacokinetic characteristics may vary. Because of the complex nature of polypharmacy, improper prescribing, and ADRs, evaluating their occurrence is essential for determining whether or not a drug's safety profile needs to be modified for the elderly. There is a correlation between the rates of polypharmacy, incorrect prescribing, and ADR. Drug-DIS (DDIS) can be avoided if prescription quality is increased, and ADES can be lowered as a result. Improving drug safety for the elderly relies on correct dosing through appropriate prescribing (Panda, 2020).

Elderly patients are more likely to fall if they receive improper prescriptions frequently. Polypharmacy is also linked to it. Some medications should be avoided altogether, while others should have their dosage, formulation, and administration modified based on the patient's age and condition. Drug-related problems (DRPs) are more common among the



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elderly in Singapore, and the more medications they take, the more likely they are to experience unwanted side effects and even be one of the reasons for the rising number of elderly patients seen in hospital emergency rooms. Two or three types of drug usage were reported by the elderly population, suggesting the possibility of DDIS in a retrospective investigation. The potential risk of DIs is four times higher for elderly patients who were treated with five or more different medicines. A major predictor of DDIs-related ADR was found to be polypharmacy. Age, number of diseases, and drug consumption all contributed to the higher risk of DDI-related ADRs in elderly outpatients (Aydos, 2020).

### **Conclusion**

Because of the prevalence of multiple age-related disorders, it can be challenging to prevent polypharmacy in elderly individuals. As a result, minimising the likelihood of adverse drug reactions is a major concern for medical professionals who prescribe medications.

The pharmacokinetics and pharmacodynamics of medications, and notably dose adjustment, should be taken into account while treating the elderly. Patients over 65 who have been prescribed five or more drugs at once require extra attention because of the increased likelihood of adverse effects from DIs. Pharmacists have a crucial role in evaluating polypharmacy among the elderly. The best treatment outcomes in the elderly need to be evaluated, and this requires the medical community to work together. This can lead to polypharmacy in the elderly, which can raise the likelihood of the incorrect prescription of drugs, which in turn increases the risk of adverse drug events and the length of time spent in the hospital.



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## **References**

Alshanberi, A. M. (2022). Recent updates on risk and management plans associated with polypharmacy in older population. *Geriatrics*, 7(5), 97.

Sinha, A., Mukherjee, S., Tripathi, S., & Dutta, S. (2021). Issues and challenges of polypharmacy in the elderly: A review of contemporary Indian literature. *Journal of Family Medicine and Primary Care*, 10(10), 3544.

Ie, K., Felton, M., Springer, S., Wilson, S. A., & Albert, S. M. (2017). Physician factors associated with polypharmacy and potentially inappropriate medication use. *The Journal of the American Board of Family Medicine*, 30(4), 528-536.

Alsuwaidan, A., Almedlej, N., Alsabti, S., Daftardar, O., Al Deaji, F., Al Amri, A., & Alsuwaidan, S. (2019). A comprehensive overview of polypharmacy in elderly patients in Saudi Arabia. *Geriatrics*, 4(2), 36.

Rohrer, J. E., Garrison, G., Oberhelman, S. A., & Meunier, M. R. (2013). Epidemiology of polypharmacy among family medicine patients at hospital discharge. *Journal of primary care & community health*, 4(2), 101-105.

Kamau, M., Mohamoud, G., Lusambili, A., Nyanja, N., & Shabani, J. (2023). Knowledge, attitudes and beliefs toward polypharmacy among older people attending Family Medicine Clinic, Nairobi, Kenya.

Akyon, S. H., Akyon, F. C., & Yılmaz, T. E. (2023). Artificial intelligence-supported web application design and development for reducing polypharmacy side effects and supporting rational drug use in geriatric patients. *Frontiers in Medicine*, 10, 1029198.



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Nitya, S., Ramya, G., Kiruthika, S., Meenakshi, R., Devi, J. N., Suganya, G., & Pravin, S. (2021). Drug utilization pattern and factors associated with polypharmacy and excessive polypharmacy in geriatric medical out-patients at a rural health training centre in India. *Journal of Family Medicine and Primary Care*, 10(7), 2636.

Lee, E. A., Brettler, J. W., Kanter, M. H., Steinberg, S. G., Khang, P., Distasio, C. C., ... & Gibbs, N. E. (2020). Refining the definition of polypharmacy and its link to disability in older adults: conceptualizing necessary polypharmacy, unnecessary polypharmacy, and polypharmacy of unclear benefit. *Perm J*, 24(18), 212.

Aydos, T. R., Emre Aydingoz, S., Lux, K. M., Efe, O. E., Isli, F., Aksoy, M., & Kadidoi, E. (2020). Polypharmacy prevalence among geriatric patients in primary healthcare settings across Turkey: a cross-sectional analysis through the nationwide prescription information system.

Panda, M., Pathak, R., Islam, F., Agarwalla, R., Singh, V., & Singh, F. (2020). Interplay of multimorbidity and polypharmacy on a community dwelling frail elderly cohort in the peri-urban slums of Delhi, India. *Journal of Family Medicine and Primary Care*, 9(3), 1647.