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Optimizing Health Management in Geriatric Patients: A Review of Medication Adherence and Related Factors

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ABSTRACT

The issue of chronic disease management in older adults is challenging since they tend to use many drugs and their bodies handle medications differently due to physiological needs. When prescribing is not done properly, it adds more difficulties for patients. That's why it's important to use recognized process tools like STOPP and START. Many cases of polypharmacy can result in inappropriate prescribing—known as PIPs—which happen most to elderly, multimedicated and essential tremor patients. Following recommended therapy affects health and daily life, so healthcare professionals and, in particular, pharmacists play a key role in encouraging adherence to medications. New virtual patient education tools are promising methods to enhance current ways of teaching students. It is reviewed here the influences on medication compliance in seniors, the effects of PIPs and the applications of best practices designed to help seniors fully benefit from their medications.

Keywords: *Chronic diseases, older adults, polypharmacy, STOPP/START criteria, medication adherence.*

1. INTRODUCTION

As the global population continues to age, the prevalence of age-related diseases among older adults has become a significant concern, affecting over 51.3% of this demographic. With the aging process comes an increased likelihood of polypharmacy, with more than 36% of older adults taking five or more medications concurrently. However, physiological changes associated with aging can impact drug metabolism, leading to an elevated risk of adverse reactions and medication-related issues. Inappropriate prescribing practices further compound these challenges, particularly among older adults, where factors such as age-related changes and polypharmacy play pivotal roles. Screening tools like the Screening Tool of Older Person's Prescriptions (STOPP) and the Screening Tool to Alert doctors to Right Treatment (START) criteria have been developed to identify inappropriate medications and prescribing omissions in this population. These criteria have evolved, with newer versions incorporating updated evidence to enhance their efficacy2,5,8. Despite the availability of screening tools, medication adherence remains a critical issue, especially among older adults managing multiple chronic conditions. Poor adherence can lead to suboptimal disease management, resulting in adverse health outcomes and unnecessary adjustments to medication regimens. Pharmacists play a crucial role in addressing medication adherence challenges through patient education and counseling, aiming to improve treatment comprehension and adherence rates. Over the past decade, the proportion of national populations aged 65 and above has been steadily increasing, a trend projected to persist for the next two decades. This demographic shift is attributed to advancements in life expectancies and the demographic bulge resulting from the post-World War II baby boom. Notably, starting in 2030, there will be a rapid escalation in the number of adults over the age of 85. By the year 2050, the global population of adults aged 80 and above is expected to triple compared to the figures recorded in 2015 (United Nations, 2015).

The United Nations Population Division anticipates a doubling of India's elderly population by 2050, with projections indicating a rise from 10 percent in 2023 to over 20 percent by mid-century. A recent report by the UN Population Fund highlights the role of healthcare advancements in driving this demographic shift, while also underscoring the challenges it presents, including the need for increased government assistance, oversight, and the expansion of care facilities. Data

spanning from 1950 to 2100 reveals an acceleration in India's aging process, with the elderly population's growth rate surging to 40.6 percent in the 2020s, compared to around 30-35 percent in previous decades. The southern and western regions, notably states like Kerala and Tamil Nadu, emerge as the oldest, with higher proportions of elderly individuals living independently from their adult children, particularly among older women who face increased economic vulnerability (Buchholz, K., et al., 2023).

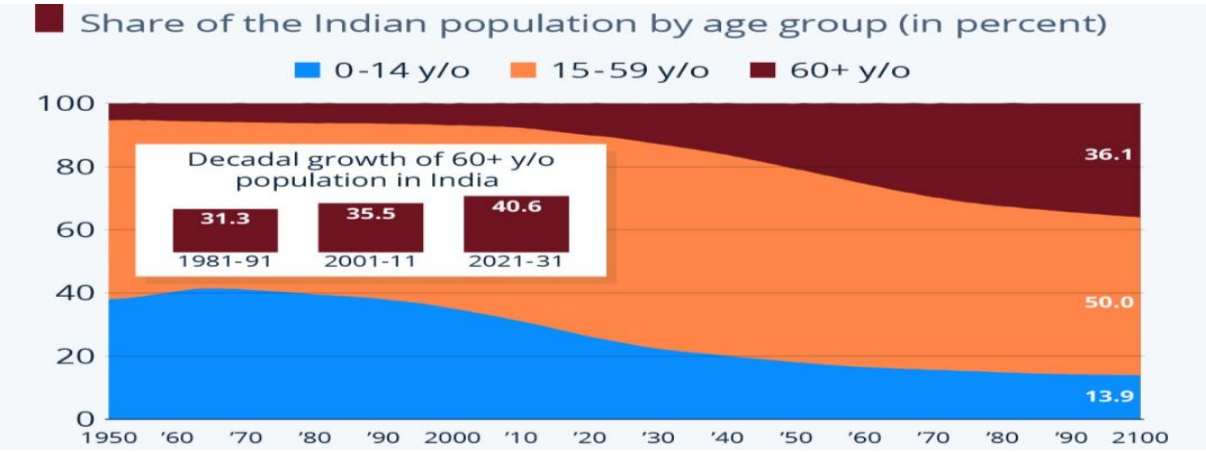

Figure 1: This graphical image is retrieved from : Katharina Buchholz et al, Aging of the Population Accelerates in India, Oct 4, 2023, available on: https://www.statista.com/chart/30958/share-of-age-groups-in-indian-population/

There is high rate of vision and hearing impairment, malnutrition risk, mobility issues, and mental health concerns among older adults. Socioeconomic status significantly influences overall health, depression, and cognition. While quality of life isn't directly associated with health factors, it's impacted by frailty, cognition, depression, and mobility. The findings underscore the need for targeted interventions to address the complex health and socio-economic needs of older populations **(Kumar, et al., 2021).**

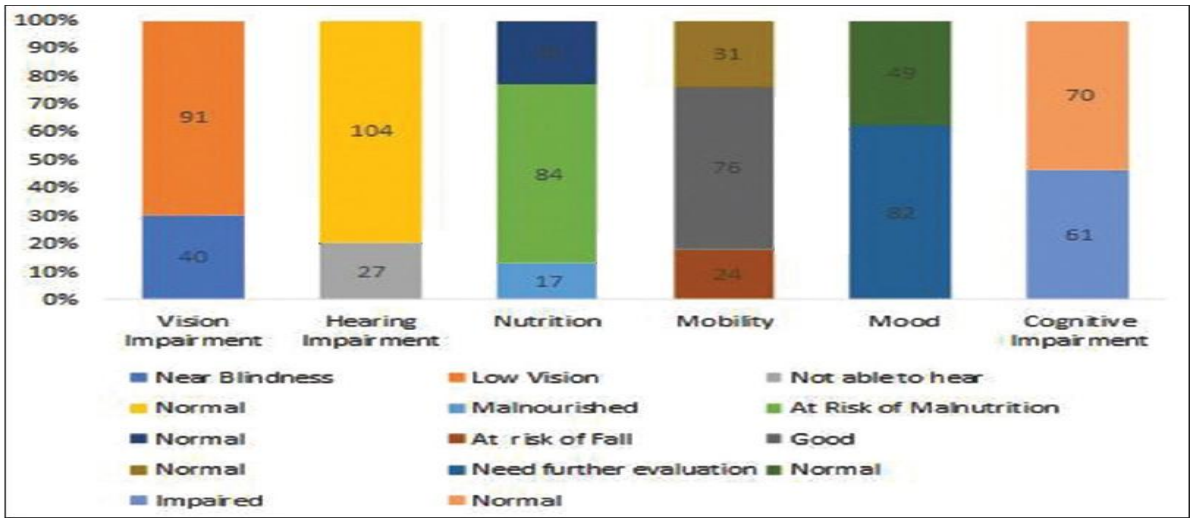

Figure 2: This graphical image is retrieved from Kumar et al, WHO South-East Asia Journal of Public Health Epidemiology of Geriatric Syndromes among Older People Residing in Six Old-Age Homes of Delhi-NCR. 10(2):p 77-83, Jul–Dec 2021. | DOI: 10.4103/WHO-SEAJPH.WHO-SEAJPH_344_20

This complication are reasons for polypharmacy and related non adherence has rose to lower the Qol in geriatrics. Recent advancements in technology have introduced virtual patient education as an innovative approach to enhance medication adherence among older adults. This method not only promotes patient independence and improves quality of life but also fosters a trusting relationship between patients and healthcare providers, ultimately leading to better health outcomes and reduced hospital readmissions. In light of these challenges and advancements, this review aims to provide a comprehensive overview of the issues surrounding medication adherence among older adults. It will explore the prevalence of polypharmacy, the impact of physiological changes on drug metabolism, the role of screening tools in identifying inappropriate prescribing practices, and the strategies employed to improve medication adherence, including pharmacist interventions and virtual patient education. Additionally, this review will highlight the importance of integrating adherence support measures into comprehensive patient care to optimize therapeutic outcomes and enhance the quality of life for older adults managing

multiple chronic conditions **(Kumar, et al., 2021).**

Methodology of review:

High-impact journals were selected including Clinical Interventions in Aging, European Geriatric Medicine, and BMC Geriatrics and others to ensure the robustness and credibility of its methodology. By sourcing data from these reputable publications known for their stringent peer-review processes and authoritative contributions to geriatric research, the review article aimed to provide comprehensive insights into medication adherence among the elderly population, thus enhancing the quality and reliability of its findings.

2. INAPPROPRIATE MEDICATION

A PIM is any medication that might bring more harm than benefit to certain groups, mainly elderly people. Many of these medicines may result in adverse reactions like falls, trouble with thinking or other unintended effects in the elderly. Many experts consider some benzodiazepines (for example, diazepam), anticholinergic medications (for instance, diphenhydramine) and slow-acting sleeping pills (such as temazepam) to be inappropriate for older adults. Researchers Abukhalil et al. (2022) looked at 247 elderly patients, of whom 50.2% were female. In total, 66.8% of participants fit the criteria for PIPs and of these, 30 had PPOs, 91 had PIMs and 44 had both. Nearly 45% of patients used 5 to 9 medicines during hospitalization and 52% were on 5 to 9 medicines at discharge. 33.6% of patients had ten or more medications during their stay, dropping to 16.4% at discharge. Of all PIMs, PPIs and BZDs appear most commonly as the active medicines involved. The study by Boland et al., 2016, included 20 people, with an average age of 76.7, of whom half at age 55 percent were female. Boland et al. (2016): Reported a wide range of recommendations to discontinue PIMs, from 18 in one set of criteria, to 70 in another. Nine times out of ten, patients were given nine medications and all versions of the criteria helped reduce the average number of drugs. Medication adjustments of great significance were made more often according to STOPP/START than they were according to Beer's criteria, as written by Boland et al. See that following STOPP/START led to advising that PIMs be stopped and that PPOs be begun in various ways in the different versions. **Baré *et al.* 2022** included data on 740 patients, average age 84.1 and 53.2% of whom were female. 81.5% of those studied had at least one unnecessary prescription, 73.2% had a PIM and 35.5% had a PPO. Potentially inappropriate medications (PIMs) are mostly reported for drugs that are prescribed without a clear clinical need and the most frequent potentially inappropriate over-the-counter remedy (PPO) is vitamin D. PIPs were found to be strongly linked to found age, polypharmacy and essential tremor. Many of the medicines elderly patients use may not be the right choice for their health. In other words, they are called Potentially Inappropriate Prescriptions (PIPs) (Abukhalil, A., *et al.*, 2022). According to Isabel Lozano-Montoya et al. 2015, out of the 388 patients studied, more than half (49.1%) had PIPs from the start and 61.3% had potential missing prescriptions (PPOs). Of the 284 PIPs found using the STOPP process, 87.0% were ended before patients went home. Benzo use in people at high fall risk and receiving two or more drugs of the same general type were common PIPs. The 397 PPOs found in the START criteria saw only 33.5% followed at discharge. ADL dependency was one reason why START criteria were met to different degrees by patients. What's important is that disabilities did not prevent STOPP compliance, but dependency on daily living activities and inability to walk reduced how well START guidelines were followed.

An important point is that these studies show more than 60% of elderly patients experienced a PIP. Therefore, it appears that PIPs are frequently found in the elderly. This means using more drugs than required for the condition you have. Abukhalil and his co-authors consider this an example of a common type of PIP. Because of possible risks or questionable benefits, PIMs may not be right for elderly patients. Examples might be drugs for which researchers have not found strong evidence, as reported by Baré et al. All research confirmed that an increased number of drugs led to a bigger danger of PIPs. The results suggest that taking care of several medications for the same person might be hard which could result in wrong drug decisions. The authors found that checking for PIPs with STOPP/START resulted in a greater number of medication changes than when using Beer's criteria. It demonstrates why it's essential to rely on proven criteria for proper PIP detection. It is important to enhance medication management for elderly patients by creating special interventions for Preventable Incident of Polypharmacy and Potential Other Incident. Fully reviewing every patient's medications and involving different staff members is important for good prescribing habits. Because patients with severe medical issues can be especially at risk, researchers should focus on developing safety-improving interventions for them. The results suggest that elderly people would benefit from better management of their medication. Identifying PIPs, avoiding too many medications and relying on established selection processes permit us to ensure the best medications are prescribed to our elderly patients (Yap, A. F., et al., 2016).

3. MEDICATION ADHERENCE

Medication adherence, or compliance, is how well patients follow their prescribed medication regimens. It involves taking medications as directed by healthcare providers, including dosage, timing, and duration. Adherence is crucial for optimal treatment outcomes, particularly for chronic conditions requiring long-term medication use. Poor adherence can lead to worsened health outcomes, increased healthcare costs, and higher risks of complications. Factors influencing adherence include the complexity of the treatment regimen, forgetfulness, side effects, cost, understanding of treatment benefits, cultural

beliefs, and social support. Healthcare providers play a vital role in assessing and addressing these factors to support patients in maintaining good adherence. **Anmaria, Thomas *et al.*** examined the influence of virtual patient counseling on medication adherence among 401 patients. It revealed a predominantly male population (58.36%), with the majority aged between 60-70 years (58.10%). Medication adherence, evaluated through the Medication Adherence Rating Scale (MARS), showed 54.86% of patients demonstrating good adherence and 45.13% exhibiting non-adherence. Comparing baseline and two follow-up periods, the test group receiving virtual counseling displayed notable improvements in adherence, with good adherence increasing by 18.23% and bad adherence decreasing by 18.55%. In contrast, the control group exhibited smaller improvements, with a 3.48% increase in good adherence and a 3.01% decrease in bad adherence. These findings suggest virtual patient counseling positively impacts medication adherence, particularly evident through significant improvements in the test group. Further research should explore the sustainability of these effects and refine virtual counseling strategies to enhance medication adherence in diverse patient populations **(Anmaria, et al., 2022).** Aml A Salama *et al.* conducted a cross-sectional investigation examining medication adherence among 438 elderly individuals living independently. Participants were categorized into adherent (73.2%) and nonadherent (26.8%) groups based on their adherence to prescribed medications. Notably, adherence was significantly associated with various demographic and medication-related factors. The mean age of adherent patients (73.33 ± 3.35) was lower than that of nonadherent patients (74.55 ± 3.71), with a higher proportion of adherent individuals being male (64%). Additionally, factors such as the ability to recall medication names, awareness of medication indications, dosage, timing, and duration, alongside medication parameters like price, number of prescribed drugs, and health insurance coverage, significantly influenced medication adherence. Adherent patients also exhibited higher satisfaction with their medication regimen. Adherence scores were calculated based on actual drug use compared to prescribed regimens, highlighting the importance of medication knowledge and understanding among elderly populations. This study sheds light on the multifaceted nature of medication adherence and underscores the need for tailored interventions to promote adherence among elderly individuals living independently **(Salama, A. A., *et al.*, 2017)**. Angela Frances Yap *et al.* explain the major reasons for medication non-adherence in geriatrics as-

- **Medication factors affecting medication adherence Factors**

Problems include formulating drugs, packaging them, managing storage, handling them, lack of use of boxes, cutting some medicines, trouble opening containers, changes in medication schedules, managing complex doses, challenges with health insurance, negative and minor drug interactions, not following some directions, using medications for only a short time and having no immediate effects from missing a dose.

- **Patient factors affecting medication adherence Factors**

Mood, Actions, Mental habits, Depressed states, Missing follow-up visits, Mild mental decline.

- **Personality**

Neuroticism, the way memory uses complementary and alternative medicines, Executive function, Concurrent use of over-the-counter drugs, Anxiety, drinking problems that are faced, Sleep disruptions, decreased self-care, Difficulty accepting support.

- **Physical health**

No social relationships, difficulty in doing small tasks with hands, difficulties with movements, limited knowledge/beliefs, trouble hearing, wrong views on medication, feeling unhealthy, believing meds are useless, lack of knowledge about the needed medicines.

- **Demographics**

Little awareness about the condition, aging, having low health literacy, being male, not understanding spoken advice well, a lack of education, not considering the condition dangerous, being married, reporting higher illness burden, speaking a different language and belonging to a different culture.

- **Health care providers' factors affecting medication adherence Factors**

Bad communication, not including patients, having doubt in health care providers, Prescriptions from those who lack medical training, Limited trust, rarely checking what medications are taken, Unhappy with time spent with physicians.

- **Health care system factors affecting medication adherence Factors**

If a patient is not taught properly, if their follow-up is missed, when there is not a clear medication routine and prescriptions are too short. Being of a certain ethnic group, Living at home, Being admitted to a hospital over the previous months, Previous history of Chronic obstructive pulmonary disorder, Suffering from recurrent dizziness.

The complexity of medication adherence among elderly individuals and the importance of tailored interventions to address this issue effectively. Anmaria, Thomas, *et al.* demonstrated the positive impact of virtual patient counseling on medication adherence, suggesting the potential of technology-driven interventions in improving adherence rates among older adults.

Conversely, **Aml A Salama *et al.*** identified various demographic and medication-related factors influencing adherence, emphasizing the need for personalized approaches considering individual patient characteristics. Additionally, Angela Frances Yap et al.'s review underscored the diverse array of factors contributing to medication non-adherence in geriatric populations, ranging from medication-related issues to patient, healthcare provider, and healthcare system factors. Additionally, tools like pill organizers, medication calendars, and smartphone apps can assist older adults in adhering to their medication schedules. Ensuring effective communication between patients and healthcare providers, which involves providing clear instructions, addressing concerns regarding side effects or expenses, and conducting regular medication reviews, is crucial for promoting adherence and overcoming barriers to it. Overall, the discussion highlights the multifaceted nature of medication adherence and the necessity of comprehensive strategies to address this challenge effectively and improve health outcomes among elderly individuals.

4. QUALITY OF LIFE

Elizabeth Winter Holt *et al.* explored medication adherence among CoSMO participants, revealing its intricate ties to quality of life (QOL) in the elderly. With a mean age of 75.0 years and a majority white and female population, the study contextualizes adherence within demographic parameters. The assessment using MMAS-8 delineated varying adherence levels, with significant implications for QOL. Factors such as longer hypertension duration, medication complexity, and cost-related issues influenced adherence, subsequently impacting QOL. High adherence correlated with better physical and mental health outcomes, while low adherence was consistently associated with poorer QOL, even after adjusting for confounding variables. Subgroup analyses reinforced these trends across demographic strata. Additionally, participants with low physical and mental component summary scores showed a heightened risk of non-persistent medication refills, further underscoring the enduring influence of adherence on QOL outcomes. These findings underscore the imperative for tailored interventions aimed at enhancing medication adherence to improve QOL among elderly populations managing chronic conditions like hypertension **(Holt, E. W., *et al*. 2010).**

Geriatric care requires a delicate approach to maintaining quality of life (QOL) while managing chronic conditions. Demographic factors such as age, gender, and education level significantly influence QOL, with advanced age and lower education often correlating with diminished well-being. Chronic conditions like hypertension add complexity, as managing multiple medications can strain QOL, especially when financial constraints lead to medication non-adherence. With higher adherence is linked to better physical and mental health outcomes. Conversely, low adherence correlates with poorer QOL, underscoring the importance of adherence in geriatric care. Tailored interventions targeting medication adherence challenges, such as patient education and support programs, are crucial for enhancing QOL in this population. By addressing the unique needs of elderly individuals and prioritizing medication adherence, healthcare providers can significantly improve QOL and overall health outcomes in geriatric patients. Improving quality of life (QOL) in geriatrics involves a multifaceted approach addressing various aspects of physical, mental, and social well-being. strategies:

- **Comprehensive Healthcare**: Ensure access to quality healthcare services tailored to the specific needs of older adults, including preventive care, chronic disease management, and geriatric assessments.
- **Medication Management:** Optimize medication regimens by minimizing polypharmacy, addressing potential adverse effects, and promoting adherence through patient education and medication reconciliation.
- **Physical Activity:** Encourage regular exercise and physical activity tailored to individual abilities and preferences to improve mobility, strength, and overall health.
- **Nutrition:** Promote healthy eating habits and address nutritional deficiencies to support optimal health and well-being in older adults.
- **Social Engagement:** Facilitate opportunities for social interaction, community involvement, and meaningful relationships to combat social isolation and loneliness.
- **Cognitive Stimulation:** Offer activities and programs that stimulate cognitive function, such as puzzles, games, and lifelong learning opportunities, to promote brain health and cognitive vitality.
- **Emotional Support:** Provide access to mental health services, support groups, and counseling to address emotional challenges, such as depression, anxiety, and grief.
- **Environmental Adaptations:** Ensure a safe and supportive living environment by addressing mobility barriers, improving accessibility, and implementing age-friendly modifications in homes and communities.
- **Pain Management:** Address pain and discomfort effectively through comprehensive assessment, multimodal interventions, and personalized pain management plans.
- **Advance Care Planning:** Engage older adults in discussions about their healthcare preferences, values, and goals of care to ensure that their wishes are respected and honored as they age.

5. CONCLUSION

Pharmacists are indispensable in optimizing health management for geriatric patients, particularly concerning medication adherence and related factors. Their expertise in identifying potentially inappropriate prescriptions, conducting medication reviews, and providing patient education and counseling plays a crucial role in addressing the complexities of polypharmacy and inappropriate prescribing practices among older adults. Pharmacists also leverage innovative solutions such as virtual patient education to enhance medication adherence and improve therapeutic outcomes. By collaborating with other healthcare providers in comprehensive care teams, pharmacists ensure that older adults receive personalized interventions tailored to their unique needs, ultimately promoting healthy aging and well-being. In essence, pharmacists are key players in the healthcare system, serving as advocates for older adults and contributing significantly to their overall health and quality of life.

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