

Mini Review: Impact of Polypharmacy Treatment on Geriatric Patients

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Abstract: Polypharmacy, the concurrent use of five or more drugs by a patient, is a common occurrence in elderly individuals and is associated with potential hazards. Identifying and avoiding polypharmacy can lead to better outcomes and improve the quality of life for elderly patients. The purpose of this paper is to describe the impact of polypharmacy acceptance in geriatric patients. The method used to achieve this aim will be described in the form of a questionnaire: The research method employed is a narrative review, conducted using databases from PubMed and Google Scholar, covering the period from 2015 to 2023. The results indicate that polypharmacy is associated with increased mortality rates, incidence of disability, combined events, and hospitalizations. Furthermore, polypharmacy has a significant impact on the cost of health services for patients and the healthcare system. It can lead to an increase in the dispensing of prescription drugs. Geriatric patients who receive polypharmacy are susceptible to Adverse Drug Events (ADEs) due to drug interactions. This can have a significant impact on their health, healthcare costs, and mortality rates. The use of multiple drugs can lead to ADEs.

1 INTRODUCTION

Polypharmacy is the use of multiple drugs that exceeds the clinically indicated amount. Nonpolypharmacy refers to the use of 0-4 drugs, while polypharmacy refers to the use of 5-9 drugs. Polypharmacy overload is the use of 10 or more drugs (Sahne BS, 2016).

Polypharmacy is a prevalent issue, particularly among geriatric patients. A European study found that 51% of home care patients take six or more medications daily. In the UK, the average number of drugs prescribed to individuals aged 65 and over has nearly doubled from 21.2 to 40.8 types per year (Johansson et al., 2016). Zulkarnaini and Martini (2019) conducted research at the Polyclinic of RSUP M. Djamil Padang and found that 64.72% of geriatric patients experienced polypharmacy (Zulkarnaini & Martini, 2019).

The global elderly population has been the subject of extensive research, with over 260 million people worldwide. According to the World Health Organization (WHO), Indonesia's elderly population is expected to reach 38 million by 2030 and 61 million by 2050 (Faisal et al., 2023). This raises concerns about the exponential increase in chronic and non-

communicable diseases, leading to geriatric patients receiving polypharmacy treatment to manage their conditions (Morin et al., 2018).

As individuals age, their body mass decreases and they tend to have a higher proportion of body fat compared to younger individuals. In the elderly, some fat-soluble drugs have an increased distribution volume, resulting in a relatively prolonged clearance rate (Rochon et al., 2017). Therefore, polypharmacy in geriatric patients may lead to unwanted effects and is associated with a higher risk of harm compared to non-polypharmacy (Almodovar AS & Nahata MC, 2019). Polypharmacy is associated with an increased risk of potentially inappropriate drugs, medication errors, side effects, hospitalization, and higher medical costs, and can even lead to death (Whitney et al., 2021).

This article review aims to examine the relative impacts experienced by geriatric patients receiving polypharmacy treatment. The goal is to identify the best treatment practices to minimize negative impacts on geriatric patients.

2 METHODS

The writing method employed is narrative studies or narrative reviews. This review uses articles obtained from literature searches using databases derived from PubMed and Google Scholar. The articles used were published between 2015 and 2023. When writing article reviews, data searches are conducted using the keyword 'the impact of polypharmacy on geriatrics'. The articles used are obtained from national and international journals. The literature search aims to increase knowledge related to research on polypharmacy.

3 RESULTS AND DISCUSSION

Polypharmacy is the term used to describe the use of multiple drugs. However, the literature provides several different definitions of polypharmacy. Some definitions refer to drug use that does not align with the diagnosis, the simultaneous use of multiple drugs to treat one or more diseases that occur together, the simultaneous use of 5-9 drugs, or the improper use of drugs that can increase the risk of adverse drug events (Sahne BS, 2016).

Polypharmacy is a common occurrence in geriatric patients and is often linked to adverse effects and prolonged hospitalization. The administration of medication to elderly patients is a challenging task that necessitates careful consideration of the benefits and potential harms. Any errors in prescribing medication can have a significant impact on the patient's health and well-being. The complexity of the challenge arises from changes in age and body functions, disease history, and the existence of polypharmacy (Johansson et al., 2016).

Polypharmacy can pose risks for elderly individuals (Wauters et al., 2016). This is due to the increased likelihood of drug interactions that can occur with a greater number of medications. Additionally, physiological changes associated with aging, such as weight loss, liver and kidney damage, decreased cardiac output, and body composition changes, can make the elderly more susceptible to adverse drug reactions (Santanasto et al., 2017).

Geriatric patients experience changes in pharmacokinetics and pharmacodynamics. These changes in pharmacokinetics are caused by a decrease in absorption ability due to changes in the gastrointestinal tract, changes in distribution associated with decreased cardiac output and protein-drug binding, metabolic changes due to decreased

liver and kidney function, and decreased excretion rate due to decreased kidney function. Pharmacodynamic changes can be influenced by the degeneration of drug receptors in tissues, which can result in altered receptor quality or a reduced number of receptors (Supartondo, 2015).

The literature reviews conducted revealed that polypharmacy can affect health, health service utilization, and drug management. Polypharmacy in the health sector can have a significant impact on health, including drug side effects, adverse drug reactions, anxiety, circulatory system diseases, cognitive disorders, delirium, depression, disability, decreased function, dizziness, dry mouth, metabolic and endocrine system disorders, weakness, gastrointestinal disorders, genitourinary disorders, malnutrition, multimorbidity, weight loss, and even death (Leelakanok et al., 2017).

Polypharmacy is concerned with the safe and effective use of drugs by patients, encompassing prescribing, dispensing, and administering. It is associated with potential treatment errors resulting from improper prescribing, non-adherence to medication, drug interactions, and differences (Burt et al., 2018).

Polypharmacy is associated with various negative outcomes related to health service utilization, such as hospitalization, unplanned hospitalization, and an increase in the number of prescriptions. These outcomes include ADR hospitalization, emergency department visits, longer hospital stays, higher medical costs, and unplanned transfers (Leelakanok et al., 2017).

Geriatric populations are at risk of potentially inappropriate drugs (PIMs) due to several comorbid conditions and changes in pharmacokinetics and pharmacodynamics, making them susceptible to improper prescribing. Despite Indonesia having a large geriatric population, information related to PIMs is still limited, particularly in healthcare facilities.

According to a review of research conducted in Europe and America, the prevalence of potentially inappropriate medication (PIM) is as high as 40%. In Japan and Malaysia, the prevalence of PIM is 21.1% and 32.7%, respectively (World Health Organization, 2018).

Polypharmacy can contribute to the occurrence of Drug Related Problems (DRP) in geriatric patients, in addition to PIM. DRP refers to undesirable events or conditions that can affect health outcomes and are often experienced by patients during actual or potential treatment therapy.

DRP can be classified into several categories based on the nature of the difference, including unnecessary drug therapy, the need for additional drug therapy, ineffective drug therapy, incorrect dosage (either too high or too low), and adverse drug reactions (ADRs) resulting from patient non-compliance (Ayele & Tesfaye, 2021).

Drug-related problems (DRP) in the elderly are influenced by several factors, including polypharmacy, inappropriate prescribing (IP), underuse, and medication adherence. Inappropriate prescribing (IP) refers to pharmacotherapy prescribing that has potential risks of use greater than the clinical benefits. This generally occurs in elderly outpatients. According to a study that used explicit criteria, 15% and 21% of seniors residing in communities and taking one or more medications experienced issues related to dosing, duration, duplication, or drug interactions.

Underuse is defined as the omission of a medication therapy indicated for the treatment or prevention of a disease. The risk of underuse is common in the aged population and increases with age (Meid et al., 2015). Underuse has important associations with negative health outcomes in older adults, including functional disability, death and healthcare use.

According to the World Health Organization (WHO), medication adherence refers to the ability of a person to use a drug in accordance with the agreed recommendations from healthcare providers. Patient compliance with drug usage is a crucial factor in determining the success of therapy and avoiding serious impacts. Non-adherence to medication among the elderly is prevalent, with rates ranging from 40% to 80% (averaging at about 50%). According to the literature examined by McGrath (2017), older patients may also be non-compliant due to possible side effects, inability to read labels on products, or even a lack of full understanding. To overcome these possible impacts, prescribing can be used. Prescription is the process of identifying and stopping drugs that are unnecessary, ineffective, or inappropriate to reduce polypharmacy and improve the quality of health. The collaborative process involves considering the benefits and harms of a drug in relation to patient care goals, functional levels, life expectancy, values, and preferences.

Fauziah's (2020) literature review suggests that patient-specific prescribing interventions are linked to improved survival rates. Discontinuing prescriptions can lead to reduced healthcare costs, fewer drug interactions and PIM, better medication adherence, and increased patient satisfaction.

4 CONCLUSION

The use of large amounts of medication or polypharmacy can have negative effects on health, increase healthcare costs, and even lead to death. This is especially concerning for geriatric patients who are receiving multiple medications, as evidenced by 18 reviewed articles that establish a clear link between the use of polypharmacy and negative health outcomes, including an increased risk of death.

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