ARTIFICIAL INTELLIGENCE SUPPORTING PHARMACEUTICAL CARE FOR THE ELDERLY POPULATION: AN INTEGRATIVE REVIEW

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Abstract

Background: Population aging is one of the most significant challenges of the 21st century, with estimates indicating that more than 2.1 billion people will be aged 60 years or older by 2050. This scenario is associated with an increased prevalence of chronic diseases, simultaneous use of multiple medications (polypharmacy), risks of adverse drug reactions, cognitive decline, and psychosocial vulnerabilities, making pharmacotherapeutic management in older adults particularly complex. Pharmaceutical care plays a crucial role in promoting the rational use of medicines, preventing adverse events, and improving quality of life. Artificial Intelligence (AI) has emerged as a strategic tool to support clinical decision-making, optimize care processes, and provide personalized interventions, enhancing medication safety and treatment effectiveness in the elderly population. **Purpose:** To analyze the scientific evidence on the application of AI in supporting pharmaceutical care for older adults, focusing on pharmacotherapy management, treatment adherence, prevention of adverse events, and quality of life improvement. **Methods:** An integrative literature review was conducted between May and June 2025 using PubMed, Scopus, BVS/Lilacs, and EBSCO databases. Controlled and uncontrolled descriptors combined with Boolean operators were utilized. Original qualitative or quantitative studies published in the past five years that focus on the use of AI in pharmaceutical care for older adults were included. Dissertations, theses, editorials, and studies unrelated to the research question were excluded. The selection process was performed in three stages: title screening, abstract analysis, and full-text review, with two researchers independently conducting the review and a third reviewer mediating in case of disagreements. **Results:** A total of 38 studies were identified. After removing duplicates, six articles were included in the review. The findings highlight AI applications in predicting medication adherence, reviewing complex treatments involving polypharmacy, early detection of clinical risks, dose personalization, and remote monitoring of elderly patients. Initiatives such as pharmacist-led adherence programs supported by AI and clinical decision-support systems showed high agreement among professionals and positive impacts on therapeutic safety. **Conclusion:** AI is a promising partner in enhancing pharmaceutical care for the elderly, improving safety, adherence, and treatment effectiveness. However, widespread adoption necessitates user-friendly interfaces, adequate training for pharmacists, and strategies to ensure the safe and equitable use of these technologies. **Implications:** The results emphasize the need for

investment in AI-based solutions applied to pharmaceutical practice to improve the quality of medication management for older adults and promote healthier and safer aging.

Keywords: Artificial Intelligence; Pharmaceutical Care; Aging; Medication Adherence.