



# Chapter 1

## A Digital Health Perspective on Medication Use and Polypharmacy Management for Improving Healthcare Outcomes in Geriatric Patients

**Tungki Pratama Umar**

 <https://orcid.org/0000-0001-6975-8096>  
*University College London, UK*


**Andrei Tanasov**

 <https://orcid.org/0000-0002-7769-3234>  
*Carol Davila University of Medicine and  
Pharmacy, Romania*


**Bella Stevanny**

*Universitas Sriwijaya, Indonesia*


**Dessy Agustini**

 <https://orcid.org/0000-0002-9364-0853>  
*Universitas Sriwijaya, Indonesia*


**Tirth Dave**

 <https://orcid.org/0000-0001-7935-7333>  
*Bukovinian State Medical University, Ukraine*


**Ayman Nabhan**

 <https://orcid.org/0000-0002-8858-093X>  
*Al Andalus University for Medical Sciences, Syria*

**Maysa Madany**

 <https://orcid.org/0000-0001-8545-3647>  
*South Valley University, Egypt*


**Muiz Ibrahim**

 <https://orcid.org/0000-0002-5714-2929>  
*International Higher School of Medicine,  
International University of Kyrgyzstan,  
Kyrgyzstan*


**Dang Nguyen**

*Massachusetts General Hospital, USA*

**Shivani Jain**

 <https://orcid.org/0000-0002-0648-745X>  
*Genesis Institute of Dental Sciences and  
Research, India*

**Nityanand Jain**

 <https://orcid.org/0000-0002-7918-7909>  
*Riga Stradins University, Latvia*

DOI: 10.4018/979-8-3693-0260-6.ch001

## **ABSTRACT**

*The high prevalence of multiple comorbidities poses unique medication-related challenges for geriatric patients. Polypharmacy is a particular concern since taking several medications simultaneously increases the likelihood of adverse drug events and the risk of drug interactions while decreasing patient adherence. These factors are associated with suboptimal health outcomes and a heightened burden on the healthcare system (insurance claims) and the patient (out-of-pocket expenses). These challenges can significantly affect the quality of life of geriatric patients. This chapter critically examines the impact of medication use and polypharmacy on the quality of life of older patients. In addition, the authors discuss how artificial intelligence-based digital tools and precision medicine can address these issues by streamlining medical decision-making, improving the patient experience, and allowing remote monitoring. Finally, they interpret the findings from the lens of ethical considerations associated with the adoption and implementation of digital applications and gadgets.*

## **INTRODUCTION**

The geriatric population experiences several medication-related concerns due to the higher prevalence of chronic diseases in this group, particularly in the context of polypharmacy, which is defined by Borodo et al (2022) and Nobili et al (2011) as the simultaneous use of more than five different types of drugs. According to Aiezza et al (2021) and Dagli & Sharma (2014), taking several medications raised the risk of adverse drug reactions (ADRs), drug-drug interactions, prescription errors, lowers medication adherence, while increasing healthcare expenses. Fauziyah et al (2017) found that these difficulties can strongly influence patients' physical, mental, and social well-being, thereby, lowering the overall quality of life.

According to Frishammar et al (2023), the advent of digital technology has resulted in innovative techniques to improve medication management in geriatric patient. Electronic medication dispensers, for example, help to coordinate medication schedules, distribute the correct dosage at the scheduled time, and provide medication reminders, according to Shahani et al (2022). Dayer et al (2013) stated that patients and caregivers can benefit from mobile applications and gadgets that track medication compliance, send notifications, and provide medication-related content, and Marien et al (2017) stated that the deployment of medication reconciliation procedures and decision support tools has also been aided by digital transformation.

As per Wheatley (2013), medication reconciliation includes a review of patient's drug regimen to confirm that it is correct and acceptable. Healthcare practitioners can use digital tools to collect comprehensive treatment histories, detect potential

37 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/a-digital-health-perspective-on-medication-use-and-polypharmacy-management-for-improving-healthcare-outcomes-in-geriatric-patients/335309](http://www.igi-global.com/chapter/a-digital-health-perspective-on-medication-use-and-polypharmacy-management-for-improving-healthcare-outcomes-in-geriatric-patients/335309)

## Related Content

---

### Thermal Evaluation of Myogenous Temporomandibular Disorders and Myofascial Trigger Points in the Masticatory Muscles

Denise Sabbagh Haddad, Marcos Leal Brioschiand Emiko Saito Arita (2017). *Oral Healthcare and Technologies: Breakthroughs in Research and Practice* (pp. 329-350).

[www.irma-international.org/chapter/thermal-evaluation-of-myogenous-temporomandibular-disorders-and-myofascial-trigger-points-in-the-masticatory-muscles/178989](http://www.irma-international.org/chapter/thermal-evaluation-of-myogenous-temporomandibular-disorders-and-myofascial-trigger-points-in-the-masticatory-muscles/178989)

### Joint Vibration Analysis (JVA) and the Diagnostic Process in TMD

Ray M. Becker, DDS, FAGD (2020). *Handbook of Research on Clinical Applications of Computerized Occlusal Analysis in Dental Medicine* (pp. 299-361).

[www.irma-international.org/chapter/joint-vibration-analysis-jva-and-the-diagnostic-process-in-tmd/233654](http://www.irma-international.org/chapter/joint-vibration-analysis-jva-and-the-diagnostic-process-in-tmd/233654)

### Understanding Posturo-Occlusal Interrelationships by Combining Digital Occlusal and Posture Diagnostic Technologies

Patrick Girouard, DMD MS (2020). *Handbook of Research on Clinical Applications of Computerized Occlusal Analysis in Dental Medicine* (pp. 1175-1242).

[www.irma-international.org/chapter/understanding-posturo-occlusal-interrelationships-by-combining-digital-occlusal-and-posture-diagnostic-technologies/233668](http://www.irma-international.org/chapter/understanding-posturo-occlusal-interrelationships-by-combining-digital-occlusal-and-posture-diagnostic-technologies/233668)

### Scientometric Analysis of Teaching Geriatric Dentistry in Institutions of Higher Education: A Global Perspective

Murtala Ismail Adakawa, Elizaveta Vitalieвна Sokolovaand N. S. Harinarayana (2024). *Geriatric Dentistry in the Age of Digital Technology* (pp. 144-173).

[www.irma-international.org/chapter/scientometric-analysis-of-teaching-geriatric-dentistry-in-institutions-of-higher-education/335314](http://www.irma-international.org/chapter/scientometric-analysis-of-teaching-geriatric-dentistry-in-institutions-of-higher-education/335314)

## Dental Implant Selection: A Study in Odisha-Based Elderly Patients

Suchismita Satapathy, Hullash Chauhan and Debesh Mishra (2024). *Geriatric Dentistry in the Age of Digital Technology* (pp. 77-100).

[www.irma-international.org/chapter/dental-implant-selection/335311](http://www.irma-international.org/chapter/dental-implant-selection/335311)