

Polypharmacy and Potentially Inappropriate Prescriptions: Insights from a Systematic Review of Definitions and Assessment Tools

Artenca Shkenza^{1*}, Irina Argjiri², Klejda Harasani¹

¹ Department of Pharmacy, Faculty of Medicine, University of Medicine Tirana; Tirana, Albania

² Ministry of Health and Social Welfare, Tirana, Albania

Abstract

Background: Polypharmacy is an important and growing challenge for modern clinical practice, attracting interest from clinicians, guideline developers, and policymakers. The variability in definitions and measurement methods across studies complicates direct comparison of results about polypharmacy. A major concern within the context of polypharmacy is the occurrence of Potentially Inappropriate Prescriptions (PIP), medications for which the potential risks outweigh the benefits.

Aims: This study aims to systematically review and synthesize definitions of polypharmacy, PIP and tools for PIP detection in the published literature.

Study design: Systematic review conducted in

accordance with PRISMA guidelines.

Methods: We screened three databases: PubMed, Google Scholar, and Cochrane, including peer-reviewed studies that reported definitions of polypharmacy or PIP, or applied tools to assess them. Eligible studies included observational, interventional, or methodological articles, and relevant systematic reviews focused on adult populations in any care setting, published in English. We extracted the following data and organized results in summary tables: first author, year of publication, study design, main objective, definition of polypharmacy, definition and tools to assess PIP and associated variables (population, age, setting, diagnosis).

Results: A total of 220 records were identified, of

which 70 studies were included. There exists substantial heterogeneity in defining polypharmacy and more specific terms such as excessive polypharmacy, appropriate polypharmacy, and unnecessary polypharmacy. A total of 60 definitions of polypharmacy and associated terms were identified. There were 36 numerical- only definitions (60 % of all definitions), 7 numerical definitions associated with other descriptive terms (11.66 %), and 17 descriptive definitions (28.34 %). The qualitative definitions of polypharmacy reflect a shift from viewing it as a purely numerical concept toward a more clinical and appropriateness-based perspective. The most common definition identified polypharmacy as the concurrent use of 5 or more medications, adopted by 19 studies (52.8 %), followed by other definitions ranging from 4 or more to 15 medications. A clear predominance of explicit criterion-based tools in defining PIP (73.53 %) reflected a standardized approach across studies. In contrast, implicit tools and clinical judgment (8.82 %), risk–benefit conceptual definitions (17.65 %).

Conclusion: This review highlights the need for more standardized yet context-sensitive definitions of polypharmacy and PIP. The integration of validated tools, along with individualized approaches such as deprescribing and shared decision-making, is particularly important in high-risk populations, including older adults and patients with multimorbidity.

Keywords: polypharmacy, potentially inappropriate prescriptions, prescribing, explicit criteria, implicit tools