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Concentration and Heterogeneity of Medication Combination Patterns for Common Diseases in Retail Pharmacies: Evidence from Xiongcheng Jianmin Pharmacy in Zhuji City, 2023-2024

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Abstract This study systematically characterizes the concentration and heterogeneity of medication-use structures for common diseases in retail pharmacies from a “medication combination” perspective, aiming to reveal real-world decision-making logic in primary care medication use and to identify potential risks of inappropriate medication use. Using health insurance settlement sales and electronic dispensing data from Xiongcheng Jianmin Pharmacy in Zhuji City, Zhejiang Province, covering 2023–2024, transaction records were taken as the unit of analysis to construct disease-level indicators of medication combination concentration. Drawing on industrial organization theory, the Herfindahl–Hirschman Index (HHI) was introduced to quantitatively measure the degree of concentration or dispersion of medication combinations across different diseases based on sales revenue, and to compare structural differences among disease categories. A total of 19,661 valid purchase records were included during the study period, with cumulative sales of approximately RMB 4.376 million. The results indicate pronounced disease-specific differentiation in medication combination concentration in retail pharmacies: chronic conditions such as hypertension and hyperlipidemia exhibit highly concentrated medication use centered on a small number of core drugs, forming a stable structure characterized by a “single core drug plus a limited number of adjunctive medications”; in contrast, gastrointestinal diseases, sleep disorders, and functional conditioning conditions show lower concentration, with the coexistence of traditional Chinese medicines and chemical drugs, more dispersed structures, and marked heterogeneity, which are more susceptible to patients’ individual preferences, pharmacists’ recommendations, and price factors. Overall, medication combinations for common diseases in retail pharmacies display a structural pattern in which high-frequency core combinations dominate alongside numerous low-frequency long-tail combinations. Indicators of medication combination concentration and heterogeneity effectively capture real-world primary care medication behaviors and provide new quantitative tools and empirical evidence for identifying potential drug-related problems, optimizing pharmacist interventions, and advancing rational medication management.

Keywords Retail pharmacy; Medication combinations; Concentration; Heterogeneity; Rational drug use

1 Introduction

With the continued advancement of China’s tiered diagnosis and treatment system and the ongoing improvement of the primary healthcare service network, the role of retail pharmacies in the supply of medicines for common and frequently occurring diseases has become increasingly prominent. Compared with medical institutions, retail pharmacies are characterized by wide geographic distribution, high accessibility, and convenient access to medicines, and have thus emerged as important healthcare service nodes for community residents to meet initial medication needs for acute minor illnesses and chronic conditions (Miller and Goodman, 2016). Previous studies have shown that, particularly in Asia and in low- and middle-income countries, patients are more inclined to obtain medications for common diseases through retail pharmacies. In China’s urban and rural primary care settings, the functions of retail pharmacies have gradually expanded from simple drug sales to include a certain degree of pharmaceutical consultation and preliminary medication guidance, making them important venues for self-medication and primary health management among residents.

Against the backdrop of a continuously increasing burden of chronic diseases and the growing prevalence of multimorbidity, the complexity of medication regimens among primary care populations has risen markedly. Retail pharmacies have assumed an increasingly central role in the routine medication management of conditions