

Role of Pharmacist in Rational Use of Drugs

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Date of Submission: 01-04-2026

Date of Acceptance: 11-04-2026

Abstract

Rational use of drugs (RUD) is essential for hoensuring safe, effective, and economical healthcare delivery. The World Health Organization (WHO) defines rational medicine use as providing medications appropriate to clinical needs, in correct doses, for adequate duration, and at the lowest possible cost. Despite advances in pharmaceutical sciences, irrational medicine use remains a major global public health concern, particularly in developing countries such as India. Common forms include polypharmacy, misuse of antibiotics, irrational fixed-dose combinations, self-medication, and preference for expensive branded medicines over cost-effective generics. These practices contribute to antimicrobial resistance, adverse drug reactions, therapeutic failure, and increased healthcare expenditure.

Pharmacists play a critical role in promoting rational drug use across hospital, community, and public health settings. Their responsibilities extend beyond dispensing medicines to prescription evaluation, patient counseling, pharmacovigilance, generic substitution, and provision of drug information. This review examines the concept, causes, and consequences of irrational drug use and highlights the role of pharmacists in promoting rational pharmacotherapy, with emphasis on WHO strategies and the Indian healthcare system.

Keywords: Rational use of drugs, Pharmacist, WHO, Pharmacovigilance, Patient counseling

I. Introduction

Medicines are among the most effective tools for disease prevention, treatment, and control. Appropriate medicine use significantly reduces morbidity and mortality and improves quality of life. However, irrational use of medicines remains widespread worldwide. The WHO estimates that more than 50% of medicines are prescribed, dispensed, or used inappropriately, and nearly half of patients do not take medicines as prescribed [2,3].

Irrational drug use includes polypharmacy, unnecessary antibiotic prescribing,

overuse of injections, and self-medication. These practices increase adverse drug reactions, antimicrobial resistance, and healthcare costs [2,9]. The problem is particularly severe in developing countries due to weak regulatory systems, inadequate patient awareness, and limited healthcare resources [3,11].

In India, irrational medicine use is influenced by easy availability of medicines without prescription, lack of adherence to treatment guidelines, and aggressive pharmaceutical marketing. Pharmacists act as an important link between prescribers and patients. Their role has evolved from simple dispensing to patient-centered pharmaceutical care, which helps improve medication safety and therapeutic outcomes [10–12].

Concept of Rational Use of Drugs

The concept of rational drug use was formally introduced by WHO in 1985. It implies prescribing the right medicine for the right patient in the right dose, route, duration, and cost [1,2]. Rational pharmacotherapy is based on scientific evidence, clinical judgment, and patient-specific factors such as age, body weight, disease severity, and coexisting conditions [4–6].

An example of rational drug use is prescribing a narrow-spectrum antibiotic for a confirmed bacterial infection according to standard treatment guidelines. In contrast, prescribing multiple broad-spectrum antibiotics without proper indication is considered irrational and contributes to antimicrobial resistance [2,9].

Rational drug use involves multiple steps including accurate diagnosis, appropriate drug selection, correct dosage, proper dispensing, patient counseling, and monitoring therapeutic outcomes. Pharmacists contribute significantly to these steps through medication review, patient education, and detection of drug interactions [10–12].

Causes and Consequences of Irrational Drug Use Causes

Prescriber-Related Factors:

Lack of updated knowledge, diagnostic uncertainty,

high patient load, and pharmaceutical marketing influence inappropriate prescribing. Prescribers may use unnecessary antibiotics or multiple medicines to meet patient expectations [1–4].

Patient-Related Factors:

Self-medication, poor adherence to therapy, and demand for injections or antibiotics contribute significantly to irrational drug use. In India, over-the-counter availability of medicines further increases misuse [1,3,4].

Pharmacist-Related Factors:

Commercial pressure, inadequate training, and weak enforcement of ethical practices may result in inappropriate dispensing, including sale of prescription-only medicines without valid prescriptions [11,12].

Healthcare System Factors:

Weak regulatory control, absence of drug and therapeutics committees, poor supply chain management, and inadequate pharmacovigilance systems contribute to irrational medicine use [2,3,7,8].

Pharmaceutical Industry Influence:

Aggressive marketing and promotion of irrational fixed-dose combinations influence prescribing patterns in settings with limited regulation [3,4].

Consequences

Clinical Consequences:

Irrational drug use leads to adverse drug reactions, drug interactions, treatment failure, disease progression, and antimicrobial resistance. Many hospital admissions occur due to preventable medication-related problems [4,5,9].

Economic Consequences:

Unnecessary and expensive medicines increase out-of-pocket expenditure and burden healthcare systems. WHO estimates that 20–40% of global health expenditure is wasted due to inappropriate medicine use [2,3].

Public Health Consequences:

Irrational medicine use contributes to antimicrobial resistance, reduced effectiveness of essential medicines, and increased disease burden, particularly in resource-limited countries [2,3,9].

Quantified Burden of Irrational Use of Medicines

Irrational use of medicines is a major global public health challenge. The World Health Organization (WHO) estimates that more than 50% of medicines are prescribed, dispensed, or used inappropriately, while nearly half of patients fail to follow proper medication instructions [2,3]. Such practices lead to adverse drug reactions, antimicrobial resistance, therapeutic failure, and increased mortality.

In India, approximately 20–30% of prescriptions are considered unnecessary or inappropriate, and nearly 30–40% of antibiotic use is irrational [3,7,9]. Adverse drug reactions contribute significantly to preventable hospital admissions, increasing healthcare burden. Economically, WHO estimates that 20–40% of global healthcare expenditure is wasted due to inappropriate medicine use [2,3]. In India, irrational medicine use results in substantial financial loss due to unnecessary prescriptions, preference for expensive branded medicines, and management of drug-resistant infections [3,7].

Role of Pharmacist in Promoting Rational Use of Drugs

Pharmacists are medicine experts and among the most accessible healthcare professionals. Their involvement significantly improves rational medicine use.

Prescription Evaluation

Pharmacists review prescriptions for accuracy, appropriateness, drug interactions, contraindications, and dosing errors. Early identification of medication-related problems improves patient safety and therapeutic outcomes [10,12].

Patient Counseling and Education

Pharmacists educate patients regarding dosage, administration, duration of therapy, storage, and possible adverse effects. Proper counseling improves medication adherence and reduces misuse [4,12].

Generic Substitution and Cost Containment

Promotion of quality-assured generic medicines reduces treatment costs without compromising therapeutic effectiveness. Generic substitution helps reduce financial burden on patients and healthcare systems [7,12].

Pharmacovigilance and Medication Safety

Pharmacists detect, document, and report adverse drug reactions through pharmacovigilance programs. This strengthens medication safety and helps identify drug-related risks [8].

Drug Information Services

Pharmacists provide unbiased and evidence-based drug information to healthcare professionals and patients. This supports rational prescribing and reduces medication errors [4,12].

Public Health and Policy Role

Pharmacists contribute to immunization programs, disease prevention initiatives, and national health programs. Their participation enhances rational medicine use at community and

population levels [2,12].

Evidence suggests pharmacist-led interventions improve medication adherence by 20–50%, reduce medication errors by 30–50%, and decrease adverse drug reaction-related hospitalizations by approximately 15–20% [4,10–12].

WHO Strategies to Promote Rational Use of Drugs and Pharmacist's Contribution

WHO recommends several interventions to promote rational medicine use, including development of essential medicines lists, implementation of standard treatment guidelines, continuing education of healthcare professionals, and strengthening pharmacovigilance systems [1,2].

WHO also advocates establishment of drug and therapeutics committees, supervision and audit of prescribing practices, public education about medicines, and enforcement of regulatory policies. Pharmacists play a key role in implementing these strategies through monitoring medicine use, educating healthcare professionals, and reporting adverse drug reactions [1,2].

Research Gap and Future Scope

Despite increasing recognition of pharmacist roles, significant research gaps remain, particularly in India. Most studies focus on theoretical roles rather than real-world clinical and economic outcomes of pharmacist interventions [3,11]. Evidence evaluating pharmacist involvement in antimicrobial stewardship, chronic disease management, and medication safety is limited. Community pharmacy practice in India is under-researched, with insufficient data on the impact of patient counseling and prescription review on treatment outcomes. Limited research exists regarding the role of health informatics, electronic prescribing, and clinical decision-support systems in promoting rational drug use [10,12].

Future research should focus on large-scale outcome-based studies to quantify clinical and economic benefits of pharmacist interventions. Strengthening pharmacist roles in primary healthcare programs such as Ayushman Bharat can improve rational medicine use at the population level. Integration of digital health technologies and artificial intelligence-based decision-support systems can further enhance pharmacist contributions to medication safety and patient care [10–12].

II. Conclusion

Rational use of drugs is essential for safe, effective, and economical healthcare delivery. Irrational medicine use remains a major public health challenge globally and in India due to factors such as easy availability of medicines without prescription, lack of adherence to treatment guidelines, and inadequate patient awareness.

These practices contribute to antimicrobial resistance, adverse drug reactions, therapeutic failure, and increased healthcare expenditure.

Pharmacists play a multidimensional role in promoting rational medicine use through prescription evaluation, patient counseling, pharmacovigilance, generic substitution, and provision of drug information. Evidence demonstrates that pharmacist-led interventions improve medication adherence, reduce medication errors, decrease adverse drug reactions, and generate significant cost savings.

Implementation of WHO-recommended strategies requires active pharmacist participation. Strengthening pharmacy education, expanding clinical pharmacy services, and integrating pharmacists into multidisciplinary healthcare teams are essential for improving rational drug use. Adoption of digital health technologies and evidence-based policy reforms can further enhance pharmacist contributions to patient-centered healthcare. Strengthening the role of pharmacists will help reduce irrational medicine use and improve healthcare outcomes in India and worldwide.

References

- [1]. World Health Organization. The rational use of drugs: report of the Conference of Experts, Nairobi, 25–29 November 1985. Geneva: WHO; 1985.
- [2]. World Health Organization. Promoting rational use of medicines: core components. WHO Policy Perspectives on Medicines. Geneva: WHO; 2002.
- [3]. Holloway K, van Dijk L. The world medicines situation 2011: rational use of medicines. 3rd ed. Geneva: WHO; 2011.
- [4]. Tripathi KD. Essentials of medical pharmacology. 8th ed. New Delhi: Jaypee Brothers; 2019.
- [5]. Rang HP, Dale MM, Ritter JM, Flower RJ, Henderson G. Rang and Dale's pharmacology. 8th ed. London: Elsevier; 2016.
- [6]. Sharma HL, Sharma KK. Principles of pharmacology. 3rd ed. Hyderabad: Paras Medical Publisher; 2017.



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- [7]. Ministry of Health and Family Welfare, Government of India. National List of Essential Medicines (NLEM) 2022.
 - [8]. Indian Pharmacopoeia Commission. Pharmacovigilance Programme of India (PvPI). Ghaziabad: IPC; 2020.
 - [9]. World Health Organization. Antimicrobial resistance: global report on surveillance. Geneva: WHO; 2014.
 - [10]. Avery AJ, Rodgers S, Cantrill JA, et al. PINCER trial. *BMJ*. 2012;344:e562.
 - [11]. Smith F. Quality of private pharmacy services in low- and middle-income countries. *Pharmacy World & Science*. 2009;31(3):351–361.
 - [12]. International Pharmaceutical Federation (FIP). *Pharmacists in the supply chain: role and responsibilities*. The Hague: FIP; 2015.