Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/t65vaq57

THE ROLE OF PHARMACISTS IN ENHANCING RATIONAL DRUG USE: A CROSS-SECTIONAL STUDY ACROSS HEALTHCARE SETTINGS

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Abstract

Rational drug use (RDU) is fundamental to effective healthcare, but irrational practices such as polypharmacy, overuse of antibiotics, and poor patient counseling remain widespread. Pharmacists, as medication experts, are strategically positioned to promote safe, effective, and cost-efficient drug use. This cross-sectional study evaluated the role of pharmacists in enhancing RDU across hospitals, community pharmacies, and primary healthcare centers, while also identifying barriers to their involvement. A total of 250 participants, including pharmacists, physicians, and patients, were recruited through stratified random sampling. Data were assembled by structured questionnaires, semi-structured interviews, and observational checklists, and analyzed with descriptive and inferential statistics. The findings revealed that pharmacists demonstrated the highest awareness of RDU principles (92.0%), compared to physicians (68.0%) and patients (40.0%). Key pharmacist-led activities included prescription review (70.0%), patient counseling (82.0%), drug information provision (60.0%), and pharmacovigilance reporting (42.0%). Hospital pharmacists were significantly more involved in prescription review and pharmacovigilance, while community pharmacists focused on patient counseling. Logistic regression indicated that pharmacists with more than 5 years of experience were twice as likely to engage in prescription review (OR = 2.1, 95% CI: 1.2–3.9, p = 0.01). Barriers to optimal involvement included a lack of inter-professional collaboration, heavy workload, and limited access to updated clinical guidelines. This study emphasizes the vital function of pharmacists in promoting rational drug use and highlights the need for supportive policies, professional training, and collaborative healthcare models. Empowering pharmacists could significantly improve medication safety, reduce healthcare costs, and enhance overall patient outcomes.

Keywords: Rational drug use, Pharmacist role, Prescription review, Patient counseling, Pharmacovigilance, Healthcare systems

1. Introduction

Rational use of medicines (RDU) is identified as a core component of healthcare delivery and one of the key factors influencing patient safety and treatment outcomes.[1] The World Health Organisation (WHO) defines rational usage of drugs as follows: Subjects are on medications that are suitable to their clinical requirements, dosages that can fulfill their individual necessity for adequate duration, at minimal expense to them and their community.[2] Despite this being one of the fundamental tenets of health provision, the challenge of inappropriate medication use prescribing is clearly evident and has been documented to occur on a global scale as it has resulted in adverse clinical outcomes, higher costs in healthcare, escalation of antimicrobial resistance and more adversative drug reactions.[3] Polypharmacy, the over-prescription of antibiotics, prescribing drugs without a prescription, assuming brand names are superior to generics as well as inadequate counselling of patients are only a few follies of drug prescribing that have negatively affected the efficiency

Irrational use of drugs has enormous public health implications as well as for patient-specific results.[4] Indiscriminate prescription of antibiotics, for instance, accelerated the growth and expansion of antibiotic resistance (AMR), which is now considered a leading global public health challenges of the 21st century.[5] In an identical manner, uncontrolled prescribing of analgesics and sedatives in some regions has driven the ongoing addiction crises, most prominently, the opioid epidemic.[6] In low-income countries, economic issues related to irrational prescribing are more critical, as a greater portion of the health expenditure will be incurred on drugs that are of no therapeutic value and increase the health inequities.[7] This consciousness of the bad impacts of irrational use of drugs has created momentum for promoting responsible prescribing and reviving structures for medicines control.

Pharmacists perform a central role in advancing the rational use of medicines.[8] While they were once regarded primarily as "dispensers of medication," their responsibilities have expanded considerably in recent decades. Today, pharmacists are recognized not only as experts in pharmacotherapy but also as educators and advocates for patients.[9] Their work now extends beyond the supply of medicines to include evaluating prescriptions, monitoring drug treatment, offering evidence-based information, engaging in pharmacovigilance, and providing counselling to support safe and effective medicine use. Pharmacists can effectively connect prescribers and patients based on their expertise and knowledge of pharmacology and therapeutics, ensuring medicines are used safely, effectively, and efficiently.[10]

Research from high-income countries has demonstrated that variation in pharmacist-led initiatives can lead to appropriate prescribing, reduced adverse drug events, and improved adherence to therapy. For example, pharmacist-led antimicrobial stewardship programs have markedly decreased inappropriate antibiotic utilization and hospital-acquired infections, and, in community settings, counseling from a pharmacist has been associated with improved adherence in chronic diseases like *diabetes* and *hypertension*.[11] Also, the involvement of pharmacists with medication reconciliation activities at transitions in care has reduced adverse events (in this case, medication errors) and rates of hospital readmission. This is significant evidence that pharmacists may be valuable team members as part of multidisciplinary healthcare teams.[12]

The pharmacists' role in rational drug use is varied in different regions and healthcare systems. In many "low- and middle-income countries" (LMICs), pharmacists cannot realize their full potential because of systemic and structural barriers.[13] The most important barriers are high turnover rates in the profession, lack of enforcement of regulations, lack of professional status in the community, and lack of integration into clinical teams. Pharmacists also cannot promote rational drug use without access to continuing professional education and clinical guidelines that reflect their changing professional practice. In contrast, regions that embrace pharmacist support through legislation, education, and collaborative practice have reported large improvements in medication safety, patient outcomes, and efficiency of care.[14]

The difference in roles that pharmacists play in various healthcare systems highlights the necessity and benefit of systematic assessments of their roles and positions in contemporary contexts, especially in places where healthcare prices are limited. Cross-sectional studies are valuable for mapping current professional practices, collaborative networks, and the challenges that may hinder pharmacists from fully performing their roles.[15] Such evidence can serve as a strong basis for policy reform, improvements in healthcare delivery, and the advancement of rational medicine use at both organizational and national levels.

The present study was designed to explore how pharmacists contribute to rational drug use across different "healthcare settings, including hospitals, community pharmacies, and primary care facilities". Using a cross-sectional approach, the study captured data at a single point in time on pharmacists' knowledge, practices, and involvement in key activities such as prescription review, patient education, drug information services, and pharmacovigilance. To provide a broader perspective, input from both physicians and patients was also gathered, highlighting not only the contributions pharmacists make but also the systemic and practice-related barriers that constrain their capacity to optimize patient outcomes.

The existing research was undertaken to determine the part of pharmacists in enhancing rational drug use in diverse health care facilities like health care facilities, hospitals, community pharmacies. The research was cross-sectional in nature as it presented a snapshot of data at one point in time regarding the knowledge, practises, and engagement of pharmacists in activities like prescription review, patient education, drug information provision, and pharmacovigilance. However, the views of physicians and patients were also included to offer a more comprehensive perspective of the contributions pharmacists make and overcome barriers that limit their participation in patient outcome improvements in the system and practise.

2. Methodology

2.1 Study Design

The research used a cross-sectional research design, which allowed for evaluating an instantaneous viewpoint of pharmacists' practices, perspectives, and role in promoting drug use in health systems. The cross-sectional design was beneficial because it allowed for data to be collected at one point in time.

2.2 Study Setting

The experiment was conducted in private hospitals, community pharmacies, healthcare facilities, public hospitals, and primary healthcare centers. These settings were selected to ensure representation of diverse healthcare environments where pharmacists provided services.

2.3 Study Population

The experimental population consisted of licensed pharmacists working in the selected healthcare facilities. In addition, a sample of prescribing physicians and patients was included to capture a broader perspective of pharmacists' contributions toward rational drug use. Inclusion criteria for pharmacists were: (i) holding a valid registration with the local pharmacy council, (ii) having at least six months of professional experience, and (iii) inclination to participate in the study. Physicians and patients were included if they had recent interactions with a pharmacist at the study sites.

2.4 Sample Size and Sampling Technique

A sample size of 250 respondents was assessed using standard sample size calculation formulas for cross-sectional studies, assuming a 95% confidence interval and a 5% margin of error. To ensure proportional representation of respondents from different healthcare settings, Stratified random sampling was employed. Within each stratum, participants were selected using simple random sampling.

2.5 Data Collection Tools and Procedure

Data were gathered utilizing a structured questionnaire and a semi-structured interview guide. The questionnaire was pre-tested on a subset of respondents (10% of the final sample) to assess clarity, reliability, and validity. It contained sections on demographic characteristics, knowledge of rational drug usage, pharmacists' roles in prescribing and dispensing, patient counseling practices, and perceived barriers to promoting rational drug use.

In addition, observational checklists were used in selected facilities to evaluate dispensing practices and patient counseling sessions. Data collection was carried out by trained research assistants led by the principal investigator. The process spanned a period of three months.

2.6 Variables and Measurements

The primary outcome variable was the role of pharmacists in enhancing rational drug use, operationalized through domains such as involvement in prescription review, patient counseling, drug information services, and pharmacovigilance. Independent variables included demographic factors (age, gender, years of experience, type of healthcare setting) and institutional characteristics. Responses were calculated employing a 5-point Likert scale fluctuating from "strongly disagree" to "strongly agree," where applicable.

2.7 Data Analysis

Data were input into Microsoft Excel and analysed using SPSS (version 22.0). Descriptive statistics such as means, frequencies, and percentages were computed for demographic data and practice-related variables. To explore associations between pharmacists' characteristics and their involvement in rational drug use practices, Chi-square tests and logistic regression analyses were conducted. P-values below 0.05 were regarded as statistically significant.

2.8 Ethical Considerations

Ethical approval for the research was obtained from the Institutional Ethics Committee of [Insert University/Organization]. Written informed consent was obtained from all participants before data were collected. Anonymity and confidentiality of respondents were preserved throughout the study, and participation was voluntary with the option to withdraw at any time

3. Results

3.1 Demographic Characteristics of Respondents

A total of 250 participants were involved in the research, consisting of 150 pharmacists (60.0%), 50 physicians (20.0%), and 50 patients (20.0%). The mean age of pharmacists was 32.8 ± 6.4 years, with a male-to-female ratio of 1.2:1. The majority of pharmacists (72.0%) had between 1–5 years of professional experience, and 45.0% were working in hospital pharmacies, 35.0% in community pharmacies, and 20.0% in primary healthcare centers.

Table 1: Demographic Characteristics of Pharmacist Respondents (n = 150)

Variable	Frequency (n)	Percentage (%)
Gender (Male)	85	56.7
Gender (Female)	65	43.3
Age (25–30 years)	68	45.3
Age (31–40 years)	54	36.0
>40 years	28	18.7
Experience (1–5 years)	108	72.0
Experience (>5 years)	42	28.0
Workplace – Hospital	68	45.0
Workplace – Community	53	35.0
Workplace – PHC	29	20.0

3.2 Awareness of Rational Drug Use

The majority of pharmacists (92.0%) demonstrated adequate knowledge of the principles of drug usage, whereas only 68.0% of physicians and 40.0% of patients were aware of the concept. Pharmacists scored highest on knowledge regarding generic prescribing (88.0%), appropriate antibiotic use (84.0%), and avoidance of polypharmacy (76.0%).

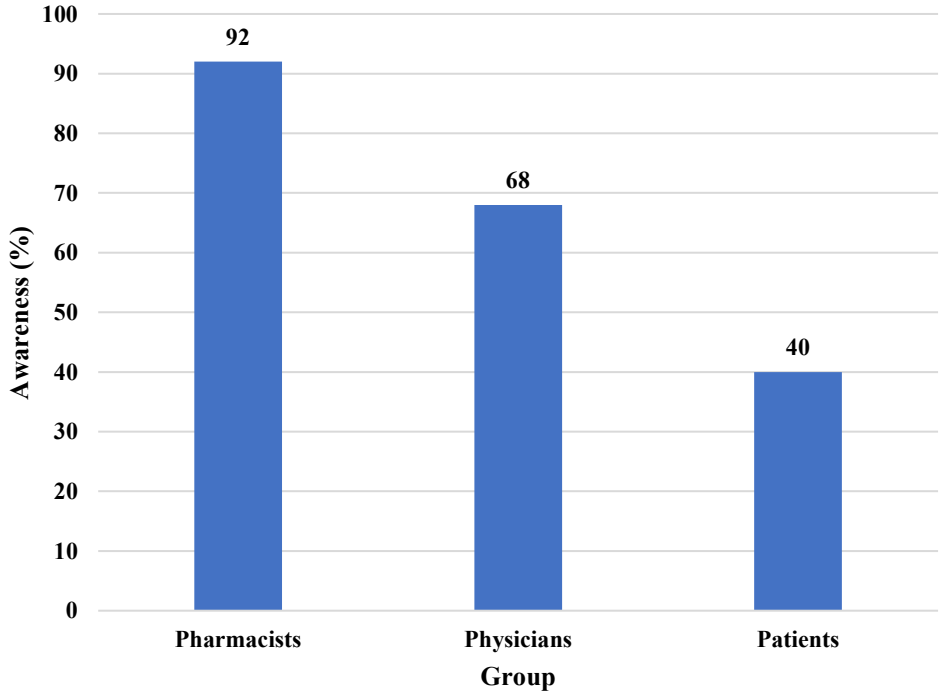

Figure 1. Awareness of Rational Drug Use Across Participant Groups

Figure 1 shows the comparative awareness levels of rational drug use among pharmacists, physicians, and patients. Pharmacists demonstrated the highest awareness (92.0%), followed by physicians (68.0%) and patients (40.0%), highlighting significant knowledge gaps between healthcare professionals and the public.

3.3 Pharmacists' Role in Rational Drug Use

Pharmacists reported active involvement in promoting rational drug use. Specifically:

- Prescription review was performed routinely by 70.0% of pharmacists, occasionally by 20.0%, and not at all by 10.0%.
- Patient counseling was provided by 82.0% of pharmacists, mainly focusing on dosage, duration, and potential adverse drug reactions.
- Drug information services (responding to queries from physicians/patients) were regularly provided by 60.0% of pharmacists.
- Pharmacovigilance activities such as adverse drug reaction (ADR) reporting were carried out by 42.0% of pharmacists mentioned in Table 2.

Table 2: Pharmacists' Role in Enhancing Rational Drug Use (n = 150)

Activity	Regularly (%)	Occasionally (%)	Never (%)
Prescription review	70.0	20.0	10.0
Patient counseling	82.0	12.0	6.0
Drug information provision	60.0	28.0	12.0
Pharmacovigilance/ADR reporting	42.0	35.0	23.0

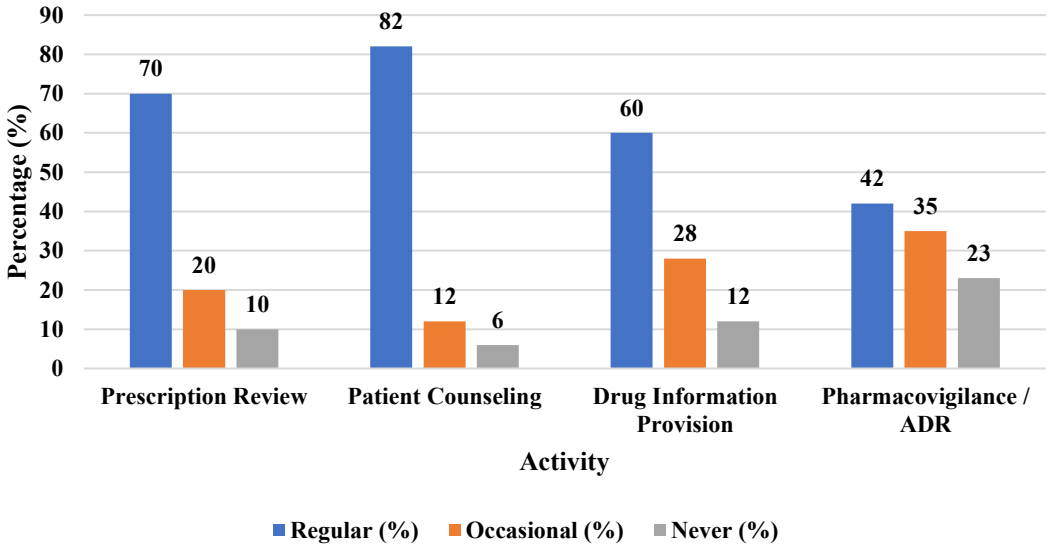

Figure 2. Pharmacists' Role in Rational Drug Use Activities

Figure 2 shows the distribution of pharmacists' involvement in prescription review, patient counseling, drug information provision, and pharmacovigilance. The figure illustrates the proportion of pharmacists who reported engaging in each activity regularly, occasionally, or never (n = 150).

3.4 Comparative Findings Across Healthcare Settings

Hospital pharmacists demonstrated significantly higher involvement in prescription review (80.0%) compared to community pharmacists (64.0%) and primary healthcare pharmacists (52.0%) ($p < 0.05$). Patient counseling was more common in community pharmacies (89.0%) compared to hospitals (78.0%) and primary care centers (75.0%).

3.5 Barriers Identified

The most frequently reported barriers to promoting rational drug use included:

- Lack of inter-professional collaboration (56.0%)
- Workload and staffing shortages (48.0%)
- Limited access to updated clinical guidelines (42.0%)
- Lack of incentives for ADR reporting (35.0%)

3.6 Statistical Associations

Logistic regression analysis revealed that pharmacists with more than 5 years of experience were twice as expected to be involved in prescription review compared to those with less experience (OR = 2.1, 95% CI: 1.2–3.9, p = 0.01). likewise, pharmacists working in hospitals were significantly more likely to participate in pharmacovigilance activities compared to those in community settings (OR = 1.8, 95% CI: 1.1–3.0, p = 0.03).

4. Discussion

This cross-sectional research investigated the role of pharmacists in enhancing rational drug use across healthcare settings and provides robust evidence that pharmacists are central to promoting safe, effective, and efficient medication practices. The findings confirm that pharmacists actively contribute through prescription review, patient counseling, drug information services, and pharmacovigilance, although their level of involvement varies by setting. Importantly, systemic barriers such as limited collaboration, staffing shortages, and a lack of updated guidelines continue to restrict the full realization of pharmacists' potential.[16]

Pharmacists in this study demonstrated significantly higher awareness of rational drug use principles (92.0%) compared with physicians (68.0%) and patients (40.0%). This reinforces global evidence

that pharmacists remain the most knowledgeable cadre in relation to medicine use and safety. Similar results have been reported in India, Nigeria, and Saudi Arabia, where pharmacists consistently outperformed other healthcare professionals in knowledge of prescribing and dispensing standards. The lower awareness observed among physicians and patients highlights the importance of multidisciplinary education and community sensitization, echoing WHO's recommendation for multi-stakeholder strategies to achieve rational use of medicines.[17]

Prescription review was routinely conducted by 70.0% of pharmacists, with hospital pharmacists reporting the highest involvement (80.0%). This finding aligns with previous studies from South Asia and Europe, where hospital pharmacists play a more clinical role due to proximity to prescribers.[18] Conversely, patient counseling was more common in community pharmacies (89.0%), reflecting their direct patient-facing role. Such patterns are consistent with global reports that community pharmacists enhance adherence and promote lifestyle modifications, particularly in chronic diseases like diabetes and hypertension. The high engagement in both prescription review and counseling underscores pharmacists' dual role in ensuring rational prescribing and empowering patients through education.[19]

Although 60.0% of pharmacists routinely provided drug information services, only 42.0% were actively engaged in pharmacovigilance. This underreporting of adverse drug reactions reflects a global concern, with studies in both high- and low-income countries attributing low pharmacovigilance participation to inadequate incentives, lack of training, and competing workload priorities. Results further indicate that hospital pharmacists were significantly more engaged in ADR reporting (52.0%) compared to their community counterparts. This suggests that institutional support and structured systems within hospitals may encourage reporting. Ensuring Drug Safety: Comprehensive Pharmacovigilance Strategies for Public Health [20]

The most frequently cited barriers were lack of inter-professional collaboration (56.0%), inadequate staffing (48.0%), and restricted access to updated guidelines (42.0%). These challenges mirror findings from Sub-Saharan Africa, Southeast Asia, and the Middle East, where systemic constraints have been consistently identified as barriers to rational drug use. Effective strategies to address these issues include workforce expansion, team-based care models, and continuing professional development tailored to evolving therapeutic guidelines.

The study underscores the urgent need to reframe pharmacists' roles within healthcare systems from peripheral support providers to core clinical partners. Policy reforms should prioritize pharmacist integration into multidisciplinary teams, structured continuing education, and financial or professional incentives for pharmacovigilance activities.[21] Evidence from antimicrobial stewardship programs demonstrates that empowering pharmacists can significantly reduce inappropriate prescribing and healthcare costs. Similarly, embedding pharmacists in primary care settings has been evidenced to promote chronic disease management and improve patient outcomes. For resource-limited settings, strengthening pharmacists' roles could be a cost-effective strategy to improve medication safety, reduce resistance, and optimize health outcomes.[22]

This study's strengths include its multi-setting approach and the use of both quantitative and qualitative data collection tools, allowing a nuanced understanding of pharmacists' contributions. Nevertheless, the cross-sectional design restricts the ability to conclude causality, and the use of self-reported data raises the possibility of social desirability bias. Additionally, data collection was confined to selected facilities, which may restrict generalizability to other regions.

Future research should espouse longitudinal or interventional designs to assess the sustained impact of pharmacist-led initiatives on rational drug use. Studies evaluating patient-centered outcomes, cost-effectiveness, and digital health interventions (e.g., e-prescriptions, mobile ADR reporting) would provide valuable insights. In particular, exploring how technology-enabled systems can support pharmacists in real-time decision-making could be transformative in both developed and resource-limited healthcare contexts.

5. Conclusion

This cross-sectional study highlighted the pivotal role of pharmacists in enhancing rational drug use across diverse healthcare settings. Among the 250 participants, pharmacists demonstrated substantial

knowledge of rational drug use (92.0%) compared with physicians (68.0%) and patients (40.0%). Their contributions were evident across multiple domains, with 70.0% routinely engaged in prescription review, 82.0% providing patient counseling, 60.0% delivering drug information services, and 42.0% participating in pharmacovigilance reporting. Notably, hospital pharmacists were more actively involved in prescription review (80.0%) and pharmacovigilance (52.0%), while community pharmacists placed greater emphasis on patient counseling (89.0%). These findings reinforce the position of pharmacists as integral members of healthcare teams, capable of influencing prescribing behavior, improving adherence, and ensuring medication safety. Despite these positive contributions, several systemic barriers were identified. More than half of respondents (56.0%) reported a lack of inter-professional collaboration, 48.0% cited heavy workload and staffing shortages, and 42.0% highlighted limited access to updated clinical guidelines as obstacles to promoting rational drug use. Logistic regression further revealed that pharmacists with more than 5 years of experience were twice as likely to routinely review prescriptions (OR = 2.1, 95% CI: 1.2–3.9, p = 0.01), underscoring the importance of expertise and continuity in practice. The implications of this study extend beyond professional practice to health policy and patient outcomes. Empowering pharmacists through policy reforms, continuous professional development, and institutional support could significantly improve rational medicine use, reduce unnecessary healthcare expenditures, and mitigate risks such as antimicrobial resistance. While the cross-sectional design restricts causal inference, the results highlight actionable opportunities. Future longitudinal and interventional studies should examine patient-centered outcomes, cost-effectiveness of pharmacist-led interventions, and integration of digital health tools to further strengthen rational drug use.

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