Pharmacology and Clinical Pharmacy Research
Volume 7 No 3. December 2022
ISSN:2527-7322 | e-ISSN: 2614-0020
doi: 10.15416/pcpr.v4i3.38647

# Evaluation of Knowledge, Attitude, and Practice about the Rational Use of Medicines among Junior Residents in a Tertiary Hare hospital in India

Sakshi Singh[1], Arvind K. Yadav[1*], Meenu Pichholiya[1], Sandeep K. Kamlekar[1], Sangita Gupta[1]

[1]Department of Pharmacology, Geetanjali Medical College and Hospital, Udaipur, Rajasthan, India

## Abstract

Rational use of medicine is an integral part of the health care system, which has become the weakest part due to various contributors like prescribers, producers, controllers, and consumers that have led to irrationality and increased the patient's socio-economic burden. This study aimed to assess junior residents' knowledge, attitude, and practice of rational medicine of medicine in a tertiary care teaching hospital. This cross-sectional observational study was conducted in the Department of Pharmacology at the tertiary care teaching hospital in Rajasthan, India, for a period of six months, from February 2021 to June 2021. All first- and second-year hospital residents, except those unwilling to participate, were included in the study. The first part of the questionnaire was about knowledge, and the second part was about the attitude and practice of junior residents regarding the rational use of medicines. The data was presented in the form of figures and percentages. Most residents (98%) were aware of the term rationality and rational use of medicines. Maximum numbers of residents (97%) were aware of the term essential medicines. The residents who were aware of drugs included in the National Essential of Medicine and term P-drug were 55% and 69%, respectively. Nearly 21% of residents prescribe drugs by generic names, while the majority (65%) prescribe both generic and brand names. Almost all (98%) of residents agreed that regular training is needed about the rational use of medicines to improve rational prescribing and 89% of residents think regular prescription auditing should be done. This study concludes that most residents were aware of the rational use of medicines, essential medicines, and the P drug concept. But they should receive regular training on the rational use of medications. This will prevent serious problems related to the inappropriate prescribing of medicines during their medical practice.

***Keywords:*** Knowledge, Attitude, Practice, Rational, Essential Drugs, P-drug.

Corresponding Author: Arvind K. Yadav, Department of Pharmacology, Geetanjali Medical College and Hospital, India.
Email: drakyadav14@gmail.com
**Received:** 8 March 2022 **Revised**: 27 July 2022 **Published:** 3 January 2023

## Introduction

Prescription writing plays an influential role in the current healthcare system. Each part of the prescription is extremely crucial in prescribing a drug. Decision-making and proper transcribing are quite essential attributes of writing an ideal prescription.[1] Rational use of medicine as defined by the World Health Organization(WHO) requires that patients receive medications appropriate to their clinical needs, in doses that meet their requirements, for an adequate period, and at the lowest cost to them and their community.[2,3] Irrational prescribing is commonly seen due to false beliefs, following a prescribing pattern of senior doctors, inadequate knowledge, ignorance, promotional activities for the profit of professionals by the pharmaceutical industry, and lack of enforcement of regulations by regulatory authorities.[4]

Essential medicines satisfy the healthcare needs of most of the population and are also an integral part of the rational use of medicines. It was defined by WHO in 1975 as a major step towards promoting the rational use of medicines.[5] The WHO Model List of Essential Medicines (also known as Essential Medicines List or EML), published by WHO, contains the medications considered to be most effective and safe to meet the most important needs in a health system. All countries frequently use the essential medicine list to develop their local lists of essential medicines.

The WHO Model List of Essential Medicines – 22nd list was published in 2021 and contains 479 medications.[6] There are 376 drugs in India's National List of Essential Medicines (NLEM), revised in 2015.[7] The fundamental goal of NLEM is to encourage rational drug usage by considering three key factors: cost, safety, and efficacy. The personal drug (P-drug) concept was introduced to benefit the patient by rationalizing drug use. P-drugs should be selected from NLEM as they will be based on good scientific evidence and consensus between experts.[8] For safe and cost-effective pharmacotherapy, rational use of drugs is critical. Most doctors and residents know the importance of the rational use of medicine, but its application is lacking in their routine medical practice. Many studies have been conducted in different parts of India, but on a literature search, studies have yet to be conducted in Rajasthan.[4,9,10] Awareness about the rational use of medicines is required in young budding doctors to enhance the quality of the health care system. So this study was planned to know residents' attitudes, knowledge, and practice about the rational use of medicine.

## Methods

This cross-sectional observational study was conducted in the Department of Pharmacology at the tertiary care teaching hospital of Rajasthan – India, for a period of six months from February 2021 to June 2021, only after approval from Institutional Ethics Committee.

Inclusion criteria: All first and second-year residents of either sex and actively working in the hospital.
Exclusion criteria: residents that were unwilling to participate or did not finish completing the questionnaire.

This study used a questionnaire that involved all residents of the hospital. A questionnaire was developed to gather the data with the help of previous studies.[10,11] This questionnaire was sent to many experts in our field for validation. Experts gave a few suggestions to modify the questionnaire, and an appropriate modification was done accordingly in the questionnaire. This final validated questionnaire was sent to residents through an online link to their email only after taking Informed consent via telephonic means.

The questionnaire was given with clear directions on how to fill it out. There were two parts of the questionnaire; the first was about knowledge of the rational use of medicines, and the second was about junior residents' attitudes and practices regarding the rational use of medicines.

The completed questionnaire data were recorded in Microsoft Office Excel 2010. The data was compiled and statistically analysed. The data was presented in the form of figures and percentages.

**Results and Discussion**

Prescribing is always challenging, requiring knowledge of essential medicine and personal drugs (P-drug) so that physicians can prescribe rationally. Rational use of medications contributes in maintaining high-quality health care. The study questionnaire was sent to all first and second-year residents, and 110 forms were received during the study period. Only 100 residents' forms were finally analyed because ten forms were incomplete. The age of residents ranged from 24-39 years. The mean age of the residents was 27.1±2.4 years. In the present study, most residents (98%) were aware of term rationality and rational use of medicines which was more than in a study conducted by Bajait et al.[9] (Table 1) This indicates increased awareness among residents about the rational use of medicines because it has been included in their undergraduate pharmacology syllabus in recent times.

Essential medicines are believed to be among the foremost cost-effective elements in modern healthcare, and their potential health impact is remarkable. Most residents (97%) knew about essential medicine, which was more than the study conducted by Shivaraju et al.[10] (Table 1) Residents are aware of the importance of prescribing drugs from an essential list nowadays because it has been included in there undergraduate curriculum. 87% of them usually prescribe essential medicines. 69% of residents are in the habit of frequently prescribing essential medicines. (Table 2)

The essential list has gained popularity and is nowadays considered a cornerstone of national prescribing policies. This limited range of carefully selected medicines can cater to most healthcare needs. The National list of essential medicines (NLEM) is one of the key instruments in a balanced health care delivery system that incorporates accessible, affordable quality medicine at all the primary, secondary, and tertiary levels of healthcare.[12] Only 55% of residents were aware of drugs included in NLEM. 31% of residents were not aware of fixed-dose combinations included in NLEM. (Table 1) Most of the junior residents learned about the essential medicine list and NLEM during 2$^{nd}$ year of MBBS. This may be the reason as they are not able to reminisce the drugs. So reorientation of knowledge about drugs included in NLEM/EML should be done.

Residents that agreed that they always prescribe fixed dose combinations from NLEM were 59%. (Table 2) Most residents (81%) were aware of the essential medicine list of the hospital. (Table 1) Adopting the essential medicines list, especially in the public sector healthcare system, has resulted in improved availability, cost-effectiveness, and more rational use of drugs.[13] To promote the rational use of drugs, World Health Organization has emphasized the treatment of diseases by the use of essential drugs prescribed by their generic names.[14] The Essential Medicine Concept is globally applicable and offers the most cost-effective solution to healthcare needs. To enhance the credibility of the Indian healthcare system, procurement and delivery systems of essential medicines need to be strengthened.

P-drug referred to as "Preferred" or "Particular" or "Personal" drug is the drug chosen by the physician for a particular disease to be treated in a cost-effective manner.[15] The P-drug concept enables clinicians to search for good drugs and understand their benefits and side effects to avoid the repeated search for good drugs, which will benefit the patient.[16] Around 69% of residents were aware of the term P-drug which was more than the study conducted in Karnataka.[17] (Table 1) Only 47% knew about STEP criteria for selecting a P-drug, less than the study conducted by Manasa et al.[17] where 57.9% knew about this criteria. (Table 1) Only 50% of residents knew about advantages of P-drug in prescription, which was more than in the study of Dakhale et al.[18] in Nagpur. (Table 1) In selecting P-drug, residents make a list of effective groups by defining diagnosis and specifying therapeutic objectives, then promote rational use of medicine by choosing P-drug from one of the most effective groups. This involvement is vital to ensure their success as the future practitioners.

In the present study, it is encouraging to know that the majority of residents practice rational use of medicine, however, most of these residents (65%) prescribe drugs by both brand name and a generic name. Most drugs should be prescribed by generic name to avoids confusion and makes the therapy rational and cost-effective.[19] (Table 2) However, it was discovered that only 14% of residents of the present study prescribe only brand names, which were found to be less than the study conducted by Hooli et al.[11] in Karnataka. (Table 2) Even more residents (20%) were found to be frequently prescribe new drugs, as compared to the study conducted by Gupta et al.[20] in Jammu and Kashmir. (Table 2)

Schedule-H consists of drugs that must be dispensed by prescription of the Registered Medical Practitioners (RMP). As per the notification released by the Department of Health under the Ministry of Health and Welfare, there are 536 schedule H-drugs.[21,22] 94% of residents were aware of schedule H-drugs which were more than the study conducted by Hooly et al.[11] (Table 1) Therefore, if schedule H-drugs were taken without a prescription by the patient, then it can be harmful and may lead to irrationality.

73 % of residents check the evidence for new drugs prescribed by medical representatives. (Table 2) A study by Tekulapally et al.[23] showed that 84% of residents were aware of the ingredients of drugs they are prescribing, less than our study (96%). (Table 2) 73% of residents felt doctors are not solely responsible for irrational prescribing. (Table 1) This could be because they know about the factors contributing to irrational prescribing. Irrationality can be due to prescribers, producers, controllers, and consumers. Prescribers are responsible for irrationality due to overprescribing, underprescribing, incorrect prescription, lack of knowledge, and the patient's insistence. But they are not solely responsible.

Producers provide false information to doctors for fast earnings, leading to irrational prescribing. The Drug Controller General of India and others government agencies are responsible because of their poor organization and less control over pharmaceutical companies. Lastly, consumers commonly lead to irrationality because of self-medication and non-compliance. Reduction in the quality of drug therapy results in increased morbidity and mortality, wastage of resources leading to reduced availability of other vital drugs, increased costs, and increased risk of unwanted affects, which causes the emergence of antimicrobial drug resistance. 76% of residents always inform the patient regarding the disease, drug therapy, regular follow-up,

and monitoring of drug therapy. However, this result was less than the study conducted in Bengaluru, where 82% of residents informed to the patient regarding the matter.[17] (Table 2) This could be due to the more first-year residents in the present study. These are the important component of the rational use of medicine, so informing the patient about the treatment and follow-up should become a part of their prescribing practice.

About 18% of residents were not taught about the rational use of medicine in their undergraduate courses, (Table 1) while 98% of residents agreed that regular training was needed concerning the rational use of medicines during undergraduate and postgraduate courses to create early awareness. Rational use of medicines should be promoted through various initiatives in this direction by incorporating them into health care systems at the national and international level. (Table 1) Additionally, 89% of residents determine that the regular prescription auditing should be considered to improve rational prescribing, (Table 1) which will intensify the rational use of medicine in their daily practice. Inappropriate prescribing practices can directly or indirectly harm the quality of patient care and negatively influence the outcome of treatment, therefore, all aspects must be carefully considered, such as creating the patient awareness program, regular prescription audits, strict control over pharmaceutical companies, and conducting regular CMEs to improve the rational use of medicine. Adopting generics policies, teaching and training the essential medicine concept at the undergraduate level, and pharmacovigilance programs will contribute to higher goal attainment of rational use of medicines.

***Limitations of Study***

This study was conducted only amongst the residents of a private Medical College and Hospital, and also not compared between consultant doctors and the residents. Therefore, further studies can be planned to compare the knowledge, attitude, and practice about the rational use of medicines between government and private residents and consultant doctors.

**Conclusion**

This study concludes that most residents were aware of the rational use of medicines, essential medicines, and the P-drug concept. However, as they have learned these concepts during their undergraduate course, so it is desired that

**Table 1. Knowledge of Rational Use of Medicines among Junior Residents**

| Questionnaire Items | Number of Respondents (%) | |
|---|---|---|
| | Yes | No |
| Are you aware of the term rationality in prescription writing? | 98 | 2 |
| Are you aware of term rational use of medicines? | 98 | 2 |
| Are you aware of the term essential drugs/essential medicines? | 97 | 3 |
| Are you aware of drugs included in National List of Essential Medicines (NLEM)? | 55 | 45 |
| Do you have essential medicine list at your college? | 81 | 19 |
| Are you aware of fixed dose combinations included in National List of Essential Medicines (NLEM)? | 69 | 31 |
| Are you aware of the term P-drugs? | 69 | 31 |
| Are you aware of STEP criteria for selection of P-drug? | 47 | 53 |
| Are you aware of advantages of using P drug for prescription? | 50 | 50 |

**Table 1. Knowledge of Rational Use of Medicines among Junior Residents (cont.)**

| Questionnaire Items | Number of Respondents (%) | |
|---|---|---|
| | Yes | No |
| Are you aware of schedule H drugs? | 94 | 6 |
| Were you taught about rational use of medicines during undergraduate course? | 82 | 18 |
| Do you think regular training is needed about rational use of medicines during undergraduate and postgraduate course? | 98 | 2 |
| Do you think only doctors are responsible for irrational prescribing? | 27 | 73 |
| Do you think regular prescription auditing should be done for improving rational prescribing? | 89 | 11 |

**Table 2. Attitude and Practice of Junior Residents regarding Rational Use of Medicines**

| Questionnaire Items | Response | Number of Respondents (%) |
|---|---|---|
| Do you prescribe essential medicines? | Yes | 87 |
| | No | 13 |
| How often do you prescribe essential medicines? | Always | 16 |
| | Frequently | 69 |
| | Occasionally | 15 |
| By which name do you prescribe drugs? | Generic | 21 |
| | Trade name | 14 |
| | Both | 65 |
| How often do you prescribe new drugs? | Always | 4 |
| | Frequently | 20 |
| | Occasionally | 76 |
| Are you aware of ingredients of the drug you prescribe? | Yes | 96 |
| | No | 4 |
| Do you always prescribe fixed dose combination from National List of Essential Medicines (NLEM)/essential medicine list? | Yes | 59 |
| | No | 41 |
| Do you check for evidences for newer drugs suggested by medical representative? | Yes | 73 |
| | No | 27 |
| Do you inform patient regarding disease, drug therapy, regular follow-up and monitoring of drug therapy? | Always | 76 |
| | Frequently | 20 |
| | Never | 4 |

they should receive regular training on the rational use of medicines. This will prevent serious problems related to the inappropriate prescribing of medicines during their medical practice.

**Acknowledgment**
Authors would like to acknowledge all the residents of this tertiary care hospital; who participated in this study.

**Funding**
No funding source.

**Conflict of Interest**
None declared.

**References**

1. Akram A, Mohamad N, Meerah TSM, ZamZam R, Abdullah D. A pilot study-an action research to acquire clinical skill. *Procedia - Social and Behavioral Sciences*. 2012; 60: 236-40. DOI: 10.1016/j.sbspro.2012.09.373
2. World Health Organization. Promoting Rational Use of Medicines: Core Components. Geneva: World Health Organization; 2002. Available at: https://apps.who.int/iris/bitstream/handle/10665/67438/WHO_EDM_2002.3.pdf?sequence=1&isAllowed=y (Accessed on February 1, 2022).
3. World Health Organisation. Rational use of Medicines. Available at: https://www.who.int/activities/promoting-rational-use-of-medicines
4. Sontakke SD, Budania RJ, Paranjape SG. Evaluation of knowledge, attitude and behavior about rational use of medicines in second year medical students. *International Journal of Basic & Clinical Pharmacology.* 2013; 2(5): 617-21. DOI: 10.5455/2319-2003.ijbcp20131019
5. The Selection of Essential Medicines-WHO Policy Perspectives on Medicines. 2002;1-6. Available at http://apps.who.int/iris/bitstream /handle/10665/ 67375/WHO_EDM_2002.2.pdf?sequence=1 (Accessed on February 2, 2022).
6. WHO Model List of Essential Medicines – 22nd List (2021). Available at: https://apps.who.int/iris/bitstream/handle/10665/345533/WHO-MHP-HPS-EML-2021.02-eng.pdf (Accessed on February 2, 2022).
7. Revision of National List of Essential Medicines November 2015. Available at: https://main.mohfw.gov.in/sites/default/files/Recommendations.pdf (Accessed on February 2, 2022)
8. Parmar DM, Jadhav SP. The concept of personal drugs in the undergraduate pharmacology practical curriculum. *Indian Journal of Pharmacology*. 2007; 39(3): 165-7. DOI: 10.4103%2F0253-7613.42308
9. Bajait CS, Pimpalkhute SA, Sontakke SD, Dakhale GN, Jaiswal KM, Urade CS. Evaluation of knowledge, attitude and practice of rational use of medicines among clinicians in a tertiary care teaching hospital. *International Journal of Nutrition, Pharmacology, Neurological Diseases.* 2014; 4: 153-7. DOI: 10.4103/2231-0738.132673
10. Shivaraju TP, Savkar MK. Awareness of rational use of medicines among interns at rural teaching hospital. *International Journal of Basic & Clinical Pharmacology.* 2018; 7: 2184-9. DOI: 10.18203/2319-2003.ijbcp20184325
11. Hooli TV, Srikanth, Somashekara SC, Suraj B. Knowledge, attitude, practice of rational use of medicines among junior residents in a tertiary care hospital. *International Journal of Basic & Clinical Pharmacology.* 2017; 6(8): 2001-4. DOI: 10.18203/2319-2003.ijbcp20173286
12. National List of Essential Medicines of India 2011. Available at: https://pharmaceuticals.gov.in/sites/default/files/NLEM.pdf (Accessed on February 1, 2022)
13. World Health Organization Model List of Essential Medicines – 22nd List, 2021. Geneva: World Health Organization; 2021 (WHO/MHP/HPS/EML/2021.02). Licence: CC BY-NC-SA 3.0 IGO
14. World Health Organization. The Pursuit of Responsible Use of medicines: Sharing

and Learning from Country Experiences. Available at: https://apps.who.int/iris/bitstream/handle/10665/75828/WHO_EMP_MAR_2012.3_eng.pdf?sequence=1&isAllowed=y (Accessed on February 10, 2022)

15. Priyadarshini BG, Kumar RP. A study on concept of P-drug selection among rural general practitioners. *International Journal of Basic & Clinical Pharmacology*.2017; 6(1): 155-8. DOI: 10.18203/2319-2003.ijbcp20164772
16. Jyothi DB, Rathod N. Knowledge, awareness, and practice of "P-drug" concept among postgraduate students in a tertiary care hospital. *National Journal of Physiology, Pharmacy and Pharmacology.* 2020; 10(3): 253-6. DOI: 10.5455/njppp.2020.10.02030202006022020
17. Manasa CR, Kalpana L, Veena RM, Lavanya SH, Kumar BVD. Assess the awareness of rational prescribing practices among medical interns in a tertiary care hospital: A questionnaire based study. *International Journal of Basic & Clinical Pharmacology.* 2019; 8: 1096-101. DOI: 10.18203/2319-2003.ijbcp20191607
18. Dakhale G, Pimpalkhute S, Bajait C, Raghute L. Evaluation of knowledge attitude and practice of rational use of medicine among interns and resident doctors in a tertiary care teaching hospital. *Journal of Young Pharmacists.* 2016; 8(2): 114-7. DOI: 10.5530/jyp.2016.2.10
19. Yadav AK, Sharma N. Drug use in medicine out-patient department: A prospective study in a tertiary care teaching hospital. *International Journal of Current Research & Review*. 2012; 4(6): 111-18.
20. Gupta R, Malhotra A, Malhotra P. Assessment of rational prescribing practice among interns: A questionnaire based observational study. *International Journal of Research in Medical Sciences.* 2018; 6(8): 2808-12. DOI: 10.18203/2320-6012.ijrms20183274
21. Drugs and Cosmetic Rules – Schedule H and Schedule H1. Available at: https://www.medindia.net/patientinfo/drugs-and-cosmetics-rules-schedule-h-schedule-h1-drugs.htm (Accessed on February 1, 2022)
22. Tandon P, Gupta V, Ranjan A, Gandhi P, Kotiyal A, Kapoor A. A Review on the Current Classification and Regulatory Provisions for Medicines in Drug & Cosmetic Act, in the light of present day context. *International Archives of BioMedical and Clinical Research.* 2017; 3(3): I-VII. DOI: 10.21276/iabcr.2017.3.3.26
23. Tekulapally K. Knowledge, attitude and practices of rational use of medicines among interns in a tertiary care teaching hospital in Telangana. Asian Journal of Medical Sciences. 2021; 12(6): 85-9. DOI: 10.3126/ajms.v12i6.33939