

# A questionnaire-based study to assess rational prescribing practice among interns

Madhura Naik, Rajan Nerurkar, Abhishek Phatak, Sagar Panchal, Abhinay Paunikar

Department of Pharmacology, Topiwala National Medical College and BYL Nair Hospital, Mumbai, Maharashtra, India.

Correspondence to: Madhura Naik, E-mail: dr.madhuranaik@gmail.com

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## ABSTRACT

**Background:** The subject of Pharmacology is taught to medical students in India in the second year of their undergraduate (UG) studies, and one of the crucial components of which is Clinical Pharmacology and Therapeutics (CPT). The main goal of teaching CPT is to impart knowledge, skills, and attitudes so that a clinician is able to weigh the potential benefits and risks of a treatment along with its cost-effectiveness. **Aims and Objective:** To understand whether interns have sufficient knowledge to prescribing rationally. **Materials and Methods:** We handed out questionnaires consisting of 15 questions on rational prescribing to 108 interns across different departments of the hospital. The completed questionnaires were then collected, and the responses were analyzed. **Result:** A large number of interns reported that UG medical curriculum was inadequate to train them to prescribe rationally. A number of them affirmed that doctors should prescribe by the “essential medicines list” (48/73). Interns most commonly prescribed by generic name (68/73) and considered safety and efficacy as the most important factors while prescribing. However, a fewer number of interns (39/73) agreed with the importance of cost or knew the definition of pharmacoeconomics (38/73). Each of them experienced problems while prescribing during internship, and the commonly reported were drug dosage calculation based on weight and age and the knowledge of trade names. With regard to prescribing skills, interns felt less confident in accessing drug-related information, dosage calculation, and writing prescriptions. Most interns (65/73) were unaware of the “six steps of rational prescribing”. **Conclusion:** The study highlighted some gray areas in the knowledge of rational prescribing among interns while also indicating possible areas of improvement. Hence, there is a need for a refresher course aimed at sensitizing interns to the practice of rational pharmacotherapy, so as to inculcate a balanced and safe prescribing approach.

**KEY WORDS:** Rational Prescribing; Interns; Clinical Pharmacology; Undergraduate Teaching; Questionnaire


## INTRODUCTION

Internship is a period of medical apprenticeship under the guidance of experienced doctors. It also marks the beginning of

the students' experience with unsupervised prescribing, which is both technically challenging and unnerving.

The subject of Pharmacology is taught to medical students in India in the second year of their undergraduate (UG) studies, one of the crucial components of which is Clinical Pharmacology and Therapeutics (CPT). The main goal of teaching CPT is to impart knowledge, skills, and attitudes so that a clinician is able to weigh the potential benefits and risks of treatment along with its cost-effectiveness.<sup>[1]</sup>

Owing to the wide gap between the second year of their studies and internship and the lack of a refresher course, most of the knowledge about rational pharmacotherapy is lost in the transition. In many medical curricula, teaching in the clinical

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disciplines is focused on symptoms and diagnosis, and little or no time is given for learning the principles of drug treatment.<sup>[2]</sup> These shortcomings in UG teaching may cause interns to be underprepared in the process of rational prescribing. The WHO six steps of rational prescribing are an important guide to prepare UG doctors in the approach of rational prescribing.

The six steps are as follows:

- Step 1: Define the patient's problem
- Step 2: Specify the therapeutic objective
- Step 3: Verifying the suitability of P drug
- Step 4: Write the prescription
- Step 5: Give instructions and warnings to the patient
- Step 6: Monitor/stop the treatment.

Medication errors are more likely to happen when new doctors arrive to work in hospitals. Studies have shown junior doctors to be responsible for a significant number of prescribing errors.<sup>[3-5]</sup> A study done on medicines management in national health service (NHS) hospitals showed that only a small proportion of doctors felt adequately prepared to handle medicines management issues at their institutions.<sup>[5]</sup>

A study was conducted in Nigeria on the prescribing knowledge in interns.<sup>[6]</sup> It demonstrated the deficiencies in UG pharmacology teaching, and concluded that medical students and interns should be periodically assessed on prescribing knowledge and skills during their training as a means of minimizing prescribing errors.

In India, however, studies assessing the prescribing knowledge in interns in teaching hospitals are scarce. This study was planned in our tertiary-care teaching hospital with a view to add evidence in this regard and indicate areas of improvement in the teaching of rational pharmacotherapy.

## MATERIALS AND METHODS

This cross-sectional, questionnaire-based study was carried out in a public tertiary-care teaching hospital in Mumbai, Maharashtra, India. A structured questionnaire comprising 15 questions on rational prescribing was prepared after modifications in the designs by Oshikoya *et al.*<sup>[6]</sup> and Tobaiqy *et al.*<sup>[7]</sup> The questionnaire was prevalidated by carrying out a pretest assessment in 10 interns and assessed for face validity and internal consistency. Changes were made in the wording depending on the pretest responses.

The questionnaire was composed of opinion-based ( $n = 4$ ), single-choice ( $n = 2$ ), multiple-choice ( $n = 4$ ), and descriptive ( $n = 5$ ) questions on the prescribing practice and awareness about rational prescribing among interns and the difficulties faced by them. Ethics committee approval was obtained.

Interns posted in different departments of the hospital in the year 2014 ( $n = 108$ ) were approached and explained the purpose of the study. The informed consent document and the questionnaire were handed over by the study investigators to individual interns at 10 a.m. and collected after half-an-hour.

The completed questionnaires were then assessed for responses.

## RESULT

Of the 108 interns, 85 of them consented to the study, while 73 of them returned the completed questionnaires (response rate was 67%). Of the 73 respondents, 37 were male subjects. The mean age of the respondents was 23.2 years [Figures 1 and 2]. A maximum number of interns (95%) had completed four clinical postings [Figure 3]. The answers to the questions 1-4 have been presented in Table 1.

Of the 73 interns, 68 (93%) of them answered that they prescribed according to the generic name of drugs, while only 38 (52%) of 73 interns knew the correct definition of "Pharmacoeconomics."

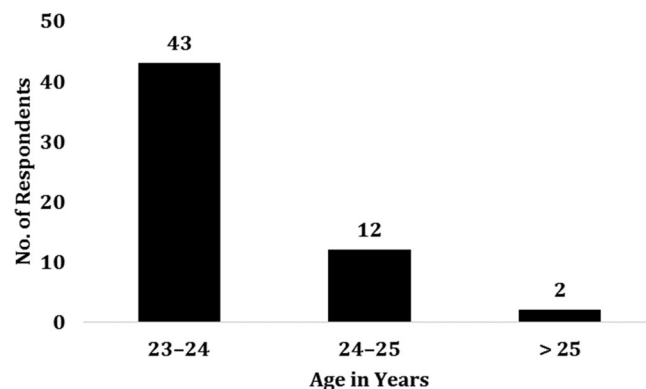
The percentage of interns expressing confidence in the various prescribing skills were as follows [Table 2]—Majority of interns (59 of 73, i.e., 81%) considered safety and efficacy as the most important factors when prescribing, while 19% of them considered all the three factors as important (including cost).

A higher number of interns prescribed doses in children according to the age (44/73, i.e., 60%) or weight (42/73, i.e., 57%), while fewer believed in prescribing according to height or body surface area.

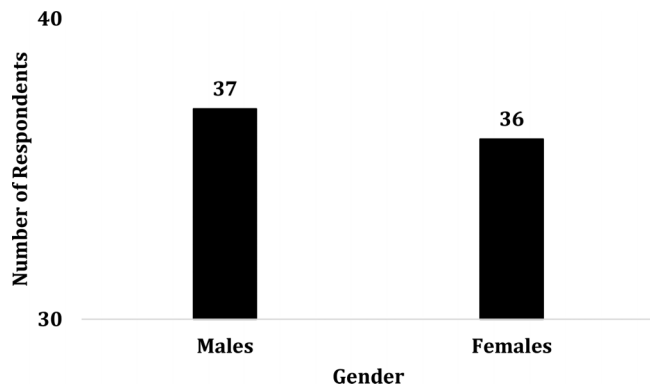
With regard to accessing drug-related information, 85% of them relied on books, 75% on the internet, while some referred to drug information indices (CIMS and MIMS) or product inserts.

All the 73 interns (100%) reported to have faced problems in prescribing during internship. "Drug dosage calculation" and "prescribing according to trade name" were the most common problems reported.

Regarding the awareness of six steps of rational prescribing, 65 of the 73 interns (89%) were unaware of the six steps of rational prescribing; 7% of them said they were aware but could not correctly answer the steps; and only 4% of total interns were aware and answered correctly.



**Figure 1:** Age distribution of respondents.



**Figure 2:** Gender distribution of respondents.

The most common points of drug-related information as conveyed to patients were dosage schedule, route of administration, and expected adverse effects.

**DISCUSSION**

Our study revealed a response rate of 67%. The reason for a lower response rate could have been the time crunch faced by the interns in the morning hours or being occupied with clinical duties.

A large number of interns felt that UG training was inadequate to prepare them to prescribe rationally. This finding is in accordance with that of the study carried out in first-year postgraduate students in India.<sup>[8]</sup> In a similar study conducted on foundation year 1 doctors in UK, it was found that they were unsatisfied with their UG CPT teaching and felt incapable of prescribing rationally and safely.<sup>[7]</sup>

Sixty-six percent interns said they were aware about the importance of prescribing according to “essential medicines list.” The essential medicines list is an important public health strategy, which improves access to essential drugs while ensuring that the maximum number benefit from effective drug therapy for disease. Study done on implementation of Essential Medicines policy in India showed that a majority of prescribers lacked the awareness about the Drug Policy, including not having undergone training sessions on the rational use of medicines.<sup>[9]</sup>

Another positive finding in this study was that the majority of interns believed in prescribing according to generic name (93%). Generic prescribing is vital for cost-effectiveness of drug therapy to patients. It reduces errors in prescribing and minimizes confusion. The importance of generic prescribing in developing countries was studied by Cameron et al.<sup>[10]</sup> It asserted that substantial savings could be achieved by switching private sector purchases from originator brand medicines to lowest-priced generic equivalents.

Fewer interns (53%), however, agreed with the importance of cost while prescribing or knew the correct definition of pharmacoeconomics (52%). This finding is in contrast with the

study done on postgraduate students in India,<sup>[11]</sup> where most students were aware of the cost factor in prescribing.

Interns by and large knew the safety and efficacy considerations for drugs while prescribing but neglected the cost. This may be an important gap in prescribing, which needs to be filled with proper training in pharmacoeconomic aspect of drugs.

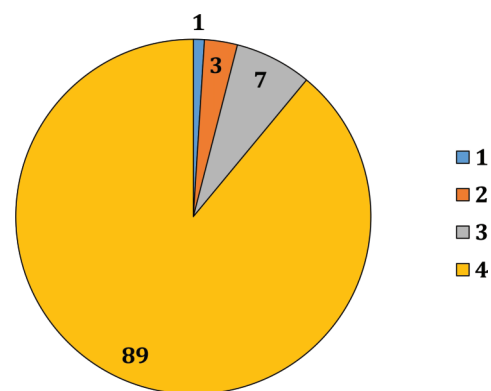
Most interns responded that they did not rely on pharmaceutical representatives for drug-related information or prescribing knowledge.

A large number of interns expressed a lack of confidence in key prescribing skills such as dosage calculation, writing prescriptions, and accessing drug-related information. This shows that doctors entering into internship are largely unprepared to handle the challenge of independent prescribing. A cross-sectional study done on interns in New South Wales hospitals also demonstrated significant deficits in prescribing.<sup>[11]</sup> Similarly, a study done on prescribing pattern among interns in a primary health center in India highlighted the problem of irrational prescribing.<sup>[12]</sup> Thus, it is important that interns are groomed in the art of rational prescribing by senior faculty and medical teachers.

Most interns calculated doses in children according to their weight or age; a few used body surface area or height. Errors in calculating drug dosages in infants and small children can cause mortality and morbidity, especially in agents exhibiting a narrow therapeutic window. Hence, calculating the correct doses in children is very important.

All interns reported to have faced problems during internship, namely, drug dosage calculation” and knowledge of trade names of drugs. The study on first-year postgraduate medical students had also described the problems affecting good prescribing—“inadequate knowledge of brand names of drugs,” “lack of knowledge of newer drugs,” and “no experience of writing a prescription in a clinical setting.” This may indicate that problems faced in interns remain largely unresolved after they enter postgraduate medical training.

Awareness regarding the WHO 6 steps of rational prescribing was seen to be inadequate among interns. The WHO six-step guide forms the basis of rational prescribing and prevents the



**Figure 3:** Number of postings completed.

**Table 1:** Opinion-based questions and the number of interns (of total 73) who expressed opinions

Statement	Strongly disagree, n (%)	Disagree, n (%)	Undecided, n (%)	Agree, n (%)	Strongly agree, n (%)
Undergraduate training has adequately prepared me to prescribe rationally	62 (85)	4 (5)	4 (5)	3 (5)	0
Every doctor should be aware of and prescribe according to the "essential medicines list"	0	12 (16)	13 (18)	8 (11)	40 (55)
The cost of a drug influences my prescribing practice	11 (15)	18 (25)	5 (6)	4 (6)	35 (48)
I rely on information given by pharmaceutical representatives about particular drugs and prescribe accordingly	34 (47)	17 (23)	1 (1)	13 (18)	8 (11)

prescriber from missing out on any of the key elements.<sup>[2]</sup> It is important that the WHO step-by-step guide to prescribing be included as a part of UG training and reiterated during the training of junior prescribers thereafter.

Most interns correctly mentioned the important points of information to be conveyed to patients by prescribers, which indicates good communication skills in prescribing.

In summary, some of the critical deficiencies in prescribing during internship have been assessed through this study. Interns largely feel unprepared to handle prescribing, and therefore, undergraduate teaching in rational prescribing needs to be fortified. Key gray areas such as drug dosage calculation, writing prescriptions, and accessing drug-related information should be emphasized on during their training. In addition, awareness about essential medicines list, importance of generic prescribing, cost-effectiveness or pharmacoeconomic aspect of drugs, and WHO six-step guide to rational prescribing should be incorporated into UG teaching through lectures and discussions. A refresher course in rational prescribing could be implemented with a focus on the above-mentioned areas, at the start of the internship. This would enable interns to be better prepared to handle prescription writing during internship and beyond. Moreover, repeated assessments of interns and postgraduate students in clinical pharmacology should be done on a semi-annual/ quarterly basis. The teaching could then be tailored to tackle specific problems faced by them.

### Limitations

This study was a subjective questionnaire-based study. This may have produced variability in responses. Although it

provided an overview about knowledge of prescribing skills, it could not analyze their application in actual clinical practice. The sample size of the study was small. A single assessment in a single setting may not correctly depict the entire picture. Repeated studies and assessments of subsequent batches of interns will be required.

### CONCLUSION

The study has brought to the forefront some important issues related to rational prescribing among interns. Findings of this study emphasize the importance of teaching interns about the practical tips in prescribing such as dosage calculation, trade names of drugs, and accessing drug-related information. Strengthening UG training in rational prescribing practice and incorporating WHO six steps of rational prescribing in their UG curriculum are the other key points from this study. A clinical pharmacology course aimed at practical prescribing skills could be devised for students at the time of their entry into internship. This will enable interns to be better equipped for internship and their clinical careers beyond.

### REFERENCES

- Gitanjali B, Shashindran CH. Curriculum in clinical pharmacology for medical undergraduates of India. *Indian J Pharmacol.* 2006;38Suppl 2:S108-14.
- World Health Organization. *Guide to Good Prescribing—A Practical Manual.* Available at: <http://apps.who.int/medicinedocs/en/d/Jwhozip23e/> (last accessed on June 2, 2015).
- Oshikoya KA, Chukwura HA, Ojo OI. Evaluation of outpatient paediatric drug prescriptions in a teaching hospital in Nigeria for rational prescribing. *Paediatr Perinat Drug Ther.* 2006;7:183-8.
- Dean B, Schachter M, Vincent C, Barber N. Prescribing errors in hospital inpatients: Their incidence and clinical significance. *Qual Saf Health Care.* 2002;11:340-4.
- Audit Commission. *A Spoonful of Sugar—Improving Medicines Management in Hospitals* London: Audit Commission Available at: <http://archive.auditcommission.gov.uk/auditcommission/sitecollectiondocuments/AuditCommissionReports/NationalStudies/nrs-poonfulsugar.pdf> (last accessed on June 2, 2015).

**Table 2:** Confidence regarding prescribing skills

Prescribing skill	Number of interns who felt confident (of n = 73)	Value in percentage
Drug history taking	71	97
Accessing drug-related information	15	20
Writing prescriptions	36	49
Administering drugs	43	59
Calculating doses	29	40

6. Oshikoya KA, Senbanjo IO, Amole OO. Interns' knowledge of clinical pharmacology and therapeutics after undergraduate and on-going internship training in Nigeria: a pilot study. *BMC Med Educ.* 2009;9:50.
7. Tobaigy M, McLay J, Ross S. Foundation year 1 doctors and clinical pharmacology and therapeutics teaching. A retrospective view in light of experience. *Br J Clin Pharmacol.* 2007;64:363–72.
8. Upadhyaya P, Seth V, Sharma M, Ahmed M, Moghe VV, Khan ZY, et al. Prescribing knowledge in the light of undergraduate clinical pharmacology and therapeutics teaching in India: Views of first-year postgraduate students. *Adv Med Educ Pract.* 2012;3:47–53.
9. Roy V, Gupta U. Improving use of medicines: Implementation of an essential medicines policy in public health facilities in Delhi (India). *J Health Manag.* 2014;16(4):527–46.
10. Cameron A, Mantel-Teeuwisse AK, Leufkens HGM, Laing RO. Switching from originator brand medicines to generic equivalents in selected developing countries: how much could be saved? *Value Health* 15(5):664–73. Available at: <http://www.sciencedirect.com/science/article/pii/S1098301512015471> (last accessed on April 9, 2015).
11. Hilmer SN, Seale JP, Le Couteur DG. Do medical courses adequately prepare interns for safe and effective prescribing in New South Wales public hospitals? *Intern Med J.* 2009;39(7):428–34.
12. Banerjee I, Bhadury T. Prescribing pattern of interns in a primary health center in India. *J Basic Clini Pharm.* 2014;5(2):40–3.

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