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Original Research Article

Knowledge, attitude and practices related to drug prescription among postgraduate medical students: A cross sectional study

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ABSTRACT

Background: Pharmacology, being both the basic and applied science of drugs, forms the backbone of rational therapeutics. With an emphasis on learning the facts of medications, traditional pharmacology teaching is mostly teacher-centred. The erroneous prescribing that can result from inadequate understanding can cost a great deal of money and lives. The aim of the present study was to assess doctors' prescription knowledge, attitudes, and practices.

Materials and Methods: The information was gathered from postgraduate students (residents) using questionnaires about their undergraduate training in clinical pharmacology and therapeutics, prescribing practices, frequently used drug information sources, and any perceived shortcomings in their undergraduate clinical pharmacology teaching. There was a calculation of descriptive statistics and a chi-square test.

Results: Among the 149 responses, 86 (57.71%) of them were male and 63 (42.28%) were female. Only 33 (22.1%) participants knew the components of a prescription, and 135 (90.6%) participants were aware that prescription writing was taught in their undergraduate course. Around 41 (27.5%) participants were aware of the concept of P drugs. Among them, 89 (59.73%) residents had good knowledge of prescriptions. Only 35 (23.5%) strongly agreed, and 113 (75.8%) agreed that undergraduate pharmacology training taught them to prescribe safely. About 83 (55.7%) participants disagreed, 33 (22.1%) strongly disagreed, and only 10 (6.7%) agreed that undergraduate pharmacology teaching should be improved. According to the patient's needs, 146 (98%) participants were prescribed additional vitamins and irons. Around 52 (34.9%) participants reported having difficulty prescribing during their internship rotation. Among them, 77 (51.67%) residents had good practice of prescription.

Conclusions: A majority of postgraduate students believed that additional training should be provided on writing rational prescriptions to make them more confident in their prescribing practices.

1. Introduction

Pharmacology is an important part of the medical college curriculum that educates students about medications. Medical students should understand the significance of pharmacology and properly apply this information in their future careers as doctors.[1] Instead of creating confused practitioners in society, pharmacology education should attempt to generate sensible prescribers. Traditional pharmacology instruction involves lectures and is more teacher-centred, with an emphasis on studying the particular characteristics of medications.[2] Planning the undergraduate medical curriculum involves periodic review of the teaching and evaluation procedures through student input and change of strategies.[3]

A medicine is employed rationally when it is chosen, administered, and maintained in accordance with instructions, clinical needs, and cost considerations

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for the provider, community, and patient. It is also properly dispensed, taken, and documented.[4] There is a severe problem with the widespread use of irrational prescription practices in medicine, which raises patient out-of-pocket expenses for side effects and the health care system.[5] Writing prescriptions in the correct format helps to reduce errors and ensure that the medication is used appropriately. When prescribing any medication, medical practitioners need to consider its cost, side effects, appropriateness, effectiveness, and contraindications.[6] According to a report by the World Health Organisation (WHO), 50% of all medicines are prescribed, dispensed, or sold incorrectly, while 50% of patients fail to take their medicines satisfactorily.[7]

The following prescribing indicators should be evaluated:

1. Average number of medicines per encounter
2. Percentage of medicines prescribed by generic name
3. Percentage of encounters with an antibiotic prescribed
4. Percentage of encounters with an injection prescribed
5. Percentage of medicines prescribed from the Essential Medicines List.[8]

Without sufficient pharmacological expertise, a lot of prescription errors are made. The most frequent error is drug interaction, followed by incorrect dosage intervals and inappropriate dosing.[9] Poor prescribing by junior doctors is the primary cause of the majority of prescription-related errors in hospitals.[10] The objective of our study was to assess postgraduate residents' prescription-related knowledge, attitudes, and practices.

2. Objective

1. To assess and find out lacunae (if any) among postgraduate residents' knowledge, attitudes, and practices related to prescription writing.
2. To suggest measures to overcome the lacunae related to prescription writing among postgraduate residents.

3. Materials and Methods

A single-centric, cross-sectional, open-ended survey study was carried out among residents of a tertiary care teaching hospital over a period of 3 months. The sample size was 166, which was calculated using the formula $n = z^2*p(1-p)/e^2$, where z is the z score (1.96), p is the population proportion (50%), e is the margin of error (8%) at a 95% confidence interval, and 10% are nonresponders.[7] The study participants were postgraduate residents who were willing to respond to the study questionnaire. Informed consent was obtained from residents for this study. The questionnaire used for the survey was designed by the authors and underwent validation by pharmacologists at our institute. The finalised questionnaire had 20 items, of which the first 8 pertained to knowledge. The remaining 12 items focused on attitude and practice. (APPENDIX I) The study was cleared by the Institutional Ethics Committee (IEC No. 73/01/2023). The information of all the participants was kept confidential throughout the study period. The results were analysed based on the responses and expressed as percentages. All data were analysed using Microsoft Excel software and SPSS (Version 23). Descriptive statistics were applied to present the data as percentages and frequencies. A chi-square test was applied for categorical data. A p-value of <0.05 was considered statistically significant.

4. Results

Out of 166 residents who were given a questionnaire, 149 completed it and were included in the analysis. Among them, 86 (57.71%) were male and 63 (42.28%) were female; around 103 (69.12%) were less than 28 years old, and 46 (30.87%) were more than 28 years old. Regarding responses from different streams, 52 (34.89%) were from first-year residents, 74 (49.66%) were from second-year residents, 10 (6.71%) were from third-year residents, and 13 (8.72%) were from senior residents.

Responses of the participants towards knowledge of prescription (n=149) are presented in Table 1. There is one score for the right answer to each question. We calculated the score of knowledge for every individual resident. The association between sociodemographic variables and knowledge of prescription (n=149) is presented in Table 2, in which 89 (59.73%) residents had good knowledge of prescription. Age (≥28 years) was statistically significant with the knowledge level of residents (OR- 2.6; 1.2–5.5) (p<0.05). According to this, we can say that there is good knowledge of prescriptions among residents over the age of 28 (n=35).

Responses of the participants towards attitude for prescribing practices (n=149) are presented in Figures 2 and 3. Most of the residents agree that their undergraduate training prepared them to prescribe rationally.

Responses of the participants towards the practice of prescription (n=149) are presented in Table 3. There is one score for the right answer to each question. We calculated the score of practice for every individual resident. The association between demographic variables and practice of prescription (n=149) is presented in Table 4, in which 77 (51.67%) residents had good practice of prescription. Age (≥28 years) (OR- 2.35; 1.1-4.8) (p<0.05) and academic stream (III year & Senior Resident) (OR- 3.1; 1.15-8.4) (p<0.05) were statistically significant with practice of prescription among residents. According to this, we can say that there is good practice of prescriptions among residents over the age of 28 and among III-year and senior residents.

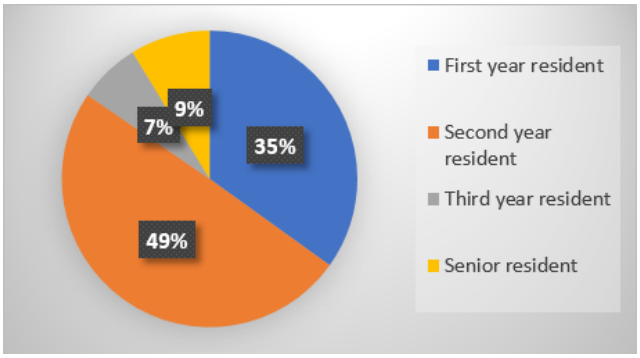

Figure 1: Response of participant according to academic stream

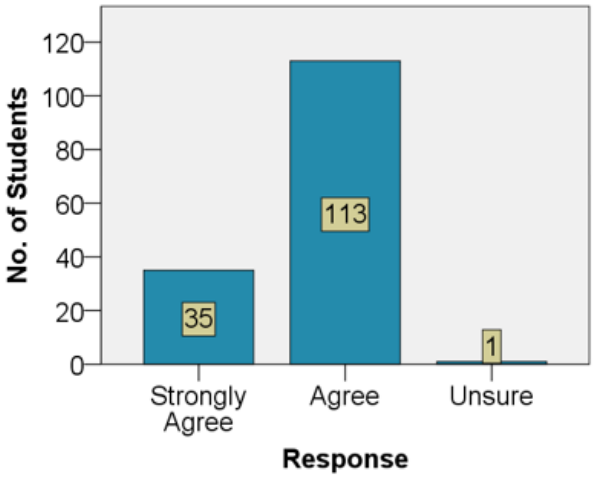

Figure 2: Agreement of students on whether undergraduate training prepare them to prescribe rationally

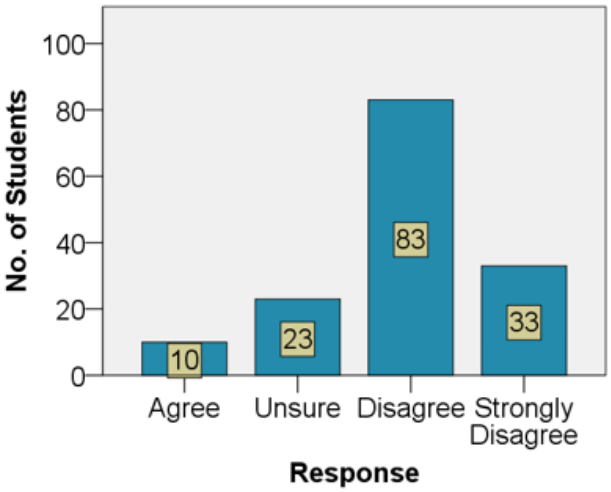

Figure 3: Agreement of students on whether UG teaching-learning of prescription writing needs further improvement

5. Discussion

The goal of our study was to evaluate postgraduate residents' knowledge of prescription while taking into account the clinical pharmacology and therapeutics lessons, they received as undergraduates. According to the results of the current study, the majority of participants learned how to write prescriptions during their UG pharmacology instruction, and they considered their prescribing skills to be average.[11,12] Many participants were expected to have some understanding of preferred or personal medications (P drugs), but just roughly one-third (27.5%) did. Knowing about P drugs helps doctors avoid having to repeatedly look for effective medications in their everyday work, and utilising one's own P drugs allows one to properly understand all of their effects and adverse effects, which is obviously beneficial to the patient.[13] The result was supported by the study conducted by Rai et al.[14]

In today's rapidly expanding pharmaceutical industry, where the availability of newer drugs is increasing, cost considerations are crucial. The majority of study participants took into account the cost of a drug since they were familiar with pharmacoeconomics.[15] More than three-quarters, i.e., 113 (75.8%) of the participants, believed that their UG clinical pharmacology instruction had equipped them with the knowledge and skills necessary to prescribe safely and sensibly. A previous study conducted by Geetha et al. had a similar result, in which around 72% of participants were satisfied with their UG pharmacology teaching.[15] In order to focus on practical knowledge, we should emphasise cost consideration, clinically focused instruction, prescription writing as a component of practical assessment, increased regular clinical posting, regular training for safety and efficacy, and rational prescribing.

The majority of the population's primary healthcare demands can be fulfilled by essential medications. Every public health initiative to lower morbidity and death is based on the essential drug list (EDL). It is the primary strategy for enhancing access to necessary medications and promoting public health. The majority of responders (96%) were familiar with EDL. A previous study conducted by Rai et al. had a similar result, in which around 86% of participants were aware of EDL.[14] Only 43.6% of participants in the current study looked for pharmacological information before writing a prescription. Drug Promotional Literature (DPL) was the source that was most frequently used, followed by MR (medical representative), Formulary, and CIMS (Current Index of Medical Specialties).

Table 1: Responses of the participants towards knowledge of prescription (n=149)

Questions on knowledge	Response	N (%)
Was prescription writing taught in UG pharmacology teaching?	Yes	135 (90.6)
	No	14 (9.4)
Do you know the parts of prescription?	Yes	33 (22.1)
	No	116 (77.9)
Are you aware of essential drug list published by WHO & India?	Yes	143 (96)
	No	6 (4)
In prescription writing, drug should be prescribed in:	Generic name	118 (79.2)
	Brand name	37 (24.8)
What is/ are the most important aspect(s) of prescribing a drug?	Safety	41 (27.5)
	Efficacy	14 (9.4)
	Suitability	7 (4.7)
	Cost	42 (28.2)
	All of above	95 (63.8)
Are you aware of term pharmaco-economics?	Yes	101 (67.8)
	No	48 (32.2)
Are you aware of the concept of P drugs?	Yes	41 (27.5)
	No	108 (72.5)
How would you grade your prescribing knowledge as at graduation?	Average	49 (32.9)
	Good/ excellent	100 (67.1)

Table 2: Association between sociodemographic variable and knowledge of prescription (n=149)

Variable		Knowledge		OR(CI)	p-value
		Good	Bad		
Age	<28 (n=102)	54	48	2.6(1.2-5.5)	0.0143*
	≥28 (n=47)	35	12		
Sex	Female (n=63)	36	27	1.2(0.6-2.3)	0.5815
	Male (n=86)	53	33		
Academic stream	I & II-year Resident (n=126)	76	50	0.85 (0.348-2.1)	0.7330
	III year & Senior Resident (n=23)	13	10		

*p-value <0.05 is stastically significant,<0.01 is stastically highly significant OR- odds ratio, CI- 95% confidenceinterval

Finding a discrepancy between participant knowledge and practice in rational prescribing was interesting. Only half, i.e., 79 (53.02%) of participants in the current study, prescribed the medicine by its generic name, despite the fact that the majority were aware that generic prescriptions should be used. It is more affordable and secure for the patient to prescribe drugs under their generic names. Additionally, it reduces the likelihood of confusion and mistakes. Thus, it is important to emphasise the use of generic medications.[16,17] The National Medical Commission (NMC) has recently proposed a format for the prescription and also given guidelines that all drug-related information should be written in capital letters in a prescription.[18] In our study, around 104 (69.8%) residents prescribed drugs in capital letters.

Our study reveals that in children, the majority of 132 (88.6%) residents calculated the dose based on weight, followed by age. Errors in medicine dosage calculations for children can result in morbidity and mortality, especially for drugs with a limited therapeutic window. The errors that paediatric residents frequently make could be fatal. Children's dose calculations typically take into account their body weight, body surface area, and age.

The majority of responders took drug cost into account while writing prescriptions, which is advantageous. It is a common issue for doctors to be influenced by their patients when writing prescriptions, but in this study, the majority of participants (91.9%) declined to write under parental pressure. Majority of the participants (98%) prescribed supplemental vitamin and iron preparations. Supplementing with extra vitamins and iron (unless there is a real need) causes polypharmacy, higher costs. Therefore, it is important to cease this practice as soon as feasible.

We found a knowledge gap in the concept of P drugs, pharmacoeconomics, and lacunae in the practice of writing the name of drugs in capital letters, prescribing the medicine by its generic name, and looking for pharmacological information before writing a prescription.

Table 3: Responses of the participants towards practice of prescription (n=149)

Questions on practice	Response	N (%)
Which nomenclature do you use to prescribe the drug?	Generic name	79 (53.02)
	Brand name	70 (46.97)
	Chemical name	0 (0)
Do you write name of drugs in capital letters?	Yes	104 (69.8)
	No	45 (30.2)
Do you check information about safety, efficacy, suitability and cost of drugs before prescribing?	Yes	143 (96)
	No	6 (4)
Do you prescribe according to essential drug list?	Yes	136 (91.3)
	No	13 (8.7)
Whenever you have to use drug combination do you prescribe from Fixed dose combination (FDC) approved list by WHO or any combination available in market?	From Fixed dose combination approved list	115 (77.2)
	Any combination available in market	34 (22.8)
Do you prescribe health supplements (vitamins, calcium and iron preparation etc.) according to patient need?	Yes	146 (98)
	No	4 (2.7)
In children how do you calculate the dose? As per-	Age	31 (20.8)
	Weight	132 (88.6)
	Body surface area	8 (5.4)
	Others	1 (0.7)
Before prescribing a newly approved drug, do you seek its information from various sources?	Yes	65 (43.6)
	No	85 (57)
Do you prescribe by parenteral/guardian/attendant demand even when not necessary?	Yes	12 (8.1)
	No	137 (91.9)
Have you had any specific problems in prescribing during your internship & PG training so far?	Yes	52 (34.9)
	No	97 (65.1)

Table 4: Association between sociodemographic variable and practice of prescription (n=149)

Variable		Practice		OR(CI)	p-value
		Good	Bad		
Age	<28 (n=102)	46	56	2.35 (1.1-4.8)	0.018*
	≥28 (n=47)	31	16		
Sex	Female (n=63)	32	31	0.94 (0.49-1.8)	0.853
	Male (n=86)	45	41		
Academic stream	I & II-year Resident (n=126)	60	66	3.1 (1.15-8.4)	0.020*
	III year & Senior Resident (n=23)	17	6		

*p-value <0.05 is stastically significant, <0.01 is stastically highly significant, OR- odds ratio, CI- 95% confidence interval

6. Conclusion

We are able to conclude from the current study that we need to improve undergraduate pharmacology teaching and also reinforce it during PG teaching. Increasing the knowledge of undergraduate students will help to increase rational prescribing as a large percentage of medical graduates serve at rural centres. Pharmacology teaching should be focused on a more rational approach that includes selection of drugs not only based on efficacy but equal importance should be given to other parameters like safety and cost-effectiveness and follow guideline given by NMC.

7. Source of Funding

None.

8. Conflict of Interest

None.

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