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Knowledge, Attitude And Practice About P-Drug Among Undergraduate And Postgraduate Medical Students At A Tertiary Care Hospital.

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ABSTRACT

Prescriptions demand essential knowledge about medicines along with rational drug use principles and optimal selection of personal drugs. The P-drug concept enables better medication prescriptions and enhances treatment adherence. The implementation of P-drug concept is inconsistent across medical education and clinical care. Research was undertaken to evaluate the knowledge, attitude and practice of personalised medicine among interns and postgraduate students. To compare the knowledge, attitude, and practice (KAP) levels regarding P-drug between interns and postgraduate students. This cross-sectional study was conducted with a validated semi-structured questionnaire assessing knowledge, attitude, and practice via Google Forms. Data were analysed using JASP software, employing descriptive statistics, Chi-square tests, and independent t-tests, with a significance level of $p < 0.05$. The majority (88.9%) were aware of rational medicine use, with postgraduates demonstrating higher knowledge levels. 92.8% were familiar with the P-drug concept, and 88.4% considered safety, efficacy, price, and tolerance while selecting drugs. Attitudes toward P-drugs were largely positive, with 91.3% acknowledging its utility in clinical practice. However, 71.5% admitted to following senior physicians' prescribing habits. While 72.5% reported practicing P-drug selection, postgraduates adhered more strictly (87.0% vs. 65.2%, $p = 0.001$). Standard textbooks (51.2%) and senior colleagues (35.7%) were the primary sources for P-drug selection. This study emphasizes the influence of rational drug usage due to awareness about P-drugs among interns and postgraduates. The positive outlook on P-drug knowledge and attitudes does not solve the problem of practical implementation needs. The educational programs combined with policy-driven interventions are crucial for fostering rational prescribing behavior among future healthcare professionals.

Keywords: Knowledge, Attitude, Practice, P-drug.

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INTRODUCTION

Being a prescriber means dealing with a difficult task that demands knowledge of Essential medicine alongside rational use of medicine and personal drugs (P-drug). The concept of 'P-drugs' plays a pivotal role in increasing the rational medicine use and boosting patient safety in healthcare services.[1, 2] The selection of personal drugs through healthcare professionals depends on three key factors: treatment effectiveness, safety for patients and healthcare providers, and drug affordability and suitability for the condition.[3] For fostering awareness and understanding of the 'P-drug' concept amongst healthcare professionals, there is a need for training programs as well as educational initiatives, particularly for undergraduates and postgraduates, who represent the future of healthcare.[4]

P-drugs are ones that a doctor routinely prescribes for a problem that they are familiar with, and the concepts can be taught in medical curriculum at early stages in the form of didactic lectures, problem-based learning, and role plays.[4–7] Studies have shown significant improvement in prescribing abilities among medical students when the concept of P-drug is taught during pharmacology education.[8] The concept encourages them to develop a personalized formulary, which helps in standardizing treatment protocols and reducing unnecessary drug use.[9]

The use of P-drug selection exercises enables students to base their prescribing decisions on unbiased, objective information while this exercise contributes to lowering the issue of irrational prescribing.[10, 11] Through their focus on promoting reasonable medicine practices, 'P-drugs' enhance patient safety by minimizing both medication errors and adverse drug reactions that routinely occur in healthcare facilities. P-Drug should never be the one that has been indicated by clinical findings, senior medical professionals, or sales representatives.[12] The selection process of p-drug should remain unbiased according to WHO guidelines represented in Figure 1, as many practitioners are unaware of the p-drug concept and rational medicine use principles.[13]

Figure 1 - The process of rational treatment

Different steps of WHO for good prescribing

Step 1: Define the patient's problem
Step 2: Specify the therapeutic objective what do you want to achieve with the treatment?
Step 3a: choose your standard treatment. (P drug)
Step 3b: Verify the suitability of your P drug treatment (Check effectiveness and safety)
Step 4: Start the treatment
Step 5: Give information, instructions and warnings
Step 6: Monitor (and stop?) treatment

While the 'P-drug' concept is instrumental in promoting rational drug use, challenges remain in its widespread adoption. Factors such as lack of awareness, resistance to change, and varying healthcare practices can hinder its implementation.[14] Addressing these barriers through targeted education and policy support is crucial for maximizing the benefits of 'P-drugs' in enhancing patient safety and healthcare quality. Policy interventions, such as the development of mobile applications and diagnostic tools, can support the implementation of 'P-drugs' and improve the rational use of medicines on a broader scale.[15]

Objective

To compare the knowledge, attitude, and practice (KAP) levels between interns and postgraduate students.

METHODOLOGY

This is a cross-sectional study involving interns and postgraduates of Sri Siddhartha Medical College, Tumkur, Karnataka. The study was conducted after obtaining permission from authorities and ethical approval from the IEC of the institute (SSMC/MED/IEC-188/July-2024 dated 12/7/2024). A semi-structured questionnaire on Google Forms comprising knowledge, attitude, and practice was prepared and validated for content by subject experts. Cronbach's alpha of 0.727 was obtained after a pilot study with 25 participants, whose responses were excluded from the final analysis. Participants who consented only were able to access the questionnaire. The study was conducted between August and September 2024 with a

sample size of 207. A structured questionnaire consisting of 7 knowledge, 7 attitude, and 6 practice questions was used.

Statistics

The data collected were entered into an Excel sheet and analyzed using JASP software.[16] Demographics were analyzed using descriptive statistics such as frequencies and percentages to summarize categorical data, such as knowledge, attitude, and practice responses; The Chi-Square Test was applied to compare categorical variables, particularly between intern and postgraduate groups, to determine statistical significance; Independent Sample 't'-test was used to compare the mean knowledge and practice scores between interns and postgraduates. A p-value threshold of 0.05 was considered statistically significant to determine differences between groups.

RESULTS

A total of 207 medical students participated in the study, consisting of 138 interns (66.7%) and 69 postgraduate students (33.3%). The mean age of interns was 23.93 ± 1.13 years, while for postgraduates, it was 28.61 ± 2.61 years, with an overall mean age of 25.49 ± 2.82 years.

Table 1: Knowledge Questions on P-drug.

Knowledge Questions		Intern	Post Graduate	Total	Chi-square, P-value
Do you know about the rational use of medicine?	Yes	118 (85.5%)	66 (95.7%)	184 (88.9%)	5.415, 0.067
	No	6 (4.3%)	0 (0.0%)	6 (2.9%)	
	Maybe	14 (10.1%)	3 (4.3%)	17 (8.2%)	
Are you aware of the term 'P-drug'	Yes	129 (93.5%)	63 (91.3%)	192 (92.8%)	0.773, 0.679
	No	3 (2.2%)	3 (4.3%)	6 (2.9%)	
	Maybe	6 (4.3%)	3 (4.3%)	9 (4.3%)	
Apart from P-drug the prescriber should also know	Schedule	1 (0.7%)	2 (2.9%)	3 (1.4%)	1.560, 0.668
	Frequency	7 (5.1%)	3 (4.3%)	10 (4.8%)	
	Dose	2 (1.4%)	1 (1.4%)	3 (1.4%)	
	All of the above	128 (92.8%)	63 (91.3%)	191 (92.3%)	
Do you need therapeutic objectives for the selection of P-drug	Yes	89 (64.5%)	55 (79.7%)	144 (69.6%)	6.540, 0.038*
	No	4 (2.9%)	3 (4.3%)	7 (3.4%)	
	Maybe	45 (32.6%)	11 (15.9%)	56 (27.1%)	
What therapeutic objectives are to be considered while preparing a P-drug list?	Symptomatic	6 (4.3%)	13 (18.8%)	19 (9.2%)	17.201, 0.002*
	Prevent	3 (2.2%)	4 (5.8%)	7 (3.4%)	
	Eradicate	0 (0.0%)	1 (1.4%)	1 (0.5%)	
	All	127 (92.0%)	49 (71.0%)	176 (85.0%)	
	None	2 (1.4%)	2 (2.9%)	4 (1.9%)	
What are the basis of selection of P-drug from the effective group	Price	1 (0.7%)	1 (1.4%)	2 (1.0%)	4.871, 0.301
	Safety	6 (4.3%)	4 (5.8%)	10 (4.8%)	
	Tolerance	0 (0.0%)	2 (2.9%)	2 (1.0%)	
	Efficacy	6 (4.3%)	4 (5.8%)	10 (4.8%)	
	All the above	125 (90.6%)	58 (84.1%)	183 (88.4%)	

The knowledge of both the groups is shown in Table 1. Most students (88.9%) were aware of the rational use of medicine, with postgraduates showing higher knowledge. The majority (92.8%) were familiar with the P-drug concept, and 92.3% recognized the importance of factors like dose, schedule, and frequency in drug selection. 69.6% believed therapeutic objectives are necessary for P-drug selection, and 85.0% agreed that symptomatic relief, prevention, and eradication should all be considered. 88.4% considered safety, efficacy, price, and tolerance while selecting drugs.

The attitude towards the p-drug concept was strongly positive, with the majority either agreeing or strongly agreeing, as shown in Table 2. Most students (91.3%) found the P-drug concept useful in clinical practice, and 88.9% believed it reduces repeated drug searches. Many (71.5%) admitted they tend to follow senior physicians' prescribing habits. A significant proportion (80.7%) acknowledged that P-drug selection varies among physicians. 88.9% supported the need for structured teaching programs on P-drug preparation.

Table 2: Attitude Questions on P-drug

Attitude Questions	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Chi-square, P-value
P-drug concept is very much useful in practice						
Intern	1 (0.7%)	3 (2.2%)	7 (5.1%)	89 (64.5%)	38 (27.5%)	5.786, 0.216
Post Graduate	0 (0.0%)	0 (0.0%)	7 (10.1%)	37 (53.6%)	25 (36.2%)	
Total	1 (0.5%)	3 (1.4%)	14 (6.8%)	126 (60.9%)	63 (30.4%)	
P-drug is beneficial for the doctors which reduces repeated search for the drugs.						
Intern	0 (0.0%)	3 (2.2%)	11 (8.0%)	88 (63.8%)	36 (26.1%)	10.721, 0.030*
Post Graduate	1 (1.4%)	0 (0.0%)	8 (11.6%)	31 (44.9%)	29 (42.0%)	
Total	1 (0.5%)	3 (1.4%)	19 (9.2%)	119 (57.5%)	65 (31.4%)	
There is tendency to follow prescribing practices of one's professor/senior/popular physicians						
Intern	0 (0.0%)	2 (1.4%)	41 (29.7%)	73 (52.9%)	22 (15.9%)	5.534, 0.137
Post Graduate	0 (0.0%)	3 (4.3%)	13 (18.8%)	36 (52.2%)	17 (24.6%)	
Total	0 (0.0%)	5 (2.4%)	54 (26.1%)	109 (52.7%)	39 (18.8%)	
Would you recommend the personal drugs(P-drug)that you use to other prescriber						
Intern	0 (0.0%)	20 (14.5%)	40 (29.0%)	67 (48.6%)	11 (8.0%)	8.646, 0.034*
Post Graduate	0 (0.0%)	21 (30.4%)	12 (17.4%)	30 (43.5%)	6 (8.7%)	
Total	0 (0.0%)	41 (19.8%)	52 (25.1%)	97 (46.9%)	17 (8.2%)	
Listing of P-drug varies between every physician						
Intern	0 (0.0%)	0 (0.0%)	33 (23.9%)	79 (57.2%)	26 (18.8%)	5.700, 0.058
Post Graduate	0 (0.0%)	0 (0.0%)	7 (10.1%)	48 (69.6%)	14 (20.3%)	
Total	0 (0.0%)	0 (0.0%)	40 (19.3%)	127 (61.4%)	40 (19.3%)	
Fixed-dose combination should be included in the P-drug list						
Intern	0 (0.0%)	5 (3.6%)	36 (26.1%)	83 (60.1%)	14 (10.1%)	6.003, 0.111
Post Graduate	0 (0.0%)	3 (4.3%)	8 (11.6%)	48 (69.6%)	10 (14.5%)	
Total	0 (0.0%)	8 (3.9%)	44 (21.3%)	131 (63.3%)	24 (11.6%)	
There is need for teaching programs regarding the preparation of P-drug list						
Intern	3 (2.2%)	2 (1.4%)	12 (8.7%)	67 (48.6%)	54 (39.1%)	1.739, 0.784
Post Graduate	0 (0.0%)	1 (1.4%)	5 (7.2%)	36 (52.2%)	27 (39.1%)	
Total	3 (1.4%)	3 (1.4%)	17 (8.2%)	103 (49.8%)	81 (39.1%)	

The practices related to the p-drug concept of both the groups are shown in Table 3. A majority (72.5%) reported practicing P-drug, with postgraduates adhering more strictly (87.0% vs. 65.2%, p = 0.001). Nearly 92.3% performed detailed history-taking before prescribing, and 72.9% followed the STEP criteria for drug selection. Standard textbooks (51.2%) and senior colleagues (35.7%) were the primary

sources for P-drug selection, while internet-based resources were used less frequently. 58.0% preferred prescribing generic drugs.

Table 3: Practice Questions on P-drug

Practice Questions		Intern	Post Graduate	Total	Chi-square, P-value
Are you practicing P-drug while prescribing	Yes	90 (65.2%)	60 (87.0%)	150 (72.5%)	10.895, 0.001*
	No	48 (34.8%)	9 (13.0%)	57 (27.5%)	
Practice of detailed history taking and making the differential diagnosis for the P-drug	Yes	127 (92.0%)	64 (92.8%)	191 (92.3%)	0.034, 0.854
	No	11 (8.0%)	5 (7.2%)	16 (7.7%)	
Do you follow STEP criteria for the selection of P-drug	Yes	94 (68.1%)	57 (82.6%)	151 (72.9%)	4.896, 0.027*
	No	44 (31.9%)	12 (17.4%)	56 (27.1%)	
How strictly do you follow the prescribed dosage for P-drug	Never	7 (5.1%)	4 (5.8%)	11 (5.3%)	1.213, 0.750
	Some time	47 (34.1%)	28 (40.6%)	75 (36.2%)	
	Most of the time	53 (38.4%)	25 (36.2%)	78 (37.7%)	
	Always	31 (22.5%)	12 (17.4%)	43 (20.8%)	
Source of making inventory of effective group of drug for selection of P-drug	Internet	12 (8.7%)	7 (10.1%)	19 (9.2%)	10.737, 0.013*
	Standard text book	64 (46.4%)	42 (60.9%)	106 (51.2%)	
	With the help of others(seniors/colleagues)	59 (42.8%)	15 (21.7%)	74 (35.7%)	
	By your own	3 (2.2%)	5 (7.2%)	8 (3.9%)	
Would you like prescribe only generic drugs	Yes	78 (56.5%)	42 (60.9%)	120 (58.0%)	0.357, 0.550
	No	60 (43.5%)	27 (39.1%)	87 (42.0%)	

DISCUSSION

This research evaluated personal drugs (P-drugs) knowledge, attitude, and practice (KAP) among interns and postgraduate medical students. The study found students hold positive attitudes toward P-drugs, but they need better training to make this practice routine.

Knowledge and Awareness of P-drug Concept

Most participants showed knowledge of rational medicine use, including both intern (85.5%) and postgraduate (95.7%) students, according to study data. Awareness levels regarding the term 'P-drug' stood at similar heights between interns and postgraduates. Maxwell et al. and Rathod et al. reported identical findings regarding the significance of rational prescribing and P-drug selection, which focuses on both safety and cost-effectiveness along with efficacy.[3,17]

Theoretical knowledge was demonstrated thoroughly, but postgraduates and interns showed limited comprehension of essential criteria for selecting P-drugs. A significant portion of 64.5% among interns and 79.7% of postgraduates failed to realize that defining therapeutic objectives should precede P-drug selection. Results indicate a training need regarding pharmacotherapeutics since De Vries et al. recommended this approach in their Guide to Good Prescribing.[13]

Attitude towards P-drug Concept

The public displayed mainly positive feelings about P-drugs as an idea. Most medical professionals demonstrated agreement that the P-drug concept works effectively for clinical practice by eliminating unnecessary drug searching. The data matches Palappallil et al. as research showed that a combination of didactic lectures, problem-based learning, and case-based discussions created positive changes in rational drug use attitudes among students.[5]

The study revealed how students at postgraduate level and interns prefer to follow prescription patterns of established physicians, including their respected senior doctors and professors and prominent colleagues. Experiential learning plays a vital role in medical training, but research shows its tendency can lead to unreasoning drug prescription behaviors, according to Indla et al.[12] Medical education should significantly enhance training related to making drug selections based on WHO recommendations to counter this problem.

Practical Application and Challenges

The implementation of P-drugs in practice proved incompatible with the high general awareness and positive attitudes. Students obtain their P-drugs from multiple different information sources according to the study results. Standard textbooks served as the main reference for students at 51.2%, but 35.7% of students relied on experienced colleagues. The study conducted by Cherian et al. showed that patients' prescribing differences stem from their dependency on informal sources, which leads to inconsistent drug selection practices.[15]

The selection of P-drugs received differing levels of implementation, with 87% of postgraduate students but only 65.2% of intern students practicing this method. This discrepancy highlights the need for early integration of P-drug exercises in undergraduate training to build familiarity and confidence in prescribing. Similar findings were reported by Khadka et al., who emphasized that structured interventions can improve the actual adoption of rational prescribing habits.[11]

Early implementation of P-drug exercises in undergraduate medical training should be introduced because present discrepancies demonstrate poor familiarity and confidence toward prescribing among undergraduate students.[18] The National Medical Commission (NMC) of India has integrated the concept of Personal Drugs (P-drugs) into its Competency-Based Medical Education (CBME) curriculum.[19] This integration will enhance rational prescribing, reduce medication errors, and standardize treatment approaches among future medical graduates. This will lead to improved patient safety, better pharmacological decision-making, and a long-term positive impact on public health.

Recommendations for Enhancing P-drug Implementation

The following actions should be implemented to reduce the divide between theoretical learning and practical execution:

- The practical application of P-drugs can be consolidated through regular quizzes and case-based discussions which implement the strategy of problem-based learning described by Soni et al.[6]
- Role-playing exercises alongside structured workshops, according to Palappallil & Retnayyan, enhance the confidence of health professionals while selecting P-drugs.[7]
- Senior-colleague dependency should decrease while nurses should develop their own decision-making abilities according to the WHO Good Prescribing Guide for unbiased drug choice selection.[13]
- Rational prescribing receives support from mobile applications and electronic prescribing tools that provide instant drug data about efficacy and safety along with costs, according to Cherian et al.[15]

Limitations

The study results reflect self-reported knowledge, attitudes, and practices, which may introduce response bias. The study was conducted in a single medical institution and with a smaller sample size, limiting the generalizability of the findings. The study primarily evaluates theoretical knowledge and self-

reported practices rather than actual prescribing behaviors, which would be a stronger indicator of competency.

CONCLUSION

This study emphasizes the influence of rational drug usage due to awareness about P-drugs. The positive outlook on P-drug knowledge and attitudes does not solve the problem of practical implementation needs. The educational programs combined with policy-driven interventions should act as essential components to develop rational prescribing behavior among future medical professionals.

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