

Existing and expected practical medical pharmacology curriculum - A survey

VASUNDARA K, PUNDARIKAKSHA H P, VIJENDRA R, GIRISH K, JYOTHI R, SRINIVASA P

ABSTRACT

To collect the opinions of the junior doctors (interns, postgraduate students, and junior residents) regarding the existing and suggested changes in the undergraduate pharmacology curriculum to make it more relevant, useful, and applicable for clinical practice.

A survey was conducted among junior doctors from various medical colleges by using a standardized questionnaire.

A majority of the participants felt that the present practical pharmacology curriculum (experimental pharmacology and dispensing pharmacy exercises) was not relevant for clinical practice. A majority of the participants felt the necessity for prior exposure to the medicinal preparations and newer drug delivery devices. Prescribing in special risk groups, pharmacoeconomics, adverse drug reaction monitoring, and the critical evaluation of drug promotional literature were other areas where the partici-

pants needed more guidance. Hospital-based and real patient-based learning of pharmacology and integrating pharmacology with other clinical subjects was felt to be more relevant in the present scenario.

The present survey indicates the opinion of the junior doctors regarding the nature and the extent of the changes which are necessary in the undergraduate pharmacology curriculum for a better clinical application of the knowledge of pharmacology.

KEY MESSAGES

The current pharmacology curriculum is widely felt to be non-relevant in the present scenario. A revision of the pharmacology curriculum should reflect the changing modern medical practice. The clinically oriented learning of pharmacology is the need of the hour.

Key Words: Pharmacology curriculum

INTRODUCTION

The application of the knowledge of pharmacology forms an integral part of clinical practice. The undergraduate pharmacology teaching should be clinically oriented, relevant and useful in making therapeutic decisions. It has been felt since long that the current curriculum is inadequate in enabling the medical students in this approach [1],[2].

The junior doctors are feeling the gap between the knowledge of pharmacology and its actual clinical implementation. The inadequacies could be interpreted as not updating the curricula to the changing scenario. Therefore, a survey was conducted among junior doctors for assessing their perception on the existing curricula and to gauge their opinions to the "lead suggestions" which were put forward by the authors regarding the extent and nature of the changes in the curricula to make it useful and relevant in clinical practice.

MATERIALS AND METHODS

Postgraduate students and junior residents of various medical college hospitals in Bangalore, who were exposed to similar medical curricula, were chosen as the participants. Interns under the medical apprenticeship of the senior doctors, who were allowed to prescribe and treat the patients, were also included in the study.

A structured questionnaire having a 4-point Likert scale (ranging from strongly disagree to strongly agree) was used as a tool. The

questionnaire was validated by an earlier pilot study. The elicited information included the demographical data of the participants, their perceptions on the existing pharmacology curricula and their opinions about the lead suggestions which were put forth by the authors. The data was analysed by using the SSPS version 13.0.

The Kruskal Wallley's statistical test was applied to find out any difference in sample variation and the level of significance between the medians of the three groups =0.05. For the simplification of the presentation, the 'strongly agreed' and 'agreed' options were considered together as 'positively agreed'.

RESULTS

Out of the 400 participants who were included in the study, 316 participants (157 interns, 57 postgraduates, and 102 junior residents) answered the questionnaire completely and their responses were considered for the study. The overall response rate was 79%.

A majority of the participants (63%) positively agreed that the existing experimental pharmacology training (experiments on isolated frog rectus, frog heart, rabbit eye, etc.) was not relevant for therapeutic application. Dispensing pharmacy exercises (preparing and dispensing ointments, liniments, lotions, etc.) was also felt to be non-relevant in clinical practice, as expressed by 78% of the participants. The median attitude scores are given in [Table/Fig 1].

Sl. No.	Question description	Overall (n=316)		Interns (n=152)		PGs (n=57)		Junior doctors (n=107)		P-value	Significance from multiple comparisons
		Mean±SD	Median(%)	Mean±SD	Median(%)	Mean±SD	Median(%)	Mean±SD	Median(%)		
1	Experimental pharmacology teaching	4.15±0.86	4.0 (83.54)	4.14±0.86	4.0 (82.89)	4.08±0.91	4.0 (84.21)	4.21±0.85	4.0 (84.11)	0.595	---

2	was not relevant in clinical practice*	4.43±0.68	5.0 (94.94)	4.44±0.62	5.0 (95.39)	4.52±0.60	5.0 (94.74)	4.37±0.78	4.0 (94.39)	0.545	(i)v/s(iii) [P<0.001]
	Dispensing pharmacy teaching was not relevant in clinical practice †										(ii)v/s(iii) [P<0.001]

[Table/Fig 1]: Comparison of the responses between interns, PGs and junior doctors on existing pharmacology curriculum

No statistically significant difference of opinions between interns, PGs and junior doctors with respect to the scores recorded for Q1 (P>0.05)
 † For Q2, there is a statistically significant difference in the scores recorded among interns, PGs and junior doctors (P<0.001). Lowest score in recorded in junior doctors & the next higher score in recorded in interns. PGs recorded the maximum score. Multiple comparisons revealed that there was no significant difference in the scores between interns and PGs, but there was a statistically significant difference in scores between interns & junior doctors (P<0.001) as well as between PGs and junior doctors (P<0.001)

Eight four percent of the participants felt the necessity for a prior exposure to the available medicinal preparations. Training in the selection of the appropriate drug formulations and the critical evaluation of the drug promotion literature were other aspects which were expressed by 95% and 77% of the participants respectively, to be included in the undergraduate curriculum.

Exposure to newer devices which are used for drug administration (nebulizers, metered dose inhalers, insulin pumps, etc.) was felt to be relevant in the day-to-day hospital practice, by 95% of the participants. Many participants (82%) concurred that teaching pharmaco-economics was an important consideration in the present scenario of the spiralling costs of health care. The participants (97%) felt that there were some inadequacies while prescribing for special risk groups like children, pregnant woman, patients with renal and liver diseases, and geriatric patients. They (95%) also agreed on the need to be sensitized about pharmacovigilance.

Hospital-based and real patient-based learning of the pharmacology practicals respectively, were other suggestions which were agreed to widely by the participants (91% and 93%). A necessity to integrate pharmacology along with other clinical subjects was expressed by 80% of the participants. The median opinion scores for the suggestions are shown in [Table/Fig 2]. No statistically significant difference in opinion was observed between the interns, post-graduate students and the junior residents for all the suggestions (p >0.05%) [Table/Fig 2].

DISCUSSION

Although it was not a representative sample, the high response rate (79%) indicated the keenness of the participants in expressing their views about the changes which were required for the present pharmacology curriculum. Our study has substantiated the view that the existing practical curricula, both experimental pharmacology and dispensing pharmacy, have become inadequate in preparing the medical students for clinical practice [3].

The junior medical graduates, under the supervision and guidance of the seniors, are actively involved in patient care. They have to take therapeutic decisions and independently prescribe drugs. Unfamiliarity and inadequate preparedness, when exposed to a wide range of drug formulations, creates confusion and difficulty in selecting the appropriate drugs. Exposing the students to the medicinal formulations of at least the essential drugs (both generic and branded), enhances their familiarity to the label instructions-drug schedule, precautions, and contraindications, and facilitates them to compare the generic and branded drugs. A majority of the participants felt the necessity for a prior exposure to the available medicinal preparations.

Most of the participants felt the necessity to be educated about the rationale in selecting the appropriate pharmaceutical drug formulations—extended release, enteric coated, dispersible tabs, etc., which were appropriate to the patient and the disease.

Sl. No.	Suggestion description	Overall (n=316)		Interns (n=152)		PGs (n=57)		Junior doctors (n=107)		P-value ‡
		Mean±SD	Median (%)	Mean±SD	Median (%)	Mean±SD	Median (%)	Mean±SD	Median (%)	
2a	Exposure to drug formulations available in the market and critically evaluate them	4.15±0.86	4.0 (83.54)	4.14±0.86	4.0 (82.89)	4.08±0.91	4.0 (84.21)	4.21±0.85	4.0 (84.11)	0.595
2b	Selection of the appropriate formulations of a drug	4.43±0.68	5.0 (94.94)	4.44±0.62	5.0 (95.39)	4.52±0.60	5.0 (94.74)	4.37±0.78	4.0 (94.39)	0.545
3c	Critical evaluation of drug information literature	4.04±0.88	4.0 (76.90)	3.96±0.94	4.0 (71.71)	4.17±0.80	4.0 (78.95)	4.08±0.84	4.0 (83.18)	0.318
4d	Taught about usage of devices in drug administration	4.51±0.66	5.0 (94.94)	4.53±0.61	5.0 (96.05)	4.50±0.71	5.0 (94.74)	4.49±0.70	5.0 (93.46)	0.987
5e	Taught about pharmaco-economics	4.13±0.83	4.0 (81.96)	4.18±0.79	4.0 (84.21)	4.26±0.74	4.0 (85.96)	4.00±0.93	4.0 (76.64)	0.194
6f	Training in prescription for special risk	4.56±0.56	5.0 (96.84)	4.55±0.56	5.0 (96.71)	4.57±0.59	5.0 (98.25)	4.57±0.56	5.0 (96.26)	0.863

	groups like children, pregnant woman, liver disease, renal disease									
7g	Adverse effect monitoring and reporting	4.64±2.84	5.0 (95.25)	4.49±0.56	5.0 (96.71)	4.54±0.56	5.0 (96.49)	4.91±0.82	5.0 (92.52)	0.75
8h	Necessity for hospital based studying of pharmacology practical	4.40±0.72	5.0 (90.82)	4.40±0.70	4.5 (92.11)	4.50±0.60	5.0 (94.74)	4.35±0.81	5.0 (86.92)	0.643
9i	necessity for real patient problem based learning of practical pharmacology	4.44±0.63	5.0 (93.35)	4.40±0.60	4.0 (94.08)	4.49±0.60	5.0 (94.74)	4.48±0.70	5.0 (91.59)	0.229
10j	clinical pharmacology be taught along with other clinical subjects in phase 3	3.95±1.02	4.0 (80.06)	4.05±1.01	4.0 (80.92)	3.98±0.95	4.0 (77.19)	3.80±1.05	4.0 (80.37)	0.072

[Table/Fig 2]: Comparison of the responses between interns, PGs and junior doctors for suggestions on expected pharmacology curriculum

‡ No statistically significant difference was observed between interns, PGs and junior doctors with respect to the scores recorded for all suggestions ($P>0.05$)

Commercial motives, rather than the educational aspects of drug promotional literatures, tend to adversely influence the medical graduates [4].

The participants agreed for the need to be appropriately trained about the critical evaluation of the drug promotion literature. A majority of them felt the need to include newer devices which are used for drug administration such as nebulizers, metered dose inhalers, insulin pumps, etc., in the undergraduate exercises.

One important factor for poor patient compliance was the high cost of drugs, especially for chronic diseases. Many participants concurred that the undergraduate teaching of pharmacoeconomics was an important consideration in the present scenario, which would help them choose the drugs based on their efficacy, safety, suitability, and costs [5].

Prescribing for special risk groups was another aspect which the participants wanted to be included as an exercise. Presently, the prescription writing exercise tends to be only deskwork for a few common diseases and does not always reflect the factual reality of drug prescribing.

Medical students should be trained in adverse drug reaction monitoring and reporting. It inculcates the discipline of attentive scientific observation and the recording and reporting of adverse drug events, even in their future clinical practice.

The participants felt the need for a hospital-based and real patient-based learning of practical pharmacology. This exposes the students to the practical realities of the application of pharmacology knowledge in patient care [6].

Attempts to simulate clinically oriented learning by introducing structured problem-based learning (PBL) tend to become stereotyped and fixed with little variation. Context learning is found to be more successful and effective than sequential learning, wherein learning and the application of knowledge are separated [7].

The suggestions on introducing practical pharmacology, such as taking the drug history, writing the medication chart, calculating

the drug dose for a given patient, observing the effect of the drug-drug interactions and the drugs which are used in the casualty, etc., would overcome the abovementioned lacunae. These exercises will be more dynamic, novel, interesting and interactive. Bedside learning and real patient-based learning creates open unstructured questions, thus involving the active participation of both the teachers and the students. It will sustain interest, enthusiasm and curiosity to observe the outcome of each exercise. The participants felt the necessity for such a bedside and real patient-based learning of the pharmacology practicals.

During the clinical postings, emphasis is laid on teaching the diagnostic reasoning of the disease (history taking, observing the signs and symptoms, etc) rather than therapeutic reasoning and prescribing. A necessity for clinical pharmacology to be taught along with other clinical subjects was expressed by the participants.

These responses indicate that in addition to teaching pharmacology in the MBBS phase II courses, there is a need to include the teaching of clinical pharmacology in the MBBS Phase III courses, to hone the therapeutic reasoning and the rational prescribing skills of the students.

In addition to the necessity for changing the present pharmacology curriculum, the present survey shows the nature and extent of the changes which are expected in the clinical application of pharmacology knowledge by the junior doctors.

In conclusion, pharmacology teaching and learning must be need based, to optimize the effectiveness of the clinical service by the future doctors.

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AUTHORS:

1. Dr. VASUNDARA K
2. Dr. PUNDARIKAKSHA H P
3. Dr. VIJENDRA R
4. Dr. GIRISH K
5. Dr. JYOTHI R
6. Dr. SRINIVASA P

NAME OF DEPARTMENT(S) / INSTITUTION(S) TO WHICH THE WORK IS ATTRIBUTED:

Dept of Pharmacology, Kempegowda Institute of Medical Sciences, Bangalore

NAME, ADDRESS, TELEPHONE, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Vasundara Krishnaiah, M.D., 1137, 13th Cross, Chandra Layout 1st Stage 1st Phase (Near Siddaganga Public School) Bangalore – 560 040

E-mail address: vasundarakrishnaiah@yahoo.co.in

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