

## Research Article

# ATTITUDE OF INTERNS AND STUDENTS ON TEACHING AND LEARNING METHODOLOGIES IN PHARMACOLOGY

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### ABSTRACT

**Objectives:** To assess the attitude of interns and students on teaching and learning methodologies in pharmacology.

**Materials and Methods:** Predesigned questionnaire was modified and validated.50 interns & 50 students were randomly approached and included .Data was analyzed using SPSS 16.

**Results:** 68% considered pharmacology to be of average interest. The subject was rated practically important by 50% participants. Interns found cardiovascular (18) pharmacology in theory interesting while students felt autonomic (19) pharmacology the most interesting. ( $p=0.003$ ).Both groups (45%) felt that cardiovascular pharmacology most useful during practice. Prescription writing was the most interesting & useful practical for both groups.46% resorted to combination of resources for learning and 44% did referencing only for seminars. 59% learned only for tests and exams. 41% learned by understanding and 64% preferred studying the subject single.

Patient Oriented Problem Solving (POPS was the most interesting teaching methods for interns while Audio-visual aided lectures for students ( $p=0.044$ ).47% preferred LCD aided lectures.44% considered short frequent test as good evaluation method.

37% felt there should be orientation classes during internship and 32% needed regular lectures on drug therapy even after second MBBS.

**Conclusion:** Better focus on teaching pharmacology with clinical correlation with inclusion of practically important topics will create interest and better understanding of the subject.

**Keywords:** feedback; pharmacology; teaching and learning

### INTRODUCTION

Pharmacology is an important subject, the knowledge which the doctors will require throughout their practicing life. It is included in the third, fourth and fifth semesters of the Bachelor of Medicine and Bachelor of Surgery (MBBS) curriculum in India. Over years the traditional teaching methods have been questioned, feedbacks analysed and newer non traditional approaches to teaching pharmacology have evolved in many medical colleges .These non traditional method like the Patient Oriented Problem Solving(POPS), Problem Based Learning(PBL),Computer Assisted Learning (CAL) are an approach to teach and learn pharmacology with an applied clinical perspective and inculcate the students with enthusiasm to learn pharmacology rather than mugging up.

Feedbacks enhance learning and provide us with an opportunity to assess the lacunae in our current system and this continuous process of repair and reforms is an essential platform to bring out the changes which would match the need of the hour. This study was done to assess the attitude of interns & students on teaching and learning methodologies and curriculum in pharmacology.

## MATERIALS AND METHODS

This was a cross sectional study conducted in a tertiary care teaching hospital. In all there were 100 participants who were randomly selected. 50 students who just completed the pharmacology university examinations and 50 interns who had learned pharmacology from the same institution were included in the study. Written informed consent was taken from each participant regarding the willingness to be a part of this study and data was collected by the investigator personally. A pre-validated questionnaire adapted from previous studies<sup>[1]</sup> was used as the tool after some modifications. The data was entered in the excel sheet and analysed using the SPSS 16 software. Descriptive statistics was used to express the data and chi square tests were used to compare non categorical variables.

## RESULTS

Out of the 100 participants 60 were males and 40 females making a M: F ratio of 3:2. Around 62% of the participants had heard of Pharmacology before they entered the third semester. Even though 68% of the participants had only an average interest in Pharmacology 50% considered the subject to be practically important throughout their life.

Amongst the topics of interest in both groups, as shown in Table 1, 33% found the topics of Cardio Vascular System (CVS) to be the most interesting. There was significant difference in the rating of the most interesting subjects in the two groups with chi square value 19.57,  $p=0.003$ . While the interns found cardiovascular(18),general(10) and endocrine pharmacology(9) in theory interesting the students felt autonomic(19),cardiovascular(15) and chemotherapy(5) interesting. Both groups felt that CVS pharmacology 45% (interns21, students24) was the most useful topic learnt that could be put into practice during internship. Prescription writing was found to be the most useful 42% (interns 21, students 21) and interesting 59% (interns 30, students 29) exercise done during the practicals.

Around 46% (interns 21, students 25) used combinations of textbooks, notes and internet for studying as shown in Table 2. While 44% (interns 21, students 23) did referencing only for seminars, 38 % (interns 16, students 12) did it for gaining knowledge. Even though 59% (interns 28, students31) studied only for tests or exams and 24% (interns13,students 11) regularly for passing exams and 17%(interns 9,students 8) for gaining knowledge it is noteworthy that ,41%(interns18, students23) tried to learn by understanding and 37% (interns 19, students 18) tried to learn by knowing the concepts in depth. Majority 64% (interns30, students34) preferred studying pharmacology alone than do combined study.

Though audiovisual aided lectures and POPS topped the most interesting teaching methods both being 26% as shown in table 3 there was significant differences in either groups preferences with a chi square value of 13.34 and  $p=0.044$ .While the interns thought POPS to be the best the students thought that the audiovisual aided lectures were the most interesting. 47% (interns23, students24) felt that the use of Liquid Crystal Display (LCD) was the best teaching aid. There was a request for Integrated teaching in important topics by 59% (interns 29, students 30). When asked to choose between group discussions, case study and treatment discussions and quiz 75%(interns 42,students33) opted case study and treatment discussions over the others.

Amongst the evaluation methods 44% (interns17, students27) opined that there should be more short frequent tests at the end of a few chapters. While the interns had a higher preference for post seminar tests 17,the students wanted more POPS related tests13,making a significant difference in the preference of evaluation methods with chi square value of 10.45, $p=0.034$

The only significant difference regarding curriculum revision in theory was that double the number of students (22 ) opined incorporation of pharmacogenomics as a major topic against 11 interns,  $p=0.03$ . In the practicals 31 students suggested the incorporation of simple toxicological tests against 19 interns with  $p=0.014$ . While 37% participants opined that there should be orientation classes before internship 32% felt that pharmacotherapeutics should be continuously taught even in the third MBBS.

**Table 1: Theory Topics and Practical of interest and usefulness**

	Topics	Interest			Usefulness			
		Intern(n=50)	Student(n=50)	Total	Intern(n=50)	Student(n=50)	Total	
Theory	General	10	3	13	11	3	14	
	Autonomic	4	19	23	5	10	15	
	Cardiovascular	18	15	33	21	24	45	
	Neurology	1	3	4	2	0	2	
	Endocrinology	9	2	11	1	2	3	
	Chemotherapy	6	5	11	8	8	16	
	None	2	3	5	2	3	5	
	Practicals	Drug interactions	14	18	32	14	14	28
		Experimental charts	2	2	4	4	5	9
Prescription writing		30	29	59	21	21	42	
Others		4	1	5	11	10	21	

**Table 2: Learning Methodologies of Preference**

		Intern(n=50)	Student(n=50)	Total
Material	Text	20	18	38
	Teacher's class notes	6	4	10
	Internet	3	3	6
	Combinations	21	25	46
Referencing	Gaining knowledge	16	12	38
	interest	3	1	4
	seminars	21	23	44
	Never	10	14	24
Pattern	Regular for knowledge	9	8	17
	Regular for passing	13	11	24
	Only for tests/exams	28	31	59
Pattern	Single	30	34	64
	Combined	20	16	36
Method	Understanding	18	23	41
	Concept oriented	19	18	37
	By heart	11	7	28
	Never learn	2	2	4

**Table 3: Teaching Methodologies of Interest**

		Intern(n=50)	Student(n=50)	Total
Method	Lectures	9	7	16
	Interactive classes	10	5	15
	Audiovisual aided lectures	7	19	26
	POPS discussion	15	11	26
	MCQ based teaching	7	2	9
	Seminars	2	6	8
Teaching Aid	Chalk and Talk	14	22	36
	LCD	23	24	47
	OHP	13	4	17
Integrated Teaching	No	3	3	6
	Only for important topics	29	30	59
	All topics	18	17	35
Pharmacology After 2 <sup>nd</sup> MBBS	Regular Pharmacotherapeutics classes in 3 <sup>rd</sup> MBBS			32
	Few lectures on recent advances			23
	Orientation course during internship			37
	Enough Pharmacology			8

**DISCUSSION**

Pharmacology an ever-changing ever expanding applied science is one amongst the most covetable bundle of knowledge a clinician should attain. Undergraduate pharmacology in the MBBS curriculum is incorporated with the prime intention of sensitizing the students to the wide world of drugs and to equip them to utilize this knowledge in a rational way during their clinical practice. The concepts of teaching methodologies and evaluation methods need to be kept under continuous review.<sup>[2]</sup> It is accepted that the feedback from the students serves as an effective tool in developing teaching methodology and evaluation methodology.<sup>[3,4]</sup>

There have been many studies that have assessed the feedbacks of the students alone<sup>[1,2,3,5]</sup> as well as interns alone<sup>[4,6,7]</sup> but till date there has been no publications comparing the feedbacks of the two groups. In this study we can see that the results are similar to many

previous studies with regards to knowledge about what pharmacology is all about and interest in the subject. But around one third students had never heard of pharmacology when they reached the second MBBS necessitating the requisite for subject orientation programmes before the students enter into medical education.

Like in other studies in overall CVS pharmacology was the most interesting and useful topic but we can see that the students found the topics related to ANS to be the most interesting. This might be attributed to the fact that the pharmacology teachers give special emphasis on the ANS topics and stress their importance over and over again during the theory classes and majority of the practical discussions in the experimental pharmacology are related to ANS.

Both the groups thought that prescription writing was the most useful and interesting practicals in pharmacology. There are some studies that point out that teaching and learning to prescribe rationally should be an important part of clinical pharmacology training.<sup>[8, 9]</sup> We conduct lectures on rational prescribing and provide practical trainings during the undergraduate period and the KUHS (Kerala University of Health Science) have strictly incorporated rational prescribing training sessions in the orientation classes for the interns as well.

As in other studies here also students preferred to study the subject alone with the help of a combination of text books, class notes, self preparatory notes and the internet. The internet usage has increased as the technological advancements have brought knowledge in the finger tips but the students need to be cautioned against the unreliability of certain websites and they should be made aware that the first source of knowledge should be the text books suggested by the Universities. Even though majority of the students resorted to learning only during exams and did referencing only for seminars they tried to understand and learn the subject rather than cramming.

While LCD topped the teaching aids, in the teaching methods audiovisual aided interactive lectures was preferred by the students while the interns suggested that POPS were better and clinical case studies and discussion should be the most effective teaching method. A study done comparing audiovisual aided lectures with POPS concluded that either were equally useful and comparable.<sup>[10]</sup> Another study points out that POPS can be incorporated along with audiovisual aids to break the monotony of dialectic lectures and as alternative to problem based learning.<sup>[11]</sup> Either groups agreed on the fact that case based discussions should be incorporated more as preferred to conducting group discussions or quiz and short frequent tests should be given for fostering learning and formative evaluation.

The one important curriculum revision suggestion difference was that the students felt that pharmacogenomics should be more incorporated in the teaching hours. Either groups agreed with same interests in recent advances in pharmacology and special topics like pediatric and geriatric pharmacology. In the practicals the students wished to incorporate simple toxicological tests too while majority of the interns didn't want this. Over the past few years the pharmacology curriculum has undergone major revisions in theory with inclusion of more clinical pharmacology hours in clinical trials, ethics, informed consent and more emphasis to special topics like use of drugs in special situations (pregnancy, elderly, liver and kidney diseases etc) while in practicals animal experiments have been replaced by Computer Assisted Learning and experimental charts; more of clinical pharmacology exercises like Adverse Drug Reaction Reporting, POPS based learning, Critical appraisal of literature have been introduced and unwanted pharmacy exercises excluded while retaining important pharmacy practicals like the preparation of Oral rehydration salt or the Normal Saline. Simultaneous reforms in other subjects and educational research will help in finding out the success of these interventions.<sup>[12]</sup>

## CONCLUSION

The feedback suggests that better focus on teaching pharmacology with clinical correlation with inclusion of practically important topics will create more interest and better understanding of the subject. Minor curriculum revisions are required and evaluations need to be continuous and formative. More long term studies are required to find out the impact of the modifications implemented through the feedbacks.

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