Teaching Pharmacology at a Nepalese Medical School: The Student Perspective

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RESEARCH

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Background
KIST Medical College, Lalitpur, Nepal conducts problem-based pharmacology learning during small-group practical sessions. The present study was carried out to obtain student feedback regarding the sessions and suggestions for improvement.

Method
The questionnaire-based study was carried out among first year medical students during July 2009. Respondents were enrolled after explaining the aims and objectives of the study and obtaining written, informed consent. Basic demographic information and student agreement with a set of 30 statements using a modified Likert-type scale was noted.

Results
Sixty-four of the 75 students (86%) participated. The median total score was 107 (maximum score 150) and was higher among males, students from within the Kathmandu valley and self-financing students. The differences were not statistically significant. The suggestions for improvement were improving the physical infrastructure of the lab and providing more time for the practical exercises.

Conclusion
Student opinion was favourable. The findings would be of interest to medical educators especially in developing countries.

Key Words
Feedback, Nepal, P-drugs, Pharmacology, Prescribing

Background

Teaching medical students to choose and prescribe drugs in a scientifically sound, safe and effective manner is a major challenge for medical schools [1]. Solving problems in therapeutics, prescribing appropriate drugs for a disease condition and delivering drug- and disease-related information in a meaningful way to patients should be regarded as key 'transferable skills' in Pharmacology [2]. Implementing problem-based training in pharmacotherapy in undergraduate medical education based on national standard treatment guidelines has been recommended as an important intervention to improve prescribing [3]. Concern has been raised that traditional pharmacology teaching focuses on memorizing information about medicines and does not adequately equip students with the skills necessary for rational therapeutics [4].

A number of initiatives have been carried out to improve the teaching of Pharmacology and Therapeutics. In China the present day pharmacology course consists of a combination of lectures, problem-based learning sessions, clinic-correlated lectures, and small group discussions [5]. In Malaysia, the teaching-learning of pharmacology has gradually moved from factual regurgitation to more clinical reasoning, from lab-based to more patient-oriented approach [6]. At the McMaster University in Canada the problem-based learning (PBL) curriculum is integrated across organ systems, spanning population- and behavior-related perspectives, rather than being based on discrete disciplinary areas [7].

In Nepal, pharmacology is taught in an integrated, organ-system based manner during the first two years of the undergraduate medical (MBBS) course. At the Manipal College of Medical Sciences (MCOMS), Pokhara, Nepal analyzing prescriptions using drug use indicators, evaluating drug advertisements, critical analysis of journal articles, selection of personal drugs for disease conditions, writing prescriptions and conveying information to the patient are some of the educational activities carried out during the practical sessions in Pharmacology [8]. KIST Medical College (KISTMC) is a new medical school in Lalitpur district of Nepal.

At KISTMC, the department of Pharmacology is committed to teaching students use essential medicines rationally. The pharmacology practical sessions are

carried out in small groups. Students learn about various aspects of essential medicines, analyze prescribing using World Health Organization/International Network for Rational Use of Drugs (WHO/INRUD) prescribing indicators, select P-drug for a particular disease condition, verify the suitability of the selected P-drug for a particular patient, write the prescription and communicate about non-drug and drug measures to manage the condition with a simulated patient. Students critically analyze drug advertisements and other promotional materials, solve clinical problems, learn to optimize time spent with medical representatives and become familiar with sources of drug information and the national pharmacovigilance program.

Pharmacology practical sessions are conducted each week and each practical group consists of 37 or 38 students. Each group is subdivided into five small groups consisting of seven or eight students [9]. The session starts with a brief introduction and statement of learning objectives by the facilitators. The topic of the session is briefly introduced and then tasks are distributed to the various small groups. Each small group has a group leader, a time keeper, a recorder and a presenter and these roles are rotated among the team members [9]. The facilitators help with the group dynamics and do not usually provide factual information. The students get about an hour for group work and then present their findings. After the presentation by each group there is a discussion before going on to the other group's presentation. Facilitators provide inputs where required. In the end two students summarize the session and provide 'Take home' messages. The assignments to be completed and the next week's topic are announced at the end. About 25 practical sessions were conducted for the first year students.

The present study was carried out at the end of the practical sessions in Pharmacology. The objectives were:

a) To obtain student feedback on the practical sessions in Pharmacology conducted over the previous year
b) Explore the relationship if any, between perception about the session and personal characteristics of the respondents and
c) Obtain suggestions for further improving the sessions.

Method

The descriptive cross-sectional study was carried out among first year medical students at KISTMC during the month of July 2009. The students had just completed their first year Pharmacology practical sessions. The students were explained the aims and objectives of the study and were invited to participate. The study was approved by the Academic Committee of the institution. Written informed consent was obtained from all study participants.

Student feedback was obtained using a questionnaire administered in English, the medium of instruction. The native language of the students was not English but most students were educated in English medium schools where the different school subjects are taught in English. The questionnaire was pretested for readability and ease of understanding among three office assistants of KISTMC. The authors met repeatedly to discuss and modify the questionnaire. Basic demographic information like gender, ethnic or caste group, native place, method of financing of medical education and occupation of parents were noted. Student feedback about the sessions was obtained using a set of thirty statements which covered various aspects of the practical course. To avoid bias certain statements were negative. The student denoted their degree of agreement with each of the statements using a modified Likert-type scale. The respondents were also asked two things they enjoyed most about the sessions, two things they disliked most, which activities they enjoyed the most and two suggestions to further improve the sessions in future.

The data was analyzed using SPSS 13.0 for Windows. The median total score and the interquartile range were calculated. The scores of the negative statements were reversed while calculating the total score. The median scores and interquartile range of individual statements were also calculated. The median total scores were compared among various subgroups of respondents using appropriate non-parametric tests. Mann-Whitney U test was used for dichotomous variables and Kruskal Wallis test for the others. A p value less than 0.05 was taken as statistically significant. The free text comments were grouped together and common comments noted.

Results

Sixty four of the total of 75 students (86%) participated. Forty-two students were male and the remaining were females. All students were Nepalese. Table 1 shows the demographic characteristics of the respondents. Brahmins, Chhetris and Newars were the dominant caste/ethnic group, a large percentage of students were from the Kathmandu valley and service was the occupation of a large number of parents/guardians.

The median total score was 107 (maximum possible score 150). The interquartile range was 12. Table 2 shows the median scores and interquartile range of various individual statements. The scores of certain statements were low. Students were of the opinion that a medical representative is a doctor's best friend, were equivocal about aggressive pharmaceutical promotion being a major issue in Nepal and about the case scenarios used during the sessions. They were also not happy with the arrangement of the pharmacology lab and were neutral about summing up the session by a student in the end. They wanted the groups to be rotated at frequent intervals and felt the time allotted for the sessions were inadequate.

Table 3 shows the median total scores among different subgroups of respondents. The median total score was higher among males, Chhetris and Newars, students from within the Kathmandu valley and self-financing students. The differences were however, not statistically significant.

Table 4 shows the common comments of the respondents. The two things most respondents liked about the sessions were 'The use of problem-based learning' and 'The sessions were very useful in developing confidence and team work'. The two things they disliked most were the lab arrangements and lack of sufficient time for carrying out the different activities. The respondents enjoyed the communication skills and role-plays and presentation of the given tasks before the larger group. The suggestions to improve the sessions concentrated on improving the physical infrastructure of the lab and providing more time for the practical exercises.

Discussion

The overall participant feedback about the practical sessions in pharmacology was positive. The scores of certain statements were low. Students were equivocal about the case scenarios used and were not happy with the arrangement of the pharmacology laboratory. There were no statistically significant differences in the total score among different categories of respondents. The students liked the use of problem-based learning during the sessions but were unhappy about the lab arrangements and required more infrastructure and resources.

The college follows a hybrid approach of lectures and small group practical sessions to teaching pharmacology. The practical sessions are held for two hours every week usually from two to four in the afternoon. The first author had previously conducted PSL sessions in Pharmacology at MCOMS, Pokhara. Certain innovations in the sessions have been carried out compared to MCOMS. The students are seated comfortably around a table and present their discussions and findings using a flip chart and whiteboard. More resources are available including CD-ROMs and softwares on the computer. Facilities for conducting experiments on the computer using various CAL programs and sharing the same with the practical group are available. The LCD projector is used to link together various parts of the session. Lesson plans are prepared before each session and printouts of problems and activities are distributed to the groups. The exercise on P-drug selection was started from the first year of the course and emphasis is laid on verifying the suitability of the selected P-drug for a particular patient and communicating drug and non-drug information to a simulated patient.

The WHO books 'Guide to good prescribing', 'Ethical criteria for medicinal drug promotion' and 'How to investigate drug use in health facilities' were recommended for practical sessions. All students have printed copies of these books. Formative assessment of different student groups was carried out during each session. The students also assessed the facilitators and the session periodically. The 'WHO Medicines Bookshelf', a CD with links to various WHO publications was provided to the students for installation on their computers. The facilitators used to meet every week to review the previous week's session and prepare for the coming week's practical.

The number of male students was more and Brahmins, Chhetris and Newars were the major groups. These are the socially and economically advanced groups in Nepal and well represented in education. Also the college is in the Kathmandu valley, the traditional home land of the Newars. The students agreed with the statement about a medical representative being the doctor's best friend. We have been teaching about pharmaceutical promotion throughout the sessions and this statement raises concerns about the effectiveness and impact of our efforts. The students were equivocal about aggressive promotion being a major issue in Nepal. Promotion is mainly concentrated in urban areas and may not be characteristic of the whole country.

During the inaugural session we had an activity of randomly pairing two students. Each student would talk to his/her partner for around 5 minutes and then introduce him/her to the larger group under predefined criteria. This technique is often used in adult learning sessions to familiarize the participants with each other and the course. The students were equivocal about this activity. They were also not completely happy with the case scenarios used. We are trying to obtain their detailed feedback and plan to modify the scenarios, if required. The arrangement of the Pharmacology lab was a problem with many participants. We are trying to work with the college administration to improve the infrastructure in the labs. We had kept the small groups constant throughout the year believing this will facilitate group dynamics. The students were not happy with this arrangement and had mentioned that sometimes, certain group members were not contributing enough to the group work. Measuring drug use in health facilities using WHO/INRUD indicators was an activity the students carried out. These indicators are mainly used for measuring drug use in primary care. We had discussed how these indicators could be used in other levels of care and even in private practice but the students do not seem to be fully convinced about the usefulness of the exercise. We plan to re look this exercise and modify it, if required to make it more relevant and interesting to the students.

The self-financing students had a higher score compared to the scholarship students. The number of scholarship students was low (8 out of 75) and being stronger academically they may have had higher expectations from the sessions. We plan to investigate this further. The students enjoyed solving clinical problems using their knowledge of medicines and pharmacology. Students attend clinical teaching sessions in the hospital every Wednesday morning. Prescribing skills is becoming increasingly important and the discipline of Clinical Pharmacology and Therapeutics plays an important role in the development of prescribing skills by undergraduate medical students [10]. The department follows the methodology described in the 'Guide to good prescribing' and 'Teacher's guide to good prescribing' for selecting P-drugs, verifying their suitability for individual patients and for rational prescribing. For selecting P-drugs we follow

the method described by Joshi and Jayawickramarajah [11]. A similar method of P-drug selection was used at MCOMS, Pokhara [12]. The four criteria of efficacy, safety, cost and convenience are used for selection and the method is a modification of that described in the 'Guide to good prescribing'.

Students complained about inadequate time for the activities. We are considering increasing the time allotted for the sessions by 15 minutes. We are discussing with the management to purchase more books and install more computers in the lab. The seating arrangements and physical infrastructure of the lab are also being discussed as stated previously. The students were of the opinion that using the CAL CD and carrying out experiments on the computer had helped them learn autonomic pharmacology. CAL software had been used to demonstrate action of drugs in animal tissues [13].

Our study had limitations. The opinions were collected only from a single batch of students. Response was collected using a questionnaire and was not triangulated with information from other sources. The questionnaire used was pretested among office staff of Pharmacology and other departments for readability and ease of understanding. Detailed analysis was not carried out. Certain respondents did not fill in all the required demographic information.

Conclusion

Thus student opinion about the practical sessions was favourable. The authors have shown that it is possible to conduct a problem-based pharmacology session in a resource limited setting in a developing country. The department has started the sessions right from the first batch of students. We believe our experiences with the module would be of interest to medical educators especially in developing countries. We plan to investigate the problems noted and examine the suggestions for improvement mentioned by the students. We plan to continue and develop these sessions in future.

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PEER REVIEW

Not commissioned, externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests

Figures and Tables

Table 1: Demographic characteristics of the respondents

Characteristic		Number (percentage)*
Gender	Male	42 (60.9%)
	Female	22 (31.9%)
Ethnic/caste group	Brahmin	16 (23.2%)
	Chettri	12 (17.4%)
	Newar	10 (14.5%)
	Others	20 (29%)
Native place	Kathmandu valley	30 (43.5%)
	Other towns	12 (17.4%)
	Villages	17 (24.6%)
Financing	Scholarship	8 (11%)
	Self-financing	50 (67%)
Occupation of parents	Doctors	4 (5.8%)
	Service	31 (44.9%)
	Business	13 (18.8%)
	Farmers	3 (4.3%)
	Others	2 (2.9%)

* The numbers may not add up to 75 and the percentages to 100 because of missing values

Table 2: Median scores and interquartile range of individual statements

Statement number	Median score (interquartile range)
1. The practical sessions in Pharmacology emphasize using essential medicines rationally.	4 (1)
2. The videos about essential medicines shown will be of importance to me.	4 (1)
3. The medical representative is the doctor's best friend. .*	2 (2)
4. Essential medicines and primary health care are topics of vital importance to Nepal.	5 (1)
5. Aggressive pharmaceutical promotion is not a major issue in Nepal. .*	3 (1)
6. I especially liked the idea of talking to one's partner for 5 minutes and then introducing him/her (inaugural session).	3 (1)
7. Selection of Personal (P) drugs on the basis of objective criteria is an important skill for a future doctor.	5 (1)
8. I plan to make a list of P-drugs for common diseases I am likely to encounter in practice.	4 (1)
9. Learning the skill of counseling patients about drug and non-drug measures is important.	5 (1)
10. I am confident of being able to objectively assess the information presented by pharmaceutical companies.	4 (1)
11. The case scenarios used during the sessions were not up to the mark.*	3 (1)
12. I enjoyed solving the clinical problems given during the sessions.	4 (0)
13. The arrangement of the Pharmacology lab was to my satisfaction.	3 (1.5)
14. The facilitators fulfilled their role effectively.	4 (1)
15. Session feedback should have been taken for all sessions.*	2 (1)
16. Summing up of the session by students was not useful.*	3 (1)
17. Flip charts are an excellent medium for presenting group activities.	4 (0)

18. The group dynamics during the session was to my satisfaction.	4 (1)
19. Keeping the groups constant throughout the year was not a good idea.*	2 (2.5)
20. The time allotted for the session was sufficient.	3 (1.5)
21. Carrying out experiments using the CAL programme helped me to learn autonomic pharmacology.	4 (1)
22. The publications by the World Health Organization used during the sessions were useful.	4 (0)
23. I am familiar with the WHO Medicines Bookshelf.	3 (1)
24. 'The guide to good prescribing' is an excellent book to learn the principles of rational use of medicines.	4 (0)
25. The Nepal Drug Review was not very useful to know about the availability of medicines in Nepal.*	3 (1)
26. The facilitators used PowerPoint slides intelligently to link together various aspects of the presentation.	4 (1)
27. The activities were interesting and informative.	4 (0)
28. I enjoyed taking more responsibility for my own learning.	4 (1)
29. The session on investigating drug use using WHO/INRUD indicators will not be useful in my future practice.*	3 (1)
30. I would like similar sessions in future.	4 (1)

* The statement was negative and the reversed score is shown in the table

Table 3: Median total scores among various subgroups of respondents

Characteristic		Median total score	P value
Gender	Male	108	0.533
	Female	106.5	
Ethnic/caste group	Brahmin	103	0.283
	Chettri	109.5	
	Newar	109	
	Others	108	
Native place	Kathmandu valley	109	0.268
	Other towns	105.5	
	Villages	105	
Financing	Scholarship	101	0.058
	Self-financing	108	
Occupation of parents	Doctors	108	0.694
	Service	109	
	Business	108	
	Farmers	107	
	Others	98	

Table 4: Common comments of the student respondents

Comments	Number of respondents
Two things respondents liked most about the sessions	
The sessions were very useful in developing confidence & promoting group work	28
Use of flip charts for presentation, use of CAL program	20
Use of problem-based learning techniques in the session	12
Solving clinical problems using knowledge of medicines	8
Two things respondents disliked most about the sessions	
Arrangement of the lab	17
Inadequate time for group work	8
Inadequate books and infrastructure	5
Same schedule and similar kind of activities	5
Activity respondents enjoyed most	
Communicating with simulated patients	26
Presentation of activity to the larger group	13
Searching answers to questions	7
Group discussions	6
Two suggestions to further improve the sessions in future	
Better ventilation & infrastructure in the lab	10
Allotment of more time for the session	9
More energy and dynamism among the participants	7
Better seating arrangements & better visibility of flip boards	4