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Conducting Problem-Stimulated Learning In A Nepalese Medical School

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The problem-based learning of Pharmacology and Therapeutics has been recommended as a key intervention towards promoting the more rational use of medicines [1]. Problem stimulated learning (PSL) sessions in Pharmacology had been conducted at the Manipal College of Medical Sciences, Pokhara, Nepal [2]. In this manuscript, the authors describe the initial experiences with problem-stimulated learning in Pharmacology in a new Nepalese medical school.

KIST Medical College

KIST Medical College is a new medical school in Lalitpur, Nepal, which is committed to excellence in holistic healthcare, education and research. The college admits 75 students to the MBBS course every year on the first of the Nepalese month of Magh (around mid-November). The department of Clinical Pharmacology and Therapeutics has the vision of creating doctors who can use essential medicines rationally and to inculcate in them the capacity to keep up to date with new developments in medicine and therapeutics. This department collaborates with the department of Medicine for achieving these objectives. PSL sessions were started right from the beginning and their aim is to develop in students, the capacity for self-directed learning, problem solving and working together in small groups.

In Nepal, Pharmacology is taught during the first two years of the undergraduate medical (MBBS) course in an integrated, organized, system based manner with other basic science subjects.

Comfortable Working Environment

Creating a comfortable 'working' environment for the students was vital. Students were divided into two batches (each of around 37 students) for the Pharmacology PSL sessions. Each batch was further divided into five groups, each containing 7 or 8 students. The groups worked around an oval table (6 feet by 2 feet). Seating was provided in the form of plastic armless chairs which could be rotated and moved around freely. Chairs with arms were not used as these would occupy too much space and the arms could create a barrier between the group members. The sessions are usually held on Thursday and Friday afternoon for the two batches from 2 pm to 4 pm.

The Groups

We decided to keep the groups constant for a year in order to facilitate group dynamics. Each group had been named after an eminent scientist or personality in Medicine/Pharmacology. The group names are Oslers (after Sir William Osler, the famous Canadian physician), Lasagnas (after Louis Lasagna, the American Clinical pharmacologist), Paracelsians (after Paracelsus), Abels (after John Abel, the father of American pharmacology) and Ehrlich (after Paul Ehrlich, the father of chemotherapy). The group name was prominently displayed on the work table along with the names of the group members. At the beginning of the year, each group had to prepare a biographical sketch of their 'group scientist'. These write ups were prominently displayed in the lab. We believe that this helped to create a sense of identification

and belonging among the group members. They also felt pride in their group being named after a prominent scientist.

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Introduction

Introduction of the student participants and the facilitators was done during the inaugural session after dividing them into pairs. Each member introduced his/her partner under certain predefined headings. The introduction statements along with a photograph of all students and facilitators were grouped together according to their interests and hobbies and were displayed as a collection titled 'Meet our gallery of experts'.

The 'walls'

The arrangement of the laboratory (where the sessions were conducted) was also crucial. We concentrated on not having bare walls and on affixing posters, drug information sheets and other interesting and informative material. The National Prescribing Service of Australia, Health Action International and the World Health Organization (WHO) helped us with the necessary materials. The department also provided pharmaceutical (medicine) care services in the hospital and the various forms, counseling aids and promotional materials were also displayed in the laboratory.

Designing The Sessions

The team members spent considerable time thinking and discussing about what should be the key learning objectives and how these could be achieved. The member from the department of Medicine contributed a clinical perspective to the deliberations. Training sessions for facilitators were conducted by the first author who had experience of facilitating PSL sessions. Role-plays, case scenarios, problems, activities, discussions, plenary sessions, simulations and videos are used as learning modalities to make the sessions interesting and informative.

A 'Safe' Environment

The students had to be motivated to take greater ownership and responsibility for the learning process. An environment where they could take risks, make mistakes and not be criticized for these had to be created. We decided not to create an artificial 'divide' between the facilitators and the students and decided on the same seating arrangement (plastic chairs) for everyone. The group decided not to have a designated teaching area or 'facilitator space' towards which the students would look for answers/solutions. We had a white board at one end of the room which was also occasionally used as a projection screen and two flip boards distributed at different locations which could double up as whiteboards. There was also an alternate projection area (a blank white wall) for simulations and movies. There was a small central table with chairs for role-plays and a bench which could be used for scenarios requiring a supine patient. Two other small tables were distributed at different corners of the room for use by the facilitators.

The Group Process

Instructions on group work prepared by the facilitators were pasted on each table. Each group has to select a team leader, a recorder, a presenter and a time keeper and the roles were rotated during different sessions. For keeping the sessions on time, a big wall clock was prominently displayed in the laboratory. The students generally prepared and presented their group work using flip charts.

Topics And Lesson Plans

[Table/Fig 1] shows the topics covered during different first year Pharmacology practical sessions. The final lesson plans for each session were prepared around a week in advance. The learning objectives and the time line for various activities are finalized after discussions and deliberations. The activities, problems and the scenario were the result of intense intellectual efforts and were crucial in facilitating student learning.

(Table/Fig 1) Pharmacology PSL sessions during the first year of the MBBS course

General concepts & antimicrobials

1. Social issues in use of medicines
2. Dosage forms & routes of administration
3. Introduction to Prescription writing
4. Pharmaceutical promotion
5. Pharmaceutical calculations
6. Essential medicines, P-drug concept
7. ADR monitoring & Pharmacovigilance
8. Prescription writing, clinical problem antimicrobials
9. Analysis of rationality of prescriptions
10. Malaria- communication skills, Clinical problems
11. Communication skills, P-drug selection
12. P-drug selection (Antimicrobials)

Neurosensory

13. Source of drug information & Analysis of randomized, controlled trials
14. Animal experiment (Computer Aided Learning)
15. Cholinergic nervous system
16. Noradrenergic nervous system
17. Anesthetics, Alcohol
18. Sedatives and hypnotics, P-drug selection, Communication skills, case scenarios
19. Antiepileptics + Computer Aided Learning CD

Musculoskeletal

20. Opioids + Computer Aided Learning CD
21. NSAIDs
22. Gout, Rheumatoid Arthritis
23. Leprosy
24. Skin

During community diagnosis posting

25. Identification of common drug use problems in the community
26. Proposed steps for improvement

Learning Material

The department had a good collection of videos and documentaries which are shown to the students. The laboratory also had a computer on which various computer-aided learning (CAL) packages were installed. Students could conduct simulated experiments on the computer, which could be hooked up to a projector for demonstrating the experiments to the entire batch. The departmental library had a collection of books and booklets related to rational prescribing. The 'Guide to good prescribing' and the 'WHO ethical criteria for medicinal drug promotion' were used as 'textbooks' during the sessions.

Assessment And Feedback

Formative assessment of the groups was done periodically by the facilitators using a checklist shown in [Table/Fig 2]. The assessments were shared with the groups and the strengths and weaknesses discussed. The students also assessed the facilitators periodically. Session feedback was obtained periodically. The students wrote their group work on A4 sheets and after correction, put them in a ring binder. The binder contained basic information for the students about the rational use of medicines and helped them to collate and organize the material. The binder allowed greater flexibility and creativity as compared to a bound practical manual.

(Table/Fig 2) Formative group assessment during PSL sessions

Date: *Day:* *Group being assessed:*

Session topic:

Name of assessor:

The group will be assessed by the facilitators under the following headings Each of these areas will be graded from 1 to 5 (with 1 being the least and 5 being the maximum)
Enthusiasm
Energy level
Group dynamics
Group working skills
Problem solving ability
Leadership skills (for group leader)
Presentation skills (for presenter)
Constructive feedback
Focus on task
Completing tasks on time
Proper use of flip chart
Respect for group members and facilitators
Ability to synthesize information
Decision making
Creative thinking
Overall
Strengths
Areas of improvement

Text box

Implications for educators especially in other developing countries

Problem-based/problem stimulated learning is feasible in developing nations
It does not require the latest and expensive technology and costly equipments
Create a partnership with the learned
Let students take more ownership of the learning process
Train the facilitators
Use 'flip charts' (flexible, cheap and adaptable)
Arrange the working area to facilitate group work
Do not create an artificial divide between students and facilitators
Take periodic feedback from the students and try to implement feasible suggestions
Create a 'safe' environment where students can make mistakes and learn
Plan thoroughly and have detailed lesson plans for each session.

Involving students:

Each group by rotation provided a brief summary of the session activities at the end of the session. Student feedback was collected periodically and their suggestions were incorporated if feasible.

Preparing For Sessions

There were training sessions on small group dynamics for the facilitators before the students joined for the MBBS course. The facilitators would meet together at the end of each week's session to analyze what went well and assess the areas which could be improved. Before the session, they also would check the preparations using a checklist. The facilitators would usually meet on Wednesdays to finalize the methodology for the next day's session. Initially, the Thursday session would be carried out by the first author as chief facilitator, while the others acted as cofacilitators. On Fridays, one of the other authors would act as the chief facilitator and learn by doing under the guidance and support of the first author. These days, the other team members also act as facilitators.

The student feedback obtained by using a written form and during informal discussions has been positive. We plan to further develop and strengthen these sessions in future.

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